

TRUTH IN SAVINGS

by 4589

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INTRODUCTION

Total personal savings during 1969 for the nation as a whole amounted to \$41.7 billion. Personal savings as a percentage of disposable income was 6.5 per cent in 1968 (U.S. Department of Commerce, 1968).

Savings represent the portion of income remaining after personal taxes and consumption expenditures have been deducted from personal income for a given period. Stated another way, ". . . the act of saving is simply the nonexpenditure of income received during a given period" (Shapiro, Soloman, White, 1968).

The saver who desires monetary return from his savings makes these funds available to sources requiring capital. This may be done directly but the greatest amount of savings are placed in financial intermediaries. They, in turn, relay these funds to business and industry as well as to individuals in exchange for a promise to repay the funds at a future date. The first major financial intermediary to accept public funds was the commercial bank. Since 1900 a number of other institutions have developed that accept funds from the public. Ranked by size of total over-the-counter savings, commercial banks in 1968 had \$185.8 billion in time-savings deposits. Ranking second were savings and loan associations with \$131.6 billion. Mutual savings banks ranked third with \$64.5 billion followed by credit unions with \$12.3 billion (United States Savings and Loan League, 1969).

Among other intermediaries that accept savings funds are the

United States Government, life insurance companies, investment companies and pension funds.

Savings - Investment Decisions

The alternatives available for investment of savings are extensive. The manner in which the individual saver utilizes his savings can enhance his income, but decisions relating to placement of funds also generally involve competing choices between growth, safety, and liquidity.

Safety

With the inception of deposit insurance in 1934 for commercial banks, mutual savings banks, and savings and loan associations, incentive for the saver to place funds in these institutions was heightened. All federally chartered commercial banks are required by law to belong to the Federal Deposit Insurance Corporation. State chartered banks may voluntarily belong. Mutual savings banks may join voluntarily. Membership provides a maximum of \$20,000 insurance for each depositor's account. Savings and loan associations are similarly insured by the Federal Savings and Loan Insurance Corporation. All federally chartered associations must belong. State chartered associations may voluntarily participate.

Liquidity

The liquidity offered by these savings institutions appeals to many savers and is the basis for their selection.

The term "liquidity" in reference to savings deposits should not be construed to mean withdrawal on demand as is the case with demand

deposits, frequently referred to as checking accounts. The depositor, though not required by contract, may be required to give notice of not less than 30 days of an intended withdrawal from a savings account. This applies to all three above mentioned financial intermediaries. In actual practice, this option is seldom enforced.

Time deposits, as opposed to savings deposits, stipulate in written contract that funds may not be withdrawn before the stated maturity. Savings deposits are most often referred to as regular savings accounts or regular passbook savings accounts. Time deposits are referred to by various names depending on the savings institution. Examples include: 90 day notice accounts, savings certificates, and certificates of deposit.

Returns defined

For the purpose of this study, the following definitions shall apply in relation to the return paid to a saver by a savings institution for the use of his funds.

Interest is the amount of money paid by a financial institution such as a commercial bank to a saver for the use of the saver's funds at a stated rate of return for a stated period of time.

Dividends are the amount of money paid by a financial institution such as a mutual savings bank or savings and loan association to a saver for the use of the saver's funds at a stated rate of return for a stated period of time.

Yield is the gross income derived by the saver for the use of his funds for a stated period of time.

not necessarily! Depends on the savings of the institution

Choices Offered by Banks

Consideration of the alternatives available to savers for investment of funds and the aggregate sum of personal savings available poses a problem of choice to the individual saver. Assuming safety, liquidity, and fair return to be of prime importance, the range of possible alternatives is still wide.

In order to narrow the range still further and illustrate the complexity of choice, attention can be focused on one financial intermediary. Commercial banks, reflecting the greatest gain in deposits of household savings in recent years, provide an example of the magnitude of factors involved in intelligent decision making by savers desiring a fair return for the use of their funds.

Over 50 methods of calculating interest at the same annual percentage rate was reported by a survey of the American Bankers Association in 1928. The amount of interest paid ranges from zero to \$130.29 depending on the method of computing interest and the deposit and withdrawal activity of four hypothetical accounts used in the survey (Cox, 1966).

Even more astonishing were figures reported by Cohen and Hanson (1958). Citing an American Bankers Association report published in 1958, over 100 different methods of computing interest were in use.

A survey by the New York State Bankers Association published in 1960 reported at least 14 different basic methods in use for computing interest. This figure did not include variations which would result from inclusion of maximum and minimum balance requirements or grace day allowances (Cox, 1966).

A more recent study published in 1964 by the American Bankers Association concludes that there are at least 54 major combinations of variables within the most prevalent methods of computing interest on savings deposits.

How can the individual saver, in view of this perplexing evidence, distinguish among the various methods of interest calculation and make the rational decision required of a prudent investor of funds?

Advertisements

Examination of advertisements of financial institutions contributes little to the saver's dilemma of sorting out the facts. In many instances, the advertised information may simply increase the confusion when one attempts to compare facts.

The lack of a standardized terminology relating to savings programs is one source of confusion. A second problem in ascertaining needed information for comparison from advertisements of savings programs is the omission of pertinent facts.

The advertisements pictured in the following plates are those of commercial banks, mutual savings banks, and savings and loan associations taken from a casual survey of newspapers and magazines. They are intended to point out the problems of determining the amount of return one may expect to receive.

