The identification problem of isolating the separate reaction-speed coefficients of borrowers and lenders is apparent; but it is bypassed in this study except for some speculations later. This is done because the combined delta coefficient of both borrowers and lenders is a weighted average of the separate coefficients of borrowers and lenders (as is shown in the discussion following). The weights themselves are the structural coefficients of the eliminated variable when equations 1 and 2 are combined into one equation. As long as the coefficients of the eliminated variable are stable, the average reaction-speed coefficient in equation 3 shown later will be stable; and this will be sufficient for such purposes as prediction. If the coefficients of the eliminated variable are not stable, the model will not be useful in any form in which it might be tried, so we have little or nothing to lose for prediction purposes by not going further into lender and borrower behavior separately. In any case, the reader should keep in mind the fact that the coefficients shown in table 1 do not reflect the behavior of borrowers separately or lenders separately but the combined results of their actions (except for the many cases where theory and experience suggest that a variable is related to only one side of the market).

For measuring needs of State and local governments for borrowed funds, three variables are tried successively in different regression runs. The first is construction put in place, which is the familiar Bureau of the Census series reprinted in Construction Review. The second is contract awards, from the same source and (like construction put in place) including projects financed by Federal grants-in-aid as long as the ultimate owner is a State or local government. The third variable is the sum of wage and salary payments by State and local governments and other nonconstruction payments by the same units. An alternative approach, measuring "real" demand by indexes of needs, was considered initially; but trial indexes were either like straight lines over time or had cycles unrelated to any in interest rates or general business conditions. In addition, the indexes considered faced a host of objections on their theoretical meaningfulness. The three series used, on the other hand, reflect actual behavior related to needs. Of these three, the third (nonconstruction spending by State-local governments) appears closest to the conceptually desirable index of needs because of the flexibility with which needs can be met by hiring additional employees. In addition, this series has the econometric advantage of being more clearly exogenous to markets for State and local bonds than are either contract awards or construction put in place.

Expectations on interest rates, of course, are known only to the gods, or perhaps to gifted technicians.[4] Four definitions of these were tried in successive equations. (1) A naive hypothesis is that expected rates of period t equal rates in period $t-1$. (2) A somewhat more credible hypothesis is that expected rates during period t equal the past rate *plus* the past change in the rate, that is, that past changes are extrapolated into the present. (3) A hypothesis related to the definition of expectations as based on some concept of normal rates and return to them is that expected rates equal their trend value; trend is judged empirically by this writer from his knowledge of financial markets and the history of the period. (4) A hypothesis related to regressive expectations is that expected rates during a given period equal a weighted average of rates in preceding periods and perhaps the current period as well.

Going back to equations (1) and (2), let us modify the notation to express the fact that some of the variables in the X and Y vectors are common to both equations (for example, the municipal bond yield affects the behavior of both borrowers and lenders). These will be taken out of these vectors and relabeled as a vector of one or more variables, Z'. The X and Y vectors henceforth include only those variables present in the demand (but not the supply) and the supply (but not the demand) equations respectively.

---

appear even stronger for State and local financial behavior. Could anyone really argue that these governmental units want to replace debt being retired with new debt so as to keep the stock of the latter constant? Or that different considerations and behavior lags apply to the portion of bond issues which happen to be offset by current amortization of old debt and to the portion which is not so offset? A decline in debt from amortization, for technical reasons related to the serial form of most State-local debt, does not result in a declining tax burden for debt interest and amortization payments, except over very long periods.

[4] David Meiselman, The Term Structure of Interest Rates, Prentice-Hall, Englewood Cliffs, N.J., 1962.