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# AVERAGE FUNCTIONAL COST AND REVENUE FOR BANKS IN THREE SIZE CATEGORIES, 1966—1969

Since the mid-1960's, most Federal Reserve Banks have offered a Functional Cost Analysis (FCA) program without charge to member banks.<sup>1</sup> FCA is a uniform cost accounting system designed to be a bank management tool and implemented jointly by the sponsoring Federal Reserve Bank and the participating commercial banks. The commercial banks supply certain income, expense, balance sheet, and activity data to the Federal Reserve Banks; in return, they receive an analysis of their own income and costs, broken down by function or activity, along with comparative data for a group of similar banks. In the FCA program, as in other Federal Reserve data collection activities, individual bank data are considered confidential; thus, group averages and other techniques are used to avoid disclosure.

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<sup>1</sup>Participation is limited to member banks with assets of less than \$10 billion. The program was made available in all twelve Federal Reserve districts, beginning in 1970. In the Fourth District, this program is administered by the Bank Relations and Public Information Department, Federal Reserve Bank of Cleveland.

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As an aid to bank management, the Federal Reserve publishes cost and revenue figures for the participating banks in three different size categories as well as similar data for a select group of high performance banks. Although the primary purpose of the FCA program is to provide participating commercial banks with a uniform cost accounting system for major banking functions and thereby assist them in improving their operational efficiency, the performance of different size banks is of more general interest. Accordingly, this article draws together and summarizes the average FCA data published by the Federal Reserve for the three size categories. The data were derived from the individual reports of all participants for 1966-1969—a period in which the data format was basically unchanged. Emphasis is placed on the differences in the functional cost and revenue experience of different size banks and changes in those differences over time.

### THE FUNCTIONAL COST ANALYSIS PROGRAM AND DATA

Inasmuch as the correct interpretation of FCA data requires some understanding of the concepts and general approach employed by FCA, it is necessary to begin with a brief introduction to the program. A note of caution concerning the limitations of the data is also appropriate.

**The Framework of FCA.** The Functional Cost Analysis program views the operation of a commercial bank in terms of funds-supplying functions and funds-using functions. Demand deposits, time deposits, non-deposit liabilities and capital<sup>2</sup> are sources of funds; cash and due from

<sup>2</sup>In the FCA approach, all nondeposit funds are included in capital accounts. Net capital, a frequently used FCA concept, refers to total nondeposit funds less bank premises and other fixed assets.

banks, investments, and loans (instalment, real estate, and commercial and agricultural) constitute the uses of funds. The classification of activities into funds-supplying and funds-using categories permits the calculation of an average cost of money rate<sup>3</sup> and an average portfolio yield. These calculations, in turn, assist the participating bank in the evaluation of the net profitability of each banking function. The earnings of a funds-using function are determined by subtracting the cost of money and the operating cost from the gross income of the particular function. Similarly, the earnings of a funds-supplying function are equal to the difference between the average portfolio yield and the expenses of the funds-supplying function. Thus each funds-using function is charged the same cost of money rate, and each funds-supplying function is credited with the same gross yield.

In addition to the analysis of individual funds-supplying and funds-using functions, FCA also generates statements of overall earnings, personnel productivity and cost, and a breakdown of costs and income for three auxiliary bank service departments that are considered to be neither funds-using nor funds-supplying: computer services, trust departments, and safe deposit operations.

**The Nature of the Data.** The FCA national average reports distinguish three bank size categories: total deposits up to \$50 million (Class 1), total deposits of \$50-\$200 million (Class 2), and total deposits over \$200 million (Class 3). Each annual FCA report for the years 1966 through 1969 contains average information (such as an average balance sheet, a statement of source and distribution of income, and a cost-revenue analysis

<sup>3</sup>The cost of money is the sum of operating and interest costs of all funds-supplying functions less any service charge or other fee income. In the FCA program, it is used principally as a percent of available funds.

of the various bank functions) for these three size classes. The published figures are computed by aggregating the reports of the individual banks in a particular class and then dividing by the number of banks in the class, even though all banks in the program do not maintain all functions. During 1966-1969, the average number of banks in each class was: Class 1, 710; Class 2, 227; and Class 3, 80. The FCA figures, therefore, obviously refer to a fictional bank; the balance sheet, functional earnings, and expenses correspond to the average reported for the class. *An analyst should not, therefore, impute the characteristics of the average bank to individual members of the class.* In order to keep this point consistently before the reader, the average FCA figures will be discussed as relating only to the Class 1 bank, the Class 2 bank, and the Class 3 bank.

Generalizations about the entire banking system from the experience of the average FCA banks should also be tempered by the understanding that participation in the Functional Cost program is voluntary. The participants do not constitute a random sample of all commercial banks.

It should also be noted that, for a given year, there are only three observations from which to infer relationships between cost or revenue and size. Finally, the foreword to the FCA National Average Report warns: "Bank cost accounting is not an exact science." For example, some subjective judgment is required in the allocation of cost to various functions.

### SOME GENERAL FINDINGS

Given their limitations, the FCA data patterns are still of interest. The data show that, during 1966-1969, earnings per dollar of available funds (the sum of loans and investments plus cash and due from banks) were highest for the Class 2 (intermediate size) bank and lowest for the Class 3

(largest size) bank. The superior record of the Class 2 bank, when compared with Class 1, resulted from a lower cost per dollar of available funds, a factor that outweighed the lower gross portfolio yield of the Class 2 bank. The performance of the Class 3 bank was found to have been adversely affected by a generally lower income per dollar of available funds that was not sufficiently offset by lower costs.

