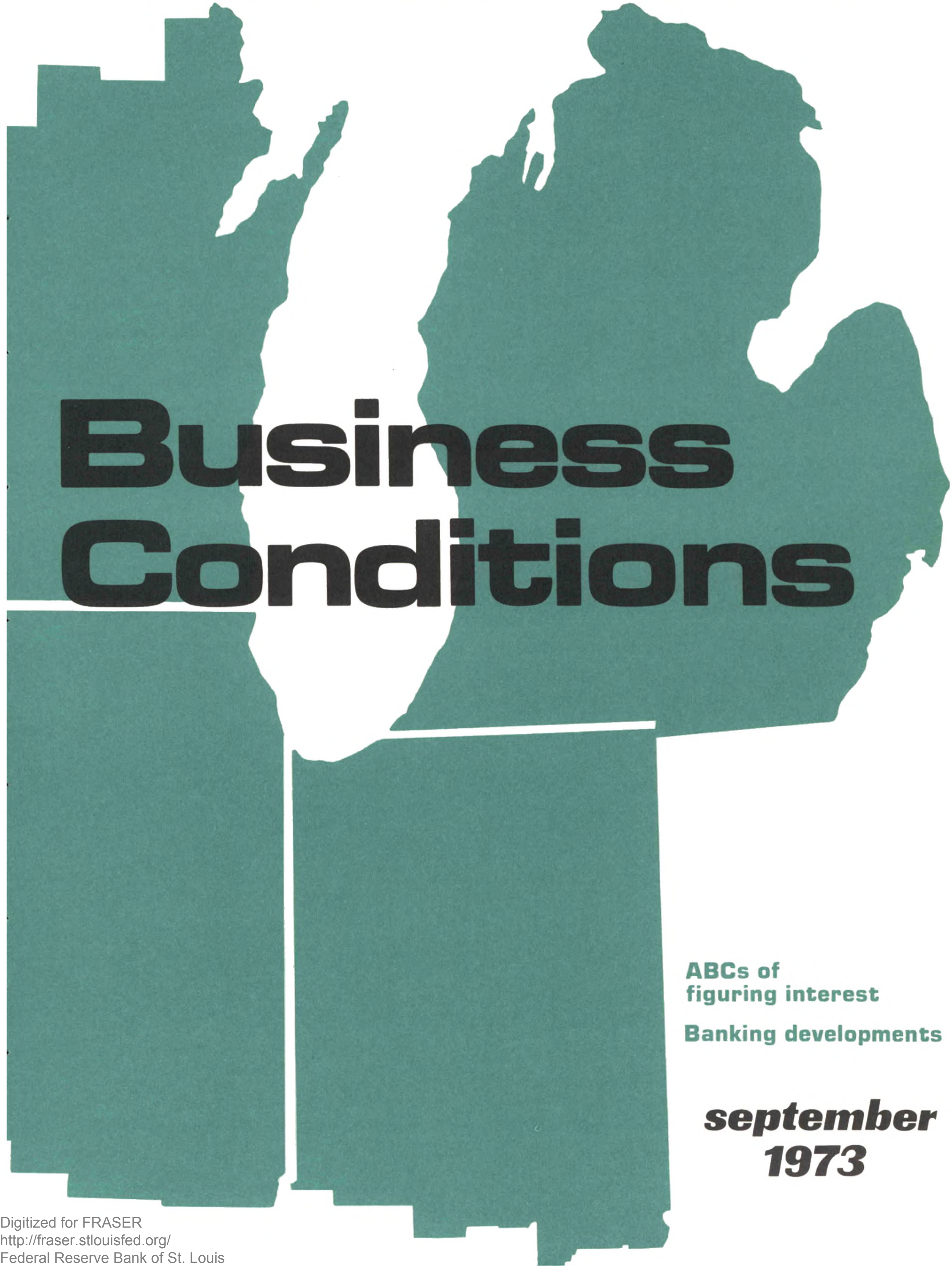
an economic review by the Federal Reserve Bank of Chicago



# Business Conditions

ABCs of figuring interest

Banking developments

**september 1973**

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# ABCs of figuring interest

During periods when market interest rates are rising, commercial banks, savings and loan associations, and other financial institutions find themselves competing for funds with direct market investments such as Treasury bills and corporate bonds. Because yields on market investments are determined by the interplay of supply and demand, they are free to go above the ceiling rates established by regulatory bodies on certain classes of consumer-type savings deposits. When market rates move above deposit ceiling rates, funds have a tendency to move out of deposits and into direct market instruments to obtain the higher yields.

During most of 1973, market rates have been above the permissible ceiling rates for regulated consumer-type savings deposits. To make such deposits as attractive as possible, banks and savings and loan associations (S&Ls) have been anxious to offer and advertise the greatest dollar amount of interest legally possible on all classes of regulated deposits. "Continuous compounding" and figuring annual interest on a "360-day year"—both permissible under the law—are techniques used to increase the dollar amount of interest paid per given amount of deposit.

