

Monetary Policy in Developing Countries and the New Monetary Economics*

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I. Introduction

Several contributions to monetary theory in recent years have been denoted by Hall (1982) as comprising the "new monetary economics." These contributions include Black, Fama (1980, 1983), Sargent and Wallace, Wallace (1981, 1983), Karaken and Wallace, Hall (1981, 1983), Greenfield and Yeagar, and King. The issues addressed in this literature generally involve the roles of various governmentally imposed legal restrictions in the development of monetary institutions or what sorts of institutions will evolve in the absence of such restrictions. Examples of legal restrictions are bank reserve requirements, legal tender laws, and the prohibition of private currency issue. The results of this literature are sometimes quite striking. For example, Karaken and Wallace conclude that equilibrium exchange rates are indeterminate in the absence of binding legal restrictions.

Most (if not all) analysis in this literature to date either implicitly or explicitly takes place in the context of models or arguments in which the level of development of the economy

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under consideration is not an issue. The purpose of this paper is to point out that some of the basic arguments from this literature can be applied to yield certain helpful insights into monetary phenomena in developing countries. Specifically, the perspective used in this literature is helpful in understanding two phenomena experienced primarily by developing countries: currency substitution and unorganized money market activity. The discussion below is primarily an application of the ideas of Fama (1980, 1983) and Hall (1981) and begins in section II with a framework designed to help clarify relevant issues. In section III, the ideas of Fama and Hall are described with reference to this framework. Sections IV and V contain, respectively, discussion of the implications of currency substitution and unorganized money market activity in light of these ideas. The arguments are summarized in section VI.

II. A Simple Framework for the Analysis of Monetary Issues

One function of money is that it generally serves as the unit of account. This fact implies that money has the unique property that its "price" is fixed at unity. The dollar price of one dollar is necessarily one. When apples become relatively more or less scarce, the price of apples is generally free to rise or fall as market forces dictate. However, such a response cannot occur by definition in the case of a change in the relative scarcity of the commodity or asset that defines the unit of account. To illustrate this idea, suppose the demand for money is given by

$$(1) \quad M^D = M^D(X),$$

where M^D is the aggregate stock of nominal money balances demanded, and X is a vector of variables that influence the demand for nominal balances. The precise definition of "money" is unimportant at this stage of the argument. What is important is that the units used to measure money are also used to quote prices.

Relation (1) is a very general specification of money demand. The demand for money follows from the extent to which it performs the functions of medium of exchange, store of value, and standard of deferred payment (as will be argued later, legal

restrictions imposed by government can also be an important determinant of demand). X will include the average price level with an elasticity of one if there is no money illusion, an income variable if money is the medium of exchange, lagged values of the money stock in the presence of a gradual adjustment mechanism, etc. A similar specification for the supply of nominal balances is

$$(2) \quad M^S = M^S(Y),$$

where M^S is the aggregate stock of money balances supplied, and Y is a vector of variables that influence the supply of nominal balances.

The stock of nominal balances is willingly held when X and Y are such that

$$(3) \quad M^D(X) = M^S(Y),$$

The condition that all money be willingly held is but one feature of a general solution, but consideration of condition (3) is still very useful. Suppose some exogenous event changes an element of X or Y and thereby changes the relative scarcity of money. This change *cannot* induce a change in the price of money, because it is by definition fixed at unity. Instead, pressure exists on other variables to adjust. Exactly how this adjustment takes place depends on the model under consideration. The following examples serve to illustrate this point.

A. The Full Information Market Clearing Model

Barro (1984) considers a model in which agents have perfect information about current and future exchange opportunities and in which prices move to clear all markets. The nominal money stock is exogenous, so Y may be treated as a shift parameter. Private agents have no money illusion and their desire to hold real balances depends on variables describing spending plans (consumption) and opportunity cost (the interest rate). A one-time increase in the stock of nominal balances induces an equiproportionate rise in the demand for nominal balances. With the other components of X unchanged, the demand and supply of *real* balances remain at their initial levels. The reduced scarcity of money means that its relative value must fall. Because its price is

fixed at unity and cannot fall, however, the prices of all other goods must rise. Given such a response, no other adjustments are necessary.