The data also indicate that the relative profitability of various bank functions differed for the three bank classes. Over the entire period 1966-1969, the highest net earning loan function (per dollar of invested funds) at the Class 1 bank was instalment lending; whereas commercial and agricultural lending tended to be among the least profitable. Commercial and agricultural lending, however, was the highest net earning loan function (per dollar of invested funds) at the Class 3 bank in 1969. The data also indicate that the unit of output is important in determining which bank class had the lowest average cost for any function. For example, in 1966-1968, the Class 3 bank had the lowest cost of demand deposits in terms of the cost per dollar of such deposits, but the highest cost per unit of account activity, such as processing a deposit or clearing a check.

### BANK SIZE CLASS AND EARNINGS, INCOME, AND EXPENSE

For 1966-1969, the Class 2 bank consistently achieved the highest earnings (gross income less expenses before taxes) per \$1,000 of available funds. The Class 1 bank was second; and the Class 3 bank, third (see Table I).

Total (gross) income and total expenses are also shown in Table I to provide an indication of the relative contribution of each to earnings. These data indicate that the higher earnings performance

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TABLE I

Income, Expenses, and Earnings per \$1,000 of Available Funds  
Averaged for Banks in Three Size Categories  
1966-1969

	Banks With Deposits up to \$50 Million <hr/> (Class 1)	Banks With Deposits \$50 Million to \$200 Million <hr/> (Class 2)	Banks With Deposits Over \$200 Million <hr/> (Class 3)
<u>1966</u>			
Total available funds income	\$56.25	\$54.99	\$52.82
Total available funds expenses	39.21	37.03	36.26
Earnings	17.04	17.96	16.56
<u>1967</u>			
Total available funds income	58.76	56.73	55.11
Total available funds expenses	41.48	38.92	38.17
Earnings	17.28	17.81	16.94
<u>1968</u>			
Total available funds income	62.65	61.25	61.10
Total available funds expenses	43.65	40.95	42.27
Earnings	19.00	20.30	18.83
<u>1969</u>			
Total available funds income	68.46	67.45	68.22
Total available funds expenses	46.60	44.52	47.47
Earnings	21.86	22.93	20.75

NOTE: Total available funds income includes earnings from loans, investments, and service charges. Tax-exempt income has been converted to a taxable basis in all FCA data. Expenses include the processing and administrative cost of loans and investments and the "cost of money." Earnings are before Federal taxes and exclusive of gains or losses from security transactions.

Source: *Functional Cost Analysis National Average Reports*

of the Class 2 bank, when compared with the Class 1 bank, was not due to a higher income rate. (In fact, total income per dollar of available funds declined as the bank size category increased, with the partial exception of 1969.) Rather, this higher ranking of the Class 2 bank was due to substan-

tially lower expenses per dollar of available funds that more than offset the lower total income per dollar of funds. Expenses per dollar of available funds were even lower for the Class 3 bank in 1966 and 1967 than for the Class 2 bank, but this advantage was inadequate to compensate for lower

income per dollar of available funds. Rapidly rising costs at the Class 3 bank in 1968 and 1969 partially offset the relative gains in income per dollar of available funds, so that this bank group continued to lag behind the net earnings performance of the smaller bank groups.

In order to see why revenues and costs behaved as they did for the three bank groups, it is necessary to examine their asset and liability characteristics.

### ASSET CHARACTERISTICS

The balance sheets of the three categories of FCA banks for the period 1966-1969 show some rather persistent differences (see Table II). The dollar volume of cash and balances due from banks (as a percent of total assets) consistently increased with bank size, while holdings of U. S. Government securities declined. In each year, the Class 2 bank allocated a larger share of its portfolio to tax-exempt obligations than the other two groups. Real estate and instalment loans made up a smaller proportion of total assets at larger banks than at the Class 1 banks, and commercial and agricultural loans increased in importance with average bank size. Overall, the Class 3 and Class 2 banks held higher proportions of cash and balances due and specialized more in commercial loans<sup>4</sup> than the Class 1 bank. The Class 2 and Class 1 banks allocated a larger proportion of funds to instalment and real estate loans and U. S. Government securities than the Class 3 bank.

<sup>4</sup>In 1969, agricultural loans constituted less than 2 percent of the volume of total commercial and agricultural loans at FCA banks with deposits over \$200 million. For the Class 1 bank, however, agricultural loans amounted to over 10 percent of the volume of commercial and agricultural loans. *Functional Cost Analysis National Average Reports*, 1969, p. A17.

In order to translate comparative balance sheets into an explanation of why gross income per dollar of available funds declined as bank size increased, it is necessary to know the yields on the various asset categories.

**Gross Yields on Portfolio Assets.** Table III contains average gross and net yield data for the portfolio assets held by the three bank groups for the period 1966 through 1969. By a wide margin, instalment loans had the highest average gross yield of any item in the bank portfolios. The gross yields on commercial and agricultural loans, real estate mortgages, and investments followed in descending order for all bank classes—except in 1969, when the gross yield on investments exceeded the gross return on real estate loans.

It is important to note that gross yields on all asset categories did not consistently decline as bank size increased (see Table III). The decline in gross income per dollar of available funds associated with increasing bank size can be explained in terms of a portfolio composition effect. There are heavier concentrations of high-income instalment loans in the higher yield portfolios and of cash and commercial and agricultural loans in the lower yield portfolios.

**Operating Cost and Net Yields on Portfolio Assets.** In addition to gross rates of return on various assets, Table III also shows the effect of operating costs in making and servicing various loans and investments. These costs constitute a portion of the total available funds expense shown in Table I; the cost of money is not included in Table III. Since the FCA approach charges each lending function the same cost of money rate, the omission of this cost does not affect the relative net yield on different assets. In addition, cost of money is more appropriately discussed in connection with its source: liability structure and cost.

