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ORIGINAL PAPER

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Overcoming the zero bound on nominal interest rates: Gesell's currency carry tax vs. Eisler's parallel virtual currency

Discussion of Mitsuhiro Fukao's "The effects of 'Gesell' (currency) taxes in promoting Japan's economic recovery"

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Abstract Despite the zero lower bound on the short nominal interest rate in Japan having become a binding constraint, conventional monetary policy in Japan, in the form of generalised open market purchases of government securities of all maturities, has never been pushed to the limit where all outstanding government debt and all current and anticipated future government deficits are (or are confidently expected to be) monetised. Open market purchases of private securities can create serious governance problems. Two ways of overcoming the zero lower bound constraint have been proposed. The first is Gesell's carry tax on currency. The second is Eisler's proposal for the unbundling of the medium of exchange/means of payment function and the numéraire function of money through the creation of a parallel virtual currency. This raises the fundamental issue of who chooses or what determines the numéraire used in private wage and price contracts —an issue that is either not addressed in the literature or addressed incorrectly. On balance, Gesell's proposal appears to be the more robust of the two.

Keywords Carry tax on currency · Deflation · Parallel virtual currency · Zero bound

JEL Classification E31 · E42 · E52 · E58

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Professor Fukao's paper Fukao (2004) argues that in Japan, traditional interest rate policy has lost its potency because the zero nominal interest rate lower bound has become a binding constraint and because there has been a gradual acceleration of deflation in Japan. In what follows, deflation (inflation) means a declining (rising) CPI or other broad price index of currently consumed or produced goods and services. Asset price deflation will always be referred to by its full name. The second 'because' is no longer factually correct, since during 2004, the rate of deflation has been getting smaller in absolute value on most relevant price indices (CPI, GDP deflator and money wages). It does, however, remain true that the short-term risk-free nominal rate of interest continues to linger at zero—the official discount rate stands at 0.10% and the uncollateralized overnight call rate stands as close to zero as makes no difference. If conventional monetary policy is defined as short nominal interest rate policy, the scope for more expansionary conventional monetary policy has clearly been exhausted in Japan.

However, as I make clear in the next two sections, conventional monetary policy, defined to include generalised open market purchases has not been exhausted in Japan. The extension of these open market operations to purchases of private sector liabilities has been premature and regrettable. In Section 3, I note that, contrary to what Fukao proposes, only base money needs to be taxed. Other government financial liabilities should be purchased in exchange for base money. Section 4 reviews the Gesell carry tax on currency proposed by Fukao and Section 5 reviews an alternative proposal for overcoming the zero lower bound on nominal interest rates due to Eisler.

1 Zero lower bound vs. liquidity trap

An economy is in a liquidity trap when monetary policy cannot influence demand, real or nominal. A necessary condition for this is that the short nominal interest rate is at its lower bound, zero in the case of currency. However, there are other transmission channels, including longer maturity nominal interest rates, current expectations of future short rates, wealth effects of base money issuance, the exchange rate and the credit channel. Since long-term nominal interest rates—even risk-free nominal interest rates—currently stand at 1.5% (October 2004, 10 year maturity), Japan is not in a liquidity trap. The interest-rate channel of monetary policy can be operative at the longer end of the maturity structure through open market purchases of longer-maturity nominal debt instruments.

2 No fiscal unsustainability if outstanding public debt and future government deficits are monetised

Professor Fukao also refers to constraints on fiscal policy in the form of large government deficits and a high public debt to GDP ratio. This makes no sense, since the monetisation of the existing stock of public debt and of current and future government deficits are clearly policy options. In what follows, 'government' means the consolidated general government and central bank. The general government will be referred to as the Ministry of Finance.