Amount of information offered

Plate I illustrates the contrast found in advertisements relating to the amount of information disclosed. Advertisement A and B do little

PLATE I

Watch Your Savings

**Take Off
and
GROW
with
DAILY INTEREST
at**



Union National Bank



A

**for the
HIGHEST
savings rates
allowed by law...**

FROM 4 1/2% TO 7 1/2% DEPENDING ON
SIZE OF ACCOUNT AND MATURITY DESIRED

GO TO

1st

UNION BANK
First National Bank

FIRST NATIONAL BANK OF TOPEKA

601 and 603rd AVENUE

B

Our officers are trained to be your "Money Managers". Call one of these "Money Managers" now:

400 16th Street Office (303) 266-3681 — Jack Fischer and Mrs. Sharon Rounds

1111 South Colorado Boulevard Office (303) 757-5601 — Jack Woodman

Westminster Plaza Office (303) 266-3681 — Dale Zimmerman

905 17th Street Office (303) 266-3681 — Mrs. Alene Feister

INSURED SAVINGS YOUR BEST AND SAFEST INVESTMENT

Check this list of accounts now being offered:

CHECK ONE	TYPE	ANNUAL RATE	MINIMUM AMOUNT	TERM	INTEREST PAID	COMPOUNDED	EFFECTIVE ANNUAL YIELD
	Passbook Account	5%	\$ 5.00	Unlimited	Quarterly	Daily	5.13
	Certificate Account*	5.25%	\$ 500.00	90 Days	Quarterly	Daily	5.39
	Certificate Account*	5.25%	\$ 1,000.00	180 Days	Quarterly	Daily	5.39
	Certificate Account*	5.75%	\$ 1,000.00	One Year	Quarterly	Daily	5.92
	Certificate Account*	6%	\$ 5,000.00	2-10 Years	Quarterly	Daily	6.18
	Certificate Account*	6.50%	\$100,000.00	60-89 Days	Quarterly	Daily	6.72
	Certificate Account*	6.75%	\$100,000.00	90-179 Days	Quarterly	Daily	6.98
	Certificate Account*	7%	\$100,000.00	180-364 Days	Quarterly	Daily	7.25
	Certificate Account*	7.50%	\$100,000.00	One Year	Quarterly	Daily	7.79

* Interest penalty of 90 days for early withdrawal on all certificate accounts.
* Provisions for automatic renewal on all certificates.
* There is no provision for additions on any certificate account.

C

more than announce the existence of a savings program at the respective institutions. Advertisement A states only that your savings "grow" with "daily interest." Advertisement B offers "the highest rates allowed by law" specifying only that the rate ranges from 4.5 per cent to 7.5 per cent.

Advertisement C represents one of the most informative advertisements found during this investigation. For each type of savings account six facts are given relating to the computation of interest: (1) the annual percentage rate, (2) the minimum amount of money necessary to open the account, (3) the period of time the money must remain in the account to earn interest, (4) the period of time at which earned interest is paid, (5) the frequency of compounding, and (6) the effective rate of interest. In addition, three other facts are given concerning certificate accounts: (1) interest is forfeited for 90 days of the period if money is withdrawn before maturity of the certificate, (2) certificates may be automatically renewed, and (3) no provision is available for additions on any certificate. If all advertisements were this informative the reader would have a good basis for comparison of savings programs.

Rate differences

Plate II pictures two advertisements from the same "company" found on the same day in two different newspapers; one from Wichita, Kansas, and the other from Topeka, Kansas. The advertised annual percentage rate varies by one-fourth of one per cent for each classification of savings account. These two advertisements serve to point out that

COMPARE

Investment Certificates

6

%

6 MONTHS
\$500 MINIMUM

7

%

6 MONTHS
\$15,000 MINIMUM

Automatically Renewed - \$100 Multiples

8% on Certificates of \$100,000 or more
6 Months Maturity

15

%

RECEIPT BOOK

May be opened for as little as \$1 and increased by any amount, any time.

TOPEKA

MORRIS PLAN

COMPANY

ESTABLISHED 1917

208 E. Eighth St. — Phone: 233-9688



COMPARE

Investment Certificates

5

3/4 %

6 MONTHS
\$500 MINIMUM

6

1/4 %

6 MONTHS
\$10,000 MINIMUM

6

3/4 %

6 MONTHS
\$15,000 MINIMUM

Automatically Renewed - \$100 Multiples

8% on Certificates of \$100,000 or more
6 Months Maturity

5

1/4 %

RECEIPT BOOK

May be opened for as little as \$1 and increased by any amount, any time.

THE MORRIS PLAN CO.

ESTABLISHED 1930

3167 S. SENECA PHONE: 591-2201
319 S. BROADWAY PHONE: 264-3251
OTHER BRANCH OFFICES IN MISSION, OVERLAND PARK AND PITTSBURG

although maximum rates for savings accounts are prescribed by law, one cannot assume every institution pays the maximum rate. In this case, rates vary among two offices of the same "company."

Rate omission

Plate III, advertisement A illustrates the lack of needed information and at the same time may tend to mislead the reader. The stated rate of 5.25 per cent does not refer to the regular passbook savings account described directly above the rate, but refers to a six month savings certificate found described in the small print. No annual percentage rate is given for the regular passbook savings account.

Use of premiums

The advertisement additionally represents the prolific use of gift premiums employed by savings institutions to entice savers.

While the prospect of receiving something free is intriguing, one might benefit to a greater extent by close examination of factors relating to actual dollar and cents yield one expects to derive from the savings account by comparison of comparable savings programs.

The values of premiums or give-aways used by commercial banks were not regulated until 1970. The Board of Governors of the Federal Reserve System placed a limitation on the value of gift premiums effective March 1, 1970 through a provision to Regulation Q which prescribes the regulations for payment of interest on deposits for federally chartered commercial banks (Federal Register, 1970).

