

Customer Profitability Analysis

Part II: Analysis Methods at Major Banks

By **Robert E. Knight**

In recent years larger banks have become increasingly interested in measuring the profitability of corporate customer relationships. One of the first approaches was account analysis.¹ In performing a standard account analysis, a bank determines the revenue from a customer's account by multiplying the average collected demand deposit balance, generally adjusted for reserve requirements, by an earnings credit or allowance. The expenses of servicing the account are computed by multiplying the number of times a given service is utilized by the cost—generally including an allowance for profit—of providing the service.

While account analysis is an important step in determining the profitability of a customer relationship, it does not measure total profitability. Account analysis generally focuses on the activity operations for which compensating balances are maintained—account maintenance, items deposited, ledger entries, wire transfers, etc.—but rarely allows for other services such as loans, investment counseling, trust services, etc. It is primarily of use, therefore, in analyzing the accounts of non-borrowers with heavy activity charges. For

other customers the omission of loan relationships has at times allowed the double or even triple use of compensating balances. Since crosschecking is frequently not automatic, a compensating balance for a loan might at times be used to compensate for activity charges and also serve as a justification for a future call on credit.

Profitability analysis seeks to overcome some of the shortcomings of account analysis by preparing considerably more detailed income and expense statements for major customer. Multiple accounts for a single corporate relationship are often consolidated, including those of subsidiaries and perhaps even major officers. Losses on one account, consequently, can be offset with profits on others. The earnings and expenses associated with loans and other fee services not typically considered in an account analysis are likely to be included in a profitability statement. Rather than emphasizing activity charges, however, profitability analysis focuses on commercial lending and is of the greatest use in determining the profitability of net borrowers.

Specific methods of measuring customer

¹A detailed description of account analysis procedures used in correspondent banking can be found in the article "Account Analysis" in the December 1971 Monthly Review of the Federal Reserve Bank of Kansas City. Since 1971 the Kansas City Reserve Bank has collected figures annually on the account analysis practices of major correspondents. The 1973 survey results were reported in "How Correspondents Analyze Accounts for Profitability," *Banking Journal of the American Bankers Association*, Vol. 66, No. 10 (April 1974).

²A general theoretical description of the approaches commonly used to measure customer profitability is contained in the first article in this series, "Alternative Approaches Toward Customer Profitability," in the April 1975 Monthly Review. A more detailed discussion of a variety of approaches to customer profitability analysis is contained in a booklet by Kenneth E. Reich and Dennis C. Neff, *Customer Profitability Analysis: A Tool for Improving Bank Profits* (Bank Administration Institute and the Robert Morris Associates), 1972.

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profitability differ significantly among banks, but the general format tends to be similar. Bank income on a relationship is often computed by adding the interest received on loans, the interest earned by the bank on the customer's deposit funds, and various fees paid the bank. Expenses include charges for such items as activity services, the interest cost of funds loaned, loan handling expenses, and the cost to the bank of fee services. The difference between income and expenses, net profit, is then related to some base representing the size of the relationship—net funds borrowed, allocated capital, gross loans, total revenue, etc.—to obtain an index number for comparing relative customer profitability. Since estimated profitability tends to be strongly influenced by loan terms such as compensating balances, interest rates, and associated fees, the analysis has often been proposed as a means to determine the loan terms necessary to meet a minimum profit goal for a bank. It can also be a helpful guide in allocating bank resources since the analysis tends to highlight the most profitable types of customers and loans.

The general principles involved in computing customer profitability are illustrated in Table 1 which contains a sample profitability statement. While most of the concepts underlying the individual entries are self-explanatory, banks exhibit little similarity in approaching the items. Variations arise from differences in the types of services emphasized, the methods of costing those services, the interest charges assigned, and the base to which profits are related. The major focus of this article is on the comparative methods used by banks to determine customer profitability.

PWE SURVEY RESULTS

To broaden the information available on profitability analysis procedures and to obtain data on figures actually used to compute customer profitability, the Federal Reserve Bank of Kansas City recently conducted a survey

Table 1	
FIRST NATIONAL BANK	
Customer Profitability Analysis	
Account: <u>XYZ Manufacturing</u>	Date: <u>July 20, 1975</u>
Affiliated Accounts?	Period: <u>12/31 - 6/30</u>
SOURCES AND USES OF FUNDS	
1. Average Loan Balance:	\$ _____
2. Average Collected Demand Balance:	\$ _____
a. Investable Balance (17.5% reserve):	\$ _____
3. Average Time Balance:	\$ _____
a. Investable Balance (3% reserve):	\$ _____
4. Total Loanable Funds (2a + 3a):	\$ _____
5. Bank Funds Used by Customer (1 + 4):	\$ _____
a. Allocated Capital (8% of 1):	\$ _____
b. Funds Transferred from Pool (5 - 5a):	\$ _____
INCOME	
6. Gross Interest Income on loans:	\$ _____
7. Earnings on Deposits (xxx% of 4):	\$ _____
8. Fees Paid:	
a. Service Charge Fees:	\$ _____
b. Loan Commitments:	\$ _____
c. Data Processing:	\$ _____
d. Total (8a + Bb + Bc):	\$ _____
9. Total Income (6 + 7 + 8):	\$ _____
EXPENSES	
10. Activity Costs from Account Analysis:	\$ _____
11. Interest Accrued on Time Deposits:	\$ _____
12. Charge for Bank Funds Used:	
a. Allocated Capital (20% of 5a):	\$ _____
b. Other Funds (xxx% of (1 - 5a)):	\$ _____
c. Total (12a + 12b):	\$ _____
13. Loan Handling Expenses:	\$ _____
14. Cost of Fee Services:	\$ _____
15. Data Processing:	\$ _____
16. Total Expenses (10 + 11 + 12 + 13 + 14 + 15):	\$ _____
NET INCOME	
17. Net Income Before Taxes (9 - 16):	\$ _____
PROFITABILITY MEASURES	
18. Allocated Capital Index (17 + 5a):	_____%
19. Net Profits/Net Funds Used (17 + 5):	_____%
20. Net Profits/Gross Amount Borrowed (17 + 1):	_____%
21. Gross Profits/Net Funds Used [(17 + 12c) + 5]:	_____%

of account and profitability analysis techniques at major correspondent banks throughout the country. Questionnaires were sent to 138 banks in the late fall of 1974. Among the 107 banks responding to the survey, all provided figures on both corporate and correspondent account analysis and 57 supplied information on methods of analyzing cus-

tomer profitability. The remaining 50 banks indicated that a formal profitability analysis had not been developed or that it was only in the formative stage.