Open market purchases of any and all interest-bearing government debt and its replacement in private portfolios with base money (currency and commercial bank reserves with the central bank) relaxes the government's intertemporal budget constraint. So does future issuance of base money. If all existing debt and future deficits are monetised, there can be no remaining government solvency or financial sustainability problem: base money is an asset to its (private) holder but not in any meaningful sense a liability of the issuer (the central bank as agent of the state). This is because base money is irredeemable or inconvertible: a given notional amount of base money does not constitute a claim on the issuer for anything other than that same amount of base money.

Thus, even if zero interest government bonds are from the point of view of the private holder perfect substitutes as stores of value for base money, they are not equivalent from the point of view of the government's intertemporal budget constraint (see Buiter 2003, 2005): the present value of the terminal stock of non-monetary financial government debt has to be redeemed in the long run; the present value of the terminal stock of base money liabilities does not have to be redeemed, even in the long run. There cannot be a problem associated with servicing yen-denominated Japanese government debt, or with financing future Japanese government deficits, as long as the government knows how to print money (issue base money). A failure to monetise debt or deficits despite the presence of unwanted deflation can only reflect a dismal failure of the monetary and fiscal authorities (the Bank of Japan and the Ministry of Finance), to coordinate their actions. It is most surprising to note that after a 25.7% increase during 2002 and a 16.4% increase in 2003, the rate of growth of the stock of base money in Japan has fallen to 4.7% (YoY) in September 2004.

If the monetisation of the entire stock of Japanese yen-denominated non-monetary debt held outside the consolidated general government and central bank does not do the job of getting inflation going, it is technically possible to widen the range of financial and/or real assets the authorities purchase through the issuance of additional base money (see Buiter 2004b). If these instruments are liabilities of the Japanese state, there would be no governance issues. Purchasing foreign currency-denominated financial liabilities issued by foreign governments/official agencies (basically generalised non-sterilised foreign exchange purchases) would also create few governance issues. It would be more problematic if the Japanese authorities were to expand on the past practice of purchasing private liabilities—be they bonds, loans, equity, mutual funds or real estate investment trusts. Unless the government could limit itself to purchasing broadly-based indices of financial instruments, relative asset prices could be distorted by its interventions. In addition, if equity were part of the menu, back-door socialisation of the means of production, distribution and exchange creates a worrying precedent. No government could credibly commit itself to put into a blind trust the private equity it acquired as part of its extended open market purchases of just about everything.

Assume all Japanese public debt has been retired through open market purchases financed with monetary base issuance. Assume even that the Japanese government has purchased all financial and real wealth held by the Japanese private sector, which now only holds base money as an asset. Assume that even then nominal interest rates (at all maturities) remain stuck at the zero floor. Assume even

that further tax cuts or transfer payments targeted at households, again financed by base money issuance, do not stimulate private consumption demand (this would, of course, violate every theory of consumption behaviour, from the most Keynesian to the infinite-lived representative permanent income consumer). Assume that Feldstein's temporary VAT or sales tax cut, complemented with the credible announcement of a present-value-of-revenue-neutral future increase in this tax also leaves consumers unmoved. What can then be done to stimulate demand? The answer is clear: if the floor is too high, lower the floor.

3 Negative nominal interest rates: tax currency only

Professor Fukao makes his negative interest rate proposal unnecessarily complicated by arguing that all government-backed financial assets (bank deposits, government bonds, postal savings, cash etc.) should be taxed at a high enough rate to make their after-tax real rate of return negative, despite the ongoing deflation. In fact all that has to be taxed is cash-base money. The other government financial liabilities should be monetised, that is, turned into base money. This avoids any legal complications. It may well be necessary in order to achieve this to allow non-bank private agents (even households) to have accounts with the central bank. On the accounts with the central bank (including the familiar commercial bank reserves held with the central bank), negative interest can be paid by electronically debiting the accounts—an administratively costless procedure. Taxing currency is slightly messier, but is also not beyond the realm of the possible.