The provision requires that premiums must have a wholesale value of not more than \$5 for savings deposits under \$5,000 and not more than

PLATE III

A

FREE

CANNON BLANKET PLUS DAILY COMPOUNDED INTEREST

EXCLUSIVELY AT AMERICAN SAVINGS
Get a big and beautiful 6 foot by 7 foot satin
bound Cannon blanket in your choice of
colors* when you open or add to your
account with \$500 or more. - - AND
EFFECTIVE JAN. 1st EARN DAILY
COMPOUNDED INTEREST ON ALL
REGULAR PASSBOOK SAVINGS,
COMPOUNDED OR PAYABLE 4 TIMES A
YEAR FROM DATE OF DEPOSIT TO
DATE OF WITHDRAWAL.

Remember, get

5.25
0/0

per annum COM-
POUNDED OR PAY-
ABLE QUARTERLY
on 6 month savings cer-
tificates of \$1,000 min.



Kansas' largest GUARANTEES

5.36% **5.25%**
ANNUAL YIELD ANNUAL RATE

for 1 to 5 years.
Interest Paid on Passbook Savings
from Day in to Day out.

B

HOW TO TURN

5.00%
PER YEAR
INTO
5.38%
PER YEAR

...Maximum earnings on
your savings Automatically
with Coast Federal's
Mazi-Matic Plan!

HERE'S HOW:

1. Open a Mazi-Matic passbook savings account at Coast Federal. Compounded daily, your savings earn 5.38% if held one year at current annual rate of 5%.
2. All multiples of \$1000 can be automatically transferred into a maximum-earning Bonus Account. If held for 36 months, these funds earn a .25% bonus, resulting in earnings of 5.63% per year. When you withdraw your money—in \$1000 multiples—you receive all regular interest due, while the balance of your account still qualifies for the bonus. Regular earnings on your bonus account are transferred to your passbook, and continue to earn the same effective yearly rate of 5.38%.

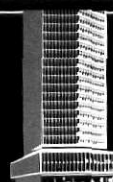
C

Nation's Largest Federal

GUARANTEES

5.39%/5.25%
ANNUAL YIELD ANNUAL RATE

Daily Compounding...For

3, 4, or 5 YEARS


New Growth Account: Deposit \$1000 or more for 3-, 4- or 5-year term and earn *unwarranted* 5.25% annual rate, compounded daily, for *guaranteed* 5.39% yield each year that savings and interest remain. In case of emergency, withdrawals can be made, with full interest paid to the end of the previous quarter.

New Income Account: Deposit \$1000 or more for 36 to 60 months and earn *guaranteed* 5.25% annual rate, compounded daily, with interest paid to you each quarter. Withdrawals can be made as in Growth Account.

New Monthly Money Plan[®]: Deposit \$10,000 to \$100,000, receive monthly checks in amount you specify, while balance earns at high current rates. Send coupon below for full details.

The Bonus Account: Deposit \$1000 or more for 3-year term. Earn .25% bonus annually over passbook rate (currently 5%, compounded daily). Bonus paid at end of 3-year term. Withdrawals before maturity, and balances below \$1000, earn passbook rate.

The Passbook Account: Deposit any amount, withdraw anytime, and earn 5% current annual rate, compounded daily, from day in to day out. Yields 5.13% when savings and interest remain a year, if 5% current annual rate and daily compounding continue a year. Deposits received by 10th of month earn from 1st when they remain till quarter's end.

D

\$10 for each deposit over \$5,000 or the premium shall be considered as part of the interest payment.

Identical regulations were adopted, effective March 1, 1970, by the Federal Home Loan Bank Board which supervises regulations for savings and loan associations (Federal Register, 1970). Prior to this adoption, savings and loan associations had been limited to a premium value of \$2.50.

Nominal vs. effective rates

The use of two different rates of interest to describe the same savings account is used extensively in advertising. The three advertisements in the lower half of Plate III state that "Kansas' largest" guarantees 5.36 per cent with an annual rate 5.25 per cent, while the "Nation's Largest" guarantees 5.39 per cent with an annual rate of 5.25 per cent and the third advertisement says one can turn 5.00 per cent into 5.38 per cent. How should the saver interpret this? Why the variance?

The nominal annual percentage rate listed in the advertisements as 5.25 and 5.0 per cent are based on different mathematical calculations than the effective rates represented by the figures 5.36, 5.38, and 5.39.

The nominal annual percentage rate is the applied rate used in the standard simple interest formula: $\text{Interest} = \text{Principal} \times \text{Rate} \times \text{Time}$. This formula does not take into account the effects of compounding interest (Morse, 1966). Compound interest is defined as to include interest paid on interest.

The effective annual percentage rate is defined as the actual annual rate of interest paid. This rate differs from the nominal rate because it includes the resulting effect of compounding (Morse, 1966).

According to the American Bankers Association (1964), the effective rate is estimated by the formula:

$$\text{Effective rate} = \frac{\text{Interest paid}}{\text{Average amount of funds on deposit}}$$

To calculate the average amount of funds on deposit, add the opening balance for each month plus the closing balance of the last month and average their sum. In the case of one year, divide the total by 13. A more precise figure is obtained by averaging the total daily savings balances.

An illustration of effective rate computation is shown by annually placing \$1,000 in a savings account for one year at 5.0 per cent, compounded quarterly.

