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FINANCIAL POLICY COORDINATION IN A KEYNESIAN FRAMEWORK

BY

ROMAR CORREA.

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Romar CORREA
Department of Economics
University of Bombay
Vidyanagari
Bombay 400 098
INDIA

ABSTRACT

We propose a simple framework within which to examine the problem of policy coordination between two central banks. The context is the various components of a broad measure of the money supply. Consider two central banks, one 'conservative' and the other 'Keynesian'! In each economy there is 'involuntary unemployment' of loans. It is shown that the monetary authorities can strategically vary short-term interest rates in order to relax the constraint in the loan market so that none of the players is worse off. Both the banks play a zero-sum game with regard to foreign-exchange reserves. Here too, the central banks can, via their influence en prices, increase the profits of firms providing (hereby a credible signal to banks. JEL Classification Nos. El2, E61, F42.

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1. Introduction

There are two characteristics of the financial institutional framework worldwide that have attracted considerable attention. In the sphere of internal financial sector reform is the lifting of controls on interest rates with the objective of allowing them to be determined by market forces. At the same time, there are moves by countries to engender cooperative outcomes by fixing exchange rates. Take the latter development first. The recent period of floating exchange rates has been characterised by a high variability of exchange rates. The movements in real exchange rates have been too erratic to be explained by changes in 'fundamentals' that require appropriate changes in order to restore external balance. One explanation is that the fluctuations are a result of the flexibility. In one theory, flexible exchange rates are held to be determined by asset-pricing models, that is, models driven by expectations about future variables. Expectations, in their turn, and exchange rates, are volatile because of the random arrival of the 'news' and swings in the optimism of agents. Moreover, recent developments in mainstream macroeconomics have shown that volatile expectations can occur even under no exogenous changes and even if agents are rational. There are benefits therefore to be attached to a system of stable exchange rates. The desirability of international policy coordination in this regard is usually demonstrated in the context of a game-theoretic model of a world economy wherein there are two or more sovereign nation-states whose economies are linked through international trade and financial constraints. Informational considerations enter on the supposition that the Central Banks have superior information about the determination of the exchange rate than does the market and that the Central Banks are motivated to reveal this information truthfully. An intervention operation may serve as a credible means to signal information to the market because it involves a commitment of the assets of the Central Bank. If market participants believe Central Bank intervention signals they will influence exchange rates by incorporating the information into their behaviour, thereby playing a game with the Central Bank. The exchange rate, after all, is a visible target. Visibility is a necessary condition" for a target to stabilise expectations.

The standard account recognises some criticisms of a regime of fixed exchange rates. In the first place, a system of stable exchange rates is said to infringe on the sovereignty of nations. Countries lose control of monetary policy in their own economies. In the familiar case of asymmetrical unions, one country (France) sets its exchange rate against the currency of the other (Germany). Monetary policy in France is necessarily constrained. The Bundesbank chooses its policy in order to achieve its no-inflation target. If the exchange rate agreement is credible, inflationary expectations in France

will be low as the people know that inflation in both the countries has to be equal in order to keep the exchange rate constant. If credibility is secured, the cost of disinflation in terms of output is reduced. A second, more serious critique of exchange rate coordination, are the recent results that the cooperative solution would tend to unravel in the case when governments play a noncooperative game with their own private sectors. Among the private sector interests most strongly affected by monetary policy is the financial services sector. Banks bear the brunt of open market operations and Central Banks have always been sensitive to the adjustment by banks to monetary policy actions. Indeed, in the context of the political economy of Central Bank independence, there are conflicts that are endemic within Central Banks themselves. In the case of the US, administration leaders try to influence the composition of the Federal Open Market Committee (FOMC), the arm of the Federal Reserve System that sets monetary policy (Havrilesky, 1994). There is some evidence that cohorts of FOMC members exist that possess ease and tightness proclivities in their FOMC voting behaviour. In short, independence provides Central Banks with the means with which to establish a regime of price stability, ft cannot, however, ensure that they will be faithful to this objective. Governments will always seek to appoint favourites in Central Bank councils.