In July 1973, regulatory authorities raised the maximum interest rates that financial institutions could pay on various categories of savings deposits by ¼ to ½ percentage points, and ceilings were removed entirely on deposits of $1,000 or more maturing in not less than four years. (Later, ceiling-free deposits for any one bank were limited to 5 percent of its total time and savings deposits.) But increases in rates not withstanding, the exact amount of interest income earned by depositors continues to depend on the rate of interest selected by their depository institution and on the method that institution uses to calculate interest. On the other side of the coin, the dollar amount of interest borrowers pay on loans granted by financial institutions also depends on the interest rate charged by the lender and on the method the lender uses to compute interest.

While various interest calculation methods continue to be used, Truth-in-Lending legislation, to a certain degree, has eliminated some of the confusion concerning costs of consumer credit. This legislation requires that the "annual percentage rate" be disclosed to the consumer. Congressional hearings are now in progress on analogous Truth-in-Savings legislation. The confusion resulting from different interest calculation methods can be lessened, however, once the relationships among the different methods are understood.

## Interest calculations

Interest represents the price borrowers pay to lenders for credit over specified periods of time. The amount of interest paid depends on a number of factors: the dollar amount lent or borrowed, the length of time involved in the transaction, the stated (or nominal) annual rate of interest, the repayment schedule, and the method used to calculate interest.

If, for example, an individual deposits $1,000 for one year in a bank paying 5 percent interest on savings, then at the end of the year the depositor may receive interest of $50, or he may receive some other amount, depending on the way interest is calculated. Alternatively, an individual who borrows $1,000 for one year at 5 percent and repays the loan in one payment at the end of a year, may pay $50 in interest, or he may pay some other amount, again depending on the calculation method used.

## Simple interest

The various methods used to calculate interest are basically variations of the simple interest calculation method.

The basic concept underlying simple interest is that interest is paid only on the original amount borrowed for the length of time the borrower has use of the credit. The amount borrowed is referred to as the principal. In the simple interest calculation, interest is computed only on that portion of the original principal still owed.

*Example 1:* Suppose $1,000 is borrowed at 5 percent and repaid in one payment at the end of one year. Using the simple interest calculation, the interest amount would be 5 percent of $1,000 for one year or $50 since the borrower had use of $1,000 for the entire year.

When more than one payment is made on a simple interest loan, the method of computing interest is referred to as "interest on the declining balance." Since the borrower only pays interest on that amount of original principal which has not yet been repaid, interest paid will be smaller the more frequent the payments. At the same time, of course, the amount of credit the borrower has at his disposal is also smaller.

*Example 2:* Using simple interest on the declining balance to compute interest charges, a loan repaid in two payments—one at the end of the first half-year and another at the end of the second half-year—would accumulate total interest charges of $37.50. The first payment would be $500 plus $25 (5 percent of $1,000 for one-half year), or $525; the second payment would be $500 plus $12.50 (5 percent of $500 for one-half year), or $512.50. The total amount paid would be $525 plus $512.50, or $1,037.50. Interest equals the difference between the amount repaid and the amount borrowed, or $37.50. If four quarterly payments of $250 plus interest were made, the interest amount would be $31.25; if 12 monthly payments of $83.33 plus interest were made, the interest amount would be $27.08.

*Example 3:* When interest on the declining balance method is applied to a loan that is to be repaid in two equal payments, payments of $518.83 would be made at the end of the first half-year and at the end of the second half-year. Interest due at the end of the first half-year remains $25; therefore, with the first payment the balance is reduced by $493.83 ($518.83 less $25), leaving the borrower $506.17 to use during the second half-year. The interest for the second half-year is 5 percent of $506.17 for one-half year, or $12.66. The final $518.83 payment, then, covers interest of $12.66 plus the outstanding balance of $506.17. Total interest paid is $25 plus $12.66, or $37.66, slightly more than in Example 2.

This equal payment variation is commonly used with mortgage payment schedules. Each payment over the duration of the loan is split into two parts. Part one is the interest due at the time the payment is made, and part two—the remainder—is applied to the balance or amount still owed. In addition to mortgage lenders, credit unions typically use the simple interest/declining balance calculation method for computing interest on loans. Consumer instalment loans are normally set up on this method and in recent months a number of banks have also begun offering personal loans using this method.

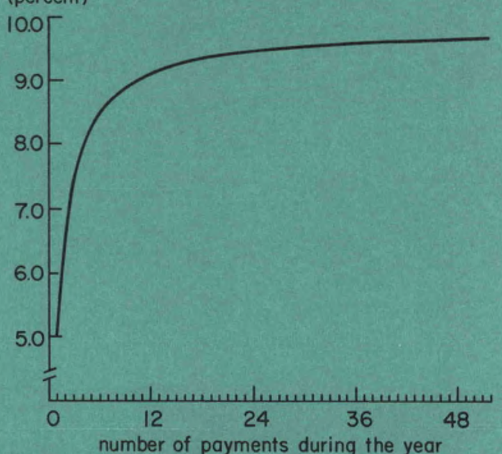
## Other calculation methods

Add-on interest, bank discount, and

compound interest calculation methods differ from the simple interest method as to when, how, and on what balance interest is paid. The "effective annual rate," or the annual percentage rate, for these methods is that annual rate of interest which when used in the simple interest rate formula equals the amount of interest payable in these other calculation methods. For the declining balance method, the effective annual rate of interest is the stated or nominal annual rate of interest. For the methods to be described below, the effective annual rate of interest differs from the nominal rate.