<u>Month</u>	<u>Balance</u>	<u>Interest Paid Quarterly</u>
January 1	\$ 1,000.00	
February 1	1,000.00	
March 1	1,000.00	$1,000.00 \times .05 \times \frac{90}{365} = 12.3285$
April 1	1,000.00	
May 1	1,000.00	
June 1	1,000.00	$1,000.00 \times .05 \times \frac{91}{365} = \frac{12.6192}{24.9477}$
July 1	1,000.00	
August 1	1,000.00	
September 1	1,000.00	$1,000.00 \times .05 \times \frac{92}{365} = \frac{12.9169}{37.9846}$
October 1	1,000.00	
November 1	1,000.00	
December 1	1,000.00	$1,000.00 \times .05 \times \frac{92}{365} = \frac{13.0798}{50.9444}$
December 31	1,000.00	
	<u>\$13,000.00</u>	

$$\text{Average funds on deposit} = \frac{13,000.00}{13} = 1,000.00$$

$$\text{Effective rate} = \frac{50.9444}{1,000.00} = .05094 \times 100 = 5.09\%$$

Advertisement B, Plate III, does not specify the frequency of compounding used to obtain the 5.36 per cent effective rate. Advertisements C and D offer essentially identical savings programs, but one advertises a 5.38 per cent rate compounded daily and the other a 5.39 per cent rate compounded daily. After reading through advertisement C, one finds that 5.0 per cent "turns" into 5.38 per cent only after saving a minimum of \$1,000 and then transferring it to a "maximum-earning bonus account" and leaving it for three years.

The confusion resulting from the use of two rate concepts was delineated by Morse in his testimony before the senate subcommittee on Financial Institutions in 1967: (Material referred to in the following statement has been reproduced and included in Appendix A.)

c. Which Rate: Nominal vs. Effective.

Much confusion has resulted from a failure to distinguish clearly between nominal (in name only) rate and a rate that yields an amount that is actually earned or collected. This difference in rate concepts is frequently evident in bank and savings loan association advertisements. Since the effective or yield rate exceeds the nominal rate, they have been tempted to give greater promise to the yield rate in advertising for savings. On December 16, 1966, four Government agencies jointly announced a new set of standards aimed at outlawing "misleading claims," in which the yield achieved through compounding should not be stated in greater prominence nor without also stating the nominal rate, which they refer to as the simple interest rate. (Attached is a copy of the directive and a letter from Mr. Sherman explaining the meaning of simple interest.) This distinction is discussed in greater detail in my Pamphlet No. 17, pages 34-5, and definitively in Pamphlet No. 18, pages 48-53.

It is important that the terms be clear for effective communication. For example, a bank collects a higher yield from savers who deposit toward the first of the month rather than toward the close of the grace period. They also collect more from depositors who withdraw their savings before the end of the quarter and forego their accumulated interest. The nominal rate is the same: the

effective rate is different. Another example would be the credit unions which collect at a rate of 1% a month, but because February has 3 less days than March, collects at a 10% higher rate in February than it does in the month of March.

To use both concepts interchangeably does violence to truthful communication; to use them in their proper context, each is equally truthful.

Truth in lending, under terms of S. 5, relates directly to the percentage rate per period; the nominal annual rate expresses the periodic rate multiplied by the number of periods in a year.

The annual rate is 12 times the monthly rate
 52 times the weekly rate
 4 times the quarterly rate
 365 times the daily rate

The equivalent annual rate, so conceived, is just as informative and real as the motorist's knowledge that he is traveling at a rate of 60 miles per hour by looking at the speedometer, regardless of whether he travels the full hour at this rate or goes the full sixty miles.

The directive just referred to by Mr. Sherman of the Federal Reserve Board did not have the force of law. Repeated violations led to congressional action and an issuance of an amendment to Regulation Q by the Federal Reserve Board. Letters, exhibits and documents pertaining to this historic development have been bound and filed at Farrell Library of Kansas State University entitled Truth in Savings (Morse, 1970).

The use of effective rates in advertising is not prohibited by Federal regulation. However, the manner in which they are stated is subject to the regulation of the Board of Governors of the Federal Reserve System and the Federal Home Loan Bank Board.

Regulation Q, section 217.6, specifies the following rules concerning the manner of advertising interest on deposits effective

August 1, 1969 for commercial banks. Identical regulations apply to savings and loan associations.

Regulation Q, Section 217.6.

(a) Annual rate of simple interest. Interest rates shall be stated in terms of the annual rate of simple interest. In no case shall a rate be advertised that is in excess of the applicable maximum rate for the particular deposit.

(b) Percentage yields based on one year. Where a percentage yield achieved by compounding interest during one year is advertised, the annual rate of simple interest shall be stated with equal prominence, together with a reference to the basis of compounding. No member bank shall advertise a percentage yield based on the effect of grace periods permitted in section 217.3.

(c) Percentage yields based on periods in excess of one year. No advertisement shall include any indication of a total percentage yield, compounded or simple, based on a period in excess of a year, or an average annual percentage yield achieved by compounding during a period in excess of a year.

(d) Time or amount requirements. If an advertised rate is payable only on deposits that meet time or amount requirements, such requirements shall be clearly and conspicuously stated. Where the time requirement for an advertised rate is in excess of a year, the required number of years for the rate to apply shall be stated with equal prominence, together with an indication of any lower rate or rates that will apply if the deposit is withdrawn at an earlier maturity.

(e) Profit. The term "profit" shall not be used in referring to interest paid on deposits.

(f) Accuracy of Advertising. No member bank shall make any advertisement, announcement, or solicitation relating to the interest paid on deposits that is inaccurate or misleading or that misrepresents its contracts.