The survey showed that both the frequency and function of profitability analysis vary widely among banks. The analysis is primarily used to analyze corporate customer relationships, with emphasis normally on net borrowers. A few banks consider only a specified number of relationships, but most begin the analysis whenever total borrowing exceeds some predetermined limit, the most common amount being \$100,000. The minimum level, however, ranged from a low of \$25,000 to a high of \$750,000. Almost two-thirds of the banks noted that the profitability of correspondent relationships would be analyzed if sizable participation loans were involved. About 40 per cent of the survey banks perform the analysis on a regular monthly basis, while another 20 per cent examine relationships quarterly. Other banks typically conduct the analysis either annually or irregularly, as when a customer has applied for a new loan or commitments are under negotiation. Although banks that perform an analysis frequently are interested in seeing if a relationship has been profitable since the previous analysis, most give primary emphasis to profitability over longer periods such as a year.³

SOURCES AND USES OF FUNDS

The first step in computing customer profitability is to determine the total funds used and supplied by the customer relationship. These figures are subsequently used to derive the imputed value of funds borrowed or sup-

³/As previously noted, the specific approaches used by banks to measure customer profitability often vary significantly. Some banks even have different formulas for judging the profitability of alternative types of customers. Considerable latitude, consequently, has been required to cast the survey responses into a general framework. Relatively few distortions occur in this process, but at times the order in which calculations are made or the procedures used for handling certain components of the analysis could affect estimated profits. For this reason the tabulations are not a precise guide and are only representative of the usual approach. In any event, only those figures used to analyze the profitability of normal corporate relationships have been tabulated.

Table 2
ANALYSIS OF SOURCES AND USES OF FUNDS

Fund Source or Use	Per Cent of Banks Including Item in Analysis
FUNDS SUPPLIED TO BANK	
1a. Investible Demand Deposit Funds	89.5%
b. Collected Demand Deposit Funds	7.0
c. Gross Demand Deposits	1.8
d. Other Demand Deposit Measures	1.8
2a. Interest Bearing Time Deposits	47.4
b. Noninterest Bearing Time Deposits	73.7
3. Treasury Tax and Loan Deposits	61.4
4. Commercial Paper Sold Customer	1.8
5. Participation Loans Sold Respondent Banks	17.5
FUNDS USED BY CUSTOMERS	
6a. Regular Commercial Loans	98.2
b. Term Loans	96.5
c. Revolving Credit Loans	94.7
7. Fraction of Unused Line of Credit	17.5
8a. Acceptances Held in Bank's Portfolio	35.1
b. Acceptances Not Held in Bank's Portfolio	5.3
9. Participation Loans Originated by Respondent Banks	64.9
10. Bank Stock Loans	42.1
11. Other Loans Designated by Loan Officers	57.9

plied. They may also serve as a measure of the size of a relationship in computing an index of comparative customer profitability.

Table 2 shows the percentage of survey banks considering alternative types of fund transactions in the sources and uses portion of the analysis. The table indicates that all survey banks treat demand deposits as a source of funds, with nearly 90 per cent basing the contribution on net investible funds, the balance remaining after cash items in process of collection and an allowance for reserve requirements have been deducted.⁴ The remaining

⁴/In addition to the possible deductions shown in the table, six banks indicated that they also made a deduction for the balances required to support activity services. This approach would not affect the estimated profit on a customer relationship as long as a bank's earnings allowance on deposit balances was equal to the figure used for the bank's cost of funds. However, since the deduction would act to increase net funds borrowed, a profitability index based on net funds borrowed would be reduced.

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banks generally count either gross or collected demand deposits.⁵

Among the banks making a deduction for reserve requirements, 78.8 per cent use the same deduction as in the account analysis. Of these, 40.0 per cent base the deduction on the highest marginal reserve requirement for demand deposits to which the bank is subject, 47.5 per cent on the average reserve requirement for demand deposits, and 12.5 per cent on an administratively set deduction bearing no direct relationship to actual requirements but often tending to be slightly higher. Eleven banks, however, have different percentage deductions in the two analyses. Seven of these have no deduction for reserve requirements in the account analysis but do make allowance for reserves in the profitability analysis. The other four banks were evenly split between those having higher deductions in the profitability analysis and those having lower.

⁵The six banks not including investable demand deposit funds in the analysis exhibited a variety of possibilities. One nonmember bank specializing in international finance includes gross demand deposits. Another nonmember bank which is permitted to count uncollected funds toward meeting state reserve requirements makes a deduction only for reserves. A third bank includes collected funds in the analysis but reduces the earnings allowance granted on these funds by the reserve requirement percentage. This approach would not affect the imputed earnings represented by the relationship, but it would lower the estimate of net bank funds used by the customer.

The other three banks also credit the customer with collected demand deposits, but they do not reduce the earnings allowance for reserve requirements. Instead they seek to give the customer a competitive return on all funds deposited. Since this approach results in crediting the customer with interest on balances the bank must hold as reserves, the cost of the imputed interest on reserves is then passed on to borrowers in the form of a higher cost of funds rate. This treatment of reserve requirements would not affect the estimated profitability of borrowers with average percentage compensating balances. The imputed interest on nonloanable funds would be offset by the additional charge for funds borrowed. Borrowers with above average compensating balances would tend to show relatively greater profitability, while those with below average balances, lower profitability.