The underlying assumption to the mainstream account above is that all Central Banks possess a unique objective which is to reduce inflation (expectations) by reducing the domestic money supply. Nothing could be farther from the Keynesian perspective on the matter'. In fact, Central Banks have always been at pains to assure the banking system that the institutional structure is such that the system as a whole can always obtain the cash in order to meet its needs, though at a price of the Central Bank's choosing. A corollary of this fact is that the interest rate will not be varied capriciously. The function of the Central Bank is to maintain orderly financing conditions not stable prices Hyman Minsky (1995) has illustrated how the rote of the Federal Reserve' is to provide liquidity to financial markets so that short-term interest rates fall. In the wake of the collapse in 1929-1933 *an* implicit contract emerged between the Federal Reserve, the deposit insurance organisations for savings banks and savings and loan associations. According to the terms of the contract, the Federal Reserve and the Treasury would ensure that the interest rates at which the thrifts financed their positions were consistent with the interest rates on thcii stock of nvutgage assets. The implication was that the use of interest rates to curb inflationary pressures was to he constrained by the condition that the net worth of thrifts was not to be jeopardised. In the interest rates experiments of the early nineteen eighties, the Federal Reserve violated this agreement. The losses were such that the net worth of many thrifts turned negative, even though there was no crisis due to nonperforrning assets.

Consider now the second aspect of financial systems mentioned in the introductory remarks. The ever increasing international mobility of money has led to deregulation and the abandonment of the structures of direct controls like quantitative controls on lending. The rationale for deregulation is that the allocation of credit and the intermediation of savings will be performed more efficaciously when determined by markets. The result is that there is a general consensus that the primary Policy instrument of the Central Bank is its ability to vary money market interest rates via open

market operation? (Goodhart, 1995A), If the demand for credit is at all sensitive to changes in interest rates, there is level of interest rates at which a given policy target for credit can be attained. The implicit theory underlying the lifting of controls on interest rates is that of a classical system of perfect auction markets for goods, services and assets. That theory could not cope, in particular, with the price-tag aspects of asset markets. Recent research, however, as best exemplified in the work of J.E. Stiglitz and his associates, has underscored that the fact that credit is not allocated in an auction process with borrowers offering to pay the higher interest rate receiving the loan. In particular, problems of asymmetric information impede the functioning of asset markets. One consequence of the existence of asymmetric information is the phenomenon of credit rationing. Among observationally identical borrowers some get loans while others do not. In addition, the latter are strictly worse off than the former. In one astute appraisal of the work of Stiglitz it has been pointed out that Stiglitz's critique of the Arrow-Debreu model is Hayekian (Roemer, 1995). Agents evaluate all kinds of information about their environments which cannot be conceivably be communicated to a central banker. Phis information would include their perceptions of the demands of consumers and the loan supplies of banks with whom they must deal. Stiglitz's response to this reality , however is quite anti-Hayekian. He argues that there is no reason to believe that laissez-faire will lead to static or dynamic efficiency. The non-classical reasons why markets may fail is that (he information in the possession of agents is imperfect. Governments, on the other hand, have an informational superiority with regard to system-wide variables.

A nice relationship between the two facets of financial systems presented above has recently been argued by Robert Pollin (1995). He has studied the relationship between so-called 'bank-based' financial systems versus 'capital market-based' systems and Central Bank policy. Bank-based systems illustrated by France and Japan have been more successful in promoting long-term growth and financial stability than 'capital market-based' systems illustrated by the US and the UK. This is because they are more amenable to public credit allocation policies as a focus of industrial strategies. Firms are difficult to influence through regulatory means. These same decisions may, however, be steered by negotiations wherein the payment for services rendered is clearly calculated in monetary terms. Since banks in bank-based systems hold equity positions and are active in the management of firms, both will be more favorably inclined towards macroeconomic policies that are expansionary. To the Anglo-American banks, on the other hand, the value of outstanding financial assets is more important than the growth prospects of firms and therefore they are more concerned about the threat of inflation. These preferences are reflected in the Central Bank policies of the two types of countries. In the US and the UK the Central Banks are accorded a relatively high degree of independence that over time has evolved into a close parnership with financial interests, These banks therefore tend to favour restrictive policies. Relatedly, the independence of the financial system has resulted in a strong international orientation for the financial sector. In both the countries the domestic currency is extensively used for international transactions and a large industry around international finance has grown. Maintenance of confidence in the currency is therefore given greater credence than in bank-based systems.

