

THE USE OF FLOW-OF-FUNDS ACCOUNTS IN MONETARY PLANNING IN YUGOSLAVIA

BY DIMITRIJE DIMITRIJEVIC

National Bank of Yugoslavia

The increased role of monetary and other financial variables has required the introduction of a quantitative framework for monetary policy planning. This has been found in a planning procedure based on flow-of-funds accounts. The very comprehensive structure of these accounts is relied upon to provide to policy makers with quantitative indications as to policy goals and measures for their implementation, and at the same time, to ensure a consistent incorporation of monetary planning in general economic planning.

There are annual and monthly plans. Annual planning involves two stages. The first is projection of flow-of-funds accounts on the basis of appropriate relationships, historical trends, institutional changes, economic policy targets, etc. The final result of this stage of planning is a projection of the Monetary Sector transactions as residuals, including changes in money supply and in short-term credits as key projections. The second is decomposition of the Monetary Sector account into the Central Bank Sector and the Other Banks Sector, which makes possible a projection of measures for the implementation of projected changes in short-term credits and money supply.

Monthly planning has two objects: first, to check annual projections and, if necessary, to adjust them to actual developments; and second, to introduce seasonal components. Seasonal adjustment is made only for the Monetary Sector, its two subsectors, and credit policy measures. Monthly projections are made every month for three months in advance.

The role of the financial structure (financial flows, financial assets and financial institutions) in Yugoslavia has increased substantially during the last decade, especially during the last two years. Money and other financial items have gained much in their influence on employment, equilibrium, balance of payments and economic growth. In this way, monetary policy has become a strategic instrument of economic policy in Yugoslavia.

The increased role of financial variables, especially of monetary policy, has required the creation of an appropriate quantitative framework for monetary policy formation and for its implementation. This framework has been found in a planning procedure based on flow-of-funds accounts. The main object of this planning is to provide policy makers with a quantitative indication as to what policy goals should be chosen and how they can be implemented. The very comprehensive structure of flow-of-funds accounts ensures at the same time a consistent incorporation of monetary planning in the general framework of economic planning.

In spite of its confinement to monetary policy formation, this monetary planning has a far broader meaning than would appear from its monetary designation. This is so because monetary variables account for the predominant part of financial variables in Yugoslavia. As in other economies with a rather weakly differentiated financial structure, the role of money may be considered as a close approximation to the role of all financial assets in Yugoslavia. Therefore, monetary planning appears to be a close approximation to financial planning.

In addition to an interpretation of the monetary planning procedure, this paper describes the main relevant institutional components of the Yugoslav economy. Some specific functional relationships are mentioned also. Both of these explanations are necessary for a better understanding of the planning procedure, in view of the very specific institutional structure of the Yugoslav economy. Section I of this paper is devoted to these explanations. Section II contains an interpretation of the flow-of-funds accounts as a basis for monetary planning. Section III is devoted to the procedure of annual monetary planning and Section IV to monthly planning. Section V provides an interpretation of the projection of policy measures. Section VI is devoted to conclusions concerning the application of the Yugoslav planning procedure.

I. INSTITUTIONAL BACKGROUND

This section deals with the strategic components and trends in the evolution of the financial structure of Yugoslavia. This interpretation focuses on the financial superstructure, but it has not been possible to avoid an explanation of its main determinants in the field of real infrastructure. Also, a part of this section will be devoted to specific relevant functional relationships.

The starting point of the present institutional structure of the Yugoslav economy was the detailed central planning system. This system of comprehensive central planning¹ left little room for the market mechanism and for financial flows, assets and intermediation. Even money was mainly an accounting medium, with the exception of currency in the hands of the population (about one fifth of the total money supply). In this way, the starting point of the existing financial structure may be characterized as zero level of financial evolution and differentiation.

Since 1950, a process of fundamental institutional changes has been evolving with an underlying tendency towards decentralization of planning, saving and decision-making power, mainly in favour of socialist enterprises and local government bodies.

The basic idea has been that an appropriate combination of planning and market components may be far more efficient than a rigid central planning system. Such a system offers a combination of the advantages of a planning mechanism with the efficiency of a market mechanism in assuring a better allocation of resources, and increased productivity of the factors of production, promotion of entrepreneurship, competition on foreign markets, etc. The backbone of this process has been the system of workers' self-management. The socialist enterprises have been endowed with decision-making power as regards level and structure of production, prices, income distribution, investments, etc. The system of allocation of goods, the uniform fixed prices and the centralized control of foreign trade have been abolished. The central planning system has been reduced to a loose planning mechanism mainly confined to the control over the income-saving ratio and to strategic investment projects.