If the earnings allowance granted by a bank on deposit funds is a market rate of interest not directly tied to the bank's average cost of funds, charging borrowers for any imputed interest on nonloanable funds would not be necessary. In this case the sum of the profits derived from the profitability analysis for all customers would not necessarily be equal to the actual profits earned by the bank. However, if the profitability analysis is to be a measure of actual profits, consistency requires that any interest imputed on noninvestable funds be offset with a charge elsewhere. The usual solution is to include this charge in the cost of funds, thus allocating the cost of reserve requirements to borrowers. For a more detailed discussion of these issues, see John F. Falkenberg, *Profitability Analysis: A Bank Marketing Tool* (unpublished thesis, Stonier Graduate School of Banking, Rutgers University, 1969), pp. 61, 72, 77.

The remaining sources of funds are relatively straightforward. Nearly three-fourths of the banks include noninterest bearing CD's, frequently after a deduction for reserve requirements. In recent years these accounts have become more widespread as customers have sought to minimize the funds placed in compensating balances. Since reserve requirements on time deposits are lower than on demand deposits, both the bank and the customer can benefit from splitting the reserve savings involved with a time deposit. The customer's required compensating balance is reduced and the bank obtains additional loanable funds. The fact that not all banks count such time deposits as a source of funds is somewhat surprising, but perhaps some do not encourage the issuance of these accounts.

A much lower fraction, 47.4 per cent of the banks, include investable funds from interest bearing time and savings deposits in the analysis. Many of these banks incorporate these accounts only if the rate of interest paid is substantially below current market rates. Interest bearing CD's are often excluded from the analysis on the grounds that they are likely to be viewed as investments by corporate treasurers and the funds are not likely to be bound to a bank by a customer relationship. Similarly, 61.4 per cent of the banks make allowance for funds deposited by customers in Treasury tax and loan accounts. While the official position of most banks is that funds in tax and loan accounts cannot serve as compensating balances, competitive pressures have forced many to recognize that bank profits are increased by the existence of these accounts. Relatively few banks consider commercial paper sold to customers or funds generated by loan participations sold respondent banks as a source of funds in the analysis. Finally, although not listed explicitly on the questionnaire, several banks also indicated they considered deposits at foreign branches and fiduciary balances among fund sources.

Loans represent the major use of bank

funds. Virtually all banks list standard commercial and industrial loans in the profitability analysis, with 57.9 per cent also counting any other loans designated by officers as being related. The treatment of bankers acceptances varied. The majority of banks do not include acceptances created for customers, but 35.1 per cent indicated that acceptances would be entered if held in the bank's own portfolio and 5.3 per cent stated they would be counted even if sold. Interestingly, 17.5 per cent of the banks noted they considered a portion of an unused line of credit as a fund use. This procedure was justified on the grounds that such lines require the bank to maintain additional liquidity. The percentage inclusion ranged from 10 per cent to 100 per cent, with 10 per cent being by far the most common amount.⁶

In the case of correspondent accounts, about two-fifths of the banks include bank stock loans and 64.9 per cent count participations in loans originated by respondents. In contrast, only 17.5 per cent of the banks stated that they give correspondent customers credit for funds supplied when respondent banks buy loan participations. This differential treatment could be the result of the equivocal attitude correspondent banks frequently have toward up- and downstream participations. It could also reflect that the survey was conducted shortly after a period of credit restraint when most smaller banks would have found Federal fund sales a more profitable outlet for excess funds than purchases of loan participations. In addition to the standard types of commercial loans, a few banks listed a variety of special loans that they include in the analysis. Among those listed were accounts receivable financing, lease financing, purchased instalment paper, Eurodollar and foreign branch

⁶In the survey the question dealing with unused lines of credit proved to be a source of some confusion. Several banks stated that they treated a commitment as though a certain percentage had been loaned, but that they did not count less formal lines of credit as a use of funds. Unfortunately the percentage of banks which differentiate between commitments and loan lines in profitability analysis is not clear and no figures were obtained on the percentage of commitments included in funds used by customers.

loans, credit card loans generated by retailers, and overdrafts.

After the sources and uses of funds have been tabulated, the next step in a profitability analysis is usually determining the net bank funds used by the customer and perhaps assigning a certain amount of the bank's capital to the relationship. These figures, as seen from Table 1, are required for calculating the profitability ratios and for computing the expense entries for bank funds loaned. Derivation of these figures will be discussed later.

INCOME

The second major portion of the profitability statement measures the income or revenue obtained by the bank from the customer relationship. While numerous sources of income can be listed, the major entries are typically interest received on loans and the interest imputed on the deposit funds included in the sources section of the analysis.⁷ In the case of loans, the actual interest accruing during the period covered by the analysis would be shown. Several approaches, however, can be used to impute interest on deposit funds. One possibility is to give the customer a return equal to what the bank can earn on the funds. Banks choosing this avenue might tie the interest rate to the average return on investable funds, the prime loan rate, or perhaps the customer's average loan rate. Another option is to select an interest rate representing the cost to the bank of obtaining funds from alternative

⁷As a practical matter, many banks do not follow the approach shown in Table 1 of crediting borrowers with interest on compensating balances and charging the cost of money on the full amount borrowed. Instead they take the difference between average loans and the average investable deposit funds supplied by the customer and assess a charge only for the cost of money, however measured, on net funds borrowed. In effect, this alternative approach is equivalent to giving the customer an earnings allowance on investable funds equal to the cost of money and charging the cost of money on all funds borrowed. Throughout the tabulations, banks including a charge only for net funds borrowed have been entered as though both interest calculations are made independently.

One survey bank does not impute an earnings allowance on demand deposits. To measure customer profitability, this bank computes the ratio of accrued interest on loans to net funds borrowed. This approach is tantamount to giving an earnings allowance on deposits equal to the average interest rate on the customer's loans. The bank, consequently, has been entered in the tabulations as though an explicit interest allowance were given.

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sources. In this instance the bank might base the return on such money market rates as the Federal funds rate, the discount rate, the rate on large denomination CD's, the average or marginal cost of borrowed money, or some combination of these rates. Finally, the return could represent what the customer could earn if the funds had been invested directly in the money market. Banks exercising this alternative would consider market rates like the Treasury bill rate or perhaps the rate on CD's.