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TABLE II

Percentage Distribution of Assets  
Averaged for Banks in Three Size Categories  
1966-1969

	Banks With Deposits up to \$50 Million <hr/> (Class 1)	Banks With Deposits \$50 Million to \$200 Million <hr/> (Class 2)	Banks With Deposits Over \$200 Million <hr/> (Class 3)
<u>1966</u>			
Cash and due from banks	12.03%	13.19%	16.63%
U. S. securities	19.49	15.74	10.56
Tax-exempt obligations	12.06	13.22	11.02
Real estate mortgage loans	17.50	15.18	13.83
Instalment loans	12.35	12.07	8.62
Commercial and agricultural loans	19.99	24.35	32.96
Other	6.58	6.25	6.38
<u>1967</u>			
Cash and due from banks	11.73	13.17	16.17
U. S. securities	18.06	15.26	11.38
Tax-exempt obligations	12.70	14.03	12.15
Real estate mortgage loans	17.38	15.52	13.83
Instalment loans	12.49	11.40	8.51
Commercial and agricultural loans	20.12	23.51	30.91
Other	7.52	7.11	7.05
<u>1968</u>			
Cash and due from banks	11.27	12.97	15.44
U. S. securities	17.28	14.76	11.15
Tax-exempt obligations	13.43	15.01	13.30
Real estate mortgage loans	17.89	16.18	15.12
Instalment loans	12.33	11.61	9.21
Commercial and agricultural loans	19.82	22.34	28.88
Other	7.98	7.13	6.90
<u>1969</u>			
Cash and due from banks	11.35	12.76	15.46
U. S. securities	14.77	12.68	8.82
Tax-exempt obligations	14.07	15.57	13.02
Real estate mortgage loans	18.37	17.02	15.57
Instalment loans	12.94	12.16	9.70
Commercial and agricultural loans	20.18	22.84	30.60
Other	8.32	6.97	6.83

NOTE: Other includes such items as other bonds and stocks, Federal funds sold, commercial paper, brokers' loans, bankers' acceptances, and bank premises and real estate.

Source: *Functional Cost Analysis National Average Reports*



**TABLE III**  
**Gross Yields, Operating Costs and Net Yields on Portfolio Assets**  
**Averaged for Banks in Three Size Categories**  
 (percent per annum)  
 1966-1969

	Banks With Deposits up to \$50 Million	Banks With Deposits \$50 Million to \$200 Million	Banks With Deposits Over \$200 Million
	(Class 1)	(Class 2)	(Class 3)
<b>1966</b>			
Investments			
Gross yield	4.79%	4.93%	5.26%
Operating cost	0.15	0.12	0.13
Net yield	4.64	4.81	5.13
Real estate mortgage loans			
Gross yield	5.80	5.77	5.88
Operating cost	0.80	0.69	0.63
Net yield	5.00	5.08	5.25
Instalment loans			
Gross yield	9.49	9.16	8.84
Operating cost	3.08	3.15	3.27
Net yield	6.41	6.01	5.57
Commercial and agricultural loans			
Gross yields	6.03	5.91	5.91
Operating cost	1.29	0.99	0.68
Net yield	4.74	4.92	5.23
<b>1967</b>			
Investments			
Gross yield	5.03	5.14	5.40
Operating cost	0.13	0.10	0.12
Net yield	4.90	5.04	5.28
Real estate mortgages			
Gross yield	5.96	5.95	6.12
Operating cost	0.79	0.69	0.71
Net yield	5.17	5.26	5.41
Instalment loans			
Gross yield	9.81	9.51	9.51
Operating cost	3.20	3.39	3.66
Net yield	6.61	6.12	5.85
Commercial and agricultural loans			
Gross yield	6.33	6.17	6.19
Operating cost	1.30	1.03	0.72
Net yield	5.03	5.14	5.47
<b>1968</b>			
Investments			
Gross yield	5.78	5.99	6.23
Operating cost	0.13	0.11	0.12
Net yield	5.65	5.88	6.11
Real estate mortgage loans			
Gross yield	6.12	6.13	6.36
Operating cost	0.73	0.62	0.62
Net yield	5.39	5.51	5.74
Instalment loans			
Gross yield	9.99	9.72	10.03
Operating cost	3.15	3.33	3.92
Net yield	6.84	6.39	6.11
Commercial and agricultural loans			
Gross yield	6.63	6.62	6.75
Operating cost	1.26	1.03	0.80
Net yield	5.37	5.59	5.95
<b>1969</b>			
Investments			
Gross yield	6.67	6.75	7.05
Operating cost	0.15	0.12	0.16
Net yield	6.52	6.63	6.89
Real estate mortgage loans			
Gross yield	6.37	6.32	6.64
Operating cost	0.71	0.63	0.67
Net yield	5.66	5.69	5.97
Instalment loans			
Gross yield	10.21	9.99	10.49
Operating cost	3.35	3.64	4.08
Net yield	6.86	6.35	6.41
Commercial and agricultural loans			
Gross yield	7.39	7.66	7.95
Operating cost	1.31	1.08	0.84
Net yield	6.08	6.58	7.11

NOTE: Operating cost does not include the cost of money and thus is not equivalent to total functional expense.