¹Central planning comprised all the details of production, costs of factors of production, savings, investment, prices, allocation of raw materials and finished goods, foreign trade, etc. Only a small portion of the individual farmers' production, accounting for a negligible part of the total national product, went to free markets.

These changes in the institutional infrastructure, together with the increased rate of economic development which followed these changes, have had a substantial bearing on the financial structure. Decentralization of saving² has required financial intermediation which resulted in an extension of financial flows, growth and differentiation of financial assets and a proliferation of financial institutions.³ The first and crucial result of the above changes in the institutional infrastructure was a fundamental change in the quality of money. At the moment when the central planning mechanism was dismantled (including all other institutional changes), money started to perform its regular functions in full measure. The differentiation of financial assets and financial flows, which followed the process of changes in the institutional infrastructure and economic growth, has reflected the growing role of money and other financial variables in the economy. During the last two years since the middle of 1965 (when further fundamental institutional changes were introduced),⁴ the process of growth and differentiation of the Yugoslav financial structure has advanced substantially and resulted in a further increase in the role of money and other financial items.

But in spite of this development and differentiation of the financial structure, it is still far less differentiated than in developed market economies, although it has reached a far more advanced stage than in the central planning economies. The main difference in comparison with the market economies is the lack of securities and of an efficient money and capital market. In addition, its functional relationships have some specific characteristics which may be of interest from the point of view of monetary planning. Monetary variables weigh far more than all other financial variables. The demand function for money is comparatively simplified, being little interest-elastic under the present system of a rather low interest-rate ceiling; demand and supply functions for other financial assets are also interest-inelastic, especially in periods of steep price rises. Demand for credits on the part of non-financial sectors is far higher than supply, so that, at least with the existing interest rate ceiling, no equilibrium is possible. A rather wide range of frictions (including territorial orientation of the supply of financial resources) makes the money and capital market highly imperfect. The lack of securities makes the money and capital market fairly inefficient.

The effects of monetary disequilibrium have a very direct bearing on the demand for goods. In a non-differentiated financial structure the possession of extra money leads mainly to the purchase of real goods. In this way, attempts of individual economic units to adjust the structure of their assets to the structure which corresponds to their demand leads to an increase in demand on commodity

²In 1966 decentralized saving amounted to 95 per cent of total saving, in comparison with only a negligible share in 1952.

³The financial assets-GNP ratio has increased from 1.2 in 1953 to 1.7 in 1966. The ultimate borrowing-GNP ratio has increased from 0.24 in 1953 to nearly 0.5 in 1966.

⁴Banks became responsible for intermediation on the capital market, taking the place of investment loan funds (semi-intermediaires), which were abolished; in the field of short-term credit the bulk of selective measures were abolished and the granting of these credits was made free on the basis of contracts between banks and borrowers; a further decentralization of saving in favour of enterprises and households increased the need for financial intermediation; a further liberalization of foreign trade and foreign exchange restrictions in addition to the devaluation of the exchange rate and the dismantling of export premiums, subsidies, etc., made money-foreign trade-foreign exchange relationships closer.

markets with nearly no dampening effect on the side of demand for financial assets. The increased demand for real goods, due to a relatively low elasticity on the side of supply, leads mainly to a deterioration of the balance-of-payments position and to an increase in prices.

Thus, in the framework of a simplified financial structure, the Yugoslav monetary (and financial) model appears to be rather simple in comparison with monetary models of developed market economies. It may be said that it represents a reduced form of a differentiated model applicable for developed economies with a differentiated financial structure.

New developments during the last two years have led to an important differentiation of the financial structure and created better conditions for an increased elasticity of the demand and supply function for financial assets on interest rate and other economic variables. But the basic features of the Yugoslav financial structure and functional relationships in the financial field have not been substantially changed as yet.

Very important characteristics of functional relationships in the Yugoslav economy are: relatively frequent and considerable changes in the demand and supply functions of money and other financial assets, and changes in other relevant behaviour of economic units. This is due to frequent and fundamental institutional changes, as have been explained. Thus, in spite of a comparatively simple monetary and financial model of the Yugoslav economy which makes monetary planning easier, the unstable relevant ratios, propensities, etc., make it complex and increase the margin of error.

From the point of view of economic policy, and especially of monetary policy, the conclusion is that monetary variables have to be regulated very carefully. If not, the monetary disequilibrium may be expected to have a heavy impact on the balance of payments and prices. In attempting to counteract adverse consequences, economic policy is forced to rely on extensive regulation of foreign trade, foreign exchange restrictions, regulation of prices, etc. Usually, these measures do not have satisfactory effects; they may even lead to a new disequilibrium of the opposite character and seriously deteriorate efficient allocation of resources, productivity of factors of production, entrepreneurship, etc., Thus, the best solution appears to be to avoid monetary disequilibrium, i.e., to detect tendencies toward disequilibrium as soon as possible, and to react by introducing appropriate measures with the least possible delay. Monetary planning as outlined in this paper is one of crucial components of this reaction.