Among the 57 survey banks, 20 different rates or combinations of rates were specified for imputing interest on deposit funds. Further variance was created as some banks use monthly, quarterly, or annual averages of rates and others use future projections of rates. Regardless, at the time of the survey the interest rates on deposit funds ranged from 8.0 per cent to 12.17 per cent, with the average and median rates being 9.41 per cent and 9.5 per cent, respectively. By comparison, the average 3-month Treasury bill rate during the third quarter was 8.19 per cent, the average Federal funds rate, 12.09 per cent, and the prime rate, 12.0 per cent. Among the market rates selected, the most common was the 3-month Treasury bill rate which was used by 14.0 per cent of the banks. However, 44.9 per cent based the credit on the cost of marginal or purchased funds, generally using various combinations of the rates listed above. Nearly all other banks tied the earnings allowance to the average cost of loanable funds, the commercial paper rate, or to interest rates charged on loans. A small group had administratively set earnings allowances not linked directly to any market rate.

Most banks also give customers income credit for direct payments made to cover service charges and loan commitments. Service charge income generally represents any amount paid to the bank for activity costs or any charge associated with obtaining loans, such as points. In the case of commitment fees, an entry would be made only if a customer paid an outright fee for a commitment or a

Table 3
ANALYSIS OF BANK REVENUE AND EXPENSES

Source of Revenue or Expense	Per Cent of Banks Including Item in Analysis
INCOME	
1. Interest Received on Loans	100.0%
2. Service Charge Fees	71.9
3. Imputed Interest on Customer Deposits	100.0
4. Fees Received from Computer Services	42.1
5. Fees Received for International Services	38.6
6. Fees Received for Trust Services	31.6
7. Fees Received for Money Market Services	40.4
8. Loan Commitment Fees	75.4
EXPENSES	
1. Activity Services Expense	98.2%
2. Loan Handling Expense	45.6
3. Direct Charge for Loan Risk	33.3
4. Interest Paid Customer on Time and Savings Deposits	47.4
5. Cost of Issuing Lines of Credit	14.0
6. Computer Services Expense	42.1
7. International Services Expense	38.6
8. Trust Services Expense	31.6
9. Money Market Services Expense	40.4
10. Cost of Money	70.2
11. Desired Return on Capital	35.1

line of credit. If a compensating balance had been maintained instead, these funds would be reflected in the sources and uses section of the analysis, and earnings accordingly imputed. Among the banks participating in the survey, 20.0 per cent indicated they strongly preferred to receive fees as compensation for commitments, 37.1 per cent desired balances, and 42.9 per cent stated either method of compensation was satisfactory. While many banks noted the commitment fee could vary with circumstances or the type of loan, the standard charge at most banks was 0.5 per cent of the commitment amount. The range of fees, however, varied from 0.25 per cent to 1.0 per cent. If balances were required, customers were generally expected to keep the standard 10 per cent of an unused commitment and 20 per cent for any borrowing.

Additional sources of income considered by banks vary greatly. As Table 3 shows, about

one-third of the banks include the income received from data processing services, international services, trust services, and such money market services as the purchase of securities and wire transfers. The inclusion of income from these nonloan services is rather controversial. Some banks feel income should be included in a profitability analysis only if it is derived from regular bank services or loans. Under this view, specialized services are treated independently of normal bank operations. These functions serve as separate profit centers and any profit they make is not allowed to influence the estimated profitability on customer loans. Others, however, believe that an accurate picture of the profitability of a customer relationship can be obtained only if all income and expenses are included. Banks in this latter group often maintain that customers are not likely to differentiate among profit centers in considering the compensation for a bundle of bank services. Regardless, if a bank includes the funds received for a specialized service in the income portion of the statement, the cost of providing that service should also be listed under expenses.

The preceding types of income were all covered in the survey questionnaire and the responses imply the list is relatively complete. Among the 57 banks, only seven listed any additional sources of income as being included. Three of the banks stated that any fee income received would be counted and two noted the inclusion of fees associated with credit card plans. Two also count fees for security safekeeping and cash management services. Whether other banks may have omitted some additional but relatively unimportant sources of income cannot be determined.

EXPENSES

The third major section of the profitability statement derives the bank's expenses for servicing the customer relationship. In many respects this portion of the analysis is the most complicated and controversial. The difficulties

arise from the numerous possible ways of deriving and allocating the costs of services and funds. These estimated costs will often vary significantly with the number of services costed, the types of cost utilized, and the base to which costs are related. A complete description of costing methods would be beyond the scope of this article, but the nature of some of the choices can be made clear.

In a complete study, all costs must be allocated. Banks pricing fewer services, consequently, would tend to have a higher price for those services. In the past, most banks have recognized that allocating costs in a multiproduct firm is always somewhat arbitrary and they have practiced a policy of pricing bundled services. Under this approach the costs of all services are spread among a relatively small number of activities. Customers are implicitly charged for noncosted services whenever they use one for which charges have been established. Those using uncosted services with above average frequency would tend to benefit from this approach, while those with below average frequency would tend to lose.

The types of costs estimated can affect profitability calculations. In pricing activity services, banks could use marginal, variable, or total costs. Any of these could be figured using historical costs, standard costs, or projected costs. Similar considerations apply in determining the charge that should be made for the cost of money. Two methods are commonly used. The first is to base the cost of money on the bank's average cost of funds and the second is to use a rate representing the marginal cost of funds purchased by the bank. Neither is wholly satisfactory. Basing the charge on the average cost is likely to result in understating the cost of acquiring loanable funds in periods of tight money, and perhaps overstating the cost in times of easy money. When interest rates are rising and additional loanable funds must often be purchased, the marginal cost of funds increases much more rapidly than the average cost. Unless the interest rate on loans

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made at such times exceeds the marginal cost of funds, losses will be incurred. However, the use of a marginal cost of funds rate during such periods would result in overstating total fund costs. Moreover, it would ignore the profits which arise from the ability of banks to lock in rate differentials on some assets and liabilities. Many banks seek to keep a sufficient amount of cheap core money (demand deposits and consumer time and savings deposits) to finance long-term fixed rate assets like mortgages and bonds. Even if rates rise, a bank is still assured of a positive earnings spread on this portion of its portfolio.