**Add-on interest.** When the add-on interest method is used, interest is calculated on the full amount of the original principal. The interest amount is immediately added to the original principal and payments are determined by dividing principal plus interest by the number of payments to be made. When only one payment is involved, this method produces the same effective interest rate as the simple interest method. When two or more payments are to be made, however, use of the add-on interest method results in an effective rate of interest that is greater than the nominal rate. True, the interest amount is calculated by applying the nominal rate to the total amount borrowed, but the borrower does not have use of the total amount for the entire time period if two or more payments are made.

**Add-on interest: the more frequent the payments, the higher the effective rate**




*Based on 5 percent add-on, one-year loan.

*Example 4:* Consider, again, the two-payment loan in Example 3. Using the add-on interest method, interest of $50 (5 percent of $1,000 for one year) is added to the $1,000 borrowed, giving $1,050 to be repaid; half (or $525) at the end of the first half-year and the other half at the end of the second half-year.

Recall that in Example 3, where the declining balance method was used, an effective rate of 5 percent meant two equal payments of $518.83 were to be made. Now with the add-on interest method each payment is $525. The effective rate of this 5 percent add-on rate loan, then, is greater than 5 percent. In fact, the corresponding effective rate is 6.631 percent. This rate takes into account the fact that the borrower does not have use of $1,000 for the entire year, but rather use of $1,000 for the first half-year, and, excluding the interest payment, use of $508.15 for the second half-year.

To see that a one-year, two equal payment, 5 percent add-on rate loan is equivalent to a one-year, two equal payment, 6.631 percent declining balance loan, consider the following. When the first $525 payment is made, $33.15 in interest is due (6.631 percent of $1,000 for one-half year). Deducting the $33.15 from $525 leaves $491.85 to be applied to the outstanding balance of $1,000. The second $525 payment covers $16.85 in interest

(6.631 percent of $508.15 for one-half year) and the $508.15 balance due.

In this particular example, using the add-on interest method means that no matter how many payments are to be made, the interest will always be $50. As the number of payments increases, the borrower has use of less and less credit over the year. For example, if four quarterly payments of $262.50 are made, the borrower has the use of $1,000 during the first quarter, around $750 during the second quarter, around $500 during the third quarter, and around $250 during the fourth and final quarter. Therefore, as the number of payments increases, the effective rate of interest also increases. For instance, in the current example, if four quarterly payments are made, the effective rate of interest would be 7.922 percent; if 12 monthly payments are made, the effective interest rate would be 9.105 percent. The add-on interest method is commonly used by finance companies and some banks in determining interest on consumer loans.

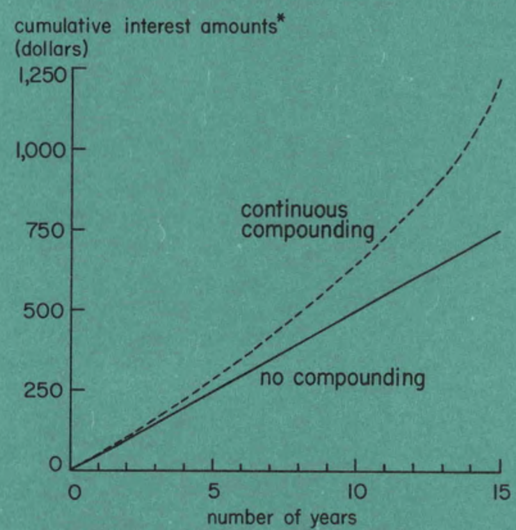
**Bank discount.** When the bank discount rate calculation method is used, interest is calculated on the amount to be paid back and the borrower receives the difference between the amount to be paid back and the interest amount. In Example 1, a 5 percent $1,000 loan is to be paid back at the end of one year. Using the bank discount rate method two approaches are possible.

*Example 5:* The first approach would be to deduct the interest amount of $50 from the $1,000, leaving the borrower with $950 to use over the year. At the end of the year he pays $1,000. The interest amount of $50 is the same as in Example 1. The borrower in Example 1, however, had the use of $1,000 over the year. Thus, the effective rate of interest using the bank discount rate method is greater than that for the simple interest rate calculation. The effective rate of interest here would be 5.263 percent—i.e., $50 ÷ $950—compared to 5 percent in Example 1.

