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Aspects of the Design of Financial Programs with the Adoption of Indirect Monetary Controls

by

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Abstract

This paper examines why the framework for financial programs may need to be reassessed with the transition from direct to indirect monetary controls. Because the controllability of broader monetary and credit aggregates with indirect monetary controls is likely to be imprecise, quantitative financial programming at the level of the banking or financial system may not be practicable with the transition to indirect monetary controls. Financial programming on the central bank's balance sheet has a number of operational advantages with the adoption of indirect monetary controls, and also a broader economic rationale.

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1/ I am grateful to Manuel Guitián for his comments on an earlier version of this paper.

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I. Introduction

This paper discusses some of the aspects of the design of financial programs 1/ that are of concern in the transition from direct to indirect (i.e., market-based) monetary controls. Many of the issues discussed are already taken into account in the design of Fund programs; however, it is useful to provide an overview and to reexamine the theoretical and operational background.

The paper assumes that in order to safeguard the use of its resources, the financial programs supported by the Fund would continue to include quantitative financial benchmarks that would be used to assess performance (performance criteria). 2/ The paper does not seek to discuss the numerous complexities of specific country experience that would have to be taken into account case by case, nor does it deal with specific institutional issues in the transition from direct to indirect monetary controls. 3/

There are a number of reasons why the framework for financial programs should be reassessed with the adoption of indirect monetary controls. First, the move to indirect monetary controls is partly a response to the increasing complexity and sophistication of monetary and financial systems. The relative merits of different approaches to financial programs need to be reassessed within these more complex systems.

1/ The term "financial program" as used here refers to financial programs with strict conditionality in the Fund sense.

2/ For a discussion of the use of quantitative benchmarks in Fund programs, see, for example, Guitián (1993).

3/ On these issues see, for example, Johnston and Brekk (1989) and Johnston (1991).

Second, the introduction of indirect monetary instruments in itself may influence the behavior of different financial aggregates. Hence, the financial program may need to be redesigned.

Third, the philosophy of indirect monetary control, unlike that of direct control, is that the authorities control a single financial variable—such as the money market interest rate or the supply of reserve money—and allow other interest rates and financial aggregates to be market-determined. The implications of this approach for the controllability of different financial variables and the selection of performance criteria need to be examined.

The paper is organized as follows: Section II sets out in general terms some of the consequences for financial policy of the recognition of the increased complexity of financial systems. Section III discusses some of the specific implications for the design of financial programs of the adoption of indirect monetary controls. Section IV sets out a programming framework which seeks to take into account concerns identified in the earlier sections. Conclusions are presented in Section V.

II. Implications of Increased Complexity/Sophistication in Financial Systems

Recognition of the increasing complexity/sophistication in financial systems has a number of potential implications for the approach to the design of financial policy. The following section sets out some of the major issues.

1. Financial asset and liability demand functions

In complex financial systems there are many competing assets and liabilities, and the relationship of a group or subgroup of these assets and liabilities to economic activity is largely an empirical matter. Economic theory distinguishes between a transactions demand for money and asset holding based on broader portfolio decisions. 1/ The transactions demand for money is related to *expenditures* and normally defined on narrow monetary aggregates. Broader holdings of money are the result of the allocation of *financial wealth* portfolios. The demand for credit from the financial system is explained by both expenditures and portfolio allocation decisions (borrowing to hold financial assets). The transactions demand for money, broad money demand, and the demand for credit from the financial system respond to the differences between their own rates of return and those of competing assets.

Estimates of the demand for these financial variables depend upon proxying the appropriate scale variable and the relevant own and competing rates of return on the asset. This is usually simplest in the case of the transactions demand for non-interest-bearing money, where income is normally the scale variable and the average interest rate in the financial system may approximate the cost of holding these money balances. For example, such simple equations may be used as a starting point to explain the demand for currency by the public. Currency demand equations usually also include

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1/ This approach follows the work of Tobin and Brainard (1963) and Tobin (1969).

other variables to explain the trend velocity in currency demand. 1/ Broader money, and financial system credit, demand functions are usually considerably more complex and need to include at least a competing interest rate.