Source: *Functional Cost Analysis National Average Reports*

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TABLE IV

Ranking of Asset Categories Based on Average Net Yields Earned by Banks in Three Size Categories 1966-1969

<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
<u>Banks With Deposits up to \$50 Million (Class 1)</u>			
I instalment loans	instalment loans	instalment loans	instalment loans
II real estate loans	real estate loans	investments	investments
III commercial and agricultural loans	commercial and agricultural loans	real estate loans	commercial and agricultural loans
IV investments	investments	commercial and agricultural loans	real estate loans
<u>Banks With Deposits of \$50 to \$200 Million (Class 2)</u>			
I instalment loans	instalment loans	instalment loans	investments
II real estate loans	real estate loans	investments	commercial and agricultural loans
III commercial and agricultural loans	commercial and agricultural loans	commercial and agricultural loans	instalment loans
IV investments	investments	real estate loans	real estate loans
<u>Banks With Deposits Over \$200 Million (Class 3)</u>			
I instalment loans	instalment loans	} instalment loans* investments*	commercial and agricultural loans
II real estate loans	commercial and agricultural loans		investments
III commercial and agricultural loans	real estate loans	commercial and agricultural loans	instalment loans
IV investments	investments	real estate loans	real estate loans

\* In 1968, instalment loans and investments had the same average net yield for Class 3 banks.

Source: *Functional Cost Analysis National Average Reports*

It is interesting to note that assets with the highest gross rates of return generally tended to have the highest operating costs. As a result, the range of average yields, net of operating costs, was much smaller than the range of average gross yields. The operating costs associated with various lending activities were obviously not the same for each bank class. For example, the average per dollar cost of making and servicing commercial and agricultural loans was much lower for the Class 3 bank than for the Class 1 or Class 2

banks.<sup>5</sup> The Class 1 bank, however, reported the lowest cost per dollar of instalment loans. Similarly, the average operating costs for real estate loans and investments were less for the Class 2 bank than for the Class 1 bank. The cost of real estate loans was about the same for the Class 3

<sup>5</sup>It should be remembered that if the average cost of some process is found to vary with firm size, this does not necessarily mean that the high cost firms are poorly managed. It may mean only that different size firms are necessarily faced with differences in, for example, the cost of inputs or the technique of production.

bank as for the Class 2 bank, but the cost of investments was slightly higher for Class 3 than for Class 2.

After subtracting costs of operation, instalment loans still had the highest average yield for all bank categories during 1966-1968. This is shown in Table III and is emphasized in Table IV, which ranks asset categories on the basis of average net yields earned by each bank class. In 1969, instalment loans continued to have the highest net yield for the Class 1 bank, but investments rose to first place for the Class 2 bank. The highest net yield earned by the Class 3 bank in that year was on commercial and agricultural loans.

To summarize, net earnings per dollar of available funds were highest for the Class 2 bank and lowest for the Class 3 bank during 1966-1969. This behavior of net earnings reflects differences in gross income and bank costs at the three banks. Gross income per dollar of available funds tended to vary inversely with bank size, while total bank costs declined more than bank income from the smallest to the intermediate size bank. From the intermediate to the largest bank, total expenses per dollar of available funds either declined less than revenue or actually increased. The decrease in reported gross income associated with increasing bank size appears to be due to differences in portfolio composition.

Asset and yield data, however, are inadequate to explain why total average expense initially declined so sharply and hence why earnings per dollar of available funds were at a peak for the Class 2 bank. For this explanation, it is necessary to broaden the discussion to include the cost of money, which involves liability structure and cost.

## LIABILITY CHARACTERISTICS AND THE COST OF MONEY

During 1966-1969, persistent differences in liability structure by bank size category existed, as was the case with the asset side of the balance sheet (see Table V). Specifically, the liabilities of the Class 2 bank included a higher proportion of regular savings accounts and a slightly larger percentage of demand deposits than either the Class 1 or Class 3 banks. Until 1969, the liabilities of the Class 2 bank also contained the smallest proportion of certificates of deposit (CDs) and "other time deposits." In that year, CDs, as a percent of total liabilities, were about the same at the Class 2 and Class 3 banks, but borrowings (including Federal funds purchased) at the Class 3 bank were over three times as high as the proportion of borrowings at the Class 2 bank.

As shown by Table VI, demand deposits had the lowest average cost of all bank liabilities. Following demand deposits, in ascending order of cost, were regular savings accounts, certificates of deposits and other time deposits, and borrowings (except that in 1967, borrowings were unusually low in price). Thus, the unique liability structure of the Class 2 bank means that this bank was in the advantageous position of paying less for funds than other banks—not because it was always able to issue any given liability for less, but because its liabilities were more heavily concentrated in low average cost categories.

An interesting question is why this bank had such a relatively desirable liability structure. Unfortunately, the FCA data do not provide a well-defined answer, but rather are consistent with a number of possibilities. Whatever the cause, however, the consequence of the Class 2 liability structure for the cost of money is unequivocal. As

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TABLE V

Distribution of Selected Liabilities  
Averaged for Banks in Three Size Categories  
(percent of total liabilities and capital)  
1966-1969

	Banks With Deposits up to \$50 Million (Class 1)	Banks With Deposits \$50 Million to \$200 Million (Class 2)	Banks With Deposits Over \$200 Million (Class 3)
<u>1966</u>			
Demand deposits	45.63%	47.39%	46.87%
Regular savings accounts	28.60	29.61	24.73
Certificates of deposit and other time deposits	15.36	11.72	14.46
Borrowings and other liabilities	1.09	1.83	4.45
<u>1967</u>			
Demand deposits	43.95	45.69	45.47
Regular savings accounts	26.77	28.09	23.27
Certificates of deposit and other time deposits	19.17	15.40	18.51
Borrowings and other liabilities	1.03	1.65	3.32
<u>1968</u>			
Demand deposits	42.00	43.89	43.47
Regular savings accounts	25.63	26.72	23.47
Certificates of deposit and other time deposits	22.41	18.57	20.33
Borrowings and other liabilities	1.14	1.82	3.90
<u>1969</u>			
Demand deposits	41.12	42.65	41.83
Regular savings accounts	23.56	25.32	21.57
Certificates of deposit and other time deposits	24.97	20.60	20.30
Borrowings and other liabilities	1.42	2.37	7.66