II. FLOW-OF-FUNDS ACCOUNTS AS A FRAMEWORK FOR MONETARY PLANNING

Recent thinking inclines to the conclusion that flow-of-funds accounts are a far less meaningful and useful tool for financial analysis than it was thought during the 1950s. The disappointment in the flow-of-funds accounts reflects the fact that they do not have an appropriate theoretical foundation. Unlike national income accounts, which are based on the Keynesian theory, flow-of-funds accounts do not have a similar theoretical background, because a general financial theory does not exist as yet. But even if the most pessimistic view is accepted

of the flow-of-funds accounts as a tool of financial analysis, there is no doubt that they may provide a very efficient instrument of financial planning. Even if it is admitted that they are not based on a system of functional equations (as are the national income accounts), they involve a system of definitional equations, which in many respects may be very useful in financial planning. They include all transactions, both financial and non-financial, and make it possible to link financial projections with those of income-product transactions. At the same time they represent a closed system of identities suitable for consistent projection of all transactions involved. It is well known that separate projections of individual transactions (as is usually the case) are highly inconsistent, and a system of identities which makes it possible to check their consistency may be considered very instrumental to monetary planning. Then, the institutional sectoring principle, which is one of the main elements in the structure of flow-of-fund accounts, is very suitable for monetary and financial planning in general. Of course, to exploit these advantages, flow-of-fund accounts have to be constructed in the proper way. Classification of economic units into sectors and classification of transactions within sectors should be carried out in such a way as to make projection better-founded and more realistic. This will make it possible to diminish the degree of uncertainty and inconsistency of projections. To this aim the classification of transactions and economic units has to be founded on the principle of a homogeneous behaviour pattern of economic units. In this way, flow-of-funds accounts have to be constructed after a serious investigation of the institutional structure and of other determinants of demand and supply functions of individual types of financial assets and transactions. This is especially the case with the Yugoslav flow-of-funds accounts, in view of the specific institutional structure of the Yugoslav economy.

The alternative solution may be to use an econometric model of planning. No doubt, this may be a far more advanced and elegant solution. But in spite of its theoretical superiority, it cannot be expected yet that this solution will offer practical and applicable information to policy makers. To my best knowledge, this kind of model is far from being operative so far, in spite of very ambitious projects which are under way in this field. Therefore, econometric models are practically no alternative to a planning procedure based on flow-of-funds accounts. The only real alternative is to use "intuition" and "feelings" as the main components of the decision-making process in policy formation. Obviously, a planning procedure based on flow-of-funds accounts is far more advanced and far better-founded than that.

Thus, in spite of deficiencies, a planning procedure based on flow-of-funds accounts may be accepted as the most suitable so far. It is obvious that it does not guarantee realistic planning, but in any case it makes macroeconomic projections consistent and substantially reduces the margin of error in these projections.

In financial planning, flow-of-funds accounts are not used in their original version.⁵ For planning purposes financial transactions are reclassified into two sub-groups: long-term (capital) transactions and short-term transactions. As to

⁵In Yugoslavia flow-of-funds accounts are compiled by the National Bank of Yugoslavia (central bank) and published in its annual reports.

sectors, the Monetary System sector is divided into two subsectors: National Bank and Other Banks. Thus, for planning purposes transactions and economic units are classified into the following sectors, types and groups of transactions.

Sectors: Socialist Enterprises, Federal Government, Local Government Bodies, Other Organizations, Households, Monetary System (with sub-sectors: National Bank, Other Banks), Investment Banks, Federal Investment Loan Funds, Local Investment Loan Funds, Rest of the World and Unclassified.

Transactions within sectors are classified into:

Nonfinancial transactions: (1) Current Receipts, (2) Current Expenditures, (3) Nonfinancial Transfers, (4) Unclassified, (5) Gross Saving, (6) Investment, and (7) Net Financial Saving [(5) minus (6)].

Financial Transactions: (8) *Long-term Uses and Sources, net*, (9) Time Deposits and Bonds, (10) Investment Credits (gross), (11) Repayment of Investment Credits, (12) Direct Credits, (13) Foreign Loans (gross), (14) Repayment of Foreign Loans, (15) Other Long-term Transactions, (16) Short-term Sources for Long-term Uses, (17) Long-term Sources for Short-term Uses; (18) *Short-term Uses and Sources, net*, (19) Money, (20) Other Liquid Assets, (21) Direct Credits, (22) Gold and Foreign Exchange, (23) Short-term Foreign Credits, (24) Financial Transfers, (25) Short-term Bank Credits, (26) Unclassified, (27) Short-term Sources for Long-term Uses, and (28) Long-term Sources for Short-term Uses.⁶

The long-term, short-term classification reflects the experience that long-term uses of short-term resources have had a heavy inflationary impact and that one of the main points in financial policy should be to control the amount of short-term resources used for long-term purposes.