*Example 6:* The second approach would be to determine the amount that would have to be paid back so that once the interest amount was deducted, the borrower would have the use of $1,000 over the year. This amount is $1,052.63, and this becomes the face value of the note on which interest is calculated. The interest amount (5 percent of $1,052.63 for one year) is $52.63, and this is deducted leaving the borrower with $1,000 to use over the year. The effective rate of interest, again, is 5.263 percent. The bank discount method is commonly used with short-term business loans. Generally there are no intermediate payments and the duration of the loan is one year or less.

**Compound interest.** When the com-

**Compound interest: over time, compounding increases the amount of interest paid**




*Amount paid on $1,000 at 5 percent annual interest rate.

pound interest calculation is used, interest is calculated on the original principal plus all interest accrued to that point in time. Since interest is paid on interest as well as on the amount borrowed, the effective interest rate is greater than the nominal interest rate. The compound interest rate method is often used by banks and savings institutions in determining interest they pay on savings deposits "loaned" to the institutions by the depositors.

*Example 7:* Suppose $1,000 is deposited in a bank that pays a 5 percent nominal annual rate of interest, compounded semi-annually (i.e., twice a year). At the end of the first half-year, $25 in interest (5 percent of $1,000 for one-half year) is payable. At the end of the year, the interest amount is calculated on the $1,000 plus the $25 in interest already paid, so that the second interest payment is $25.63 (5 percent of $1,025 for one-half year). The interest amount payable for the year, then, is $25 plus $25.63, or $50.63. The effective rate of interest is 5.063 percent which is greater than the nominal 5 percent rate.

The more often interest is compounded within a particular time period, the greater will be the effective rate of interest. In a year, a 5 percent nominal annual rate of interest compounded four times (quarterly) results in an effective annual rate of 5.0945 percent; compounded 12 times (monthly), 5.1162 percent; and compounded 365 times (daily), 5.1267 percent. When the interval of time between compoundings approaches zero (even shorter than a second), then the method is known as continuous compounding. Five percent continuously compounded for one year will result in an effective annual rate of 5.1271.

## How long is a year?

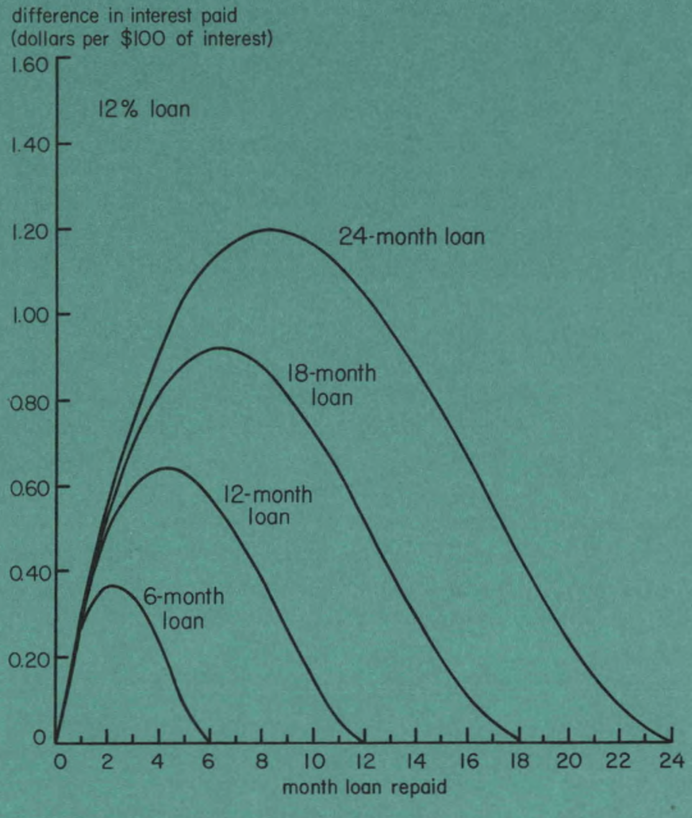
In the above examples, a year is assumed to be 365 days long. Historically, in order to simplify interest calculations, financial institutions have often used 12 30-day months, yielding a 360-day year. If a 360-day year is assumed in the calculation and the amount borrowed is actually used by the borrower for one full year (365 or 366 days), then interest is paid for an additional 5/360 or 6/360 of a "year." For any given nominal rate of interest, the effective rate of interest will be greater when a 360-day year is used in the interest rate calculation than when a 365-day year is used. This has come to be known as the 365-360 method.

*Example 8:* Suppose $1,000 is deposited in a bank paying a 5 percent nominal annual rate of interest, compounded daily. As pointed out earlier, the effective annual rate of interest for one year, based on a 365-day year, is 5.1267 percent. The interest payable on the 365th day would be $51.27. Daily compounding means that each day the daily rate of 0.0137 percent (5 percent divided by 365 days) was paid on the $1,000 deposit plus all interest payable up to that day. Now suppose a 360-day year is used in the calculation. The daily rate paid becomes 0.0139 percent (5 percent divided by 360 days) so that on the 365th day the interest amount payable would be $52. The effective annual rate of interest, based on a 360-day year, would be 5.1997 percent.

