

bank demand for municipals. A shift from demand to time deposits does not alter the absolute spread between after-tax bank earnings on taxable and tax-exempt investments, other than through indirect and probably small alterations in noninterest costs of operations.<sup>17</sup> But this shift does alter the relative spread between earnings on long-term investments to the advantage of tax exempts, and bank portfolios have shown large increases in tax-exempt holdings after each amendment of regulation Q beginning in 1957.<sup>18</sup> Thus, bank demand for municipals have fluctuated both inversely to business demand for loans and positively with movements in time deposits related to the business cycle, impacts of monetary policy on the public's demand for time and checking deposits, and one-time developments like Federal Reserve amendments to regulation Q.

(3) Demand by individuals is concentrated among those subject to high marginal income tax rates. Such individuals are financially sophisticated when taken as a group, so they would presumably respond to small alterations in the spread between after-tax earnings on taxable bonds and tax-exempt municipals. And this has happened, in fact, as shown by Federal Reserve flow of funds estimates on net acquisitions of State and local securities by all households. But factors other than this spread also play a part in demand, including fluctuations in the wealth of high-tax-bracket individuals. We might speculate that fluctuations in stock market values would have a positive wealth effect on their demand for tax exempts which might well be stronger than the negative effect on their demand from the resulting inverse fluctuations in common stock and tax-exempt bond yields.

(4) We have few facts and even less theory on which to construct hypotheses on the demand for construction and other capital goods by States and local governments and the resulting derived demand for long-term borrowed funds. A theory based on cost-minimizing behavior postulates would have to deal with the collective nature of costs as well as benefits from public work and with difficulties posed by the generations problem analyzed by Prof. James Buchanan.<sup>19</sup> Never-

<sup>17</sup> Let  $r_1$  be the yield of tax-exempt bonds,  $r_2$  be the average yield of taxable loans and investments,  $r_3$  be the average rate paid on time and savings deposits, and the letter "a" be the marginal tax rate (stated as a fraction of taxable profits). We will further assume that banks always have taxable income against which interest paid on time and savings deposits has its full tax value (equal to interest paid times the marginal corporation income tax rate). Taking noninterest costs of operation as fixed, the marginal effect on after-tax profits of a dollar of deposits invested in different ways is as follows:

|                                                       |                    |
|-------------------------------------------------------|--------------------|
| Demand deposits, invested in taxable investments..... | $= (1-a)r_2$       |
| Demand deposits, invested in tax exempts.....         | $= r_1$            |
| Time deposits, invested in taxable investments.....   | $= (1-a)(r_2-r_3)$ |
| Time deposits, invested in tax exempts.....           | $= r_1-(1-a)r_3$   |

Hence, a shift from demand to time deposits lowers after-tax profits per dollar of total deposit liabilities by the same amount, i.e., by  $(1-a)r_3$  points, whether that dollar had been invested in taxable or in tax-exempt investments.

<sup>18</sup> Any reasonable allocation of operating costs among tax exempts, taxable bonds and mortgages, and business loans in the aggregate portfolios of commercial banks would indicate that since 1952 at least, tax exempts have been more profitable than the other two classes of investments. Banks have presumably not followed a strict profit-maximizing policy because of institutional constraints as well as the need to have taxable income against which to write off interest costs on time and savings deposits. Given this positive spread between tax-exempt yields and other yields after tax, any shift of funds from demand to time deposits would cause a relatively larger decline in net earnings from taxable investments than in net earnings from tax-exempt investments, favoring a bank portfolio rearrangement into tax exempts. For example, suppose that a bank earned 4.0 percent from tax exempts and 3.0 (after tax) from taxable securities. If the deposit liabilities which financed these investments are shifted from demand to time status by their owners, and if the time deposit rate of interest paid is 3 percent, bank earnings on tax exempts net of interest cost drop from 4.0 to 1.0 percent, i.e., by 75 percent of the former level. But earnings on taxable securities net of interest cost drop from 3.0 to 0 percent, i.e., by 100 percent of the former level.

<sup>19</sup> James Buchanan, *Public Principles of Public Debt*, Homewood, Ill., 1958 and "Confessions of a Burden Monger," *Journal of Political Economy*, vol. 72 (October 1964).