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Cash Flow Examination Procedures for Banks

Hyman P. Minsky Ph.D.

MEMO: Cash Flow Examination Procedure for Banks

I.   Queries: (1) Can data gathered by bank examiners be transformed into meaningful inputs for Federal Reserve decision making?

(2) Can bank and banking system data be so organized that it is possible to estimate the impact upon particular banks and thus the array of all banks of economic system and economic policy changes? If this can be done, then the impact of such variables upon the viability of particular units and the array of all units can be estimated. Such information could be used to make Federal Reserve operations more precise.

(3) Can the results of econometric analysis be used in examining bank? In particular can knowledge about market reactions to economic system, financial market and economic policy variables be used to develop 'conditional' examination statement for commercial banks.

Suggestion: By formulating the problems of a bank in terms of its cash flows, and linking such cash flows to economic, other financial and policy variables the objectives stated above can be achieved.

Proposal: That a feasibility study of a suggested cash flow framework for bank examination plus the usefulness of the data gathered by such examination procedure be undertaken by a task force in the summer of 1967. The task force to consist of research and bank examiner personnel from the staff of the Board of Governors, with Prof. H. P. Minsky as an 'academic' consultant.

Note 1: What follows is phrased in terms of a bank, whereas in all generality the units could be any economic unit, financial or non financial. What follows is also phrased as if any feasibility study will be undertaken by the Federal Reserve System and the domain of study will be member banks. It may well be that any such undertaking will best be a joint effort of a number of regulatory bodies and that the initial attempts at empirical implementation will involve some non-bank financial intermediary.

Note 2: Underlying the research proposal is an awareness that modern data handling capabilities could make information about each of the some 14,000 banks in the United States available to economic policy makers. In particular by setting "threshholds' to particular bank characteristics, the likely candidates for overshooting such threshholds could be made known to policy makers.

II. The research designed to uncover the feasibility of the cash flow approach can be broken down into six steps:

(1) Precise formulation of the cash flow analysis of an individual bank.

(2) Identification and hypothetical statement of the relations between economic system variables (including monetary and fiscal policy variables) and the parameters and variables of the cash flow model of a bank. (These relations will vary among banks.) Ultimately step 2 would mark the incorporation of the results of econometric analysis into bank examination procedure.

(3) **The invention of a 'typical' cash flow statement (or a set**
of typical cash flow statements for different classes of banks) by
using available data on the banking system and the economy as well
as the expertese of bank examiners.

(4) By making precise assumptions as to the relations between
economic system and the cash flow variables for particular banks, to
simulate the interaction between the banking system variables and
economic policy and system variables.

(5) Presentation of the results of steps 1 through 4 to selected
bank and academic economists for comment and suggestions for implementation.

(6) Experiment in deriving data for the cash flow analysis from a
small sample of real world banks.

No new data is needed until step 6. Steps 1 through 4 can be
carried through as an in-house exercise, step 5 should not be taken
until satisfactory progress has been made on steps 1 through 4.

The cash flow model is designed to estimate the distribution of the
effect of various environmental and policy variables upon banks and thus
to isolate differential effects of changes in these variables. Of
particular interest is the set of environmental and policy variables
that would tend to generate financial distress and impose failure upon
some banks. Obviously propositions to the effect that within a particular
environment, policy actions of a specified kind would have undesirable
consequences can follow from such an approach.

III. The model

A.   Definitions and Propositions

Df: Vulnerability: A financial unit is vulnerable to a specified event if the occurrence of this event means that the unit will not be able to fulfill its financial commitments, i.e. its commitments to make payments.

The vulnerability of a unit increases as the events that would yield an inability to meet financial commitments become either more common or of smaller size.

Hyp: The vulnerability of an economic unit to changes in income, financial and policy changes depends upon the unit's cash flow position as stated by its assets, and liabilities and by the markets for its assets and liabilities. Knowledge of how the various elements in a cash flow position are affected by economic and policy variables will aid in developing more precise policies.

B.   Measurement and evaluation of the vulnerability of particular institutions.

The cash flow to and from a unit over a period of time is the key item. Balance sheet data as conventionally defined can be ignored. All balance sheets from the point of cash flow contain an arbitrary valuation of those assets which do not have active and thick markets. The value of an asset - in balance sheet terms - is relevant to a cash flow analysis only to the extent that the unit can market the asset at that price, i. e. use the asset to generate a cash flow to

the organization. Thus in the precise formulation of the contingent
cash flow position of a particular bank the 'breadth, depth and
resilience' of secondary markets for assets will be of significance,
as well as the explicit or implicit guarantee of the short term
market value of such assets by the Federal Reserve.

For the assets of a bank three items will be needed:

(1) the payment commitments of the 'debtor' as stated on the
contract.

(2) the conditions under which this asset would become a 'scheduled
item'; the proportion of scheduled items that would appear from a
particular asset class under various alternative income and financial
market conditions is one of the 'economic' inputs to the proposed
analysis.

(3) The marketability of the asset, again under various market
conditions: included in marketability would be the conditions under
which the Federal Reserve will support some market price of this asset.

Similarly for deposit liabilities, the conditions determining
the rate of change of particular items will be important. Income and
relative yield factors will determine their change. As an example,
a 'bank' which has purchased ability to lend by selling time deposits
to 'foreigners' will be more likely to have a large cash flow reaction
to a change in the relative rates from a bank which has mainly 'local'
depositors. It is obvious from the perspective being discussed that
the address on deposits may be a relevant determinant of classes of deposits.