Source: *Functional Cost Analysis National Average Reports*

Table VII shows, the Class 2 bank had the lowest cost of money in each year.<sup>6</sup>

<sup>6</sup>The cost of money figures shown in Table VII are affected not only by liability structure but also by the cost and volume of capital funds at each bank. The capital funds function, in this paper, is treated only in part; i.e., the "borrowings" portion. A complete discussion was omitted in the interest of brevity and because of the difficulty of obtaining comparable cost figures on liabilities and equity capital. For example, the FCA program does not include dividend payments in the cost of equity.

While the overall cost of money was the lowest at the Class 2 bank in 1966-1969, the behavior of the components of operating cost—processing and administrative costs—in the demand and time deposit functions was sufficiently complex and revealing to warrant detailed examination.

**The Demand Deposit Function.** In 1966-1967, demand deposit cost per dollar of demand deposits was lowest at the Class 3 bank and highest at the

TABLE VI

**Total Operating and Interest Cost (Less Activity Charges) for Selected Liabilities Averaged for Banks in Three Size Categories (percent per annum)**

1966-1969

	Banks With Deposits up to \$50 Million	Banks With Deposits \$50 Million to \$200 Million	Banks With Deposits Over \$200 Million
	(Class 1)	(Class 2)	(Class 3)
<b>1966</b>			
Demand deposits	1.47%	1.33%	1.25%
Regular savings accounts	3.98	4.16	4.42
Certificates of deposit and other time deposits	4.14	4.32	4.75
Borrowings and other liabilities*	5.10	5.10	5.10
<b>1967</b>			
Demand deposits	1.57	1.42	1.39
Regular savings accounts	4.13	4.24	4.47
Certificates of deposit and other time deposits	4.45	4.62	4.83
Borrowings and other liabilities	4.37	4.23	4.44
<b>1968</b>			
Demand deposits	1.74	1.56	1.53
Regular savings accounts	4.22	4.34	4.52
Certificates of deposit and other time deposits	4.79	4.93	5.17
Borrowings and other liabilities	5.49	5.57	6.82
<b>1969</b>			
Demand deposits	1.76	1.61	1.73
Regular savings accounts	4.49	4.59	4.64
Certificates of deposit and other time deposits	5.06	5.14	5.50
Borrowings and other liabilities	7.62	7.77	9.55

NOTE: Average cost of borrowings and other liabilities do not include operating expenses.

\* Cost of borrowings for 1966 are not strictly comparable with figures for later years.

Source: *Functional Cost Analysis National Average Reports*

Class 1 bank (Table VIII). The Class 3 bank, however, experienced more rapidly rising costs than the other bank groups; and this advantage eroded to the point that, in 1969, the Class 2 bank had the lowest cost per dollar of demand deposits.

Another interesting aspect of the data in Table VIII is an indication of what appear to be substantial economies of scale in the use of tellers, but diseconomies in the use of other support personnel in the demand deposit function at the

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TABLE VII

Cost of Money\*  
 Averaged for Banks in Three Size Categories  
 (percent per annum)  
 1966-1969

	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
Deposits up to \$50 million (Class 1)	2.67%	2.88%	3.14%	3.37%
Deposits \$50-\$200 million (Class 2)	2.58	2.76	3.00	3.26
Deposits over \$200 million (Class 3)	2.69	2.84	3.15	3.58

\* The cost of money is computed by summing the operating and interest costs of all funds-supplying functions less any service charge or other fee income and dividing by the quantity of available funds.

Source: *Functional Cost Analysis National Average Reports*

Class 3 bank. The larger the bank, the lower the expense was for teller salaries per dollar of demand deposits; but wages, other than for tellers, per dollar of demand deposits were lowest for the Class 2 bank rather than the Class 3 bank. Moreover, since 1966, the Class 1 bank had incurred significantly lower expenses than the Class 3 bank for these "backroom" wages per dollar of demand deposits. Other processing expense (which includes furniture and equipment, computer, stationery and supply charges) was consistently lowest per dollar of deposits for the Class 3 bank. The Class 2 and Class 3 banks—but never the Class 1 bank—had at various times during the four-year period the lowest administrative and overhead cost per dollar of deposits. As a result, the Class 2 and Class 3 banks had lower total demand deposits costs per dollar of deposits than the Class 1 bank.

One measure of the productivity of tellers and other demand deposit employees at the three banks is shown in Table IX. A teller at the Class 3 bank handled more deposits per day than his counterpart at the Class 2 or Class 1 bank and cashed as many checks. On the other hand, as the bank size increased, the number of daily home

debits ("on us" checks) and accounts per non-teller employee in the demand deposit function decreased. Nevertheless, any diseconomies in support activities were insufficient to offset economies elsewhere. As has already been observed, when measured in terms of cost per dollar of demand deposits, the Class 3 and Class 2 banks had lower overall demand deposit costs than the Class 1 bank.

Cost per dollar of demand deposits, however, is not the only measure of cost performance. For example, a different picture emerges from an examination of the cost of a unit of deposit activity in checking accounts, such as cashing a check or accepting a deposit. As Table X shows, the per unit cost of every demand deposit activity, as well as the annual maintenance charge per account, increased directly with bank size. Moreover, the cost difference between bank classes—and the cost advantage of the Class 1 bank—increased from 1966 through 1969.