The simpler functional form for the transactions demand for non-interest-bearing money implies, theoretically, that such measures of money are more likely to be related unambiguously to nominal expenditures than to broad money and bank credit. 2/ Hence, the transactions demand for money is likely to be a superior intermediate target. Nevertheless, given the complexities of financial systems, it may be necessary to rely on an empirical approach. Thus, while, theoretically, certain narrower measures of money may be the best (most stable) indicators of expenditures, the value of different money and credit aggregates is a matter for empirical investigation.

2. Inadequacies of direct controls

The second consequence of increased sophistication of financial systems is the ineffectiveness of direct controls on interest rates and credit in managing macroeconomic developments. The problem is not that the specific interest rates or aggregates cannot be controlled administratively, but that

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1/ These variables may include, for example, the proxies for the use of currency in transactions, such as the number of credit cards (see Johnston, 1984).

2/ For a discussion of the theoretical relationship between different financial aggregates and expenditures in a portfolio model, see Johnston (1986). Put simply, expenditures are more likely to be influenced by the level of interest rates rather than by interest rate differentials. Therefore, the demand for non-interest-bearing money is more likely to signal correctly the response of expenditure to a change in interest rates than broad money or credit aggregates.

the controlled aggregates cease to bear a stable relationship to the macroeconomic objectives. The problems of disintermediation and distortion of targeted aggregates with direct controls (so-called Goodhart's Law) are well-known and need not be repeated. This is not to exclude the possibility that direct credit and interest rate controls can be useful when the financial system, and the instruments for indirect control, are poorly developed, but the efficiency of these controls is likely to diminish over time. Direct controls are also likely to inhibit financial sector development and the efficiency of resource allocation. 1/

3. Objective of macroeconomic financial management

The third consequence of increased complexity of financial systems is a recognition that the authorities' ability to manage financial variables (money and credit) at the level of the financial or banking system is imprecise. Moreover, the implications of controlling variables that are directly under the control of the central bank also involves a good degree of uncertainty. As a result, the objectives of financial policy have tended to become more limited, with the focus on managing aggregate demand and, through this, inflation and the balance of payments. Also, while different exchange rate and credit policies can impact differently on inflation and the balance of payments in the short run, there is a recognition that a *sustainable* improvement in the balance of payments will require bringing inflation under control. Hence, the primary objective of monetary and credit policy should be reducing inflation, and exchange rate policy should

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1/ For a discussion, see Johnston and Brekk (1989).

be established consistent with this objective. 1/ Adjustments of fiscal policy can help resolve potential conflicts between maintaining a tight monetary policy and an appropriate value for the exchange rate.

4. Greater reliance on judgmental approaches

The fourth consequence of the increased complexity of financial systems is that *all* quantitative targets become less reliable guides for policy implementation. Hence, the implementation of financial policy relies more on judgment and less on sticking rigidly to preannounced quantitative targets. This requires a good degree of sophistication on the part of policy makers in order to interpret the latest financial indicators and assess the stance of policy.

III. Results of the Adoption of Indirect Monetary Controls for Financial Programs

Under a system of indirect control, the main instrument of monetary control is the central bank's control over interest rates in the money market through its ability to manage the supply of reserve money relative to the demand for it. Money market rates, in turn, affect other lending and deposit rates. The authorities manage the operational variables and leave market mechanisms to determine the detailed structure of deposit and lending

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1/ Attempts to fine-tune instruments to achieve different targets in the short run will ultimately be self-defeating if these targets are inconsistent. For example, an attempt to maintain an undervalued exchange rate to improve the balance of payments while simultaneously seeking to bring inflation down through tight credit policy could result in monetary inflows that could undermine the inflation objective. According to the above view, this conflict should be resolved in favor of achieving the inflation objective even if this involves an initial smaller improvement in the balance of payments.

rates and the composition of financial assets and liabilities. The key instruments of indirect control are the central bank's ability to manage its own balance sheet and the terms at which it is willing to provide assistance to cover cash reserve shortages.