B. The Fixed-Price IS-LM Model

In the fixed price IS-LM model, the money stock is exogenous and Y is again a shift parameter. An exogenous increase in M^S initially reduces the relative scarcity of money, but the average price level is by definition fixed and cannot adjust as in the Barro model. As a result, other elements of X must respond, and (given a downward sloping IS curve) income rises and the interest rate falls. Both phenomena increase the demand for money and thereby offset the change in relative scarcity resulting from the increase in M^S .

C. Friedman's Proposition about Inflation

Milton Friedman's oft-quoted statement that "inflation is always and everywhere a monetary phenomenon" has been the focus of a lively discussion in recent years. This debate has evolved to a point where most economists would agree to its validity in the "long run," but the applicability of the statement to shorter periods of time still provokes disagreement.

Barro (1982) clarifies this debate immensely by pointing out that most discussions of Friedman's proposition interpret "monetary phenomenon" as referring only to the *supply* of money. More generally, the proposition is in some sense tautological if it is interpreted as inclusive of phenomena relating to both money supply and money demand. Given that money is the unit of account, changes in its relative scarcity can only be reflected by changes in the prices of other goods — that is, in the average price level. An exhaustive explanation of money supply and money demand must necessarily therefore explain the determination of the price level. Inflation simply means money has become less scarce. The consensus referred to above regarding the determination of inflation in the "long run" is simply a consensus adoption of the idea that money supply movements dominate money demand movements in the "long run."

D. The Transmission of Monetary Phenomena to Other Markets

The above discussions indicate that the unit of account function of money is one reason why changes in the relative scarcity of money can have impacts across a broad spectrum of markets. Specifically, suppose that an economy is characterized by a significant degree of price stickiness across a substantial subset of markets.¹ Money is special in such an economy because changes in its relative scarcity result in pressure on a great variety of prices while changes in the relative scarcity of any other good are reflected primarily in pressure on the price of that particular good. If nominal rigidities prevent the instantaneous attainment of the Walrasian general equilibrium price vector, such changes must be reflected in quantity adjustments. If these impacts are relatively predictable and involve variables of interest to policymakers, then policies that involve manipulation of the relative scarcity of money are potentially useful. Existing institutions are such that in most countries this manipulation occurs via changes in the supply of money, which is generally subject to a reasonable amount of control by policymakers.

Policy becomes difficult when the response of private agents to actual or prospective policy actions is highly volatile. (Instability in the public's desired ratio of currency to deposits is one source of such instability, because it has implications for the demand for bank reserves.) Nevertheless, the essential mechanism transmitting policy actions to the economy — the diffusion throughout the economy of induced disequilibria in the market for the asset that defines the unit of account — is the same regardless of the predictability of supply and demand behavior. Alternatively, suppose for some reason that "money" — the asset with policy determined supply — suddenly ceases to serve as unit of account in favor of some other asset. For example, suppose all French citizens begin quoting prices in terms of Deutschmarks.² In this case, the French franc becomes just another commodity (like apples) whose price is

¹ This somewhat casual introduction of price stickiness is a simple way of accounting for monetary nonneutralities. The key element of the present discussion is that the structure of economies of interest is non-Walrasian.

² In such a scenario, whether French citizens would continue to hold their own currency is clearly an important question. For purposes of the example assume that a well-defined demand for francs is maintained.

quoted in terms of Deutschmarks. If the French money supply is increased and francs accordingly become less scarce, the price of francs is free to fall with only slight adjustments in other prices. Because the "price" of francs is no longer fixed at unity, the essential mechanism transmitting policy actions to the economy is reduced to whatever economy-wide adjustments result from the failure of one price to move substantially as opposed to the failure of several prices to move substantially. More conventional economy-wide adjustments with the new unit of account would occur in response to changes in the relative scarcity of Deutschmark in the French economy.