III. PLANNING PROCEDURE: ANNUAL PLANS

It has been mentioned that there are two planning schemes: annual and monthly plans. Both of these are consistent parts of a single method of planning, but the procedure and composition are different and a separate interpretation will help a better understanding.

The annual planning procedure involves two stages. The first is projection of flow-of-funds accounts. The final result of this stage of monetary planning is aimed at the projection of the demand for money and short-term credit, and the projection of the consistent change in the supply of short-term credit. The second is projection of the central bank balance sheet by decomposing the Monetary System sector into Central Bank and Other Banks subsectors, and the projection of monetary policy measures for implementation of projected changes in money supply and credit.

Projection of Flow-of-Funds Accounts

This stage of the planning procedure involves two phases: projection of

⁶For the breakdown of items shown here see *Annual Report of the National Bank of Yugoslavia* for 1966. Also, Dr. Banko Horvat: "An Integrated System of Social Accounts for an Economy of the Yugoslav Type", *Review of Income and Wealth*, Series 14, No. 1, pp. 19-36.

sector accounts and reconciliation of sector accounts projections under the matrix constraints of flow-of-funds accounts.

The projection of sector accounts involves two groups of transactions: first, projection of transactions on the basis of the appropriate behaviour relationships, ratios, propensities, historical trends, institutional changes, general economic policy targets, etc., and second, residual and balancing items of the sector accounts.

Projection of sector transactions starts with nonfinancial transactions. As a rule, projections of nonfinancial transactions are made outside the National Bank of Yugoslavia and accepted by the National Bank planners. If there are no outside projections, the planners prepare them themselves, using more or less sophisticated methods of projection. This may be also the case if transactions have been projected by appropriate institutions only as aggregates for the whole economy, without sector decomposition.

This procedure includes projection of Current Receipts, Current Expenditures, Nonfinancial Transfers and Investment. The projection of nonfinancial transactions is concluded by calculating Saving (by subtracting current expenditures plus nonfinancial transfers granted from current receipts plus nonfinancial transfers received) and Net Financial Investment (by subtracting investment expenditures from saving). This calculation may produce nonsensical amounts and therefore the amounts of saving and net financial investment have to be checked by using the appropriate behavioral patterns, historical trends, institutional changes, etc. In this way, the projection of saving and net financial investment cannot be considered as a simple calculation of residual items. If the checking shows that the calculated amounts of saving and net financial investment cannot be accepted as plausible, projections of current receipts, expenditures, transfers and investment have to be readjusted to a more sensible amount of saving and net financial investment.

After the projection of nonfinancial transactions has been finished, the planning procedure turns to projection of financial transactions of nonfinancial sectors. The normal case is that these projections are made by monetary planners. The exceptions are projections of foreign transactions, which are usually done outside the Bank. Demand and supply functions of individual types of assets and liabilities are used now, taking into account not only the past behaviour pattern, but also the effects of institutional changes and general policy goals. As has been mentioned, fundamental institutional changes are relatively frequent in Yugoslavia and they usually have the greatest effect in the financial field. This makes projection of financial transactions more uncertain than in the case of a stable institutional structure and requires reinvestigation of past behaviour patterns in the light of changes in the institutional structure.

As has been mentioned, financial transactions are classified into two sub-groups: long-term and short-term financial transactions. Long-term transactions are projected first, because they have to be consistent with a specific policy rule which says that long-term uses cannot be financed by short-term resources (except for definite planned amounts). In this way, the amount of Short-term Sources for Long-term Uses and the amount of Long-term Sources for Short-term Uses is considered a policy variable. After individual long-term transactions

have been projected (transactions 9, 11, 12, 13, 14 and 15 listed on page 106), the Investment Credits are projected as a residual item. This residual item is calculated as a balancing item to fulfill the identity: Net Long-term Uses minus Net Financial Investment plus Long-term Sources for Short-term Uses must be equal to Net Long-term Sources plus Short-term Sources for Long-term Uses.