C. **Cash flows from can be divided into**

1. Balance sheet: those that follow from the language on the contracts.

Thus a Certificate of Deposit with 28 days to run states an amount of cash to be lost by this balance sheet item on a specified date. Balance sheet cash flows from can be classed as:

      1. dated

      2. demand and

      3. contingent

Note that agreements to acquire assets - such as unused lines of credit (which may be implicit lines of credit as well as explicit agreements) are a form of cash flow from. It would be interesting to ask bankers how much the deal obligated to lend to large depositors who do not have any formal line of credit but who from time to time do borrow.

2. Portfolio cash flows that result from decisions to acquire assets.

There is a 'fine line' between considering a new loan as a portfolio decision or as a contingent balance sheet payment. The extent to which the bank is free not to make the loan is a determinant of whether a particular loan will be considered a portfolio or a balance sheet transaction. However, it is clear that the purchase of an investment is a portfolio cash flow from. Operations designed to change the composition of a 'banks' investment portfolio will be portfolio transactions.

3. Income cost flows.

Mainly the operating costs of a bank. A running drain of cash due to labor, etc. exists. A question as to whether dividends on deposits are to be an income cash flow from. Stock dividends clearly are such a cash flow.

D. Cash flows to can be divided into the same classes. For a bank the

1. Balance sheet cash flows to follow from the contracts owned, both loans and investments.

2. Portfolio cash flows to can be split into two types:

(a) those due to liability emission

(b) those due to asset sales

3. Income cash flows are of minor importance to a bank; service charges are an income cash flow. For ordinary households and business firms the cash flow from operations, the income cash flow is the ordinary source of funds for meeting cash losses, for banks the ordinary sources are balance sheet flows and portfolio cash flows due to liability emission.

IV. Symbolic statement:

$$\sum_{t=t_0} (C_t^{g\,B_1} + C_t^{g\,Y_1} + C_t^{g\,P_1} - C_t^{1\,B_j} - C_t^{1\,Y_j} - C_t^{1\,P_j}) + \overline{C}_{t_0} > 0$$

Df Symbols and Examples:

C_t = cash flows during 'day't

g = gain (cash flow to)

l = loss (cash flow from)

B_1 = cash flows due to balance sheet assets, e. g. repayments of bank loans

Y_1 = cash flows due to contributions to income (G.N.P.) production, e. g. bank service charges

P_1 = cash flows to a unit that could be generated by selling assets, e. g. the sale of Treasury Bills

B_j = cash flows from a unit due to balance sheet liabilities, e. g. C. D's on their due date

Y_j = cash flows from due to contribution to income (G.N.P.), e. g. wages and salaries of a bank

P_j = cash flows from due to the purchase of assets, e. g. the purchase of a treasury bill, also the granting of a bank loan

$\bar{C}_{to}$ = the initial cash position

Each balance sheet financial asset of a bank has two cash flow attributes. One is the cash flow stated in the contract, i. e. to pay $x on some specified date. The second is that it could be sold today in some market, i.e. generate a portfolio flow. Thus a private and a Treasury bill might both state that $1,000.00 will be paid on say May 31, but the 'market' for the private bill is poor (rediscounting may make it better), whereas the market for the Treasury Bill is usually quite 'good'.

Thus balance sheet assets should be keyed in two ways - one is the cash flows over current and future dates as stated on the contracts and secondly the availability of the asset to generate 'portfolio' flows to the unit at the unit initiative.

For 'banks' not much need be said about 'income' flows to and from the unit. For non financial units, the excess of income flows to over income flows from becomes the cash flow available to meet balance sheet commitments.

Portfolio cash flows to depend upon the structure of assets and the markets for assets owned. For each unit the initial cash plus the maximum cash flow to that can be generated quickly by its asset structure, yields a maximum cash loss the unit can sustain. This maximum obviously depends upon assets owned and the market for these assets - as well as any restriction explicit or implicit on its use of assets. For example, the existence of collateralized deposit makes large blocks of Federal debt not available assets for purposes of quickly generating cash. The alternative to using Treasury debt may be the use of state and municipal debt. A cash squeese under these circumstances tests the resilience of the market for 'municipals'. The limits to monetary constraint under these circumstances depends on the absorptive capacity of the market for municipals. It is important for the monetary authorities to have firm ideas of the extent and distribution of such pressures and the ability of various markets to withstand pressures.

Balance sheet flows from a 'bank' depend upon its liability structure. The larger the ratio of foreign purchased (C. D., etc.) deposits as against local service (DD's) deposits, the greater the probability that a cash flow from will be generated by specified (to be determined) market events. This implies that a classification of CD's, etc. by address might be important.

Portfolio flows from a bank reflect purchase of assets including the granting of a new loan excepting where the new loan is due to a prior commitment.

Both balance sheet assets and liabilities may further be classified as demand, dated, and contingent. Lines of credit are a contingent balance sheet liability.

Two types of functional relations need to be estimated. One is the likelihood, under various assumptions as to system behavior, that various items in the portfolio will become 'scheduled' items. The second is the expected behavior of various types of deposits under different market and system assumptions.

Thus in the fundamental policy constraint

$$\sum_{t = to} C_{to}^{x} + \sum_{to} > 0, \quad x = \text{all types of cash flows}$$

Various C^x will be 'estimates' of relations between cash flows and system variables, other C^x will reflect bank policy decisions.

By specifying these various system and bank policy relations, the fundamental equation can by a recpursive process generate time series of portfolios and cash. Thus the cumulative effects over time on particular institutions of specified situations can be estimated. Limits upon the duration of various policies or states of the economy can be estimated. This is useful to both regulatory authorities and bank examiners.

Essentially the examination technique would consist of applying what should be a useful management tool.