The base on which charges are computed can often influence estimated profitability. Loan handling expenses provide an example. Once the costs of the loan department have been determined, a variety of methods could be used to allocate costs to borrowers. One possibility would be to determine the average cost per note or renewal. This approach, however, could place an unduly heavy charge against the small borrower whose loan application is relatively simple to process. Costs could be allocated in proportion to the number of dollars borrowed, but this method could overstate the cost associated with large loans, since processing time normally does not increase directly with the size of a loan. Another approach would be to express costs as a function of available manhours. If officers were to maintain an accurate record of the time spent on each note, the hourly charge could then be allocated to the customer. Unfortunately, this method could result in higher charges for customers assigned to less efficient loan officers. None of the alternatives is wholly satisfactory, and as a result, some banks use combinations of each. On balance, many somewhat arbitrary decisions must be made in allocating costs and these decisions will often have a significant impact on the estimated cost of servicing a customer relationship.

The percentage of survey banks including selected types of expenses in the customer

profitability analysis is shown in Table 3. As can be seen, nearly all banks made an entry for activity services. Among these banks, over half stated the charges were based on prices of services as specified in the account analysis and slightly less than one-third indicated they were based on actual costs. The remaining banks did not specify how the charge was derived. The method of charging seems to depend largely on the degree of confidence a bank has in its cost figures and on whether it wishes to assign profits from activity services to general profits associated with loans. If a bank has not fully costed all activity services or the accuracy of its cost estimates is uncertain, use of the price figures tends to build in a margin for unlisted services and for potential underestimates of cost. In addition, some banks feel that it is inappropriate to allocate all profit to loans. According to these banks, the users of services requiring much labor and equipment should be expected to contribute to the profitability of those services. If prices are used, an allowance for profit can be built in and that allowance can even vary among services. Nevertheless, if price rather than cost figures are used, caution must be exercised in interpreting the profit estimated by the analysis since it could be an understatement.

The survey did not request information on the estimated costs to banks of performing services. Consequently, direct comparisons of the charges for activity services as computed in the profitability analysis are not possible. However, data were obtained on the charges made by banks in the account analysis. These charges and the corresponding collected balance requirements for a variety of corporate banking services are shown in Table 4.⁸ As can

⁸The tabulations in Table 4 are based on the 106 banks providing information on their account analysis procedures for corporate customers. While these types of figures could be used to determine the profitability of nonborrowing customers with heavy activity usage, they are not fully comparable to those used in the profitability analysis. The number of banks included in Table 4 is nearly double that of the profitability analysis figures reported elsewhere in this article. Moreover, at some banks the charges for activity services in the profitability analysis are based on the cost of providing the service, while the charge in the account analysis in-

be seen, most banks make explicit charges for account maintenance, ledger entry credits and debits, items deposited and returned, wire transfers, currency and coin furnished, payable through drafts, and domestic collections. A smaller proportion charge for securities drafts, currency and coin deposited, bond coupons collected, and stop payments.⁹

The most outstanding feature of the table is the very wide range that exists among banks in the prices and collected balance requirements for these standard banking services. For example, the charge for encoded items deposited at one bank is 0.5¢ and at another bank

includes a markup for profit. Also, the earnings allowance and deduction for reserve requirements at times differ between the profitability and account analyses at the same bank. The degree to which these types of factors could bias the figures in Table 4 from being representative of those used in the profitability analysis cannot be known but definite tendencies are present.

The collected balance requirements in Table 4 refer to balances a customer must hold for a given service, not what remains after a deduction for reserve requirements has been made. Specifically, if P is the price of a transaction or service, i is the imputed earnings allowance at an annual rate and expressed as a decimal, and r is the fraction of collected balances deducted to meet reserve requirements, the annual collected balance required for a given service can be derived from the following formula:

$$B = P/[i(1.00 - r)].$$

If the complications associated with compounding interest are ignored, the collected balance required to generate sufficient income over one month to pay for a service would be twelve times the amount indicated by B.

The survey also obtained data on the procedures used to analyze the accounts of respondent banks. While the prices and earnings allowances at many banks were identical for both corporate and respondent customers, at others they differed. In general, corporations tend to have higher charges for checks deposited, returned items, and wire transfers. Correspondent customers tend to be charged higher prices for account maintenance and some currency and coin transactions. For other services the charges are generally quite similar. Copies of the account analysis tabulations applicable to respondent banks are available from the author.

9/A few comments on Table 4 are in order. Banks not shown as charging in the account analysis may in some instances require customers to pay direct fees for the services. Previous surveys, however, have generally suggested that such practices are relatively uncommon for standard activity services involving no out-of-pocket expenses to the bank. If expenses are incurred, such as an exchange charge for collecting a nonpar check, these costs are normally passed on directly.

In reducing the account analysis charges to the common denominator of required collected balances, a number of difficulties arose. One bank has a sliding earnings credit which falls with the size of the account. Since the range in the earnings allowance is small, the maximum rate has arbitrarily been used to determine required collected balances. Similarly, most banks list explicit account maintenance fees in their analysis, but a number have only indirect maintenance fees. Such maintenance fees could arise if a bank has a charge for a monthly statement or has varying charges for the number of items deposited. The bank, for example, might charge 2.25¢ for the first 1,000 items deposited and 2¢ for all additional items. In effect, customers depositing over 1,000 checks are charged a maintenance fee of \$2.50 and a rate per check of 2¢. In tabulating the results, any charge for a regular monthly statement has automatically been considered to be an account maintenance fee; but a similar adjustment cannot be made for banks which have marginal charges for the number of

the charge is 6¢. Similarly, the minimum charge of 3¢ for ledger entry credits is about one-thirtieth the maximum of 87¢. While the price figures form the basis of the charges in both the account and profitability analyses, the collected balance figures are a better measure of the actual cost to customers of activity services. A bank with a higher price may actually have a lower effective price if it is more generous with the earnings allowance or makes a smaller deduction for reserves. For comparative purposes the median collected balance requirement is probably more meaningful than the average. A tendency exists for many banks to have slightly below average prices while a

few have prices substantially above average.