The next step is projection of short-term transactions. After projecting individual transactions (items 19, 20, 21, 22, 23, 24, 26 on page 106), Short-term Bank Credits are forecast as a residual item. This residual is calculated as a balancing item to fulfill the identity: Net Short-term Uses plus Short-term Sources for Long-term Uses must be equal to the amount of Net Short-term Sources plus Long-term Sources for Short-term Uses. Short-term Sources for Long-term Uses and Long-term Sources for Short-term Uses amount to the same figures as in the sub-group of long-term transactions, but are on the opposite side of the account.

In this way, Short-term Bank Credits represent the final residual of financial transactions, being determined both by the Net Financial Investment (balancing item of nonfinancial transactions) and by all long-term financial transactions (including investment credits) and short-term transactions.

The projection of the financial transactions of financial sectors (Monetary System, Investment Banks, Federal Investment Loan Funds, Local Investment Loan Funds) is easier than in the case of nonfinancial sectors. This is because it is possible to assume that the readiness of financial institutions to take over liabilities is at least equal or higher than the readiness of nonfinancial sectors to acquire financial assets created by these institutions. Also, it is very realistic to assume that the demand for nonfinancial sectors for credits from financial institutions is at least equal to or higher than the supply of credits by financial institutions. Under these assumptions the projection procedure, in the case of financial sectors, is reduced to simple arithmetic. Sources of financial transactions are equal to uses of nonfinancial sectors. Uses of financial sectors are equal to sources of nonfinancial sectors. This procedure is based on horizontal matrix identities meaning that the algebraic sum of "uses" financial transactions must be equal to the sum of "sources". But, as already mentioned, there are also vertical matrix identities, relating to net financial investment, and to short-term and long-term sources and uses. They also must be equal to zero. And, as a rule, this is not the case. The vertical identities of financial sectors can be fulfilled only if the algebraic sum of "uses" net financial saving (final balancing amount of nonfinancial transactions) is equal to "sources" net financial saving, but this is usually not the case. According to experience, isolated sector projections are usually highly inconsistent and the result is a deviation of the algebraic sum of sector net financial investments from zero.

This means that the uses of financial sectors will be higher or lower than sources and that it will not be possible to reach uses-sources equilibrium before nonfinancial transactions are reconciled to horizontal identities of flow-of-funds accounts. In this way, all inconsistencies of sector projections (both financial and nonfinancial) will be reflected in inconsistencies in financial sectors. Therefore, reconciliation of the projection for financial sectors has to be postponed to the next stage of the projection procedure, i.e. to the stage of sector reconciliation.

Reconciliation of Sector Projections

As has been explained, sector transactions are projected separately, using any sources of information that are available, taking into account historical trends, behaviour patterns of individual sectors, including effects of institutional changes, as well as policy goals and measures, etc. It is obvious that this procedure cannot result in a consistent projection which satisfies matrix identities of flow-of-funds accounts. The normal case will be that these projections result in a bizarre picture of sector projections which are far from being consistent.

It was shown that in the stage of sector projections vertical identities have been fulfilled in the case of nonfinancial sectors, but not in the case of financial sectors. Also, horizontal identities have been fulfilled for financial transactions, but not for nonfinancial transactions. This means that the stage of sector reconciliation should involve both vertical and horizontal reconciliation of all sectors and all transactions. Which of them will be changed more and which less will depend on the probability of the projections. Less certain projections are subject to wider adjustments. Of course, it is not possible to establish a very exact set of rules for estimating the degree of uncertainty of individual projections. Many components of projection have to be taken into account: the stability of ratios, propensities, etc.; the reliability of sources of data; the reliability of methods used for analysis and projection; effects of relevant institutional changes, etc. In addition to this, in Yugoslav conditions it must be assumed that the margin of error in individual projections is changing fast, due to frequent institutional changes.

The reconciliation procedure has to result in the satisfaction of cross-matrix identities (vertical and horizontal) of the flow-of-funds accounts. Therefore, it will be difficult to make all reconciliations in one round of adjustments. It will be necessary to make a set of subsequent readjustments until all the projections are reconciled. In this procedure micro projections (sector projections) represent the starting point and the reconciliation procedure will mean the introduction of macroeconomic elements. The final result will be a consistent system of projections which is based on micro projections involving numerous functional relationships and at the same time satisfies macroeconomic identities. This is the essence of the role of the flow-of-funds accounts as the basis for monetary planning. It makes it possible to incorporate numerous micro-projections into a macrosystem of simultaneously consistent equations, comprising all relevant transactions and relationships.

The first step in the reconciliation procedure is the adjustment of non-financial sector projections to horizontal identities. This adjustment may involve alterations of any individual projection. The final result of this reconciliation procedure is that the sum of the "uses" net financial saving becomes equal to the "sources" net financial saving.

