Fiscal Foundations of Monetary Regimes

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Abstract

Fiscal considerations and commitment drive the choice of monetary policy regime, especially for developing countries. I survey the fiscal foundations of price determination, and study the maximize-inflation-tax, interest rate rule, peg and currency board, and dollarization regime. Since nominal debt acts like equity for the government, the dollarization question is like the question whether a firm should choose debt vs. equity finance.

Introduction

In this paper, I draw from recent research in monetary economics to think about what monetary policy *regime* a country, and especially a smaller or less developed country, should follow.

Monetary economics is not widely perceived as an active field, but the last 10 years have seen deep changes in the field, perhaps as deep as those of any decade in the 20th century, including the decades of Irving Fisher's and Milton Friedman's seminal contributions to the quantity theory. Three big issues comprise much of the advance: First is the importance of *commitment* and *time-consistency*. Monetary policy is like Odysseus' voyage past the sirens: tying oneself to the mast is important to avoid making poor decisions later. Second, as a response to the time-consistency question, as well as in recognition of how important stable private sector expectations are to good monetary policy, monetary economists have focused on the importance of monetary policy *rules* and the nature of optimal rules, rather than analyze specific *decisions*. We ask "should interest rates respond to unemployment or stock

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prices?" rather than "should the Fed cut the funds rate another 50 basis points?" Third, *fiscal* considerations are much more important than we once thought. The "fiscal theory of the price level" puts this issue most starkly, but even traditional analyses pay much more attention to underlying fiscal constraints than they used to.

The question of monetary *regime* is more fundamental even than the question of a monetary *rule* or action. By "regime" I have in mind questions like, should a country attempt to peg an exchange rate? If so, directly or with a currency board? Should it dollarize, or Euro-ize, at least partially? Or should it float and follow an interest rate rule such as a Taylor rule? Perhaps it should return to a Gold standard? As we will see, issues of government finance are closely linked to monetary policy regime. Should the government borrow domestically or in foreign currency? What happens to the lender of last resort function in a dollarized economy?

Fiscal foundations of the price level

Fiscal dominant regimes

The price level shows up in *two* places in any well specified economic model. First, most models have either a money supply = money demand relation,

$$M_t V(r_t, \cdot) = P_t Y_t \tag{1}$$

or a Phillips curve relation, something like

$$P_t/P_{t-1} = \alpha(Y_t - \bar{Y}) \tag{2}$$

where $\bar{Y}$ is some measure of potential output or employment. (Modern "neo-Keynesian" models are usually a good deal more sophisticated than the equation I have written down, but they still describe some relation between inflation and output or other gaps.)

Second, every well-specified model also contains an equation, usually labeled (mislabeled, in my view, as I shall argue below) the Government's intertemporal budget constraint,

$$B^f_{t-1} + \frac{M_{t-1} + B_{t-1}}{P_t} = E_t \sum_{j=0}^{\infty} \delta_{t,j} s_{t+j} \tag{3}$$

$$\begin{aligned} & \text{Foreign, real or indexed debt} + \frac{\text{Nominal debt, including base money}}{\text{price level}} \\ = \; & \text{Present value of future primary surpluses} \end{aligned}$$

In the past, equation (1) or (2) determined the price level, and equation (3) followed along. Equation (3) provided directions for the treasury to raise or lower taxes so that the surplus

team s validated whatever price level P the central bank had chosen. (Many theoretical models have a sentence or two about "lump sum rebates." This is about forcing (3) to hold.)

Now, equation (3) is more important. In a "fiscal dominant regime," the governments sets primary surpluses $\{s_t\}$ exogenously, either by choice or because they are at their limits of taxing power. Equation (3) then determines the price level, while equations (1) or (2) follow along, determining either the money stock or output gaps. Even in "money-dominant" regimes with the conventional understanding of the chain of causality, limits the government faces in adjusting primary surpluses loom, and can constrain the range of options for the monetary authority.