The shift from direct to indirect monetary instruments may involve no more than a change in the procedures for establishing the key market interest rate, which will, in turn, influence all monetary and credit aggregates. However, in a number of cases the adoption of indirect monetary control also involves a more active management of the stock of reserve money. Moreover, the freeing up of interest rates that would have to accompany the adoption of indirect monetary controls may also have broader implications for the behavior of financial aggregates.

1. Relationship between reserve money and broader aggregates

There has sometimes been a presumption that nothing much changes for the design of financial programs which are set at the level of the banking system with the adoption of an indirect approach to monetary control based on controlling the stock of reserve money. 1/ This presumption rests on the argument that broad money, and its counterparts, can be linked in a semiautomatic way to the monetary base. However, a monetary-base approach to controlling broad money does not usually provide a programmable outcome both for broad money and its credit counterparts and, therefore, for the net foreign assets (NFA) of the banking system.

The relationship between control at the level of the central bank and the banking system is normally presented in terms of money multipliers:

1/ This presumption is reflected in IMF (1987).

$$M_2 = mM_o \qquad (1)$$

where M_2 is broad money, M_o the monetary base, and m the money multiplier linking the monetary base and broad money. 1/ However, equation (1) does not define the distribution of the counterparts to broad money between net domestic and foreign assets (i.e., between the NDA and NFA) as would be necessary to program an outcome for the NFA of the banking system. 2/ A path for M_o could be derived from the projection for broad money using equation (1) consistent with the use of broad money as an intermediate target. However, with monetary base control, the programming of the NDA and NFA would have to occur at the level of the central bank.

It might also be noted that the selection of M_2 as an intermediate target, because of characteristics of stability and predictability, may itself imply greater instability in the money multiplier, m. Stability in M_2 is likely to mean that its component parts, currency and bank deposits,

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1/ Where: $M_o = C + D_o$, $M_2 = C + D_2$,

$$m = \left| \frac{C + D_2}{C + D_o} \right| = \frac{\alpha + 1}{\alpha + \beta} \qquad (2)$$

with $\alpha = C/D_2$ the ratio of currency to bank deposits, and $\beta = D_o/D_2$ is the ratio of banks' holdings of deposits with the central bank to bank deposits. If the ratios α and β are stable, then equation (2) provides a framework for controlling the stock of broad money through the monetary base. This is sometimes known as monetary base control.

2/ Also, it is not possible to derive simple, easily interpretable ratios between the monetary base or its components and the domestic credit of the banking system that would allow for a independent programming of the banking system's credit expansion and, therefore, the NFA of the banking systems. For example, the statistical relationship between the monetary base and bank credit is generally much worse than between the monetary base and broad money.

are close substitutes but that stochastic shifts between these components cannot be fully modeled, i.e., the stochastic errors in the component-demand equations are negatively correlated. However, such negative correlation in stochastic errors will imply a larger variance in the money multiplier. 1/ Of course, the error structure of the M_2 components could be independent; but, in that case there are no stability advantages in using M_2 as an intermediate target rather than its individual components.

2. Impact on financial aggregates of adopting indirect monetary controls

The second main implication for designing financial programs is that the shift away from direct controls toward a reliance on indirect monetary controls can have important effects on the behavior, and controllability, of the broad money and credit aggregates. The introduction of indirect

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1/ Writing the demand equations as:

$$C = F_1(Y, r, P...) + u_1$$
$$D = F_2(Y, r, P...) + u_2$$
$$\text{and } M_2 = C + D = F_3(Y, r, D...) + u_3$$

where u_1, u_2, and u_3 are stochastic error terms. The decision on the appropriate level of aggregation for a monetary aggregate often depends on how well it is possible to model the particular aggregate or sub-aggregate. A decision to target M_2 would suggest a priori that M_2 is more predictable than its individual components.