Class 2 and Class 3 banks were able to achieve lower costs per dollar of checking account volume (Table VIII)—in spite of higher costs per unit of deposit activity as shown in Table X. This appears to be due principally to the fact that deposit

TABLE VIII

**Demand Deposit Expense**  
**Averaged for Banks in Three Size Categories**  
 (dollars per \$1,000 of demand deposits)  
 1966-1969

	Banks With Deposits up to \$50 Million	Banks With Deposits \$50 Million to \$200 Million	Banks With Deposits Over \$200 Million
	(Class 1)	(Class 2)	(Class 3)
<b>1966</b>			
Teller salaries	\$ 4.66	\$ 3.44	\$ 2.36
Transit and bookkeeping wages	5.08	4.19	5.05
Total processing wages	9.74	7.63	7.41
Other processing expense	6.86	6.86	5.28
Administration and overhead	6.45	5.58	5.71
Total expense	23.05	20.07	18.40
<b>1967</b>			
Teller salaries	4.47	3.21	2.31
Transit and bookkeeping wages	5.58	4.66	6.03
Total processing wages	10.05	7.87	8.34
Other processing expense	7.50	7.25	5.98
Administration and overhead	6.91	6.07	5.71
Total expense	24.46	21.19	20.03
<b>1968</b>			
Teller salaries	4.69	3.41	2.69
Transit and bookkeeping wages	5.36	4.81	6.06
Total processing wages	10.05	8.22	8.75
Other processing expense	8.14	7.49	6.90
Administration and overhead	7.87	6.73	6.75
Total expense	26.06	22.44	22.40
<b>1969</b>			
Teller salaries	4.96	3.68	2.85
Transit and bookkeeping wages	5.48	4.92	6.98
Total processing wages	10.44	8.60	9.83
Other processing expense	8.75	8.05	7.71
Administration and overhead	7.42	6.88	7.18
Total expense	26.61	23.53	24.72

Source: *Functional Cost Analysis National Average Reports*

activity did not rise in proportion to the dollar volume of deposits. The average size of checking accounts at the Class 3 bank (\$3,918 in regular checking accounts in 1969 versus \$1,960 for the

Class 1 bank)<sup>7</sup> contributed to this lower per dollar cost; maintenance expense was spread over a larger

<sup>7</sup>*Functional Cost Analysis National Average Report, 1969, p. A8.*

## ECONOMIC REVIEW

TABLE IX

Output of Employees in the Demand Deposit Function  
Averaged for Banks in Three Size Categories  
1966-1969

	Banks With Deposits up to \$50 Million <u>(Class 1)</u>	Banks With Deposits \$50 Million to \$200 Million <u>(Class 2)</u>	Banks With Deposits Over \$200 Million <u>(Class 3)</u>
<u>1966</u>			
Daily deposits per teller	71	71	87
Daily checks cashed per teller	84	73	83
Daily home debits per trans-bookkeeper*	317	298	246
Accounts per trans-bookkeeper	420	335	238
<u>1967</u>			
Daily deposits per teller	76	79	96
Daily checks cashed per teller	86	84	†
Daily home debits per trans-bookkeeper	322	286	233
Accounts per trans-bookkeeper	423	325	232
<u>1968</u>			
Daily deposits per teller	75	78	91
Daily checks cashed per teller	78	76	80
Daily home debits per trans-bookkeeper	358	303	245
Accounts per trans-bookkeeper	459	340	256
<u>1969</u>			
Daily deposits per teller	75	79	89
Daily checks cashed per teller	77	79	80
Daily home debits per trans-bookkeeper	381	325	234
Accounts per trans-bookkeeper	480	365	245

\* Trans-bookkeeper is an abbreviation for all demand deposit employees other than tellers.

† Unavailable. The published figure is incorrect.

Source: *Functional Cost Analysis National Average Reports*

dollar volume. Account activity (measured in terms of weighted home debits, deposits, and transit checks) per dollar of checking accounts also declined as deposit volume rose. These effects are summarized in Table XI in terms of the number of activity weight units (including annual maintenance) per dollar of checking account funds for the three bank groups. The sharp decrease in activity per dollar of checking account funds as bank size increased is quite apparent.

The data regarding the demand deposit function

from the FCA studies indicate that larger size does not necessarily imply lower cost. Whether or not average cost rises or falls from one bank size category to another depends on the measure of output.

**The Time Deposit Function.** Differences in the operation of the time deposit function by bank size were similar to those differences observed in the operation of the demand deposit function. The Class 3 bank had the lowest cost in terms of



TABLE X

Costs of Demand Deposit Activity and Maintenance  
 Averaged for Banks in Three Size Categories  
 (cents per item)  
 1966-1969

	Banks With Deposits up to \$50 Million (Class 1)	Banks With Deposits \$50 Million to \$200 Million (Class 2)	Banks With Deposits Over \$200 Million (Class 3)
<b>1966</b>			
Home debit	6.27 ¢	6.64 ¢	6.83 ¢
Deposit	8.77	9.29	9.56
Transit check*	2.30	2.43	2.50
Regular checking account—annual maintenance†	1,657.73	1,755.54	1,807.00
Special checking account—annual maintenance	552.52	1,023.95	1,053.97
<b>1967</b>			
Home debit	6.89	7.34	7.92
Deposit	9.65	10.26	11.09
Transit check	2.53	2.69	2.90
Regular checking account—annual maintenance	1,823.45	1,939.91	2,095.41
Special checking account—annual maintenance	607.75	1,131.49	1,396.78
<b>1968</b>			
Home debit	7.32	8.00	8.46
Deposit	10.25	11.20	11.84
Transit check	2.68	2.93	3.10
Regular checking account—annual maintenance	1,936.98	2,117.04	2,238.39
Special checking account—annual maintenance	645.59	1,411.20	1,492.10
<b>1969</b>			
Home debit	7.47	8.24	9.88
Deposit	10.46	11.53	13.83
Transit check	2.74	3.02	3.62
Regular checking account—annual maintenance	1,976.42	2,179.83	2,614.25
Special checking account—annual maintenance	658.74	1,089.79	1,742.64

NOTE: Home debits include all "on us" checks plus all charges against checking accounts.