Money as stock – corporate finance and a fiscal regime

Equation (3) is familiar with different names attached to the symbols. For a corporation,

$$\text{debt} + \#\text{shares} \times \text{price per share} = \text{present value of future earnings.} \tag{4}$$

Following this analogy, we come to a startling realization: *Nominal government debt, including the monetary base, is just like corporate equity. Real, indexed, or foreign debt is just like corporate debt.* (Price is in the numerator for the corporate equation (4), since we measure values as goods per share, while we measure the price level as dollars (shares) per good.)

What do I mean by "just like?" Suppose surpluses decline dramatically – the government runs into a time of fiscal stress. It will have to lower debt service one way or another. If the government is financed entirely by real, indexed, or foreign debt, it must explicitly default. If it is financed by nominal debt, however, inflation can raise P_t, just as a stock price decline rather than explicit default can lower the financial value of a firm whose earnings have declined.

This analogy makes clear that equation (3) has been mislabeled all these years. Equation (4) is a *valuation equation*, not a "budget constraint," and therefore so is (3). A budget constraint means that the government must choose $\{B_t^f, B_t, M_t, s_t\}$ subject to (3), after observing P_t. Yet if an irrational bubble raises Amazon.com's stock price, there is no constraint that *forces* it to raise subsequent earnings. Similarly, then, (3) does not *require* a government to raise surpluses in response to off-equilibrium deflation. Most dramatically, a firm can split its shares, with no change in surpluses, and count on the price to halve. The government can undertake a currency reform, changing money and nominal debt by a factor of a thousand with no change in surpluses, and count on the price level to change by the same factor of a thousand. Neither the government nor a firm can change its *real* debt without changing earnings or surpluses, and count on the price level to fall, just as you cannot double your demand for Porsches and count on the price to halve. The latter prohibition is how a budget constraint works. The fact that a currency reform or share split are possible shows how (3), like (4) is a valuation equation, not a budget constraint.

The practical importance of "valuation equation" is this: it is perfectly sensible to regard equation (3) as determining the price level from a given surplus process, just as we regard

equation (4) as determining stock prices from a given earnings process. This is a "fiscal dominant regime." A government with sufficient fiscal slack may *choose* the opposite causality, to adjust the surplus process so as to stabilize a price level or exchange rate, or to hand its control over to the central bank via equations (1) or (2). But this is a choice, not a constraint.

Sargent and Wallace's (1981) "Unpleasant Arithmetic" was really the first in the modern era to emphasize the link between fiscal and monetary policies. The fiscal regime analyzed here goes considerably beyond Sargent and Wallace's analysis. Sargent and Wallace saw that intractable deficits could force a government to print money for seignorage, which would cause inflation. Their analysis presumed debt was real or indexed. Here, inflation may directly devalue outstanding nominal debt. This channel continues to operate even if seingorage is trivial, or if there is no domestic monetary base. Leeper (1991) and Woodford (1995) are classic early papers in the fiscal theory. Cochrane (2001a) extends the theory to long term debt. Cochrane (2001b) discusses the equity analogy in depth and provides more extensive references.

Monetary doctrines demolished

The possibility of a fiscal dominant regime overturns many cherished doctrines of monetary economics, some in pleasing ways given real world institutions that do not conform to those doctrines. In particular, in a fiscal regime,

1. *Passive money, real bills, or interest rate pegs do not lead to indeterminate price levels.* We have long been taught that these monetary arrangements can lead to unstable or indeterminate price levels, by leaving undetermined the split between money and nominal debt. In a fiscal-dominant regime, (3) sets the price level, so all of these monetary policies can still be consistent with a determinate price level. That's a good thing too, since passive money, "providing adequate liquidity to accommodate the needs of trade" and interest pegs are widely followed, usually with results that while perhaps not always pleasant, are not the catastrophes that the conventional prediction of "indeterminate price level" would seem to imply.