i.e., $\text{Var}(u_3) < \text{Var}(u_1), \text{Var}(u_2)$

Assuming $C = \bar{C} + u_1$, $D = \bar{D} + u_2$, then

$$\text{Var}(\alpha) = \text{Var}(C/D) = \frac{\bar{D}^2 2u_1^2 - \bar{C}^2 u_2^2 - 2\bar{C}\bar{D}u_1u_2}{\bar{D}^4 + 2u_2^2\bar{D}^2 + u_2^2/B^2}$$

which will be larger when u_1 and u_2 are negatively correlated.

monetary controls would have to be accompanied by a freeing up of interest rates and credit control, and this liberalization is likely to be followed by an initial shift in money and credit aggregates, and a structural change in the interest elasticity of demand. First, the liberalization of controls on bank credit is often associated with large increases in the stocks of gross financial assets and liabilities, and increased borrowing to hold larger money balances at any given level of interest rates and income. 1/ A liberalization of credit ceilings often leads to an initial rapid rise in lending, where lending was previously constrained by direct controls. 2/ Second, a liberalization of bank interest rates may result in an initial rise in deposit rates relative to other rates of return and an increase in broad money holdings. The liberalization of bank interest rates will make broad money less sensitive to changes in the general level of interest rates since own interest rates would move in line with competing interest rates.

Because of these structural shifts, the information content of monetary and credit aggregates will be very difficult to assess immediately following the liberalization. The broad money and banking system credit aggregates may also be extremely difficult to control through changes in interest rates during the transition phase. The historical money and credit demand equations will not provide reliable guides whether for resource pressure or

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1/ See, for example, Johnston (1985) for an examination of the impact of the liberalization of credit availability on the demand for financial assets in the United Kingdom.

2/ See Bisat, Johnston, and Sundararajan (1992).

for the necessary interest rate changes, and it may take a number of years before the shifts in the demand for money and credit can be assessed. 1/

IV. Consequences for the Design of Financial Programs

Potential instability in monetary and credit aggregates following the introduction of indirect monetary instruments makes it more difficult to formulate monetary and credit targets that can act as precise benchmarks in macroeconomic adjustment programs. These problems may be especially acute in the initial phase of reform, and when setting targets at the level of the banking system because of the initial uncertainty about the size, and even the sign, of the short-run interest elasticity of broad money and credit demand. However, this is not to argue that financial programming should be abandoned, but rather that the design needs to take account of this factor.

1. Role of quantitative targets

First, it should be recognized that, even when the information content of financial aggregates has been uncertain, countries have often retained quantitative intermediate targets as a central element in macroeconomic policy formulation, e.g., because of the advantages of announced targets for the formulation of expectations. 2/ However, in these situations, precise

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1/ It may also be noted that such structural shifts in asset holdings are not automatically taken into account through divisia monetary indicators, since the range of assets covered by such indicators also needs to be defined. In addition, divisia monetary indicators do not provide readily interpretable counterpart equations that would be amenable to financial programming.

2/ For example, there was much debate about the stability of the M_1 aggregate in the United States long before its deemphasis in 1982; and the lack of evidence on the stability of the M_3 aggregate did not prevent the U.K. authorities from using this as the only announced monetary target until 1982.

short-term control of the aggregates is not desirable, or often feasible, and except for the U.S. experience in 1979-82, 1/ most monetary authorities have not attempted precise short-term control of the money supply. This reflects, inter alia, the generally slow speed of response of broad money and credit to a change in interest rates, and the resulting likelihood that attempts to bring the aggregates back on target in a short period would cause interest rates and the exchange rate to overshoot.

Most counties, therefore, adopt a more judgmental approach to setting interest rates rather than adhering strictly in the short run to a quantity target. The more judgmental approach may involve setting and announcing annually a target range for a monetary aggregate (or aggregates) to be achieved over a certain period of time (e.g., a year). Fluctuations in the growth of the monetary aggregate relative to its target range are assessed when new data are available, e.g., monthly, and sometimes more frequently. This assessment may involve the examination of a broad range of financial and economic indicators to help interpret monetary conditions and possible shifts in money demand. The authorities react to movements of the targeted monetary aggregates relative to their preannounced target by changing interest rates, unless other financial and economic indicators strongly indicate evidence of money demand instability. 2/

This more judgmental approach does not, however, necessarily provide a good basis for establishing conditionality in financial programs for

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1/ See, for example, Heller (1988) for a discussion of U.S. monetary control procedures.