\* Transit checks is a term covering all outgoing clearing items.

† Annual maintenance cost is the average cost to the bank of servicing a deposit, even if the deposit is inactive.

Source: *Functional Cost Analysis National Average Reports*

## ECONOMIC REVIEW

### TABLE XI

Weighted Activity Units\* Per \$1.00 of Checking Account Funds  
Averaged for Banks in Three Size Categories  
1966-1969

	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
Deposits up to \$50 million (Class 1)	.935	.919	.920	.926
Deposits \$50—\$200 million (Class 2)	.746	.732	.721	.739
Deposits over \$200 million (Class 3)	.634	.627	.657	.634

\* One weight unit equals the activity (cost) required to process one transit check. Since every activity involves a cost, the cost of any given activity may be expressed as a multiple of the cost of any other activity. FCA uses the cost of a transit check as the standard unit.

Source: *Functional Cost Analysis National Average Reports*

### TABLE XII

Operating Cost of Time Deposits  
Averaged for Banks in Three Size Categories  
(cost in dollars per \$1,000 of time deposits)  
1966-1969

	<u>Banks With Deposits up to \$50 Million</u> (Class 1)	<u>Banks With Deposits \$50 Million to \$200 Million</u> (Class 2)	<u>Banks With Deposits Over \$200 Million</u> (Class 3)
<u>1966</u>			
Processing expense	\$2.23	\$2.33	\$2.08
Administration and overhead expense	2.23	2.23	1.99
Total operating expense	4.46	4.56	4.07
<u>1967</u>			
Processing expense	2.26	2.37	2.30
Administration and overhead expense	2.27	2.17	1.73
Total operating expense	4.53	4.54	4.03
<u>1968</u>			
Processing expense	2.29	2.46	2.27
Administration and overhead expense	2.10	2.08	1.89
Total operating expense	4.39	4.54	4.16
<u>1969</u>			
Processing expense	2.58	2.77	2.64
Administration and overhead expense	2.54	2.60	2.15
Total operating expense	5.12	5.37	4.79

Source: *Functional Cost Analysis National Average Reports*

TABLE XIII

Cost of Time Deposit Activity  
Averaged for Banks in Three Size Categories  
(cents per transaction)  
1966-1969

	Banks With Deposits up to \$50 Million	Banks With Deposits \$50 Million to \$200 Million	Banks With Deposits Over \$200 Million
	(Class 1)	(Class 2)	(Class 3)
<b>1966</b>			
Deposit	56.10¢	56.69¢	72.67¢
Withdrawal	61.71	62.36	79.94
Account opened	173.91	175.74	225.28
<b>1967</b>			
Deposit	63.07	60.53	74.42
Withdrawal	69.37	66.59	81.86
Account opened	195.51	187.65	230.70
<b>1968</b>			
Deposit	66.79	64.59	72.66
Withdrawal	73.47	71.05	79.93
Account opened	207.06	200.22	225.25
<b>1969</b>			
Deposit	76.71	78.82	85.01
Withdrawal	84.38	86.70	93.51
Account opened	237.79	244.34	263.54

Source: *Functional Cost Analysis National Average Reports*

operating expense per dollar of time deposits (Table XII). Costs per unit of time deposit activity, however, tell a different story. As Table XIII shows, the Class 1 and Class 2 banks had the lowest average cost per transaction unit over the four-year period. The Class 3 bank consistently had the highest per unit cost for time deposit activity, just as it had the highest per unit activity cost in the demand deposit function. Again, the Class 3 bank was able to achieve low administrative and processing costs per dollar of time deposits chiefly because deposit activity did not increase in proportion to deposit volume.

## BANK SIZE AND PERSONNEL EXPENDITURE

The FCA study also compiles and reports average data on the number of and expenditure for total personnel for the three bank classes. Much of this information is summarized in Table XIV. The top panel in the Table indicates that the Class 3 bank was able to operate with fewer employees per dollar of available funds. This situation is often attributed to increased specialization of labor at larger banks, which results in higher overall output per employee. As noted in the previous two sections, however, it may also be attributed to the

## ECONOMIC REVIEW

TABLE XIV

**Personnel Use and Cost  
Averaged for Banks in Three Size Categories  
1966-1969**

	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
<u>Number of employees per \$1,000,000 of available funds</u>				
Deposits up to \$50 million (Class 1)	2.10	2.02	1.86	1.83
Deposits \$50—\$200 million (Class 2)	1.86	1.79	1.67	1.69
Deposits over \$200 million (Class 3)	1.53	1.59	1.58	1.57
<u>Annual personnel expense per employee (\$1,000 of dollars)</u>				
Deposits up to \$50 million (Class 1)	\$ 5.28	\$ 5.58	\$ 5.92	\$ 6.22
Deposits \$50—\$200 million (Class 2)	5.35	5.64	5.97	6.27
Deposits over \$200 million (Class 3)	5.72	6.02	6.35	6.81
<u>Annual personnel expense in dollars per \$1,000 of available funds</u>				
Deposits up to \$50 million (Class 1)	\$11.09	\$11.27	\$11.01	\$11.38
Deposits \$50—\$200 million (Class 2)	9.95	10.10	9.97	10.60
Deposits over \$200 million (Class 3)	8.75	9.57	10.03	10.69
<u>Personnel expense as a percent of gross income on available funds</u>				
Deposits up to \$50 million (Class 1)	21.03%	20.49%	19.23%	18.28%
Deposits \$50—\$200 million (Class 2)	19.48	19.19	18.06	17.46
Deposits over \$200 million	17.76	18.65	18.01	17.16