The group of services in Table 4 are those for which relatively fixed account analysis fees have commonly been established. Many banks also charge for a variety of miscellaneous transactions but these vary from bank to bank. Examples of services for which comparatively few banks charge are cashing payroll checks, issuance of duplicate statements or cashiers checks, credit investigations, phone calls, investment advice, negative collected balances, and FDIC insurance. In addition, most banks charge for such services as security safekeeping, account reconciliation, lockbox opera-

items deposited. In a few instances the number of items required to secure the minimum charge is so high that comparatively few customers would be able to qualify. Although it makes little difference in the averages reported in the table whether the minimum or maximum per item charges are used, the average of the two has been used wherever reasonable.

A more basic shortcoming of several of the entries in the table is that they do not fully show the diversity that exists in the pricing structure of individual banks. Most banks, for example, have a standard charge for all domestic collection items, but some charge a given percentage of the amount of the collection, and others differentiate between cash and noncash collections or among documentary and clean collections, city and country collections, etc. Where alternative types of collections are designated, the prices often vary significantly. To enter these banks in the tabulations, the minimum charge for noncash documentary collections was used whenever available. Some banks, however, may have charges for such collections which were not reported on the questionnaire. The charges shown for collection items, consequently, are at best indicative of the general range of charges and could be significantly biased. Similarly, the charge for wire transfers at some banks depends on whether the transfer is processed by the Federal Reserve. In these cases, the charge for Federal Reserve transfers was entered. While the figures must be interpreted in light of these limitations, such tabulating problems occur relatively infrequently among the list of standard services shown in the table. Moreover, any special charges would have only a minor or insignificant effect on the reported average and median figures.

Table 4
ACCOUNT ANALYSIS CHARGES FOR SELECTED CORPORATE BANKING SERVICES
October-November 1974
(106 banks)

Transaction	Charge Per Transaction (Amounts in Dollars)		Annual Collected Balance Required Per Transaction in the Account Analysis (Amounts in Dollars)			Per Cent of Banks Charging in Account Analysis	Per Cent Nonresponse
	Mode	Range	Average	Range	Median		
1. Annual Account Maintenance	12.00	7.80-240.00	752.07	135.84-12,394.20	353.70	92.45%	0.94%
2. Ledger Entries							
Credits	.07	.03-.868	2.35	.40-13.95	1.47	81.13%	—
Debits	.06	.02-.30	1.29	.25-5.76	1.13	96.22%	—
3. Items Deposited							
Not Encoded	.03	.01-.06	.48	.15-1.08	.44	97.16%	0.94%
Encoded	.02	.005-.06	.35	.06-1.08	.30	98.11%	0.94%
4. Returned Items	.50 & 1.00	.119-5.00	11.60	1.62-77.16	6.94	74.52%	0.94%
5. Wire Transfers							
Outgoing	2.00	1.00-10.00	34.70	6.42-181.82	28.90	95.28%	0.94%
Incoming	1.50 & 2.00	.50-3.00	29.40	7.17-67.61	28.30	49.05%	1.88%
6. Securities Drafts	2.00	.03-10.00 (Alternative Methods)	49.63	.44-188.29	41.05	42.45% 4.71%	{ 3.77% }
7. Payable Through Drafts	{ .03, .04, .07 & .08 }	.015-3.00 (Alternative Methods)	3.98	.25-81.80	1.01	71.69% 6.60%	{ 0.94% }
8. Currency Furnished							
Per \$1,000	.20 & .30	.043-1.50	5.68	.33-21.80	4.02	33.96%	{ 0.94% }
Per Hour	5.00	3.70-15.00	168.76	53.16-597.56	121.70	9.43%	
Per Order	—	1.00-6.10	46.94	14.19-86.67	43.46	3.77%	
Per Package	—	.02-1.00	3.05	.23-15.33	1.61	11.32%	
Per 1,000 Notes	—	.076-2.00 (Alternative Methods)	17.49	1.37-29.20	16.80	4.71% 2.83%	
9. Currency Deposited							
Per \$1,000	.30	.02-1.80	8.66	.33-27.05	5.11	24.52%	{ — }
Per Hour	5.00	3.70-16.10	138.48	53.16-426.84	106.63	16.98%	
Per Package	—	.03-.40 (Alternative Methods)	2.70	1.14-5.81	1.15	2.83% 2.83%	
10. Coin Furnished							
Per Roll	.02	.01-181	.55	.13-3.27	.33	67.92%	{ 0.94% }
Per Hour	5.00	3.70-15.00	107.68	53.16-236.64	70.46	3.77%	
Per Bag	.50	.25-1.00 (Alternative Methods)	9.53	2.94-14.23	10.47	3.77% 8.49%	
11. Coin Deposited							
Per \$1,000	{ .20, .40, & 1.50 }	.10-1.80	10.93	.77-27.05	9.12	15.09%	{ — }
Per Hour	{ 5.00, & 10.00 }	3.70-16.10	133.94	53.16-251.30	124.93	15.09%	
Per Roll	.02	.01-.05	.32	.16-.59	.27	7.54%	
Per Bag	—	.11-1.35 (Alternative Methods)	11.63	1.58-23.31	11.38	6.60% 2.83%	
12. Domestic Collection Items							
Per Item	1.50	.08-7.65	31.90	1.26-180.09	23.88	62.26%	{ 1.88% }
By Dollar Amount	0.1%	0.05%-1.0% (Alternative Methods)	—	—	—	8.49% 9.43%	
13. Food Coupons							
Per Item	.01	.001-.50 (Alternative Methods)	1.07	.01-13.06	.21	23.58% 8.49%	{ 2.83% }
14. Bond Coupons							
Per Envelope	1.00	.0175-2.50	14.40	.21-41.05	12.20	41.50%	{ 4.71% }
Per \$1,000	1.00	.20-1.00	10.17	2.57-18.18	11.64	5.66%	
15. Stop Payments	3.00	.50-5.00 (Alternative Methods)	41.09	7.20-81.30	41.94	24.53% 2.83%	{ — }

tions, and cash management services, but the prices imposed are often negotiated and vary with volume and the precise services performed. As a result, simple tabulations of these prices are not possible. Their omission should not be interpreted as suggesting that these fees are unimportant; for some customers they could represent the major expense in the account analysis.