2/ There are risks in this judgmental approach, particularly of a "bias to delay" and from interest rate decisions becoming less automatic and more political.

safeguarding the use of Fund resources. For this purpose, it would be desirable to have more precise benchmarks that are directly under the control of the monetary authorities. As already noted, such precise benchmarks are not likely to be achievable—at least in a predictable period of time—at the level of the banking or financial system with indirect monetary controls. Hence, the adoption of indirect monetary controls in the context of Fund programs will likely require a reformulation of the program targets.

2. Programming at the level of the central bank's balance sheet

The design of financial programs at the level of the central bank's balance sheet rather than the banking system would have a number of potentially desirable operational features in the context of the introduction of indirect monetary instruments:

a. The NDA of the central bank is under its direct control, whereas with indirect instruments, the development of the NDA of the banking system will depend on not easily predicted portfolio responses. Also, the central bank's NFA may be a direct operational variable related to its intervention in the foreign exchange market. Hence, the prospects for achieving short-term targets would be better with a program at the level of the central bank's balance sheet rather than the banking system's balance sheet.

b. Since the indirect instruments of monetary control are directed at managing the central bank's balance sheet, there is a closer link between the operational arrangements for monetary control and the targets.

c. Information on the central bank's balance sheet is often more accurate and updated more frequently with shorter delays than banking system

aggregates. Hence, more up-to-date monitoring of the program may be possible.

d. The developments in the central bank's balance sheet may be less prone to structural shifts with the change to indirect controls than the banking system's balance sheet. The shifts that do occur, such as in holding precautionary reserve balances, are closely linked to the central bank's own operating procedures and, therefore, may be more amenable to prediction.

e. As already discussed, currency demand equations are also usually functionally much simpler than broad money demand and credit equations.

3. Rationale for programming on the central bank's balance sheet

The above points suggest that there are important operational reasons for programming on the central bank's balance sheet. There is also a broader rationale.

A point that is quite often difficult to grasp is that using currency or reserve money demand as the relevant monetary aggregate in the financial program does not necessarily involve any loss of control over aggregate demand or inflation compared with using a broader monetary aggregate. The key issue concerns the information content of the different aggregates as evidenced, e.g., by the stability in the money demand functions. If the underlying demand for currency (or reserve money) has features of stability and predictability in terms of income/expenditure, interest rates, and predictable trend variables, then management of the demand for currency as an intermediate target would provide the desirable outcome for expenditures

and inflation. Under these conditions, it is not necessary to have separate targets for broad money.

Another way of rationalizing the approach is to consider that the central bank's balance sheet is the only source of "outside" money and that control of the supply of outside money relative to demand is the major monetary element in the control of expenditures and inflation. If the central bank does not monetize a new demand for credit, e.g., through refinance credits, the commercial banks will have to mobilize new deposits. If the monetary system is initially in equilibrium, the mobilization of deposits would require some net rise in bank interest rates to attract funds out of other assets or through an increase in savings. This per se is not necessarily inflationary. If there is initially disequilibrium resulting in a balance of payments deficit and loss of international reserves, the central bank would have to constrain the supply of outside money.

The programming framework would therefore consist of the following: (1) defining the macroeconomic framework, and (2) establishing the path for the central bank's balance sheet consistent with this framework. The projected path for the central bank's balance sheet would depend on an estimate of the demand for currency or reserve money consistent with the macroeconomic objectives. Other, broader financial system aggregates do not need to be specifically targeted, although this approach would not exclude setting indicative targets for broader money and credit aggregates that can also help to guide policy. Given the targeted growth of currency or reserve money, ceilings would be established on the NDA of the central bank consistent with the programmed growth of the central bank's NFA. The NDA

ceilings can then be broken down into operating targets, which can be met using the indirect monetary instruments. 1/ This approach is already used in a number of Fund programs.