2. The Institutional Framework

We proceed now to suggest a systematic framework within which the argument outlined above can be conducted. The behaviour of the monetary authorities is examined in a Keynesian milieu in which the the labour, goods and asset market prices are sticky. Furthermore, changes in the demand for credit are not synonymous with changes in the demand for money. Therefore, fluctuations in the demand for bank loans could lead to changes in the supply of money not matched by an increase in the demand for it. Either bank loans or bank deposits must vary as a residual in order to maintain the balance of the balance-sheet of the bank. The assumption here is that people are usually **unwilling** or unable to allow their borrowing to adjust passively on a regular basis but are always willing to accept money temporarily even if they do not plan to hold it for more than a short space of time. Money is a 'buffer-stock' par excellence (Goodhart, l989). Consequently, at any point of time, the demand for credit at the given level of interest rates determines the slock of money. Competition and innovation within the financial system to some extent influence the appropriate definitions of money and the relationship between any particular definition and the flow of national income. In an economy with a sophisticated banking system, the stock of broad money is endogenous. The flow of funds approach therefore would indicate beginning with the factors determining the outstanding totals of all the various forms of government debt extant, including the cash liabilities of the public sector. The credit aggregates approach to the determination of the money supply i-< applicable to a broad monetary aggregate like M_3 . The familiar "European' budget constraint reads as follows (Goodhart, 1089).

$$M_3 \equiv PSBR - G + Ext + l$$

where PSBR is the public sector borrowing requirement, G is the holding by the nonbank private sector of nonmonetary government debt or other forms of public sector debt, Ext is the finance raised by receiving the rupee counterpart of accommodating a currency outflow, 1 is bank lending to the nonbank private sector. As already suggested, bank lending is assumed to be demand determined at the going interest rates, set either in the market or by the banks. Some of these flows axe outside the control of the monetary authorities (MA). For instance, the size of the public sector deficit cannot be varied in the short run as a flexible instrument for the purpose of achieving some desired rate ot growth in the monetary aggregates. The component will therefore be dropped in what follows. One alternative route is to induce the nonbank private sector to purchase enough government debt relative to the PSBR. These operations are conducted in the open market and the implication is that the authorities must accept a price which the other party to the transaction will accept voluntarily, in order to induce a flow into or out of marketable securities. These interventions alter relative prices and thereby induce portfolio alignments. In sum, the behavioural process runs from an initial change in interest rates administered by the Central Bank or determined by market forces to a subsequent

readjustment in monetary aggregates. Consider each of the components of M in turn. In the loan market, the price i^N is the outcome of an implicit contract between the firm and the bank. The superscript N is to denote the Nash nature of the solution. Output and loans are related by the function y = F (1). It should be noted that this relationship differs from the usual statement of the principal-agent problem where the form of the function is known. In the standard account the principal has imperfect information about what action the agent might undertake depicted by means of an additional argument in the function F. The bias in these stories is in favour of one-sided asymmetric information. A major asymmetry is posited between businessman and banks because the former know more about the conditions and prospects for their own companies. Per analogum, however, financial intermediaries are privy to information on their own condition not publicly available to their borrowers. This realisation is to be found, for instance, in World Bank surveys of the outcomes of financial sector reform. In the East Asian 'miracle' cases, as a result of ending regimes of interest rate repression, the discretionary power of banks to raise intermediate margins increased The state of the balance-sheets of banks is information not revealed to firms. As a result, banks were tempted to misallocate resources. Underfunded banks faced an incentive to finance high risk/high return projects. The proportion of nonperforming loans in bank portfolios therefore rose. The implicit cost had to be born by debtors still meeting their obligations. It is natural therefore to take asymmetric information to mean bilateral private information. This is accomplished by assuming that the form of the function F is not known to both borrower and bank. The profit maximisation problem of a rationed bank is given by

$$\max_{l} \Pi_b = i\, F\,(\,l\,) \text{ subject to } F\,(\,l\,) = \bar{y}$$

where y is the PERCEIVED output constraint facing the bank (Benassy, 1986). The bank will lend exactly the amount necessary for this level of production. This is found by inverting the function F and evaluating it at the constraint level y. $l_b = F^1\,(\,y\,) = l_b\,(\,y\,)$. This is the EFFECTIVE loan supply to distinguish it from the NOTIONAL supply when the bank faces no quantity constraints. Under a constraint-free regime, the partial derivative of the profit function with respect to the interest rate yields the loan supply function $l_b\,(\,i\,)$.