The charges for nonactivity services demonstrate similar diversity. Among the survey banks with a customer profitability analysis, 45.6 per cent include a charge for loan handling costs. This entry is usually intended to cover the operation and maintenance of the loan department, salaries of loan officers, and any nonbillable expenses the bank incurs in making loans, such as legal fees. Unfortunately, relatively few banks provided detailed information on the precise magnitude of the charges levied. Among those that did, slightly over half indicated that the charge was directly proportional to the dollar amount borrowed, with the fee ranging from .35 per cent to .6 per cent of the loan at different banks. About a fourth of the banks use a flat charge per loan, occasionally varying with the type of loan. Remaining banks demonstrated a variety of possibilities including charges for the number of hours of loan officer time, standard costs per payment or transaction, and a handling charge based on loan risk. By comparison, several banks not making charges for loan handling expenses commented that these expenses were treated as fixed costs since the bank was required to maintain staff and overhead regardless of whether a particular loan was made.

One-third of the survey banks also included an expense entry for loan risk. The function of this entry is to prevent loans with the highest yield and risk from automatically appearing to be the most profitable. Most banks base the charge on their historical loan loss experience. While several attempt to classify loans by risk categories and charge accordingly, others simply use the same figure for all loans. Among

a limited sample of banks which provided complete information, the charge for risk ranged from .06 per cent to 2.4 per cent of the loan amount, with the average charge being about .25 per cent. This figure is generally comparable to the loan loss experience of Federal Reserve member banks which averaged .24 per cent in 1972, .26 per cent in 1973, and .39 per cent in 1974. Although an expense entry is one method of accounting for risk, most banks prefer other options. These include such possibilities as assigning more capital to riskier loans or increasing the desired net return (or profit rate) on riskier loans.

A charge for the cost of money loaned is included in the profitability analysis by 70.2 per cent of the survey banks. In general, banks listing such charges tend to emphasize net profit or allocated capital ratios while other banks usually calculate gross profit ratios. Examples of each are shown in Table 1. At the time of the survey, the interest rates used for the cost of funds ranged among banks from 7.2 per cent to 12.09 per cent, with the average and median figures being 9.79 per cent and 10.0 per cent, respectively. These comparatively high rates reflect the timing of the survey, which occurred shortly after interest rates began declining from historic peaks. The marginal cost of funds at this time was well above the average for most banks. About three-fourths of the banks, as a result, based the cost of funds charge on various short-term money market interest rates representing the cost of purchased funds. The most common rates selected were those on Federal funds and 3-month CD's, but a noteworthy group of banks also used the rates on commercial paper, Treasury bills, and borrowings at the discount window. Often an average of several of these rates was taken. The remaining one-fourth of the banks generally employed their average cost of funds. Among all banks including a charge for the cost of money, approximately five-sixths had exactly the same rate for the cost of funds as was used to impute interest on the deposit

Customer Profitability Analysis

funds supplied by the customer. No consistent relationship, however, was evident among the small group using different interest rates for the two variables. These banks were equally divided between those which had higher and lower charges for the cost of funds.

Slightly over one-third of the banks included a charge to cover the desired return on capital allocated to the customer relationship. On average, these banks sought a pretax return on capital of about 25 per cent, but the figure at individual banks varied from 10 to 50 per cent. The most common amount, however, was 20 per cent, which was applied by nearly half the banks. The methods of allocating capital among customer relationships will be discussed subsequently, but for the time being it should be noted that banks wishing to build in a desired return on capital have at least three options. First, the bank's capital can be allocated among customers, the desired return specified, and an explicit entry made under expenses for the desired return on capital. This approach is demonstrated in Table 1. For this method to be consistent with actual profits earned by the bank, the capital allocated should be equal to the total capital of the bank and the charge for noncapital loanable funds should be based on the actual cost of those funds.

The second option would be for a bank to set a desired return on capital and to include capital in the bank's general pool of loanable funds. Banks using this approach would tend to find that the average cost of pool funds was greater than in the previous instance because the desired pretax return on capital is usually substantially higher than the bank's cost of other loanable funds. A third possibility is for a bank to assume again that all loanable funds are derived from a general pool, of which capital represents one component. Rather than including a target return on capital in the cost of funds, however, the bank could temporarily consider capital to be costless. The desired return on capital could be attained by specifying

the minimum levels of the various profitability ratios necessary to realize that return. Variants of this approach are frequently used by banks not allocating capital to customer relationships or not including any allowance for the desired return on capital under the expense category of the analysis.

Despite these considerations, alternative methods of handling the desired return on capital had little effect on the average cost of funds. With only two exceptions, each of the 20 banks that included an expense entry for the desired return on capital based the cost of funds on money market rates rather than the bank's average cost of funds. In fact, the average cost of funds rate of 9.94 per cent for banks expressly including a charge for capital was less than the average rate of 10.06 per cent for banks not building in such a charge. On balance, these considerations suggest that most banks use the profitability analysis to show the effect on profits if the customer relationship were to be lost, but do not attempt to make the sum of the profits estimated by the analysis equivalent to actual bank profits.