(g) Solicitation of deposits for banks. Any person or organization that solicits deposits for a member bank shall be bound by the rules contained in this section with respect to any advertisement, announcement, or solicitation relating to such deposits. No such person or organization shall advertise a percentage yield on any deposit it solicits for a member bank that is not authorized to be paid and advertised by such bank.

Methods and terminology

The individual who attempts to make a comparative analysis of programs before placing his funds on deposit encounters an array of methods and terminology in use. In addition, the type of information disclosed in advertisements varies widely.

Plate IV shows six descriptions of regular passbook accounts taken from newspaper advertisements. One of the variations in methods of calculating interest is the frequency of compounding. Example A lists semi-annual compounding. Quarterly compounding is offered in Examples B, C, and E. Daily compounding occurs in Example F. Compounding in Example C either does not occur or is unspecified.

The frequency with which accrued interest is made available to the saver through payment or by crediting to his account can be difficult to determine from information given in many advertisements. In the sample advertisements, Example A simply states: "Daily interest figured and compounded June 1 and December 1." Example B compounds quarterly, but only pays semi-annually. Example C states: "Paid quarterly," and Example D states: "paid daily."

Terms which are not clearly definitive, but occur in the advertisements are "daily interest," "computed daily," "paid daily," and "day of deposit to day of withdrawal." Do each of these imply different methods?

Examples C and D demonstrate the confusion in terminology. One reads "paid daily and compounded quarterly" while the other reads "computed daily--paid quarterly." Which is the better for the consumer?

PLATE IV

A**4 1/2%**

• • Daily Interest
Figured and compounded
June 1 and December 1

B

Effective January 1, 1970, Regular Passbook Savings Accounts will earn 4 1/2% interest, compounded quarterly. Paid Semi-Annually.

4 1/2%**C****REGULAR SAVINGS ACCOUNTS**

Effective new rate of 4 1/2%
Computed daily—paid quarterly

D**4 1/2% REGULAR SAVINGS ACCOUNTS**

Again interest is
paid daily and
compounded quarterly.

E**REGULAR PASSBOOK SAVINGS ACCOUNTS****5%**

CURRENT ANNUAL RATE COMPOUNDED QUARTERLY
**FROM DAY OF DEPOSIT
TO DAY OF WITHDRAWAL**

PROVIDED BALANCE OF AT LEAST \$1 REMAINS TO END OF QUARTER WHEN INTEREST IS PAID
No limit on frequency of withdrawals. No notice required. No penalties.
No minimum deposits. Deposits made by 10th of any month
earn from 1st of that month if held to end of quarter.

F

**Dividends at 5% a year—Latest Dividend on
REGULAR SAVINGS ACCOUNTS** with balances of

\$10 or more. **Compounded Daily** from day of deposit and **EARNED MONTHLY** to the first of the month during which withdrawal is made, and payable at the end of the quarter at the previous quarter's rate—provided a minimum balance remains in the account.

Limitations

Limitations on savings activity which affect the return one can expect are revealed in some advertisements. Example E promises interest will be paid "provided balance of at least \$1 remains to end of quarter when interest is paid," while Example F offers dividends with balances of \$10 or more.

Example E states: "no limit on frequency of withdrawals. No notice required. No penalties." Should one assume other institutions limit how often one can withdraw his funds? Penalties for what?

Example E introduces the concept of grace days. Payment for use of funds not actually on deposit is allowed by both the Board of Governors of the Federal Reserve System and the Federal Home Loan Bank Board. Each permits interest to be paid effective the first of the month if funds are deposited by the tenth of the month. Interest also may be paid on funds withdrawn during the last three business days of a regular interest period calculated to the end of that month. Example E provides for ten grace days on deposits, but makes no mention of withdrawal grace days.

Example F provides yet another method of payment. Dividends are "COMPOUNDED DAILY from day of deposit and EARNED MONTHLY to the first of the month during which withdrawal is made and payable at the end of the quarter at the previous quarter's rate--provided a minimum balance remains in the account." Does this mean that a deposit made on February 5 and withdrawn March 25 will receive dividends for 23 days of February and will not qualify for dividends for the 25 days in March?

These sample advertisements indicate the deficiencies in the information disclosed and the need for understanding the methods and language used by savings institutions. The saver must be informed if he is to compare and choose the most advantageous opportunity consistent with his liquidity and yield preferences.

The overriding questions that prompted this study were: what were the savings institution's attempting to convey? Were the various terms used intended to represent different concepts or were they variations concocted to create an appearance of difference? Could the language be standardized to facilitate communication with benefits for both the consumer and the financial institution?

OBJECTIVES

The objectives of this study were:

- (1) to develop and test for reliability a standard activity pattern for measuring and contrasting savings yield produced by the various methods of calculation with attendant variables.
- (2) to compare the savings yield produced by model systems which combine selected methods of calculation with attendant variables.
- (3) to test the standard activity pattern for reliability of yield determination under systems in use by selected savings institutions.

PROCEDURE

Various methods of interest calculation applied to the standard interest formula will produce varying yields for a given principal, rate and time. Introduction of certain variables such as frequency of compounding or grace days will alter yield. Individual use of the savings account in the form of deposits and withdrawals also causes yield variation as the amount of principal, referred to as the account balance, varies during an interest period. Any comparison of yield requires familiarity with the variables that may be applied and knowledge of the particular method of computing interest used by the savings institution.

Preliminary Survey

A preliminary survey of local banks and savings and loan associations was conducted to learn of the prevailing methods used for calculating interest, and to determine what variables are used which affect yield. This information was supplemented with a survey of savings advertisements and available resource material.