2. *The price level is determinate even in a completely cashless or frictionless economy.* To a quantity theorist, the presence of some money demand is vital to price level determination. If we moved to an economy in which every transaction was accomplished by (say) electronic transfer of shares in a money market fund, the quantity equation would reduce to $0 \times \infty = P \times Y$. Equation (3) can determine the price level with *no* money M whatsoever. As many authors, most recently Friedman (1999) have pointed out, we may not be far from that limit. The traditional distinction between low interest, transactions-service-providing "money" and interest paying, illiquid "bonds" is rapidly evaporating, and remaining money demand such as that by drug dealers is delinked from the rest of the economy. Some monetarists have even called for regulation of financial innovation to assert a stable money demand curve and provide the central bank the means of price level control.

3. *Only government money (base) and debt matter. Private transactions balances (checking*

accounts, banknotes, etc.) and inside liquid assets have no effect on the price level. Quantity theory analyses have long stressed that inside transactions balances compete with base money to provide liquidity services. Thus, the Fed must control M1 or some larger aggregate, not just the base, and the Fed must offset fluctuations in the multiplier. In a fiscal dominant regime, only government B and M count on the left hand side of (3).

Observers of exchange rate movements often attribute them to changes in trader's "faith" in the governments rather than to changes in relative money growth rates, while international economists have had little quantitative success in attributing exchange rate movements to money growth rates. The fiscal dominant regime relates exchange rates (domestic vs. foreign P) precisely to such "faith" in future surpluses. Alas, the source of most stock price variation remains mysterious. It's hard to trace price movements to independent news about future cash flows or discount rates. Much exchange rate and inflation variation is also mysterious. If it is generated by the same present value formula, that is an expected, though depressing, mystery.

A fiscal- dominant regime would not *feel* any different if you lived in one. Inflation would still feel like "too much money chasing too few goods" or "too much aggregate demand." The only, subtle, difference, is that it would be too much total nominal debt chasing too few goods, and the standard would be aggregate tax payments rather than aggregate income.

An empirical example – Asia 1997

To give a sense that fiscal price determination–or at least a strong fiscal constraint on monetary policy–is not purely theoretical hot air, I quickly review Burnside, Eichenbaum and Rebelo's (2001a, 2001b) study of the 1997 East Asian Crises.

These crises posed a challenge. *Current* fiscal deficits were quite small, and there was no sign of excessive money creation, so "first generation" models that related exchange rate crises to intractable deficits seemed not to apply. A range of "sunspot," "contagion," "multiple equilibrium," or "speculative attack" models were adduced. Burnside Eichenbaum and Rebelo showed that the countries that suffered large exchange rate devaluations were countries that had very large *prospective* deficits – terms s_{t+j} in (3)– and (just as importantly) that nearby countries without such prospective deficits did not suffer crashes. The crisis countries had very large nonperforming bank loans, and it was widely expected that the government would bail out the banks sooner or later. By the logic of equation (3), a collapse was inevitable. Table 1 gives a quantitative sense of the connection.

Country	$\frac{\text{Bad Loans}}{\text{Gov't Revenue}}$	$\frac{\text{Cost}}{\text{GDP}}$	Exch. rate fall
Indonesia	66%	66%	85%
Korea	128%	24%	60%
Malaysia	79%	22%	40%
Philippines	34%	35%	40%
Thailand	195%		40%
Hong Kong	18%		0%
Singapore	12%		15%

Table 1. The East Asian crashes and prospective deficits due to bad bank loans. Source: Burnside, Eichenbaum and Rebelo (1999).

This event, and similar crashes such as Argentina's recent abandonment of its currency board, or the Russian default and devaluation, sing of fiscal roots. Could *any* open market operation – any exchange of money for debt – have stopped the crashes, unless at least accompanied by some solution to the fiscal crisis? This interpretation is not particularly novel of course. The IMF has for at least a decade focused on *fiscal* rather than purely monetary affairs. What is new is its integration into macroeconomic and monetary theory, and the realization that fiscal rather than monetary affairs can *completely* determine the price level.