If a particular unit of account is used so widely as to insure that changes in the relative scarcity of the asset that defines it will induce response across a large part of the economy in question — both in terms of markets for different goods and services and in terms of geographical coverage — it is hereby denoted as a viable unit of account. If some phenomenon induces agents in a quantitatively significant number of markets and/or regions to adopt a new unit of account, the viability of the established unit of account is threatened. If the new unit of account replaces the old one throughout the entire economy, the old unit of account has collapsed. The above discussion indicates that threats to unit of account viability also threaten (or at least change) the fundamental mechanism relating monetary policy actions to other markets.

Sections IV and V below will argue that certain kinds of currency substitution and the widespread existence of unorganized money market activity are phenomena that occur primarily in developing countries which pose potential threats to unit of account viability. As a result, analyses of these phenomena that assume complete viability of the existing unit of account may underestimate the problems they pose for monetary policy determination. Before these issues are addressed, however, a discussion of certain arguments from the "new monetary economics literature" is necessary.

III. A New Perspective on Monetary Phenomena

The papers most relevant for the issues at hand are those by Fama (1980, 1983) and Hall (1981). To understand Fama's

arguments, one must understand the distinction between the numeraire and the unit of account. The numeraire is the tangible good that serves as the base of the price system, while the unit of account defines the denomination of prices. The two need not coincide, i.e., the unit of measure of the numeraire need not be the unit of account. For example, gold was the numeraire and dollars (as opposed to ounces of gold) the unit of account in the gold standard era in the U.S. The standard tied the value of a dollar to a certain weight of gold. In such a system, policy actions (i.e., changes in the relative scarcity of the asset that defines the unit of account) must involve either intervention in the market for the numeraire good or re-definition of the unit of account in terms of the numeraire.³

Fama characterizes current fiduciary monetary institutions in terms of the above framework as follows: the units measuring the monetary base (dollars) serve as the unit of account. Legal restrictions such as bank reserve requirements and the prohibition of private currency issue work to establish a well-defined demand for the base, and the government has a monopoly on its supply. By virtue of such control, the government can manipulate the relative scarcity of the asset that defines the unit of account and thereby influence the economy via the mechanisms discussed in section II above.

Fama (1980) points out that the ability to influence the relative scarcity of the unit of account is in principle unrelated to the operation of credit markets. He makes this point quite forcefully in a parable about a currency-less economy of the future in which reserve requirements are imposed on spaceships. Because spaceships are presumably valuable in this economy, the legal restriction creates a meaningful demand for "reserve certificates." As long as these certificates define the unit of account,⁴ the essential mechanism relating policy actions (manipulation of the relative scarcity of reserve certificates) to the other market is

³ The latter policy action is known as debasement and has been widely practiced. Hall (1981) gives a somewhat amusing chronicle of debasement of the British pound sterling from an actual pound at the time of its establishment of William the Conqueror (Reign: 1066-87) to the 0.015 pounds of silver the "pound" would buy in 1981.

⁴ Why reserve certificates should define the unit of account in this economy is an open question. One obvious scenario is that government requires prices to be quoted in terms of the reserve unit.

identical to that in current economies.

Fama (1983) contends that price level control can be achieved via control of the relative scarcity of currency alone. Because currency and deposits are imperfect substitutes in some transactions, a legal restriction prohibiting private currency issue is sufficient to establish a meaningful demand for government currency. As long as currency defines the unit of account, government control over its relative scarcity can control the price level with no direct implications for the availability of credit.

Hall (1981) discusses the role of government in the establishment of the unit of account. He views the choice of a unit of account as in principle similar to the choice of a system of weights and measures, because the unit of account is simply a measure of value. One option for the government is to simply suggest a measure of value — such as one pound of sterling silver — and let market forces do the rest. Hall contends that experience has shown that economic agents generally respond to such suggestions favorably. In fact, as Fama points out, units of account seem to have a great deal more “inertia” than numeraires. When gold standard abandonment broke the link between dollars and gold, agents continued to quote prices in dollars and the monetary base effectively became the new numeraire. The other option — to maintain gold as the numeraire and adopt a new unit of account — did not materialize. The refusal of the court system (until 1977) to enforce contracts indexed to gold may be one explanation for this inertia.