4. The role of the exchange rate

To the extent that the growth of currency or reserve money has been targeted to bring down inflation, either the exchange rate should be allowed to adjust or intervention beyond the NFA objective should be sterilized, consistent with meeting the monetary target. The NFA objective provides an operational target for the volume of central bank intervention in the foreign exchange market consistent with the programmed path for the NDA. Exchange market intervention beyond the NFA objective would have to be offset by adjusting the NDA path consistent with meeting the target for the growth of currency or reserve money. This adjustment could include changes in the fiscal stance or sales of market instruments to reduce liquidity.

Operationally, it would be possible to accommodate a range of exchange regimes consistent with the financial program. The exchange rate could be floated or adjusted discretely, consistent with meeting the NFA objectives. The exchange rate might be pegged if there is sufficient flexibility in domestic monetary (and fiscal) operations to offset the consequences for the NFA. An initial adjustment of the exchange to bring it to a realistic level consistent with liberalization in the exchange system would generally be desirable. Information on movements in the exchange rate or developments in

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1/ For a discussion of the operation of indirect monetary instruments in rudimentary financial systems, see Johnston and Brekk (1989) and Johnston (1991).

the NFA when the exchange rate is maintained at a certain level should be used in the assessment of monetary conditions.

5. Supplemental review

Given what has been said about the potential instability of *all* financial aggregates, including the demand for currency or reserve money, the setting of targets at the level of the central bank's balance sheet would have to be supported by a broader review of financial indicators (the more judgmental approach already discussed). Such reviews should be based on the assessment of a range of financial indicators.

Because of the increased concern about aggregate instability, a greater role might be given to unanticipated shifts in prices (interest rates and exchange rates) as part of these reviews. This might imply giving greater weight to real interest rate or nominal exchange rate targets in the financial programs, which could have attractions when money and credit demand are unstable, since the aggregate instability would be accommodated. 1/

The authorities would need to develop their monetary and credit information systems to help conduct these reviews. The interpretation of monetary conditions would require on-going research on the demand for different monetary and credit aggregates. Up-to-date indicators of monetary

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1/ However, the calculation of real interest rates is problematic as it depends on the nominal interest rate relevant to savings and investment decisions, and it is very difficult to measure inflation expectations. Exchange rate targeting can be important, inter alia, because of the lack of reliability of other target variables. Nevertheless, the decision to maintain the exchange rate target would require the monetary authorities to make an independent assessment of their monetary conditions.

conditions would need to be developed, such as the growth of money and credit aggregates, nominal and real interest rates, the exchange rate, inflation, labor costs, asset prices, etc.

V. Conclusions

The increasing importance being given to indirect monetary instruments reflects, inter alia, a recognition of the increased complexity of financial systems. Such complexity, and the implications of the introduction of indirect monetary instruments, also requires an examination of the framework for financial programming. This is already being done in a number of Fund programs.

The major conclusions of this review are first that the controllability of broader monetary and credit aggregates with indirect monetary instruments is likely to be imprecise. This will be especially true following the type of financial reforms that would accompany the introduction of indirect monetary controls. As a result, it is likely to be difficult to meet, with any degree of certainty in a relatively short time period, performance criteria established at the level of the financial or banking system using indirect monetary controls. This suggests that quantitative financial programming at the level of the financial or banking system will not be practicable.

A second conclusion is that a practicable approach to financial programming would be to establish the program on the central bank's balance sheet. This not only would have a number of operational advantages, but also has a wider economic rationale. With a stable demand for currency (or

reserve money), which is a measure of the transactions demand for money, setting targets for the growth of currency (or reserve money) would be consistent with inflation control. The domestic and foreign counterparts can be programmed consistent with the balance of payments objective for net international reserves. Programming on the central bank's balance sheet can be combined with indicative targets for other financial aggregates and can accommodate a range of exchange rate arrangements, especially if there is sufficient flexibility in domestic financial operations.

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