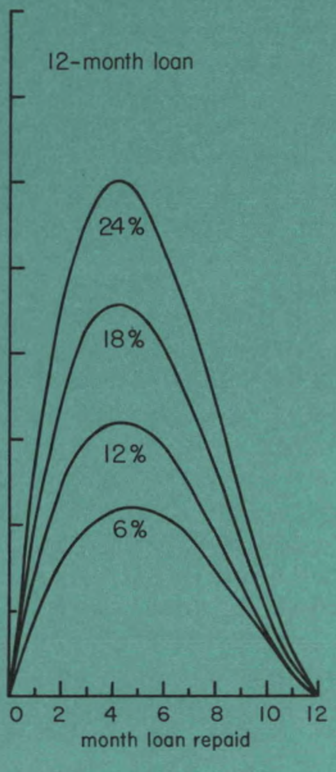
*Example 9:* Suppose that a $1,000 note is discounted at 5 percent and payable in 365 days. This is the situation discussed in Example 5 where, based on a 365-day year, the effective rate of interest was seen to be 5.263 percent. If the bank discount rate calculation assumes a 360-day year, then the length of time is computed to be 365/360 or 1 1/72 years instead of one year, the interest deducted (the discount) equals $50.69 instead of $50, and the effective annual rate of interest is 5.267 percent.

## Interest paid under the Rule of 78 is always more than under the declining balance— but how much more depends on:

### The term of the original loan contract




### The effective annual rate of interest



## When repayment is early

In the above examples, it was assumed that periodic loan payments were always made exactly when due. Often, however, a loan may be completely repaid before it is due. When the declining balance method for calculating interest is used, the borrower is not penalized for prepayment since interest is paid only on the balance outstanding for the length of time that amount is owed. When the add-on interest calculation is used, however, prepayment implies that the lender obtains some interest which is unearned. The borrower then is actually paying an even higher effective rate since he does not use the funds for the length of time of the original loan contract.

Some loan contracts make provisions for an interest rebate if the loan is prepaid. One of the common methods used in determining the amount of the interest rebate is referred to as the "Rule of 78." Application of the Rule of 78 yields the percentage of the total interest amount that is to be returned to the borrower in the event of prepayment. The percentage figure is arrived at by dividing the sum of the integer numbers (digits) from one to the number of payments remaining by the sum of the digits from one to the total number of payments specified in the original loan contract. For example, if a five-month loan is paid off by the end of the second month (i.e., there are three payments remaining), the percentage of the interest that the lender would rebate is 1+2+3=6÷1+2+3+4+5=15, or 40 percent. The name derives from the fact that 78 is the sum of the digits from one to 12 and, therefore, is the denominator in calculating interest rebate percentages for all 12-period loans.

Application of the Rule of 78 results in the borrower paying somewhat more interest than he would have paid with a comparable declining balance loan. How much more depends on the effective rate of interest charged and the total number of payments specified in the original loan contract. The higher the effective rate of interest charged and the greater the specified total number of payments, the greater the amount of interest figured under the Rule of 78 exceeds that under the declining balance method. (See chart.)

The difference between the Rule of 78 interest and the declining balance interest also varies depending upon when the prepayment occurs. This difference over the term of the loan tends to increase up to about the one-third point of the term and then decrease after this point. For example, with a 12-month term, the difference with prepayment occurring in the second month would be greater than the difference that would occur with prepayment in the first month; the third-month difference would be greater than the second-month difference; the fourth month (being the one-third point) would be greater than both the third-month difference and the fifth-month difference. After the fifth month, each succeeding month's difference would be less than the previous month's difference.

*Example 10:* Suppose that there are two $1,000 loans that are to be repaid over 12 months. Interest on the first loan is calculated using a 5 percent add-on method which results in equal payments of $87.50 due at the end of each month ($1,000 plus $50 interest divided by 12 months). The effective annual rate of interest for this loan is 9.105 percent. Any interest rebate due because of prepayment is to be determined by the Rule of 78.

Interest on the second loan is calculated using a declining balance method where the annual rate of interest is the effective annual rate of interest from the first loan, or 9.105 percent. Equal payments of $87.50 are also due at the end of each month for the second loan.

Suppose that repayment on both loans occurs after one-sixth of the term of the loan has passed, i.e., at the end of the second month, with the regular first month's payment being made for both loans. The interest paid on the first loan will be $14.74, while the interest paid on the second loan will be $14.57, a difference of 17 cents. If the prepayment occurs at the one-third point, i.e., at the end of the fourth month (regular payments having been made at the end of the first, second, and third months), interest of $26.92 is paid on the first loan and interest of $26.69 on the second loan, a difference of 23 cents. If the prepayment occurs later, say at the three-fourths point, i.e., at the end of the ninth month (regular payments having been made at the end of the first through eighth months), $46.16 in interest is paid on the first loan and $46.07 in interest paid on the second loan, a difference of but 9 cents.