4 Two mechanisms for paying negative interest on currency

4.1 A carry tax on currency in the spirit of Gesell

Let i be the one-period risk-free nominal interest rate on bonds, i_c the one-period nominal interest rate on currency, i_R the one-period nominal interest rate on bank reserves with the central bank. γ is carry costs (storage, insurance, taxes) per dollar invested in bonds, γ_C carry costs per dollar invested in currency and γ_R carry costs per dollar invested in reserves. If currency and reserves yield non-pecuniary returns that are at least as high as those on bonds, then no-arbitrage implies that the following weak inequality must hold:

$$1+i \geq \max\left\{\left(\frac{1+\gamma}{1+\gamma_C}\right)(1+i_C), \left(\frac{1+\gamma}{1+\gamma_R}\right)(1+i_R)\right\} \tag{1}$$

It is clear that $\gamma_C > \gamma \geq \gamma_R$. It therefore follows that the nominal interest rate on bonds could be below the nominal interest rate on currency by an amount given by the carry cost differential. Assuming that the carry costs of currency are higher than those on bonds, the nominal interest rate on bonds can be below the nominal interest rate on currency by an amount given by the carry cost differential. In practice, with the nominal interest rate on currency equal to zero, the lower floor on

the nominal interest rate on bonds is some small negative number. For concreteness, in what follows, carry costs will be ignored.

The reason it is difficult to pay interest, positive or negative, on currency is that currency is a negotiable bearer bond. Its holder is anonymous: his identity is not known to the issuer—the central bank. Commercial bank balances with the central bank (reserves) are what I have called elsewhere (Buiter and Panigirtzoglou 2001, 2003) registered financial instruments or securities. The identity of the owner (the creditor) is known to the issuer (the borrower). Interest, whether negative or positive, can be paid on reserves with effectively zero marginal cost, by electronically debiting or crediting the accounts.

For negotiable bearer bonds, since the owner cannot be identified, the financial instrument must be clearly identifiable as being current (interest payable (due) has been paid (received) once and once only). With positive nominal interest rates, the bearer of the bearer bond was prevented from presenting it multiple times for payment of the interest, by clipping coupons off the paper certificate. With negative interest rates, the holder must be induced to come forward to pay the issuer. For currency, a declaration by the issuer that the currency expires after a certain date unless it has been marked (stamped) to indicate it is current on its interest obligations does not provide a sufficient incentive for the holder to come forward to pay the interest due. The reason is that, with intrinsically worthless fiat currency, the currency will have the value the private holders collectively believe it to have, regardless of what the authorities may declare.

It is true that by removing legal tender status from 'old' or unstamped currency, the authorities may be able to jolt the value attributed by the private holders of the old currency. But it is not enough for the authorities to simply announce an expiration date for old, unstamped currency for it to become worthless after that date in the eyes of the holders. There has to be a credible penalty (e.g., the threat of confiscation or other fines) attached to the possession of unstamped, overdue currency, for the payment of negative interest on currency to be possible. This would make paying negative interest on currency an administrative costly and intrusive process. Early proposals for such a carry tax on currency can be found in Gesell (1916) and Fisher (1933). Recent revivals can be found in Buiter and Panigirtzoglou (2001, 2003) and Goodfriend (2000).

4.2 A parallel virtual currency in the spirit of Eisler

A completely different method for removing the zero bound on nominal interest rates has recently been proposed by Davies (2004). In his note, Davies sketches a proposal for removing the zero lower bound on nominal interests rates that does not require the payment of negative interest rates on currency. Davies attributes the proposal to Eisler (1932) (see also Einaudi 1953; Gaitskell 1969 and Boyle 2002). The Eisler proposal has been fleshed out and developed formally in Buiter (2004a). A brief summary follows.