The present value accounting issues are tricky. In a follow up paper that also addresses the wide difference between inflation and devaluation (traded vs. nontraded goods), Burnside Eichenbaum and Rebelo (2001b) show that Korea largely "paid" for the bank bailout by devaluing salaries of government workers. This "nominal debt" does not show up in conventional budget accounting. Furthermore, it means that we do not see large ex-post deficits in conventional accounting terms. Inflation taxes also do not show up in conventional deficit measures.

Regimes

Now, let us look at some possible monetary regimes that a country could follow, and their fiscal underpinnings.

Maximize inflation tax

One very common regime (alas) is driven by the government's need to maximize inflation tax revenue. The primary surplus in the equations so far is the conventionally measured primary surplus (i.e. taxes - spending, but not counting interest payments on outstanding debt) plus the inflation tax

$$\text{primary surplus} = \text{tax} - \text{spending} + \text{nominal interest rate} \times \text{monetary base}$$

A government with insufficient taxes or too much spending will try to raise as much as possible from the last term.

The characteristics of such a monetary regime include

1. Own country fiat money. A gold standard, exchange rate peg, dollarization don't allow you to make much if anything from the inflation tax, so we won't see them. Even countries that should by conventional theorizing forego a national currency will keep it to profit from inflation.

2. Chronic high inflation. This raises nominal interest rates, and therefore raises more inflation tax revenue.

3. Legal restrictions to boost the demand for base money. The more base money, the more inflation tax revenue. Of course, with high inflation, people will try to avoid holding base money, so the government will try to stop them from such avoidance. Classic tools of the trade include:

a) Currency controls. Don't let people hold dollars instead of domestic currency. Currency controls lead naturally to *trade controls* to keep people from getting wealth out of the country by other means.

b) Banking, financial and, interest rate controls. The government does not want people to hold inside money such as checking accounts rather than base, as it makes no inflation tax revenue from inside money. Thus, checking accounts will be severely limited, branch banking will be limited, and interest rate regulation will make banking less attractive. Improvements in transactions technology, such as credit cards, ATM machines, etc. also let people hold less base money, and the government will limit these substitutes.

c) Stock and bond market regulation. Money is a "temporary store of value" as well as a "transactions medium" and the government will try to limit the use of competing stores of value.

d) Anti-"hoarding" and "speculation" measures. Lacking other temporary stores of value that do not depreciate, people will start buying durable goods. The government will try to block this, to force them to hold more rapidly depreciating base money. This naturally leads to

e) Price, then quantity controls. Once the government has instituted price controls, it has to allocate goods so an increasingly complex allocation system will spring up.

This regime happens in times of fiscal stress. The revolutionary governments of France used the whole range of policies (Sargent and Velde 1995). The US has used many of them in wars, including the civil war, and the two world wars. Communist countries, essentially on a permanent war footing, followed the full list of characteristics. And, sadly, it describes well the monetary affairs of many developing countries.

The measures taken to increase the inflation tax are obviously highly distortionary, and we

can all decry them for that reason. But governments choose them out of desperation, not out of ignorance. One cannot escape the maximize-inflation-tax regime without solving the underlying *fiscal* problem. There is some good news: The *present value* fiscal problem must be solved. There is room for a reform that leaves quite a few years of substantial deficits.

Interest rate targets and Taylor rules

Interest rate targets and Taylor rules lie on the other end of the fiscal spectrum. This regime is a good characterization of the US and European monetary regimes at the moment. An interest rate target is a "money-dominant" or "Ricardian" regime; the central bank controls the price level (for example, in some neo-Keynesian models, interest rates affect output gaps which drive inflation by a Phillips curve as in (2)). Then the treasury adjusts surpluses so that (3) continues to hold.