Source: *Functional Cost Analysis National Average Reports*

fact that there was less to be done (account activity was less) per dollar of available funds at the Class 3 bank; therefore, fewer personnel were required to process a dollar of funds. During 1966-1969, the Class 1 and Class 2 banks had considerable success in reducing the number of employees per dollar of available funds. In contrast, the ratio of employees to available funds at the Class 3 bank was practically unchanged from 1967 through 1969.

The second panel in Table XIV reveals that the Class 3 bank had higher personnel cost per employee than the Class 2 and Class 3 banks. It is also apparent that expense per employee at the Class 3 bank increased more over the 1966-1969 period than personnel expense in the other bank groups. The gap between personnel expense per employee at the Class 3 bank and at the Class 1

bank widened during this period of generally increasing personnel cost.

The net effect of the changing relative productivity and remuneration at the various banks on personnel expense per dollar of available funds is shown in the third panel of Table XIV. Because of productivity gains at the Class 1 and Class 2 banks and larger increases in wages and salaries at the Class 3 bank, the Class 2 bank replaced the Class 3 bank with the lowest personnel expense per dollar of available funds. As the bottom panel shows, however, personnel expenditure remained a smaller percentage of gross income for the Class 3 bank than for the other two bank groups.

## AUXILIARY SERVICE FUNCTIONS

Three specific service functions are analyzed in the functional cost study—computer services, trust

TABLE XV

Losses in Auxiliary Bank Service Departments  
Averaged for Banks in Three Size Categories  
(percent of departmental expense)  
1966-1969

	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
<u>Computer service department</u>				
Deposits up to \$50 million (Class 1)	9.67%	15.97%	13.29%	12.51%
Deposits \$50-\$200 million (Class 2)	9.87	11.51	13.97	13.27
Deposits over \$200 million (Class 3)	6.61	8.89	10.11	6.11
<u>Trust department</u>				
Deposits up to \$50 million (Class 1)	20.28	24.18	27.37	29.89
Deposits \$50-\$200 million (Class 2)	9.55	11.78	12.24	17.91
Deposits over \$200 million (Class 3)	(9.46)	(1.59)	(1.66)	1.92
<u>Safe deposit department</u>				
Deposits up to \$50 million (Class 1)	35.84	27.58	26.41	38.66
Deposits \$50-\$200 million (Class 2)	37.21	32.34	30.00	39.57
Deposits over \$200 million (Class 3)	34.35	25.44	32.70	37.57

NOTE: Profits are in brackets; losses are unbracketed.

Source: *Functional Cost Analysis National Average Reports*

operations, and safe deposit. Table XV shows that, except for the trust department operations of the Class 3 bank, these departments were operated at a loss throughout the period. The fact that these services appear to be provided at a loss does not necessarily mean that FCA banks would be well advised to eliminate them. Auxiliary service departments are maintained because they generate funds and profitable business in other bank departments. Strictly speaking, all of these losses should, therefore, be allocated as expense items to those departments that benefit from the presence of auxiliary service functions in the bank.<sup>8</sup> Such an allocation, however, is not feasible.

<sup>8</sup> Expenses for computer services performed for specific bank functions are allocated to those functions; the remaining auxiliary service expenses are not allocated.

## SUMMARY

This survey of the published FCA bank data for the years 1966-1969 has indicated pronounced differences in the functional revenue and cost flows of the different size banks. Using earnings per dollar of available funds as the criterion, the Class 2 bank consistently achieved the highest overall performance, and the Class 3 bank just as consistently ranked third. The overall superiority of the Class 2 bank over the Class 1 bank was due to substantially lower cost per dollar of available funds. This more than compensated for the lower gross yield received by the Class 2 bank. The relatively inferior performance of the Class 3 bank was due to an unfortunate combination of generally lower income and insufficient offsetting cost economies.

## ECONOMIC REVIEW

Differences in asset structure and yield by bank size categories were also noted. Specifically, larger banks were found to hold higher proportions of cash and commercial and agricultural loans, while the smaller banks' portfolios on average contained heavier concentrations of instalment and real estate loans and U. S. Government securities.

The liability structure and cost was also seen to vary considerably with bank size. The Class 2 bank, in particular, was the beneficiary of a liability composition that was weighted towards low average cost items. Substantial differences were also found in the cost of producing and maintaining demand and time deposit liabilities. Viewed in terms of operating cost per dollar of deposits, the Class 3 bank achieved the lowest cost

(except for demand deposits in 1969); but in terms of cost per unit of deposit activity, the Class 3 bank had the highest cost record. These results can be reconciled by the fact that as deposit volume grows, deposit activity increases less than in proportion to deposit volume.

During the period under review, because of productivity gains at the Class 1 and Class 2 banks and more rapidly rising labor cost at the Class 3 bank, the Class 2 bank replaced the Class 3 bank in having the lowest personnel expense per dollar of available funds.

Generally, a conclusion that may be drawn from the FCA data is that, during 1966-1969, bank size did make a difference in functional costs and revenues, and this difference did not always favor the largest banks.

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The 1970 *Functional Cost Analysis National Average Report* will be available in June 1971 from the Bank Relations and Public Information Department, Federal Reserve Bank of Cleveland.

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