In the benchmark (pre-Eisler) economy, there is currency (sterling, say) with a zero nominal interest rate. Ignoring carry costs, the risk-free nominal interest rate on non-monetary securities (sterling bonds, say), $i^{£}_{t+1,t}$, cannot be lower than zero.

$$i^{£}_{t+1,t} \geq 0. \tag{2}$$

The instrument of the monetary authorities is either the nominal quantity of sterling base money or the nominal interest rate on short sterling bonds.[1] Descriptive realism makes $i^{£}_{t+1,t}$ the monetary instrument in the sterling economy. The authorities unbundle the means of payment/medium of exchange role of money from its numéraire or unit of account function. All sterling notes and coins are retired, so sterling currency no longer exists in physical form (or even in disembodied, virtual form as balances held in an electronic ledger). The constraint that the nominal interest rate on sterling bonds cannot be below the interest rate on sterling currency has become moot. Sterling continues to be the numéraire in the price and wage contracts that matter, and the authorities continue to pursue a price level or inflation target for the sterling price index, using the short sterling interest rate as the instrument.

The authorities also introduce a new currency, drachma say, which takes on the means of payment and medium of exchange role formerly performed by sterling currency.[2] The nominal interest rate on drachma currency is zero, as it would be equally awkward to pay interest on drachma currency as on sterling currency. The authorities issue drachma bonds with a one-period risk-free nominal interest rate $i^{d}_{t+1,t}$. This rate is subject to the zero lower bound:

$$i^{d}_{t+1,t} \geq 0. \tag{3}$$

The authorities also continue to issue sterling bonds. Sterling has disappeared as a means of payment and medium of exchange, but it continues to exist as the unit of account of some of the government's interest-bearing liabilities. If drachma bonds and sterling bonds can both be issued by the private sector, their risk-adjusted returns should be equalised. Since both $i^{£}$ and i^{d} are risk-free interest rates, they are linked by covered interest parity (CIP). Let S_t be the period-t spot exchange rate between sterling and drachma (defined as the number of drachma per unit of sterling) and $F_{t+1,t}$ the period t one-period forward exchange rate. Then

$$1 + i^{£}_{t+1,t} = \frac{S_t}{F_{t+1,t}}\left(1 + i^{d}_{t+1,t}\right) \tag{4}$$

[1] Base money includes commercial bank sterling balances held with the central bank as well as sterling currency (and coins). Such balances held in electronic ledgers are not 'bearer bonds'. The Central bank knows the identity of each account holder and the balance outstanding. Paying interest on commercial bank balances held with the central bank is easy and effectively costless. Formally, such balances are either ignored in what follows, or they are perfect substitutes for sterling bonds but not for currency (in retail transactions etc.).

[2] In a modern economy with well-developed financial, payments, clearing and settlement systems, only a small fraction of legitimate transactions (mainly at the retail level) involve the exchange of currency.

The authorities have three instruments: the nominal interest rate on sterling bonds and the spot and forward exchange rates between sterling and drachma. Given these three, the nominal interest rate on drachma bonds is determined as

$$\begin{aligned} 1+i^{d}_{t+1,t} &\equiv \tfrac{F_{t+1,t}}{S_t}\left(1+i^{£}_{t+1,t}\right) \text{if } \tfrac{F_{t+1,t}}{S_t}\left(1+i^{£}_{t+1,t}\right) \geq 0 \\ &\equiv 0 \text{ if } \tfrac{F_{t+1}}{S_t}\left(1+i^{£}_{t+1,t}\right) < 0 \end{aligned} \tag{5}$$

Given the nominal interest rate on drachma bonds and the zero interest rate on drachma currency, the demand for real drachma money balances, m^d can be determined. The nominal stock of drachma balances, M^d is endogenously determined as the product of the real stock of drachma currency and the drachma price level, P^d:

$$M^d_t = P^d_t m^d_t. \tag{6}$$

Let $\varphi_{t+1,t} \equiv \frac{F_{t+1,t}-S_t}{F_{t+1,t}}$ be the (proportional) forward premium on sterling vis-à-vis drachma. A negative nominal interest rate on sterling bonds can be implemented even if the nominal interest rate on drachma bonds is constrained by the zero lower bound on drachma nominal interest rates. If, for instance, $i^d_{t+1,t}=0$ then $i^{£}_{t+1,t}=-\varphi_{t+1,t}$. By setting the forward price of sterling above its spot price (by 'appreciating' sterling relative to the drachma), that is, by setting $\varphi_{t+1,t}>0$ the nominal interest rate on sterling bonds can always be set by the authorities at any desired negative level, even when the nominal interest rate on drachma bonds is bounded from below by zero. The forward rate cannot, of course, be set independently of the (expected) path of future spot rates. In efficient financial markets, the following relationship holds between the sterling interest rate, the drachma interest rate and current and future spot exchange rates:

$$\frac{1+i^{£}_{t+1,t}}{1+i^{d}_{t+1,t}} = \frac{S_t}{F_{t+1,t}} = E_t\left(\frac{S_t}{S_{t+1}}\right) + \frac{Cov_t\left(u'(c_{t+1};.)\frac{P^{£}_t}{P^{£}_{t+1}}, \frac{S_t}{S_{t+1}}\right)}{E_t\left(u'(c_{t+1};.)\frac{P^{£}_t}{P^{£}_{t+1}}\right)} \tag{7}$$

Here Cov_t and E_t are, respectively, the conditional covariance and the conditional expectation operator, $P^{£}_t$ is the period- t sterling general price level and $u'(c_{t+1};.)$ is the period t+1 marginal utility of consumption of the representative investor. If there is no uncertainty about the future spot exchange rate, the conditional covariance in Equation (7) is zero and uncovered interest parity (UIP) prevails. The same applies if investors are risk-neutral ($u'(c;.)=0$ and currency appreciation and sterling inflation rates are uncorrelated:

$$\frac{1+i^{£}_{t+1,t}}{1+i^{d}_{t+1,t}} = E_t\left(\frac{S_t}{S_{t+1}}\right) \tag{8}$$

Davies argues that since, by assumption (presumably by government fiat or decree), sterling remains the unit of account, it is the sterling price level whose behaviour (stability, low inflation) the authorities continue to target. For that reason, the fact that the nominal interest rate on sterling bonds is no longer subject

to the zero lower bound is what matters, rather than the fact that the nominal interest rate on drachma bonds is now subject to the zero lower bound.

Whether or not Davies's proposal is of practical interest rests on one technical assumption and on two key behavioural assumptions. Both behavioural assumptions are contestable. The technical assumption is that the monetary authorities can fix the relative spot and forward prices of sterling and the drachma even though sterling currency no longer exists. The first key behavioural assumption is that the monetary authorities determine what the (unique) unit of account used for private contracting in the economy is. Specifically, sterling remains the (unique) unit of account even though the drachma is now the medium of exchange and means of payment. The second key behavioural assumption is that it is the behaviour of the price level in terms of this unit of account (sterling) or the rate of inflation of this price level that matters for economic welfare, and that it therefore the sterling price level/rate of inflation that is or should be targeted by the monetary authorities.

4.3 How do the authorities set the sterling–drachma exchange rate in the Eisler economy?

In normal parlance, the sterling–drachma exchange rate refers to the exchange rate of sterling currency for drachma currency. This definition cannot apply in the Eisler economy, since here sterling currency no longer exists. To peg the relative price of two currencies (as for any two commodities) the price fixing agency has to be willing and able to supply or absorb any amount demanded or supplied by the other market participants at that price. Since sterling currency no longer exists, fixing the relative price of sterling currency and drachma currency is not possible in the Eisler economy.