## Bonus interest

Savings institutions are permitted to pay interest from the first calendar day of the month on deposits received by the tenth calendar day of the month, and also on deposits withdrawn during the last three business days of a month ending a regular quarterly or semi-annual interest period. If a savings institution chooses to do this, then it is paying for the use of the depositor's money for some period of time during which the savings institution does not have the use of the money. The effective rate of interest is, therefore, greater than it would be otherwise.

*Example 11:* Suppose that on January 10, $1,000 is deposited in a bank paying 5 percent interest compounded daily based on a 365-day year and that funds deposited by the 10th of any month earn interest from the 1st of that month. On the following December 31, 355 days after the deposit is made, interest for 365 days is payable on the deposit, or $51.27. The bank, however, had the use of the funds for only 355 days. The effective rate of interest, or that rate which when compounded daily for 355 days would yield the interest amount $51.27, is 5.1408 percent.

Although savings institutions choosing to pay interest for these grace periods are prohibited from advertising an effective yield which takes this into account, depositors should be aware of the effect such practice has on the price paid for the use of their money.

## Charges other than interest

In addition to the interest which must be paid, loan agreements often will include other provisions which must be satisfied. Two of these provisions are mortgage points and required (compensating) deposit balances.

**Mortgage points.** Mortgage lenders will sometimes require the borrower to pay a charge in addition to the interest. This extra charge is calculated as a certain percentage of the mortgage amount and is referred to as mortgage points. For example, if 2 points are charged on a $10,000 mortgage, then 2 percent of $10,000, or $200, must be paid in addition to the stated interest. The borrower, therefore, is paying a higher price than if points were not charged—i.e., the effective rate of interest is increased. In order to determine what the effective rate of interest is when points are charged, it is necessary to deduct the dollar amount resulting from the point calculation from the mortgage amount and add it to the interest amount to be paid. The borrower is viewed as having the mortgage amount less the point charge amount rather than the entire mortgage amount.

*Example 12:* Suppose that 2 points are charged on a 20-year, $10,000 mortgage where the rate of interest (declining balance calculation) is 7 percent. The payments are to be $77.53 per month. Once the borrower pays the $200 point charge, he starts out with $9,800 to use. With payments of $77.53 a month over 20 years, the result of the 2 point charge is an effective rate of 7.262 percent.

The longer the time period of the mortgage, the lower will be the effective rate of interest when points are charged because the point charge is spread out over more payments. In the above example, if the mortgage had been for 30 years instead of 20 years, the effective rate of interest would have been 7.201 percent.

**Required (compensating) deposit balances.** A bank may require that a borrower maintain a certain percentage of the loan amount on deposit as a condition for obtaining the loan. The borrower, then, does not have the use of the entire loan amount but rather the use of the loan amount less the amount that must be kept on deposit. The effective rate of interest is greater than it would be if no compensating deposit balance were required.

*Example 13:* Suppose that $1,000 is borrowed at 5 percent from a bank to be paid back at the end of one year. Suppose, further, that the lending bank requires that 10 percent of the loan amount be kept on deposit. The borrower, therefore, has the use of only $900 ($1,000 less 10 percent) on which he pays an interest amount of $50 (5 percent of $1,000 for one year). The effective rate of interest is, therefore, 5.556 percent as opposed to 5 percent when no compensating balance is required.

## Summary

Although not an exhaustive list, the methods of calculating interest described here are some of the more common methods in use. They serve to indicate that the method of interest calculation can substantially affect the amount of interest paid, and that savers and borrowers should be aware not only of nominal interest rates but also of how nominal rates are used in calculating total interest charges.

*Anne Marie LaPorte*

# Banking developments

## Consumer deposit interest rates

Preliminary evidence indicates that a majority of district member banks raised the rates they pay on savings and time deposits of less than $100,000 to the new higher maximums permitted as of July 1 and are offering ceiling-exempt, four-year obligations with minimum denominations of $1,000. The July amendments to the Federal Reserve's Regulation Q permitted banks to compete more effectively for consumer savings and thus slow the shift out of deposits into other investments in response to the sharp increase in market interest rates.

In the most recent quarterly survey of time and savings deposits, almost two-thirds of the 257 respondents in the Seventh District said they were paying the new 5 percent ceiling rate on passbook savings in early August, while more than three-quarters reported they had moved to the new ceilings on the various maturity categories of time deposits. (The rate reported for each category is the most common rate paid on the largest volume of new deposits.) In total, the survey banks account for 80 percent of all member bank savings and time deposits. The reporting panel includes all district member banks with deposits of $100 million or more. Although smaller banks comprise 60 percent of this panel, these respondents include less than one-fifth of all the smaller district member banks, and the survey results, therefore, may not accurately represent the pervasiveness of the rate adjustments that have taken place at the smaller banks.

Among other things, the survey revealed that a smaller proportion of the survey banks was paying the maximum rates in early August than three months earlier especially with respect to passbook savings accounts. However, the ceilings applicable in the earlier survey had been in effect since January 1970, and many banks adjusted to those levels only after a considerable lag.

Although some banks do not offer time deposits other than passbook savings, of those that do, the vast majority tend to offer the ceiling rate on such accounts.