The survey consisted of a questionnaire relating to the characteristics of three basic types of savings programs: the regular pass-book savings account, the certificate of deposit and savings certificates, and special savings accounts such as the 90-day notice savings account. A copy of the schedule used is in Appendix B. It proved useful in the initial phase of the study, but it is not recommended without revision for subsequent study.

Five local savings institutions and one out of state commercial bank were contacted for information. The resulting information plus the information from savings advertisements was so confusing that some substitute for words was needed. It indicated the need to construct a standard activity pattern to which the sundry methods of calculation and variables of savings programs could be applied individually or in combination. The meaning of words then could be seen in terms of their effect on the yield from the standard activity pattern.

The regular passbook savings account was selected for the basic unit of comparison because no contractual time limit is imposed on the use of this type of savings account as opposed to time deposits which require funds to remain on account for a specified period of time to qualify for interest. The flexibility which regular passbook savings accounts afford the saver by providing the opportunity to add to his funds or to remove his funds can result in change of the amount of principal subject to interest during the interest period. This changing amount of principal, referred to as account activity, has encouraged savings institutions to develop a variety of methods for calculation of interest.

Development of Model Systems

Selection of methods and variables

Five methods of calculation were selected to demonstrate dollar yield variation: (1) low balance, (2) FIFO applied to the beginning balance, (3) FIFO applied to first deposits, (4) LIFO, and (5) day of deposit to day of withdrawal. Each is defined and illustrated in the

following pages.

Four variables found in the survey to be used frequently by savings institutions were selected: (1) frequency of compounding of interest, (2) frequency of crediting earned interest to the account, (3) number of grace days allowed, and (4) penalty assessment for an excess number of withdrawals made during a stated period of time.

The variables selected represent only four of numerous variables that may affect the amount of savings yield.

Examples of other variables the saver may encounter are:

- (1) Minimum account balance requirements which stipulate that a stated amount must remain in the account for any funds to receive interest.
- (2) Maximum account balance restrictions in which a limit is set upon which interest will not be paid on amounts above the limit.
- (3) Gifts or premiums given for opening or adding to an account.
- (4) Gifts or premiums given in lieu of interest.
- (5) Postage paid by the savings institution on deposits and withdrawals.
- (6) Forfeiture of interest on time deposits when the principal is withdrawn before maturity.
- (7) Bonus interest rates that reward the saver for maintaining the account balance for a stated period of time.
- (8) Interest exemption from state tax in certain states.
- (9) Free checking service when a savings account is maintained.

The preceding list is not all inclusive, but serves to indicate the factors that can alter savings yield.

Model systems were constructed combining methods of calculation with variables to contrast yield. Forty model systems were developed from the many possible combinations of the five methods and four variables. The selected combinations seemed most likely to represent those to be confronted by the saver.

Standard activity pattern

A standard activity pattern was developed for regular passbook savings accounts which standardizes the dates and amounts of deposits and withdrawals for a six month period.

Standard Activity Pattern

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	
4- 1-70					
7- 1-70					

Account activities were inserted in such a manner as to construct an activity pattern that would distinguish one system from another.

Gross yields were computed for each of the 40 model systems using the standard activity pattern. A comparison of these yields was compiled. The effect of individual methods and variables were also contrasted.

To test the standard activity pattern for reliability, a portfolio containing the 40 model systems with the yield computations were sent to eight savings institutions. Each institution was asked to indicate the model system that duplicated their system of calculation. If none of the models were representative of their system, they were asked to demonstrate their system by calculating the yield on the standard activity pattern. A copy of the portfolio of models and sample letter is in Appendix C.

RESULTS AND DISCUSSION

The results of savings yield variation produced by the hypothetical model systems and the actual systems used by selected financial institutions are contrasted in table form. Each method of yield calculation and the application of variables are demonstrated. The effect on yield resulting from application of each variable is shown.

Illustrations of Yield Calculations

The following illustrations demonstrate yield calculations used. Each of the five methods of calculation is shown with two variables: frequency of compounding and frequency of crediting. The two remaining variables, grace days and penalty assessment for excess withdrawals are demonstrated in the last illustration. Calculations are based on the formula: $\text{Interest} = \text{Principal} \times \text{Rate} \times \text{Time}$. The column labeled "interest" in the standard activity pattern shows the date interest is actually credited to the account, therefore paid to the saver. The "interest memo" column indicates the notation of an interest calculation

by the savings institution, but not necessarily credited to the account. Mathematical calculations for each transaction are shown directly below the standard activity pattern with an accompanying explanation.

Low balance calculation

Low balance is a method of interest calculation in which yield is calculated on the lowest balance in the account for the specified interest period.

Illustration 1

Method: Low balance

Variables: Compounded semi-annually at 6%
Credited semi-annually

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	
4- 1-70				2,000.00	29.75
7- 1-70			29.75	2,029.75	

$$1) 1,000.00 \times .06 \times \frac{181}{365} = 29.75 \quad \text{low balance equals opening balance}$$

29.75 Total yield

Illustration 2

Method: Low balance

Variables: Compounded quarterly at 6%
Credited semi-annually

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	14.79
4- 1-70				2,000.00	15.18
7- 1-70			29.97	2,029.97	

- 1) $1,000.00 \times .06 \times \frac{90}{365} = 14.79$ low balance equals
opening balance
- 2) $1,014.79 \times .06 \times \frac{91}{365} = 15.18$ low balance plus
interest on interest
- 3) 29.97 Total yield

When the compounding period and crediting period occur at different intervals as in Illustration 2, yield is 22 cents greater than in Illustration 1 where both compounding and crediting occur semi-annually.