The remaining entries shown under expenses in Table 3 are largely self-explanatory. Banks including interest bearing time and savings deposits in the analysis of funds supplied by the customer must make a deduction under expenses for the interest accrued on those deposits. To the extent that the interest actually paid differs from the interest imputed on those funds, the profitability of the customer relationship would be raised or lowered. Likewise, banks which include the income from various fee services like data processing or money market transactions in the income portion of the statement are required to make a deduction under expenses for the costs of these services. Finally, a small group of banks listed several miscellaneous charges that were likely to be included with expenses. Among these items were demand deposit administration and overhead charges, the expense of granting lines of credit, loan entry and maintenance

costs, an allowance for the cost of servicing Treasury tax and loan accounts, and the costs associated with leasing operations, security safekeeping, credit card plans, and cash management services.¹⁰

THE PROFITABILITY RATIOS

After the total income and expenses associated with the customer relationship have been estimated, the next step is to determine the difference between the two. At banks which do not build in an allowance for the cost of funds under expenses, this difference would measure the estimated "gross profit" on the relationship. However, if the cost of funds has previously been included, it would show "net profit." Although a profit figure contains valuable information, most banks place primary emphasis on a variety of profitability ratios designed to adjust the profit figure for differences in the size of customer relationships. Numerous profitability ratios could be computed, but at most banks profitability is judged on the basis of a handful of standard indicators. These include the ratios of gross profits to net funds used, net profits to net funds used, net profits to gross amount borrowed, and net profits to allocated capital."

For individual banks, the particular ratio or ratios selected largely appear to have been a management decision. Factors such as the size of a bank, its location, or the sophistication of its analysis procedures do not explain the differences. In part, the variance may arise from the fact that no single profitability measure is necessarily superior. Regardless, one point must be emphasized. While only one of the

commonly used indexes makes any explicit reference to bank capital, many banks using other profitability measures have established target returns on capital. In general, these alternative ratios can be related in a fairly direct way to the earnings on capital and the desired return on capital can set minimum acceptable values for the noncapital ratios.

Twelve of the survey banks compute the ratio of gross profits to net funds used. If a customer is a net borrower, the value of this index can be compared directly to the bank's cost of funds or to money market rates. As long as the ratio exceeds the bank's cost of funds, the relationship would be profitable. To ensure that a target return on capital is realized, however, the index must exceed the bank's cost of funds by a sufficient margin. The survey did not explore the issue fully, but several banks commented that an interest differential of 2 to 3 per cent was generally adequate to meet profit objectives.

Despite the relative ease in computing gross profits, most banks prefer to base an analysis of customer profitability on net profits. Net profits are gross profits minus an allowance for the cost of funds. Among the survey banks, 12 compute the ratio of net profits to net funds loaned. This profitability ratio differs from the gross profits/net funds used measure only in that the cost of funds (expressed as a percentage) is subtracted from the gross profit yield. If the gross profit index, for example, were 10 per cent and the cost of funds were 6 per cent, net profits/net funds used would be 4 per cent. Obviously, a positive ratio for net borrowers implies the relationship is profitable. Another customer profitability measure used by 13 of the banks was the ratio of net profits to gross amount borrowed. A zero value for this ratio would imply a break-even situation. Banks utilizing this formula, though, generally seek a minimum return on gross loans of 1.5 to 2.5 per cent to realize a desired return on capital.

The fourth profitability measure, the ratio

¹⁰Only eight banks indicated that they charged for setting up lines of credit. Where figures were provided, this expense entry was generally the same as the amount listed under income for lines of credit. It is not clear if banks using this approach estimated that the cost was actually equal to the fee charged customers or if they were just removing any profit associated with this item.

¹¹A detailed analysis of the applicability and behavior of these profitability indicators under varying situations was presented in the preceding article in this series. As a result, the discussion in this article is largely limited to the direct results of the survey. Also, since many banks compute more than one profitability ratio, the tabulations include some banks more than once.

of net profits to allocated capital, was reported by 12 banks. If capital is allocated to both earning assets and deposits, this index is perhaps the most versatile of those widely used. The profitability of all customers, both borrowers and nonborrowers, can be analyzed. Of the 20 banks in the survey explicitly allocating capital to customer relationships, 19 provided information on the general methods of allocating capital. Nine of the banks assign capital as a flat percentage of loans, with the same fraction being used for all customers. Among these banks, the percentages ranged from 5 to 10 per cent, with nearly half using 8 per cent. Four banks assign capital to both deposits and loans, with two of these using unvarying percentages. Only two banks volunteered that capital was assigned in relation to risk ratings on loans. The remaining four banks all allocate capital to loans only but did not specify the allocation methods.

Four-fifths of the banks responding to the survey utilize one or more of the four basic ratios just discussed in analyzing customer profitability. The remaining banks have all developed alternative measures. These include such ratios as gross profits/total loans, net profits/total revenue, total income/net funds borrowed, actual income/target income, and total revenue/total expenses. Three banks compute net or gross profits, but do not relate the figure to any specific indicator of the size of a customer relationship. Several banks also calculate separate ratios for the profitability of activity services. Unfortunately, space considerations do not permit a detailed examination of these alternative approaches.

Regardless of the ratios computed, great care must be exercised in their interpretation since several biases could influence the results. The profitability figures on fixed rate loans, for example, may be severely depressed if money market rates rise sharply or if compensating balances are temporarily reduced. Similarly,

when interest rates are rising, banks basing a profitability analysis on the average cost of funds could understate the value of compensating balances and the cost of acquiring additional loanable funds. For these reasons most banks do not place great emphasis on short-run changes in profitability, preferring instead to examine profitability over a period of 1 to 3 years. To minimize distortions some banks also calculate ratios using both the average and marginal costs of funds.

CONCLUDING OBSERVATIONS

In the future, bank profitability is likely to depend increasingly on the differential between loan rates and the cost of funds. Since customer profitability analysis tends to focus on this spread, it represents an innovative management tool for commercial banks. By combining numerous aspects of a customer relationship into a single analysis, it affords a more accurate picture of customer profitability and overcomes some of the limitations of account analysis. Moreover, it can also be a valuable guide in the pricing of services and loans to a customer or for measuring the trade-off between fees and balances. For the present, effective use of customer profitability analysis is probably limited to fewer than 75 banks, but an expansion could come quickly.

While the profitability analysis provides banks with a structural framework for analyzing a total relationship, the analysis is always a direct reflection of the goals and priorities of management. As the survey has indicated, no single method of valuing services and fund flows is necessarily correct. Each stage of the analysis involves a number of difficult choices, and the specific options selected will often have a significant influence on estimated customer profitability. Customer profitability analysis, therefore, can be a valuable tool, but it can never be a substitute for sound management judgement.