The characteristics are own country fiat money, a floating exchange rate, and a large or closed economy. The exchange rate must float, as monetary policy cannot target two things at once. A small open economy cannot affect its *real* interest rate, so to the extent that affecting the real interest rate is important in the operation of an interest rate target, it must apply to a large or closed economy. (There is certainly an open economy variant of the Taylor rule, in which the central bank targets the exchange rate, and exchange rate changes affect aggregate output and hence inflation via some sort of exchange rate based Phillips curve, but I don't know where or if it has yet been written down.)

The advantage of an interest rate target is that it can, in principle, be used to offset real shocks: interest rates can be lowered in bad times. For example, Woodford (2003) characterizes optimal monetary policy as a Taylor rule with an intercept that reflects the underlying real rate and a coefficient greater than one on inflation. The variation of the intercept with the real rate gives the optimal shock-smoothing property. However, this supposed advantage may be ephemeral for developing countries. How many crashes and hyperinflations is the ability to offset real shocks worth? The history of developing country discretionary monetary policy is not comforting.

The difficulties of interest rate targets are many, and are the focus of most research in monetary economics of the last decade. First, the interest rate must rise more than one for one with inflation. It must do so even in bad times. For example, fitted values of the "good," post 1982 Taylor rule to the "loose" 1970s prescribe a federal funds rate over 20% for 1975, in the depths of the worst recession since the great depression. It's easy to be a Taylor rule fan now, with very low inflation. It's harder to raise interest rates 2 for 1 with inflation when inflation hits 10 or 20%!

More deeply, the Taylor rule has an output gap as well as an inflation component: $i = \bar{\imath} + \phi\pi + \beta y$. ϕ is supposed to be substantially greater than one, to give price stability. But β – the offset real shocks part – allows the central bank to lower interest rates in a recession. Just how bad is the recession, really? There is an excuse here to always regard the economy as

"in recession." Orphanides (2001) argues that mistaking the severity of the recession, rather than failure to understand the importance of fighting inflation, is exactly what happened to the Fed in the 1970s. For a developing economy, with worse recessions and weaker central bank independence, it may never seem like flush times at which it's appropriate to raise interest rates, and being tough on inflation in the middle of recessions will be particularly difficult.

These difficulties spark the huge research output on interest rate targets, in particular the focus on *rules, inflation targets,* and *central bank independence.* These are methods to tie oneself to the mast, to solve the *commitment* and *time consistency* problems. (An *inflation target* is a simple case of a Taylor rule in which the central bank commits itself only to fighting inflation, $\beta = 0$, states an explicit target, and promises to ignore recession fighting. We shall see how this works the next time there is a substantial recession with substantial inflation.)

The *fiscal* constraint on an interest rate rule (or an exchange rate rule) may prove even more relevant for a developing country, however. The government valuation equation (3) is still there. For example, suppose the central bank decides to deflate. This action will raise the real value of nominal debt on the left side of (3), and will raise the real value of the promised nominal debt payments. The treasury must now raise taxes. If it is unable to do so, then the deflation will not hold and (3) rather than the central bank will take over price level determination.

Thus, an interest rate rule requires substantial fiscal slack. The treasury must be willing and able to follow along and adjust surpluses, no matter what the central bank does to the value of nominal debt. Furthermore, the Taylor rule requires a *global* commitment to raise or lower interest rates with inflation. If the public knows that the rule will be abandoned for some, fiscally challenging, values of inflation or output gap, then the price level stabilization properties of the Taylor rule vanish.

An interest rate rule does not solve the *fiscal* temptation to inflate, even if it solves the other temptations such as the time-consistency problem, i.e. the temptation to inflate to try to boost the economy. One must be able to afford a Taylor rule. It is not an option for countries with fiscal difficulties, present or looming.

Exchange rate pegs and currency boards

An exchange rate peg is a natural choice of regime for a government with a little less fiscal discipline and commitment ability. It lowers the chimeric ability to offset real shocks, as that must be done by devaluation, but it offers great transparency and a target more visible and verifiable than inflation. It is also naturally useful for an open economy, or one that wants to become open, as it simplifies international transactions.