The reconciliation procedure should start with nonfinancial transactions because nonfinancial relationships weigh more than financial in the Yugoslav economy, so far. But this does not mean that financial considerations are not taken into account at all at this stage of reconciliation. Projections of investment expenditures have to be reconciled with projections of the appropriate resources: saving + long-term financial resources – long-term financial uses + short-term

resources for long-term uses – long-term resources for short term-uses. Therefore, to start with the reconciliation of nonfinancial projections does not mean that this part of the reconciliation procedure has been definitely completed. It may be readjusted if the reconciliation procedure of financial transactions shows that the projection of investment is not consistent with the projection of the appropriate financial resources. This will be the case if projections of investment credits borrowed are lower than is necessary to satisfy the above mentioned identity. The growing role of the financial components in the economy (as has been explained) has made these considerations more and more important, especially during the last two years, when investment bank credits began to play a strategic role in the field of investment financing.

The next step is reconciliation of long-term financial transactions. This reconciliation involves both vertical and horizontal adjustments to matrix identities. Vertical reconciliation is necessary if nonfinancial projections have been readjusted, resulting in changes in the sector of Net Financial Investments. Long-term financial transactions have to be reconciled vertically with the amounts of projected Long-term Sources for Short-term Uses, or Short-term Sources for Long-term Uses (which are policy variables for both long-term and short-term transactions, as has been mentioned). In addition to this, consistency between these projections and the projection of investment has to be checked and, if necessary, the appropriate reconciliations have to be performed.

The final step of the reconciliation procedure refers to short-term financial transactions. The final result of these reconciliations will be to find changes in short-term credits by sectors as balancing items for vertical and horizontal identities of flow-of-funds accounts. Made at the end of the reconciliation procedure, they represent at the same time balancing items for all the flow-of-funds accounts identities, both vertical and horizontal. In this way they are determined by all nonfinancial and financial transactions and represent residual items which correspond to the monetary equilibrium and consequently condition the equilibrium position of the whole economy.

This is the final result of the flow-of-funds accounts projection which indicates the future course of credit policy. It involves the goals of development policy, stabilization policy, employment policy and balance-of-payments policy. It also includes fiscal and other policy measures and, in particular, it corresponds to monetary policy targets expressed as changes of money supply. In this way, the projected changes in short-term credits balance, and at the same time condition, the whole set of identities corresponding to the overall policy goals.

This projection of changes in short-term credits provides a quantitative basis for the projection of credit policy measures. Having projected the optimal changes in short-term credits, policy makers can now focus their attention on the projection of measures required to ensure the implementation of these changes. In this way, the above projection of short-term credits represents a link between policy targets on the one hand and the operations of the central bank in the field of credit control on the other. Having in mind that credit regulation represents the strategic determinant of monetary developments, the projection of short-term credits in this way determines nearly all the activities of the monetary authorities in Yugoslavia.

Projection of Credit Policy Measures

Projection of credit policy measures is based on the above projection of the Monetary System sector transactions. It involves three stages: first, decomposition of the Monetary System Sector projection into two subsectors: Central Bank (the National Bank) and Other Banks; second, projection of reserve requirements and liquidity reserves of Other Banks; third, projection of borrowings of Other Banks from the Central Bank.

Decomposition of the Monetary System Sector into the Central Bank and Other Banks subsectors is based on institutional determinants, historical trends, etc. Additional information is needed for the decomposition of the foreign exchange transactions.

Projection of changes in reserve requirements is determined by changes in relevant deposits of Other Banks and in the reserve requirements ratio. In this projection it is possible either to apply the existing reserve requirement ratio, or to assume a change in it. Which ratio will be used depends on considerations which are normally applied in this connection.

Projection of liquidity reserves is also based on projection of changes in relevant deposits of Other Banks. But projection of the liquidity reserve ratio is far more intricate than projection of the reserve requirement ratio. Projection of the liquidity reserve ratio must include economic determinants of the behaviour pattern of banks in this field and stochastic components as well. There are many determinants of bank decision-making relating to the adoption of a higher or lower reserve ratio. New investigations show that the bank behaviour pattern in this field may lead to important changes in the reserve ratio. Therefore, projection of liquidity reserves is far from being only arithmetic. The degree of uncertainty is relatively high in this projection and it also increases the degree of uncertainty of the whole set of credit control measures. The problem of projection of the liquidity reserve ratio is aggravated by institutional changes, which may produce fundamental shifts in this field.⁷

Other Banks borrowing from the National Bank is projected as a residual item balancing the Central Bank sector account, after reserve requirements and liquidity reserves have been projected. As Other Banks credits are to a substantial percentage (nearly 50 per cent on the average in 1966)⁸ covered by this borrowing, it represents the strategic instrument of credit control in Yugoslavia. The National Bank rediscounting operations constitute the most important part of this borrowing.