Factors influencing the selection and maintenance of a given unit of account have received little attention in the literature. One reason may be the belief that choice of a unit of account is essentially arbitrary, much like the decision regarding which side of a road should be used by drivers. The actual side chosen is unimportant; what is important is that every driver adopts the convention. The convention, once adopted, will hold as long as every agent perceives obeying the convention to be in his or her interest. Another view is that of White, who maintains that the unit of account is inextricably linked to the prevailing medium of exchange. The important influences of unit of account determination are therefore those factors that determine the medium of exchange.

The use of a given kind of money (currency and deposits) for most or all transactions in an economy is probably a sufficient condition for the viability of a unit of account based on the unit by which that money is denominated. In section IV, the argument is advanced that currency substitution can in principle cause this condition to be violated, thereby posing a potential threat to the viability of the unit of account. Furthermore, section IV also argues that by virtue of such a threat, currency substitution may complicate monetary policy determination to a greater extent than has been previously recognized.

A necessary condition for use of a given unit of account is that the good that defines it have the attribute of scarcity. Prices in terms of gold or cattle are sensible. Prices in terms of dirt, air, or seawater are meaningless because the abundance of these goods makes relative valuation in terms of them difficult if not impossible. In section V, the argument is advanced that widespread unorganized money market activity can in principle result in the absence of scarcity of the numeraire good in a fiat money economy. More generally, such activity on a relatively broad scale can severely complicate manipulation of the relative scarcity of the asset that defines the unit of account.

IV. Currency Substitution

In recent years a great deal of attention has been paid to the currency substitution (CS) phenomenon — see Girton and Roper, Miles, Ortiz, and Bordo and Choudhri. Probably the most interesting result of this literature relates to the insulation properties of flexible exchange rates. The essential insight is that exchange rate movements induced by foreign phenomena (such as a change in foreign income or inflation) can influence the domestic demand for money and thereby induce changes in the relative scarcity of the asset that defines the domestic unit of account. As discussed above, such changes can manifest themselves in a number of ways, so the domestic economy is in general not fully insulated from foreign disturbances.

As traditionally discussed, CS occurs because foreign currencies are an alternative store of value. That is, CS occurs primarily because of a *speculative* motive. As such, the anticipated rate of

depreciation of domestic currency is an opportunity cost of holding domestic currency and should be included in the domestic demand for money function. To the extent that movements in foreign variables influence the expected rate of depreciation, they will influence domestic variables through essentially the same mechanism that transmits changes in the quantity of domestic money to the economy, i.e., altering its relative scarcity. As discussed above, exactly what those effects are depends on a number of other factors such as the degree of price and wage flexibility.

One treatment of CS from a *transactions* viewpoint is that of Poloz, who uses a Baumol-Tobin inventory-theoretic model to drive the demand for domestic and foreign currency when an exogenously specified fraction of transactions involve the use of foreign currency. An important question not addressed by Poloz (or in any other transactions-based treatment of currency substitution) involves which unit of account is employed in transactions involving foreign currency. If these transactions employ domestic currency unit as the unit of account, CS involves no threat to unit of account viability. In this case, the CS phenomenon can be classified as complicating (perhaps severely) the determination (and manipulation through policy) of the relative scarcity of the asset that defines the unit of account.

As argued above, however, there is a natural link between the medium of exchange and the unit of account. If certain transactions consistently take place in terms of foreign currency, the adoption of foreign currency units as the unit of account for those transactions would seem to be very likely. Hence with the widespread existence of transactions motivated CS, there is a potential threat to the viability of domestic currency as the unit of account.