Simple pegs are notoriously subject to "speculative attack" or "runs." A currency board seems like a 100% watertight solution to that problem. In a currency board, the entire

domestic monetary base is 100% backed by foreign securities. The public is always free to exchange a Peso for a dollar, and there are as many dollars in the bank as there are Pesos outstanding. It acts like 100% reserve banking, which would certainly stop any bank run. From a monetary perspective, what could be more ironclad? It is a stronger commitment device than a peg.

However, our fiscal equation (3) is still there, and it makes no mention of reserves. Why not? It recognizes that even with 100% reserves, if the surpluses aren't there, sooner or later there will be trouble. Even if the *currency* is 100% backed, *nominal debt* is not 100% backed. When the debt comes due and the coffers are empty, the government will be forced to print money, i.e. to abrogate the board. If the government has intractable deficits, the pool of foreign securities rotting away in the currency board offices will look more and more attractive. Argentina's recent combination of abrogation, devaluation, and explicit default on foreign debt is the clearest example.

The fiscal perspective shows us that, despite common wisdom, *reserves don't matter.* If a government has reserves, even 100% reserves, but a poor fiscal situation, sooner or later there will be a default and devaluation. If the government has no reserves, but a healthy fiscal situation, it can borrow all the reserves it needs, credibly promising to raise future taxes. 100% reserves are slightly useful as a visible indication that some real resources are available, but they can easily be swamped.

Dollarization and the corporate finance of government debt

Dollarization (or Euroization, etc.) is an even more extreme version of an interest rate peg. It has several advantages over the peg or board. First it is *hard to go back.* It's not impossible; the government can always try to introduce a new currency and pass laws outlawing the use of dollars, though it may require a lot of effort to get people to comply. But it certainly is much harder to reverse than it is to devalue a peg or to abrogate a currency board. Thus, it provides greater commitment. Second and perhaps more importantly, in a dollarized economy there is *no nominal debt to inflate away.* The fiscal temptation to inflate is removed. To devalue the outstanding stock of debt, the government must now explicitly default. Thus, dollarization helps the *fiscal* commitment problems of pegs and currency boards as well. Third, dollarization makes international transactions a good deal easier. Much of the reason for the Euoro is the expectation of increasing trade and cross-border investment and capital flows, even though the original currencies were pegged and freely convertible. Finally, the choice of numeraire amounts to a choice of units, and dollarizing or euroizing amounts to using internationally common set of units to measure value, as any sane country uses internationally common units to measure length and weight.

There are traditional (non-fiscal) objections to dollarization. As it makes devaluation harder and solves the commitment problem harder, it removes the ability to offset real shocks, though like a peg one has to ask how many crashes and devaluations that ability is worth. The government also loses any inflation tax or seignorage, though seignorage revenue sharing

may be negotiable with the Fed or European central bank.

From the fiscal point of view (3), dollarization has an additional and interesting drawback, emphasized by Sims (2000). *A dollarized country is just like a firm financed entirely by debt.* If the US deflates, the dollarized treasury really must come up with more surpluses, just as you and I must come up with more real resources to pay off our mortgages, or it must explicitly default. Similarly, a decline in the present value of surpluses cannot be met by inflation, it must also be met by explicit default. (The B, M, P term is missing from (3).) Private firms choose a mix of debt and equity finance precisely to lower the costs of frequent explicit default. Stock – state contingent debt – is good! (A dollarized government also cannot print up currency to serve as lender of last resort. It must instead raise real resources by taxation or borrowing from abroad. While monetary economists focus on this problem, it is just a case of the more general problem that the government cannot inflate to solve fiscal problems.)