Projection of Other Banks borrowing from the National Bank leads to the final step of credit control projection. The Other Banks' borrowing from the National Bank comprises two different parts: rediscounts and consolidated credits. Rediscounts represent the strategic part of National Bank credits to Other Banks. Consolidated credits represent a residual item showing the difference between the rediscount ceiling established at the end of 1966 and the existing

⁷Thus, the average liquidity reserve ratio amounted to about 13 per cent in 1965; in 1966 it decreased to 11 per cent and in the first quarter of 1967 it was reduced to 5 per cent.

⁸This means that in Yugoslavia borrowing from the central bank is far more than "last resort" borrowing.

borrowing of Other Banks from the National Bank. These credits can only be decreased as an instrument of restrictive policy.

Therefore, after having decided if consolidated credits are to be decreased and how much, the focus of credit control projection is on projecting rediscount policy measures: changes in the list of discounting documents, definition of creditworthiness by Other Banks, discount interest rate, rediscount ceiling and rediscounting period.

Projection of policy measures involves a relatively high degree of uncertainty. First, it is not possible to reach a high level of accuracy in estimating the effects of new measures. The possibility of changes in the behaviour pattern of banks, changes in the stochastic determinants of Other Banks' credit capacity, etc., increase the margin of error in this projection. Second, lagged effects of past measures and of past institutional changes have also to be taken into account. Thus, projection of policy measures is far from being an arithmetical procedure based on the reserve requirements ratio and creation of reserve money considerations. In this way, even if projection of short-term credits is very accurate and closely corresponds to policy goals, the margin of error in annual monetary planning is very high.

An attempt to express determinants of changes in short-term credits in algebraic form may help in estimating the margin of error which is included in the projection of credit control measures. Assuming that nonfinancial sectors are ready to absorb all credits that banks are willing to grant, a change in the level of short-term credits can be defined in the following way:⁹

$$\Delta C_j = \sum_{t=1}^{t=j} F_t \cdot k_{j-t+1}$$

Where:

ΔC = change in the amount of short-term credits

j = period under consideration (for instance, number of months)

t = ordinal number of the period unit (month) within the period under consideration

F_t = A function defining autonomous inflow or outflow of reserve money to and from the giro accounts of Other Banks, in period t (autonomous = that which is not part of the process of credit multiplication)

k_t = credit multiplier in period " t ", i.e. the amount of credits which can be granted till the end of period " j " on the basis of a unit autonomous inflow of reserve money to the giro accounts of Other Banks.

$$k_t = \frac{1 - (1 - r_0 - r_1)^{tv} \cdot h^{tv}}{1 - (1 - r_0 - r_1) \cdot h}$$

⁹Usually, the definition of credit multiplication does not involve dynamic components, assuming that the number of multiplication phases is infinite. But, for practical purposes, a definition of multiplication and changes in short-term credits within a short period of time is needed (one month, two months, three months, etc.) and the assumption of an infinite number of multiplication phases is inappropriate. Instead, a time variable should be included. This expression may be considered as a dynamic definition of changes in short-term credits within a definite period of time. Detailed interpretation of this approach is given in: D. Dimitrijevic, "Kreditni potencijal poslovnih banaka," *Ekonomist*, Beograd, No. 4, 1956.

- r_0 = reserve requirement ratio
- r_1 = liquidity reserve ratio
- v = credit multiplication velocity, i.e. the number of multiplication phases completed within a period unit (one month)
- h = coefficient showing leakage of reserve money from Other Banks' giro accounts with the central bank in the process of credit multiplication.

The above algebraic expression reveals the complicated body of determinants of short-term credits. Only two determinants of changes in short-term credits are in the hands of monetary authorities: creation or withdrawal of reserve money and changes in the reserve requirement ratio. By creating or withdrawing reserve money the central bank can influence the autonomous flows of reserve money to and from the giro accounts of Other Banks (F_t), but it cannot fully control them. It is possible to have quite opposite autonomous flows of reserve money to and from giro accounts of Other Banks (for instance, changes in the amount of currency in circulation due to changed demand for currency, changes in deposits of Federal Government with the central bank, changes in foreign assets and liabilities of banks, etc.).

By changing the reserve requirement ratio monetary authorities can influence credit multiplication, but this is only one among a number of determinants of credit multiplication, the others being beyond the control of monetary authorities. Having in mind that these other determinants of credit multiplication may be subject to volatile changes, it is obvious that no projection of credit measures can be expected to yield very accurate results. A more advanced analysis of the above expression may show still better the degree of uncertainty in the projection of credit measures.