This turns out not to be a substantive objection, however. The solution can be found in Woodford's (2003) characterisation of a cashless economy. In such an economy, currency no longer exists but the government still issues a financial instrument that can be interpreted as the other (non-currency) component of the monetary base: commercial bank balances held with the central bank or bank reserves for short. Unlike currency, reserves are not negotiable bearer bonds: the identity of their owner is known to the issuer (the central bank). It is therefore trivial to pay interest, at a positive or a negative rate on reserves. The unit of account in terms of which these reserves are denominated is the same as that of the defunct currency—sterling in the Eisler model.[3] The authorities issue or purchase this sterling-denominated financial instrument on demand at the relative spot price of sterling and drachma, S_t and the relative forward price, $F_{t+1,t}$ that they set. The sterling-drachma exchange rate is therefore the exchange rate of a unit of sterling reserves for a unit of drachma currency. The further assumption is then made that sterling bank reserves and sterling bonds are perfect substitutes in private portfolios. Therefore, a unit of sterling means (is) a unit of the sterling bond. In the Eisler economy the numéraire is the one-period risk-free sterling bond or, more precisely, a unit of the one-period risk-free sterling bond defines the numéraire. Since a unit of drachma currency buys one unit of drachma bonds, the sterling-

[3] The authorities could denominate these reserves in terms of anything physical, virtual or imaginary. We use the name sterling because it fits the example we are discussing.

drachma exchange rate is also the exchange rate of a unit of risk-free sterling reserves (or a unit of the risk-free one-period sterling bond) for a unit of the risk-free one-period drachma bond.

4.4 Who or what determines the numéraire?

Davies assumes that the government (the monetary authorities) determines what the unique unit of account in the economy is. *"The monetary authorities could withdraw all existing cash while maintaining the existing monetary unit of account."* (emphasis added). How would they do this? The government certainly can choose units of account (or a single unit of account) in terms of which one or more of its own financial liabilities are defined. It can declare certain financial instruments (including some of its own liabilities) to be legal tender, and it can decide what should be the unit of account that define the financial instruments that have legal tender status. It can choose the units of account used to define tax liabilities and the instruments that are acceptable for settling tax liabilities. The government may even be able to define the unit of account in a wide range of contracts involving itself and other agents of the state. It is certainly possible that the fact that the government uses a particular unit of account to define some of its financial instruments and insists on the use of that unit of account in most of its transactions with other parties makes it likely that private parties would use that same unit of account in exchanges among themselves.

Possible, but not necessary. Davies points out, correctly and with historical evidence to back it up, that the unit of account used (or used most widely) in a society need not be the unit of denomination of whatever financial instruments are used as means of payment and medium of exchange. It is equally true, however, that the unit of account used most widely in a society need not be the unit used to define (some of) the liabilities of the central bank (or of any other agent of the state). In countries with very high inflation or hyperinflation, the unit of account has often been a more stable foreign currency. The US dollar played that role in Israel during the inflation surge that prompted the (successful) stabilisation plan of July 1985 and in Peru during the hyperinflation that led to the successful stabilisation package of August 1990 (see Buiter 2004a) for a more thorough review of the casual empirical evidence).

Davies is in good company in his misunderstanding both of who or what determines the unit of account and what the implications of a particular choice of unit of account are. For instance, Woodford (2003, p. 35) writes: *"... the unit of account in a purely fiat system is defined in terms of the liabilities of the central bank."* (emphasis in the original).

What serves as unit of account in private transactions and in the mental arithmetic involved in economic calculation and computation is determined by individual choice, conditioned by social convention, not by government decree. The unit or units (there could be more than one) of account that matter for private decision makers is decided by them alone. In conventional economic theory there is no requirement that this unit of account be defined in terms of the liabilities of the central bank or in terms of the media of exchange or means of payment widely used in the economy. There is no requirement that it be something that exists either in the physical world or in the virtual world of cyberspace—it could be something purely

imaginary like phlogiston. The unit of account used for mental calculus by one private agent need not even be the same as that for other private agents.