The problem of the firm is similar. The unconstrained or notional loan demand function would be $l_f = l_f\,(i, p),\ \delta l/\delta i < 0,\ \delta l/\delta p > 0$. If loan supply falls short of the firm's demand for loans at (i, p), however, the firm will face a quantity constraint on the loan market. Output falls short of the profit maximising level. The firm's EFFECTIVE output supply y , which recognises the constraint on loan availability equals y = F (1). Bars over variables denote quantity constraints, a hat indicating a constraint or effective supply/demand in a given market given the constraint the agent faces in the other market. The equilibrium level of loans will be denoted by $I\,(\,i^N\,,\ p,\ y\,)$. To summarise, the unconstrained maximum of the profit functions would correspond to the optimal

transactions. In the absence of any constraint on the market, each agent would express a demand equal to its target transaction. The target demand is notional, that is, constructed under the assumption that the transaction will be equal to demand. Denote the optimal interest rate corresponding to the notional demand as i*. Then,

$$\Pi_i \quad (i^N , \bar{y}) \leq \Pi_i (i^*) \qquad\qquad i = f,b \qquad (1)$$

With the introduction of the MA into the model is natural to imply a hierarchical solution concept like the Stackelberg equilibrium. Recall that the objective of the MA is to maximise the purchase by the nonbank private sector of government debt relative to the PSBR. Then the constrained profit function of the MA is

$$\max_G \Pi_g = i\, G - i^N\, l \quad \text{subject to } l = \bar{l}$$

where i is the price of marketable debt and 1 is the imposed level of loans emanating from the private sector.

Suppose first that the MA is the leader and the private sector is the follower. Assume further that the optimal reaction of the follower R (i) is a singleton for every i_g. It is well known that in two-person nonzero-sum games with unique follower responses, the leader never prefers to play the "Nash game" rather than the "Stackelberg game". In the present situation, the same can be shown to hold true for the follower as well. Let i^S denote the OPTIMAL STRATEGY for the follower that is IN EQUILIBRIUM with i\ The pair (i^S , i^S) is a STACKELBERG SOLUTION for the game with the MA as leader. The following fact is of some interest.

PROPOSITION. $\Pi_i (i^N, \bar{y}) \leq \Pi_i (i^g , \bar{y})$ $\qquad i = f,b$

Proof. .Assume to the contrary that there exists a Nash equilibrium solution i N, whose corresponding profits to either member of the private sector is higher than their Stackelberg profits, that is,

$$\Pi_i (i^S, \bar{y}) \leq \Pi_i (i^N , \bar{y}) \qquad\qquad i = f,b$$

Since R (i) is a singleton, let i* be the unique response of the follower to some announced strategy of the leader. By definition,

$$\Pi_i (i^*) \leq \Pi_i (i^S, \bar{y}) \leq \Pi_i (i^N , \bar{y}) \qquad\qquad i = f,b$$

But this would contradict inequality (1).

Q.E D

The result hinges on the fact that the MA possess superior state-level information to enable, them to effect the desired response from the private sector. Indeed, Goodhart (1989) has argued that the form of the private contract permits agents to vary price not on the basis of private information alone but also on the basis of public information. Interest rate contracts would then be related to a publicly observed rate, administered by the MA. It is straightforward to see that the above result holds in the model with the private sector as leader, indicating that the notion of leadership is relative. When all players mutually benefit from the leadership of one of them, there is no reason for any player to deviate from the corresponding Stackelberg solution that was computed under mutual agreement. The equilibrium is stable.

The next step would be derive policy multipliers by relaxing the ration in the output market. However, in the absence of knowledge of the shape of the production function, differentiation of the expression for the equilibrium level of loans cannot be carried out. The clue to proceed is provided by the price argument in the function which is there because of the profit maximisation behaviour of the firm. The price argument, by definition, is related to the nominal exchange rate and will lead to the last component of broad money to be considered, the foreign exchange reserves of the Central Bank. Thus, assume that a shadow or virtual price, p exists such that the unconstrained firm will choose at this price the same production level as it chooses at the prevailing market price in the presence of the quantity constraint, y. (For the sake of convenience, the subscripts identifying the bank and the firm are dropped). By definition, it will hold that

$$\hat{\Pi}(\,p,\,i,\,\bar{y}\,) = \Pi(\,\bar{p},\,i\,)$$

Using Hotelling's lemma, differentiation of the constrained profit function at the virtual price vector yields

$$\hat{\Pi}_{\lambda} = \hat{l}\,(\,p,\,i,\,\bar{y}\,) = l\,(\,\bar{p},\,i\,)$$

$$\delta l/\delta p = \Pi_{ip} \quad (\delta l/\delta p)$$

$$(+) \quad (+)$$

The profit function, it will be recalled, is convex in price.