IV. MONTHLY PLANNING

It is obvious that a one-year period is too long for a realistic projection of monetary policy measures. And, in addition to the above mentioned high degree of uncertainty, the practical implementation of monetary planning requires that seasonal oscillations of relevant developments be taken into account. This makes it impossible to use annual planning for the practical purposes of monetary policy formation and implementation.

The very pessimistic outlook of the above considerations may be substantially moderated if the period of projection is shortened. The most suitable solution may be monthly projection for a three-month period. There are two objects of monthly projection. First, the annual projection has to be checked, taking into account current developments after this annual projection has been made. Second, the seasonal components must be taken into account.

The checking of the annual projection is aimed at the adjustment of annual projections to later developments. Thus, if later developments do not justify assumptions, behaviour patterns, trends, effects of institutional changes, effects of policy measures, etc., used in the annual projections, these will have to be changed in an appropriate way. The procedure develops in the same way as has been explained for the original annual projection.

The introduction of seasonal components is very important, especially in the case of projection of financial transactions. The most general approach to this problem may be to make a seasonal adjustment of the whole projection of flow-of-funds accounts, including the policy measures projection. But, this is too ambitious and has been beyond the scope of technical possibilities available to the National Bank of Yugoslavia so far.¹⁰ Instead of this, it is possible to use a partial seasonal adjustment procedure. It may comprise seasonal adjustment of only the Monetary System sector account and of the two subsectors compiled on the basis of the Monetary System sector projection. In this way, seasonal adjustment is confined to strategic variables of monetary policy formation and implementation.

Monthly projection is performed every month. But, in order to avoid sudden changes in monetary policy this projection each time covers a three-month period. A three-month projection makes it possible for the National Bank to change policy goals and policy measures slowly and makes it possible for banks to adjust to them gradually.

Thus, from the point of view of the planning procedure as a whole, monthly projections may be considered as operative instruments of monetary policy formation and its implementation, while annual projections provide groundwork for monthly projections. Both of them are consistent parts of a whole planning procedure.

V. APPLICATION AND EXPERIENCE

This method of monetary planning was introduced at the beginning of 1967, to replace a method of partial planning based on projection of bank balance sheets. Thus, no prolonged experience has been acquired so far in the application of this procedure. To some extent, this procedure involves experimental components. It was shown that it must be assumed that the ratios, propensities, effects of institutional changes, etc., used in this projection may deviate substantially from actual events and that very often projections are not borne out by actual developments. Having in mind the volatility of financial fluctuations it would be too optimistic to expect a very close association of actual developments with projections. This is especially true of annual projections which, as a rule, cannot be expected to be justified by actual developments and must therefore (as has been explained) be checked every month.

I do not believe that the experience we are going to gain this year will show the adopted planning procedure is justified in all respects. Having in mind the very intricate structure of this planning, it is more realistic to expect that the methods used will need substantial improvement (especially the methods of estimating existing and future relevant ratios, propensities, trends, seasonal components; the method of projecting both financial and nonfinancial developments, and, in particular, the method of projecting the key cells of flow-of-funds accounts). For this purpose it would be necessary to organize steady and serious work in the field of investigation of the relevant demand and supply functions, to introduce more sophisticated methods of analysis and projection of time series

¹⁰To my best knowledge, seasonal adjustment of flow-of-funds accounts is performed only by the Federal Reserve System in Washington.

analysis and of seasonal adjustment, etc. This will improve the level of accuracy of projections but would never exclude a significant margin of error. The best we can expect is to evolve a continuous process of asymptotic approximation of projections to an optimal level of accuracy.

It has been shown that, in spite of a substantial degree of uncertainty, monetary planning based on flow-of-funds accounts is a very useful instrument for monetary policy formation and implementation. It offers to policy makers a quantitative basis assuring far better information and indication as to what the monetary policy goals should be and how these goals may be implemented than if they rely on “feelings” and “intuition”. This does not mean that “feelings” and “intuition” are to be absolutely excluded. They may be useful, especially if projections are expected to have a relatively high degree of uncertainty. And a well-managed splicing of flow-of-funds accounts projection with “intuition” may result in an optimally realistic policy formation and its efficient implementation.

As to the official status of flow-of-funds projection, it is fully recognized as a quantitative framework for policy formation in the National Bank of Yugoslavia. The policy-making process within the National Bank of Yugoslavia is based on these projections and it is accepted that the quality of policy formation and its implementation has considerably improved since the flow-of-funds projection procedure has been introduced. Flow-of-funds projections are not published as yet. They are used as internal background materials within the National Bank. But, having in mind the important role the National Bank plays in monetary policy formation, the confinement of flow-of-funds projections to the National Bank decision-making process does not diminish the role of these projections in policy formation, and, especially, in the implementation of policy goals.