The proportion of responding banks that had not increased their passbook savings rate to 5 percent by early August was a relatively large 35 percent, and one-sixth of these banks were still paying 4 percent or less. Last May, only one-fourth of the survey respondents were still below the old 4½ percent ceiling.

Reluctance to raise rates on savings stems mainly from the large increases in costs entailed in the application of the higher rate to all outstanding accounts. New high-rate time accounts may draw former savings funds as well as new money, but because the higher rates apply only to new deposit contracts, the cost impact of such a shift is relatively small while the bank is assured use of the funds over a longer period.

## Interest rates paid on IPC time and savings deposits under $100,000 by 257 district member banks[1]

| | Savings | | Time (by maturity class) Under 1 year | | 1-2 yrs. | 1-2½ yrs. | 2 years and over | 2½-4 years |
|---|---|---|---|---|---|---|---|---|
| | May | Aug. | May | Aug. | May | Aug. | May | Aug. |
| Maximum rate (percent) | 4.5 | 5.0 | 5.0 | 5½ | 5½ | 6 | 5¾ | 6½ |
| Percent of banks: | | | | | | | | |
| Paying maximum rate | 77 | 65 | 95 | 79 | 90 | 81 | 93 | 77 |
| Paying less | 23 | 35 | 2 | 19 | 7 | 17 | 1 | 6 |
| Not offering | 0 | 0 | 3 | 2 | 3 | 2 | 6 | 17 |

[1]Based on quarterly surveys as of the end of April and the end of July but including changes made the first week of August.

### Four-year, $1,000 minimum

The most distinctive feature of the July amendments to Regulation Q was the removal of rate constraints from time deposits carrying maturities of four years or more in amounts of at least $1,000. This exemption was later modified to apply only up to 5 percent of a bank's total time and savings deposits. Of the survey respondents, 87 percent of the large banks (total deposits of $100 million or more) and 70 percent of the smaller banks reported offering some such instrument. Characteristics varied widely—33 different combinations of terms were reported. Rates ranged from 6.75 percent to 8.50 percent; computation was from simple interest to continuous compounding; minimum denominations varied from $1,000 to $25,000. The most common type was a $1,000 denomination at 7 percent compounded quarterly.

### Flows of funds

Despite the higher rates offered, total consumer-type time and savings deposits at the survey banks declined 0.5 percent between April 30 and July 31, 1973, in contrast to a gain of more than 2 percent in the comparable period of 1972. Passbook savings at these banks declined 0.7 percent in the three months ended July 31, 1973, compared with gain of nearly 2 percent during the comparable period a year earlier. Consumer-type time deposits declined 0.2 percent over the three months ended July 31. When the four-year obligations ($425 million issued in July) are deducted from the totals, consumer-type time deposits declined 4.4 percent.

The net decline from April through July was concentrated at the large Illinois banks. Total time and savings deposits of individuals, partnerships, and corporations (IPC) declined about 3 percent at 40 Illinois member banks with total deposits over $100 million.

Whether or not there were stirrings of a turnaround in August is questionable. Weekly data reported by 55 large district banks indicate relatively small net inflows of consumer-type funds in August. The total rose less than $40 million, or 0.2 percent, from August 1 to September 5. An inflow of $330 million into the ceiling-free deposits in the period was largely offset by declines in savings and other time deposits subject to ceiling rates.

The possibility that future gains in ceiling-free deposits either will offset declines in other consumer-type deposits or contribute to net inflows is uncertain. A Joint Resolution of the Congress directing the regulatory authorities to take action to limit the rates of interest paid on deposits of less than $100,000 at financial intermediaries has been forwarded to the President for his signature. ■

## Portfolio changes—first-half 1973

As would be expected in a period of strong loan demand and increasing monetary restraint, bank investment portfolios declined during the first half of 1973. At Seventh District member banks, all of the decline was in U. S. Government securities. Holdings of both municipals and federal agency issues rose more than in the same period a year ago. Much of the record loan expansion was financed by a large net inflow of time and savings deposits.

Total loans of district member banks, excluding sales of federal funds, rose $5.6 billion, or 12 percent, through midyear—a record volume and more than twice the rate of expansion in the comparable period of 1972. Holdings of U. S. Treasury securities declined almost 15 percent, which represented an offset of only about 22 percent of the dollar increase in loans. On June 30, 1973, loans comprised 71 percent of total earning assets of all district member banks, up from 67 percent a year earlier. Governments accounted for less than 10 percent of total portfolios, down from 12 percent a year earlier. State and municipal obligations in the portfolios of these banks rose by 3.5 percent in the first half. They comprised about 15 percent of all earning assets and more than half of investment securities held at midyear. Holdings of U. S. agency securities rose 8 percent in the first half but were still only 3.4 percent of all loans and investments.