In practice, an economy-wide abandonment of domestic currency units as the unit of account is unlikely. A more realistic possibility is the widespread adoption of a foreign currency as unit of account in one *region* of an economy — such as a border area. (Northern Mexico along the U.S. border is one possible example of this phenomenon.) In such a region, domestic currency has a price in terms of the unit of account just like any other commodity. Monetary policy effectively loses its mechanism in such a region, even if domestic money is still held and used in trans-

actions. Another possibility is that foreign currency becomes the economy-wide unit of account in a subset of transactions — perhaps those involving illegal activities or certain specific goods. Again, monetary policy actions will probably have reduced influence in these markets. In either case, changes in the relative scarcity of foreign currency has direct effects rather than operating indirectly through the expected rate of depreciation.

The above discussion suggests that the implications of CS could depend critically on whether the CS threatens the viability of domestic currency as the unit of account. In this context, whether CS is motivated by speculative or transactions considerations appears to be of some importance. A major item for further research involves a specific examination of the factors influencing unit of account determination.⁵

V. Unorganized Money Markets

In many developing countries, severely binding legal restrictions such as deposit interest rate ceilings have resulted in the development of unorganized money markets (UMMs — also called “curb” markets) in which loan agreements are made that evade these restrictions. Wai surveys the characteristics of these markets. Most of the literature in this area examines the role played by these markets in facilitating or inhibiting financial intermediation. Of particular interest is the extent to which government legal restrictions result in “financial repression” that retards development. McKinnon and Shaw contend that higher (governmentally controlled) time deposit rates raise output and lower inflation by increasing the amount of financial intermediation and thereby facilitating the availability of credit to finance production. Van Wijnbergen maintains that the McKinnon-Shaw hypothesis rests on the assumption he finds implausible. Chang and Jung develop a general model in which the competing hypotheses

⁵ One likely feature of research in this area would involve consideration of economies characterized by bimetalism in which both gold and silver coins served as media of exchange. The guinea was adopted as a measure of gold by Britain in 1663 (see Hawtrey, 1950, p. 236) and survives today as a phantom unit of account denoting one pound plus one shilling. Study of unit of account use in situations where gold and silver coins fluctuate in relative value could yield some insight into the issues of interest.

of McKinnon-Shaw and Van Wijnbergen are compared.

The potential implications of UMM activity for unit of account viability are very subtle. Consider an economy without currency in which all transactions are carried out through an accounting system of exchange, as in Black. Further suppose that bank reserves function as the numeraire good and that the denomination of bank reserves is the economy-wide unit of account. Assuming that bank reserves pay no interest, a legal restriction in the form of reserve requirements is needed to guarantee a market for the numeraire good. In the extreme case where the advent of curb markets completely supplants the organized banking system, the demand for official reserve deposits at the central bank will fall to zero. The relative scarcity of the asset that defines the unit of account is no longer defined in this case, and hence the aggregate price level in terms of the existing unit of account becomes indeterminate. Policy actions become meaningless, as manipulation of the supply of an asset for which no demand exists cannot change its relative scarcity. The "numeraire" good has adopted properties that make pricing in terms of the good meaningless, e.g., similar to pricing in units of air or seawater.⁶ In such an extreme situation, the economy would be forced to adopt a new unit of account.

While consideration of extreme cases is helpful for expositional purposes, they generally have little relevance to actual economies. UMMs usually *coexist* with an official banking system and as such some demand for bank reserve deposits does exist. Further, the numeraire good consists of currency in addition to bank reserve deposits. Given that currency and deposits are imperfect substitutes in some transactions, and assuming private currency issue is prohibited, the asset(s) that define the unit of account do possess scarcity. As a result, although the widespread existence of UMMs does in principle threaten unit of account viability, such a threat does not seem likely to emerge given a prohibition on private currency issue.

Importantly, however, the existence of UMMs does complicate the mechanism that relates policy actions to the rest of the

⁶ While air and seawater lack scarcity by virtue of a limited demand in the face of an overwhelmingly large supply, the numeraire good in this example lacks scarcity by virtue of no demand in the face of a finite supply.

economy. In practice, most countries allow free convertibility between currency and bank reserve deposits, and policy is undertaken by changing the relative scarcity of reserves. Currency is generally not a scarce item. With UMMs, however, increased scarcity of bank reserves need not induce a multiple contraction of loans and deposits. Instead, loans and deposits might respond to such scarcity by leaving the official system and finding a place in curb markets.⁷ Although a great deal of research remains to be done in this area, the manipulation of reserve scarcity by policymakers in such a way as to have predictable effects on the economy seems to be severely complicated by the presence of UMMs.