Illustration 3

Method: Low balance

Variables: Compounded quarterly at 6%
Credited quarterly

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 6-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	14.79
4- 1-70			14.79	2,014.79	30.14
7- 1-70			30.14	2,044.93	

1) $1,000.00 \times .06 \times \frac{90}{365} = 14.79$ low balance first quarter
equals opening balance

2) $2,014.79 \times .06 \times \frac{91}{365} = 30.14$ second quarter interest

44.93 Total yield

A yield increase of \$15.18 results when both the compounding and crediting frequency increases from semi-annual to quarterly as in Illustrations 1 and 3.

FIFO calculation applied
to beginning balance

FIFO (first in, first out) applied to the beginning balance is a method of interest calculation in which withdrawals are deducted from the beginning balance of the period and then from subsequent deposits.

To illustrate this method, yield will be calculated from the day of deposit until the end of the period. This method permits deposited funds to begin earning on the day deposited unlike the low balance method

where deposited funds do not begin earning until the beginning of the next interest period.

The FIFO method applied to the beginning balance requires a withdrawal to be deducted from the beginning balance therefore earns no interest for the entire period. If the beginning balance is less than the withdrawal, the remaining sum is deducted from the first deposit then following deposits if necessary.

Illustration 4 demonstrates this system in steps 6, 8, and 10.

FIFO calculation applied
to first deposits

FIFO (first in, first out) applied to first deposits is a method of interest calculation in which withdrawals are deducted from the first deposit of the period and then from subsequent deposits. If no deposits were made, the withdrawal is deducted from the beginning balance.

This method penalized the saver less than the previous method where no interest is earned on withdrawn funds deducted from the beginning balance. The withdrawal deducted from the first deposit earns for the number of days between the beginning of the period and the first deposit. Steps 6, 8, and 10 in Illustration 5 show these calculations.

LIFO calculation

LIFO (last in, first out) is a method of interest calculation in which withdrawals are deducted from the most recent deposit within the interest period and then from the next most recent deposits. If no deposits occurred, the withdrawal is deducted from the beginning balance.

In Illustration 4, yield is calculated from day of deposit to the end of the period. The LIFO method does not penalize the saver to as great an extent as either FIFO method. Withdrawn funds are permitted to earn a greater number of days when subtracted from the latest deposits. Step 6 in the following illustration shows deduction from the latest deposit.

Day of deposit to day of
withdrawal calculation

Day of deposit to day of withdrawal is a method of interest calculation in which yield is calculated for the actual number of days funds remain in the account, therefore from the day they are deposited until the day they are withdrawn. This method is also referred to as daily interest, instant interest and day in, day out.

The following illustration will show that the yield calculated by this method results in the greatest return to the saver of the methods demonstrated.

Grace day and penalty variables

Two other variables used in the model systems are the number of grace days allowed by the savings institution and the penalty assessed when withdrawals are made in excess of a stated number for a specified period of time. The following illustration incorporates the variables in steps 2, 4, 10 and 11.

Yield Variation

Illustrated systems

Variation in savings yield produced by the five methods of calculation with applied variables in the previous illustrations is shown in Table 1. Yields range from a low \$29.75 to a high \$78.79 with a difference of \$49.04.

Table 1. Comparative yield - illustrated systems.

System	Yield (\$)
Low Balance Compounded and credited semi-annually	29.75
Low Balance Compounded quarterly and credited semi-annually	29.97
Low Balance Compounded and credited quarterly	44.93
FIFO Applied to Beginning Balance Compounded and credited quarterly	52.44
FIFO Applied to First Deposits Compounded and credited quarterly	53.93
LIFO Compounded and credited quarterly	58.44
Day of Deposit to Day of Withdrawal Compounded and credited quarterly	75.30
Grace Days and Penalty Applied to Day of Deposit to Day of Withdrawal Compounded and credited quarterly	78.79

Model systems

Comparison of yield for the 40 hypothetical model systems using a combination of five methods of calculation and four variables resulted in 34 different amounts of yield for the 40 models. These are shown in Table 2. Yields range from \$29.25 to \$79.13; a difference of \$49.88. The combinations of variables used in the models can be extended to produce ever greater variation.

Method of calculation

Total yield the saver may expect to receive will depend on the method of calculation used. The yields produced by the five methods of calculation employed in this study are shown in Table 3 in order from lowest to highest; a difference of \$30.37. Each was compounded quarterly at six per cent and credited quarterly with no grace days and no penalty assessments.

Table 3. Comparative yield - method of calculation.

Method of calculation	Yield (\$)
Low Balance	44.93
FIFO Applied to Beginning Balance	52.44
FIFO Applied to First Deposit	53.93
LIFO	58.44
Day of Deposit to Day of Withdrawal	75.30

Variables

Frequency of compounding. To illustrate the yield effect of compounding frequency, Table 4 lists the amount of yield obtained when \$1,000 is compounded at a nominal annual rate of six per cent at various periods.

Table 4. Comparative yield - frequency of compounding.

Principal (\$)	Compounded	Yield (\$)
1,000	annually	60.000
1,000	semi-annually	60.900
1,000	quarterly	61.364
1,000	monthly	61.678
1,000	weekly	61.800
1,000	daily	61.831
1,000	continuously	61.837

Source: Morse, 1966. Consumer Credit Computations

Frequency of crediting. When the crediting frequency and compounding frequency occur at different intervals resulting yield will vary. The low balance method demonstrates the difference in yield when the crediting period changes from quarterly to semi-annually.