These portfolio developments reflect a combination of normal cyclical adjustment patterns and the composition of securities supplied to the market. The trend over recent years has been for banks to keep their portfolios of U. S. securities, which yield relatively low returns, within a fairly narrow band above the minimal levels consistent with collateral needs against government (federal, state, and local) deposits. These holdings tend to increase in periods of slack loan demand and falling interest rates and to be liquidated when credit markets tighten. Fluctuations reflect, in part, changes in the trading accounts of those banks that have dealer departments, where inventory positions are affected both by the volume of new Treasury offerings and prospective changes in securities prices implied by interest rate expectations. At midyear, Government security portfolios of all district member banks were below the previous low of $7.1 billion reached in June 1970, and continued to decline in July and August.

One factor that may have contributed to the declining importance of Treasuries in banks portfolios is the changed treatment of capital gains under the Tax Reform Act of 1969. With capital gains now treated as ordinary income for tax purposes, banks have a greater incentive to reach out for higher-yielding assets than Treasuries. Moreover, the recent emphasis on liability management has reduced reliance on Government securities as a source of liquidity. This undoubtedly has been enhanced by the relaxation of ceiling rate constraints in the CD market since mid-1970.

Holdings of other securities, by contrast, have followed a fairly steady upward trend, reflecting both their higher net yields relative to Treasuries, and sharply increased supplies reaching the market. Although the spread between short-term Treasury and U. S. agency issues has been reduced markedly in recent years, yields on ten-year or longer agencies still averaged about 40 basis points above their Treasury equivalents in the first half of 1973. Perhaps even a more important factor explaining the acquisition of agencies was that net offerings of agencies in the first half of 1973 were more than three times as large as a year earlier.

Securities issued by states and muni-

## Strong loan demand is reflected in the asset portfolios of district member banks

| | Loans[2] | Securities[1] U. S. Govt. | Fed. Agency | State and local |
|---|---|---|---|---|
| | Percent change—first half of 1973 | | | |
| District | 11.9 | −14.6 | 7.7 | 3.5 |
| Illinois | 15.3 | −11.4 | 4.9 | 3.1 |
| Indiana | 10.3 | −15.2 | 8.4 | 5.5 |
| Iowa | 9.1 | −14.5 | 13.8 | 5.3 |
| Michigan | 8.0 | −18.1 | 9.9 | 3.8 |
| Wisconsin | 9.2 | −20.6 | 12.4 | .5 |
| | Percent of total loans and investments, June 30, 1973 | | | |
| District | 71.0 | 9.8 | 3.4 | 14.6 |
| Illinois | 71.5 | 9.6 | 3.5 | 14.0 |
| Indiana | 69.3 | 10.7 | 3.6 | 15.0 |
| Iowa | 64.1 | 13.5 | 6.1 | 15.8 |
| Michigan | 71.1 | 9.3 | 2.7 | 15.9 |
| Wisconsin | 74.8 | 8.7 | 3.2 | 12.5 |

[1] Excludes corporate and other securities comprising about 1 percent of total loans and investments.

[2] Excludes federal funds sold and securities purchased under resale agreements.

cipalities, generally exempt from federal taxes, have comprised a steadily rising share of bank investment portfolios. Earnings are undoubtedly a major factor in this growth. On a net after-tax basis, yields on ten- and 30-year prime municipals have averaged about 90 and 160 basis points, respectively, above comparable Treasuries through most of this year. Commercial banks are a major market for securities of local governments, and they often underwrite general obligation issues. Furthermore, the purchase of tax anticipation notes of these entities is clearly an important way that banks supply credit in response to community needs. Nearly half of all outstanding state and local government debt obligations are held by banks, and their expansion in bank portfolios is closely related to the volume of financing. The pace of the banks' acquisition of these issues is affected, of course, by their ability to attract funds in relation to customer credit demands. Deposit growth in the first half of 1973, paced by the 9 percent gain in time and savings accounts of individuals, partnerships, and businesses (IPC accounts), obviated the necessity to liquidate municipals or even to slow the rate of acquisition significantly.

How do the asset changes at member banks in the first half of 1973 compare with those of the same period of 1969, when a similar rise in short-term interest rates was taking place? Liquidation of Treasury securities was almost the same in both years. Other securities rose less in 1969, with declines in agency issues offsetting a substantial rise in municipals. Loans on the banks' balance sheets grew by only 3 percent in the first half of 1969, as the major source of loanable funds—inflows of time deposits—dried up as market yields moved above maximum legal deposit interest rates under Regulation Q. During the first half of 1973, IPC time and savings deposits for the district as a whole increased by $3.3 billion, or 9 percent, the major portion of which consisted of CDs in denominations of $100,000 or more. For the same period in 1969, IPC time and savings deposits decreased by more than $300 million. During the earlier period, however, the large banks were acquiring funds by borrowing in the Eurodollar market and by selling loans.

For the most part, asset changes in the first six months of 1973 on a state-by-state basis are similar to the district pattern. (See table.) Illinois member banks recorded the greatest increase in loans and the smallest decline in Treasury securities. Private time and savings deposits increased by 13.7 percent in Illinois. This was the largest increase for any state in the Seventh District and is mainly attributable to the issuance of large certificates of deposit by Chicago money market banks.