In the presence of institutions that make the manipulation of relative scarcity of bank reserves quite difficult, one alternative for policymakers is to concentrate on the relative scarcity of currency and not worry about bank reserves. As noted above, Fama (1983) maintains that such an approach can achieve price stability with no interference in credit markets; the chief advantage in the present context is that the relative scarcity of currency might be more subject to manipulation than the relative scarcity of reserves. In fact, if curb market "banks" use currency as "reserves," such a policy could approximate a reserve oriented policy in an economy with no curb markets.

These waters are somewhat uncharted, however, because the response to a change in the relative scarcity of currency is unclear — particularly with regard to an excess demand. Even though individuals might prefer to use currency in some transactions, the number of transactions that necessarily *require* currency is unknown (currency requirements are surely proportionately much greater in developing countries than in developed countries, however). Because the official banking system usually offers the only viable accounting system of exchange (especially for small transactions), an excess demand for currency might drive deposits and loans out of curb markets and into official banks.

An excess demand for currency might also encourage the use of substitutes. Although any small denomination bearer cer-

⁷ While the precise nature of this phenomenon remains to be explored, it seems to bear a theoretical similarity to the financial innovation phenomena observed in the U.S. in recent years as various regulatory constraints have become binding. For a discussion of these issues, see Hester.

tificates are in principle good candidates for use as media of exchange, foreign currencies are likely to be among the prime alternatives. The implications of currency substitution are discussed above, and to the extent that attempted manipulation of the relative scarcity of domestic currency encourages currency substitution, unit of account viability is again at risk. With widespread curb market activity, monetary policy determination therefore becomes potentially very complex indeed.

An alternative response to the problems caused by widespread unorganized money market activity is to simply deregulate the financial system. While considerably less esoteric than the policies discussed above, structural and political factors might prohibit its explicit implementation. The above discussion can therefore be viewed as relating to policy options other than simple deregulation.

VI. Summary

This paper has provided an overview of a perspective on monetary institutions that has interesting implications for monetary phenomena and policy in developing countries. From the standpoint not only of policy determination but monetary theory in general, the unit of account function of money seems to play an important role in the transmission of monetary policy actions to the private economy. As long as money has a price of unity, changes in its relative scarcity cannot be accommodated by a change in its price. Other variables must adjust in response to such changes, and how these adjustments occur have long been of interest to monetary theorists.

When domestic money ceases to define the unit of account (either in certain markets or in particular region), however, it becomes a just another commodity whose price moves in response to changes in its relative scarcity. Any phenomenon that threatens unit of account viability also threatens to make monetary policy the simple intervention in one market among many.

Currency substitution can occur due to speculative or transactions based motives. If the demand for foreign currency is motivated by its store of value properties, the treatment of the existing literature is applicable. If foreign currency is desired for use

in certain transactions, however, the unit of account function of domestic money is threatened with respect to those transactions.

The presence of unorganized money markets in effect implies an unregulated banking system operating alongside the official system. Because unregulated banks are not subject to reserve requirements, the demand for reserve deposits at the central bank is influenced by funds moving between the official system and curb markets. In principle, the widespread proliferation of curb markets could threaten unit of account viability by reducing the demand for the numeraire good (currency and reserve deposits) to such an extent that it no longer exhibits scarcity. While such a threat is not likely to occur in practice, the arguments of Fama (1980, 1983) suggest that policies aimed at influencing the relative scarcity of currency in economies with widespread curb market activity might be considered as alternatives to the traditional approach of influencing the relative scarcity of bank reserves.

In conclusion, currency substitution and/or widespread curb market activity have potential implications for the unit of account function of money that could seriously complicate monetary policy determination. This paper has provided an overview of many issues that relate to this point, and further research into the determination of unit of account choice appears to have some promise in the context of understanding monetary phenomena in developing economies.

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