Given a fixed exchange rate e, the domestic-currency price p is also fixed p = ep*. The price of the tradeable good equals the exchange rate after normalising so that p* = 1. The home Central Bank can induce a currency outflow/inflow by by inducing a currency depreciation/appreciation. However,' if the foreign Central Bank is similarly disposed, both get locked into the familiar cycle of 'competitive depreciation' or 'beggar thy neighbour'. However, even a perfectly antagonistic game such as this has a saddle-point. The value of the payoff functions with each exchange rate are the same in value but are opposite in sign. The process of the game consists of the two Central Banks choosing a certain exchange rate. Using an asterisk to denote a foreign magnitude, the identities are

$$M = Ext\ (e) + \hat{l}\ (e, i, \bar{y})$$
$$(+) \qquad (+)$$

$$M^* = -Ext\ (e) + \hat{l}^*\ (e, i, \bar{y})$$

Note that the argument in the function Ext strictly cannot be signed but will be of the opposite sign of the corresponding influence in the other country. Suppose that the home country has a 'Keynesian' Central Bank and the foreign a 'conservative' Central Bank. A currency depreciation at home would result in an increase in the price level and domestic credit expansion. Correspondingly, there would be a fall in prices abroad and a reduction in the levels of loans there. The outcome would be an improvement from the point of view of the 'conservative' Central Bank as the level of money supply has fallen. Firms in the foreign country, on the other hand , are worse off. However, a fall in the equilibrium level of loans on this account can be more than compensated for by an increase in the level of loans brought about by open-market operations as indicated earlier.

Conclusion

The Bretton Woods arrangements were constructed to permit countries to follow the dictates of their domestic economic policies without having them distorted by foreign exchange speculation. Keynes believed that prices should be set by market forces. His one exception, was the price of money (Wachtel, 1995). The price of money has an internal price and an external price. The internal price is the interest rate and the external price is the foreign exchange rate. Keynes argued that the interest rate should be established by the Central Bank in order to achieve a high level of employment. If the external price of money was subjected to the play of market forces, the domestic interest rate would be subjected to the same forces. Therefore, exchange rates should be fixed by countries in international accord. This would promote international trade.

Governments have been reluctant to hand over to Central Banks the right to take STRATEGIC decisions on the exchange rate (Goodhart, 1995B). Central Banks have only one major control variable, the interest rate. In general, this cannot be used to hit two targets simultaneously, that is, an external objective for the exchange rate and an internal objective for price stability. In principle, it was possible to determine the exchange rate consistent with price stability at home, but this rate would not stay constant over time. Monetary policy could not ensure both a stable price level and a stable nominal exchange rate unless the home country and the foreign country perfectly coordinated on a joint path of price stability.

REFERENCES

Benassy, Jean-Pascal 1986. The Economics of Market Disequilibrium, New York, Academic Press.

Goodhart, C.A.E., 1989. Money, Information and Uncertainty, London, Macmillan.

_____ .1995A 'The Objectives for, and the Conduct of, Monetary Policy in the 1990s' in The Central Bank and the Financial System,, C.A.E. Goodhart, ed., London, Macmillan, pp. 216-235.

_____.1995B 'Central Bank Independence' in The Central Bank and the Financial System.
C.A.E. Goodhart, ed., London, Macmillan, pp; 60-71.

Havrilesky, Thomas 1994. 'The Political Economy of Monetary Policy', European Economic Review, vol. 10, no, l,pp. 111-134.

Minsky, Hyman 1995. 'Longer Waves in Financial Relations: Financial Factors in the More Severe Depressions', Journal of Economic Issues, vol. XXXIX, no. 1, pp. 83-98.

Pollin, Robert 1995. 'Financial Structures and Egalitarian Economic Policy'. New Left Review, no. 214, pp. 26-61.

Roemer, John 1995. 'An Anti-Hayekian Manifesto'. New Left Review, no. 211, pp. 112-129.

Wachtel, Howard 1995. 'Taming Global Money', Challenge, Jan.-Feb., pp. 36-40.

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Neeraj Hatekar

Editor, Working Papers

Department of Economics,

University of Bombay

Vidyanagari, Kalina

Santa Cruz (East)

Mumbai - 90.

India.