Why is dollarization good for New Mexico, and not for Old Mexico? Sims points out that the states of the US are linked by fiscal transfers. If New Mexico's economy declines, the US federal government supplies many resources that are not provided if old Mexico's economy declines. Thus, the fiscal perspective teaches us that *optimal currency areas depend on fiscal arrangements* as much as they do on traditional considerations such as labor mobility and commonality of real shocks. The Maastricht deficit limits for the Euro area are an attempt to address the same problem, though we will see whether keeping countries from running deficits at all is a sufficient substitute for transfers or explicit defaults.

Sims also points out that dollarization may not, as widely supposed, lower interest rates paid on government debt. The Modigliani - Miller theorem tells us that a debt-equity trade makes no difference to the value of the firm. Once we see debt and equity in government finance we see that the same theorem applies. What once was "devaluation risk premium" will now be a "default risk premium."

While the analysis is unobjectionable, I disagree with Sims' conclusion that dollarization is undesirable for developing countries. Inflation also has real costs that stock price declines for private firms do not have. It is not obvious that explicit default on real debt, largely owned by foreigners and wealthy individuals, is more costly than inflation, which tears up every private contract in the economy.

More deeply, private equity comes with control rights, which ensure that the firm actually does pay some dividends rather than waste the investment. The only visible "control rights" of public equity – fiat currency and nominal debt – are the millions of unhappy voters. Thus it may be no coincidence that the only successful fiat money regimes occur in stable democracies. A team of international banks fearing explicit default on dollar denominated debt may be a better monitoring structure than the voters of an underdeveloped country with poor democratic institutions. Restaurants and other small businesses do not issue equity, they operate as debt-only firms with monitoring by banks. Sargent and Velde (1995) remind us how the Bank of England functioned as a monitoring device that forced the English kings of the 1700s to honor their (gold denominated) debts. The bank accepted temporary

suspensions of convertibility in objective hard times, i.e. write downs of the value of the debt. This institution allowed the English to more resources in times of war. This may still be the right structure for, say, Argentina.

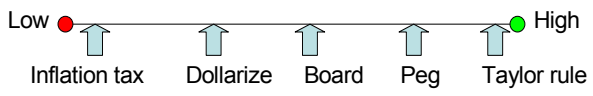
Alternatively, there are ways to create "government equity," so that a country can have a stock-like buffer while retaining the advantages of dollarization. First, the government can create a "reserve currency." While keeping the economy dollarized for all transactions including clearing, some government debt can be denominated in local currency units, and some tax payments made in the same units. Peso debt pays Peso reserves, which investors will quickly exchange for dollars, selling the Pesos to others who need to make Peso tax payments. Equation (3) requires no transactions demand to establish a determinate value. Second, the government can issue long term debt with a variable coupon, essentially a "dividend." Both of these methods allow the creation of "government equity" without imposing any of the real costs on the private sector of an inflation-induced "default." Of course, there is no need to run a string of deficits in order to create an appropriate stock of nominal debt. Like a firm, a government can adjust its "debt equity ratio" at any time by issuing nominal debt and buying dollar debt.

If I were to choose a monetary regime for a small, open (or opening) economy with a questionable fiscal situation, this would be it.

Summary and Conclusions

Money and nominal debt are like corporate *equity*. Real, indexed or foreign debt are like corporate *debt*. This fact has two implications. First, the price level and exchange rate can be determined from the present value of future primary surpluses. This channel may dominate the effects of the *composition* of government debt (money vs. bonds) which is the focus of traditional monetary economics. When this channel dominates the determination of the price level, many cherished propositions of monetary economics are overturned. Second, the choice of dollariztion or domestic currency, and the choice of how much the government should borrow in foreign or domestic currency, is exactly the same as the basic corporate finance question whether a firm should finance by debt or equity.

Fiscal considerations and commitment ability underlie the choice of monetary regime. Interest rate rules require the greatest fiscal slack and commitment ability. Pegs and currency boards requires a bit less fiscal slack and commitment ability (i.e. they provide the otherwise lacking commitment device) and dollarization requires even less. At the bottom of the fiscal heap lies the maximize-inflation-tax regime, as well as many unfortunate and less developed countries. In pictorial form,



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