Conventional (unbounded rationality) economics has no theory of the numéraire. To explain at a deep level why the numéraire is one thing rather than another, why the numéraire is so often (although not universally) the means of payment and medium of exchange, and why it matters what the numéraire is, would require the abandonment of unbounded rationality. Sterling being used in the Eisler economy as the unit of account by the monetary authorities probably makes it a likely focal point for the numéraire used in private contracts and for private calculations. Drachma being used as the means of payment and medium of exchange also makes it a natural focal point as a private numéraire. Most historical examples from the fiat government money era bundle the government unit of account and means of payment/medium of exchange characteristics into a single object. It is not at all clear *a priori*, whether the private numéraire would follow the currency or the government numéraire when the government unbundles its unit of account from the currency.

Let us, for the sake of argument, suppose that things work out the way Davies and Woodford assume. Sterling remains the unique numéraire for all transactions, public and private in the Eisler economy. Drachma currency performs the medium of exchange and means of payment role. The authorities can use the nominal interest rate on sterling bonds without any zero lower bound constraint to pursue or target the sterling price level or the sterling rate of inflation. The question is: should they? Is the price level or the inflation rate measured in terms of the numéraire (sterling) the relevant price index for economic policy? We assume that the authorities are benevolent and aim to promote (or even maximize) household welfare.

It should be obvious that, unless there are price (or wage) rigidities in terms of the numéraire, the numéraire is of no welfare significance whatsoever. If there are nominal rigidities in terms of the numéraire, and if these rigidities are not transferred in the Eisler economy from sterling to the drachma, then there will be a case for the government targeting the behaviour of the price level in terms of the old numéraire. Even then, however, it will generically not be true that the authorities maximise welfare by pursuing price stability in terms of the numéraire —despite recent assertions to that effect (see e.g., Woodford 2003). In Buiter (2004c) I show that optimal monetary policy consists in implementing Friedman's optimal quantity of money rule (achieved by setting the pecuniary opportunity cost of holding cash equal to zero) and validating or accommodating core inflation—the inflation generated by the constrained price and wage setters in the Calvo model. In the Eisler economy, Friedman's optimal quantity of money rule is achieved when the nominal interest rate on drachma currency equals the nominal interest rate on drachma bonds. If there are Calvo-style nominal rigidities in terms of the numéraire, it is the sterling rate of core price inflation that should be validated. Price stability is only optimal if that core inflation rate happens to be zero—which is assumed by Woodford when he linearises his dynamic stochastic model (with constrained price setters updating their prices using a lagged, partial indexation rule) at the zero inflation deterministic steady state.

The fundamental weakness in the Eisler proposal for achieving negative nominal interest rates are the assumptions: (1) that the government determines the

numéraire or unit of account (and that although a new currency (the drachma) is introduced, sterling nevertheless remains the numéraire); and (2) that price stability in terms of that numéraire should be the objective of monetary policy.

5 Conclusion

Conventional monetary policy (under which I group not only the fixing by the central bank of the Repo rate or some similar short nominal interest rate, but also open market operations in government financial instruments of all kinds and maturities) has not been exhausted in Japan, and there is therefore no urgent case yet for adding negative nominal interest rates to the central bank's policy instrumentarium and implementing a negative interest rate policy. Should such a policy ever be implemented it should only apply to the monetary base. Other government liabilities should be monetised rather than taxed. Administrative problems with paying negative interest rates on the monetary base apply only to the currency component of the monetary base. Here Gesell's proposal for stamping currency seems to be preferable to Eisler's proposal for unbundling the numéraire and means of payment functions of money.

With Japan emerging at last from a decade of stagnation and half a decade of deflation, this may not look like a good time to create the administrative capacity for taxing currency. However, even if today's war is different from yesterday's, it behooves us to keep in mind the fact that in a world dedicated to price stability, there will always be a risk that the zero lower bound on nominal interest rates will become a binding constraint on expansionary monetary policy. Tomorrow's war may be yesterday's war once again, so institutionalising memory and the capacity to respond to deflationary threats looks like the sensible thing to do.

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