A yield difference of \$14.96 results when the crediting frequency decreased from quarterly to semi-annually. When the crediting period occurs semi-annually, the low balance for the period is \$1,000. When the crediting period occurs quarterly, the first quarter low balance

is \$1,000 and the second quarter low balance is \$2,000 thus doubling the yield for the second quarter.

Compounded quarterly at 6%
Credited quarterly

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	14.79
4- 1-70			14.79	2,014.79	30.14
7- 1-70			30.14	2,044.93	

Compounded quarterly at 6%
Credited semi-annually

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	14.79
4- 1-70				2,000.00	15.18
7- 1-70			29.97	2,029.97	

Grace days. The greater the number of grace days allowed by the savings institution, the greater the resulting yield to the saver. Table 5 shows the resulting yield in the model systems due to grace days using the LIFO method, compounded quarterly at six per cent and credited quarterly. The difference in yield is \$9.76 between the lowest and highest.

Table 5. Comparative yield - grace days.

Grace days	Yield (\$)
No grace days	58.44
10 deposit grace days 1st - 10th of period	61.44
10 deposit grace days 1st - 10th each month	62.28
No deposit grace days 3 withdrawal grace days	65.20
10 deposit grace days 1st - 10th of period 3 withdrawal grace days	68.20

Penalty assessment for an excess number of withdrawals. Yield is decreased when a penalty assessment is applied. This occurs if the number of withdrawals exceeds the stipulated number allowed by the savings institution for a stated period of time. When the penalty is applied to the model systems the yield is decreased by 50 cents based on a charge of 50 cents for each withdrawal over two per month.

Savings institution systems

Eight savings institutions including both commercial banks and savings and loan association were contacted for the purpose of testing the standard activity pattern as a means of yield measurement when applied to actual savings institution systems. If none of the model systems based on the standard activity pattern matched the system used by the institution, each was asked to calculate the yield resulting from the standard activity pattern using their system.

Results are reported for seven of the eight institutions. The other savings institutions offered no regular passbook savings program. Its savings program consisted of time deposit accounts and the shortest time requirement was 90 days with a \$100 minimum deposit and \$100 minimum for additional deposits.

The savings institutions surveyed represent three population areas in size. Two institutions are located in metropolitan areas with populations over one million. Two institutions are located in towns with under one thousand population and the remaining three are located in a city population of approximately thirty thousand.

Two savings programs are reported by savings institution G: Plan I, "Passbook Savings," and Plan II, "Everyday Interest Savings."

In no case did the six month yield calculated by the savings institutions match the yield of any of the hypothetical model systems after adjustment for differences in the nominal rate. No two savings institutions using the same nominal rate calculated the same yield. Only two savings institutions, B and D, used identical systems and rates.

The systems and yields as calculated by the savings institutions are shown in Table 6.

Unreliability of calculations. Savings institution D based its calculation on 183 days for the January 1 to June 30 semi-annual period instead of 181 days. This overstated total yield. Savings institution B based its calculations on 180 days and therefore understated the yield.

Accuracy of the compounding and crediting frequency by savings institution D is subject to question. The savings institution originally identified their system as one with semi-annual compounding and

Table 6. Comparative yield and systems of savings institutions.

Savings insti- tution	Rate %	System					Yield \$
		Method of calculation	Compounding frequency	Crediting frequency	Deposit grace days	Withdrawal grace days	Penalty excess withdrawal
A	4-1/2	Day dep. to day withdrw.	semi- annual	semi- annual	None	None	50¢ after each 2 withdr./mo. 55.48
B	4-1/2	Day dep. to day withdrw.	semi- annual	semi- annual	None	None	None 55.97
C	5	Low balance	semi- annual	semi- annual	10 each month	3	None 50.00 50.50
D	4-1/2	Day dep. to day withdrw.	semi- annual	semi- annual	None	None	None 56.34
E	4-1/2	Day dep. to day withdrw.	quarterly	quarterly	10 each period	3	50¢ for each withdr. after 3 in semi-ann. period 53.72
F	4-1/2	FIFO variation	semi- annual	semi- annual	None	None	None 36.67
G Plan I	4-1/2	Highest continuous balance	quarterly	quarterly	10 each period	3	None 50.95
G Plan II	4-1/2	Day dep. to day withdrw.	quarterly	quarterly	None	None	None 57.42

crediting. The author's understanding of the verbal description was quarterly compounding and semi-annual crediting. Two follow-up telephone conversations with two different officers of this institution, approximately one month later, provided two different answers. One officer reported semi-annual compounding and crediting while the other reported quarterly compounding and crediting.

Variance from model systems. Although yield calculated by the seven savings institutions did not equal the model yield in any instance, the difference in two cases resulted from slight variations of variables. One institution has a penalty assessment of fifty cents for each withdrawal after three per semi-annual period rather than after two per month as in the model. A second institution indicated the appropriate model system varied only in the compounding period; semi-annual vs. quarterly.

Another institution, using the low balance method, had a yield difference because they calculated the time factor as one half a year rather than on the actual number of days in the six month period. If both the institution and model extended the account to one year instead of six months, the yield would have been identical.

Imposition of the penalty charge for excess withdrawals during a stated period was reported to be done on a discretionary basis by savings institution C. Consequently, the universal form was checked "none" in reference to the question concerning penalties.

The use of grace days was reported by one institution to be a factor that would not be applicable to day of deposit to day of withdrawal method of calculation, but only to low balance calculations.

CONCLUSIONS

A standard activity pattern can be used to measure the dollar amount of yield for regular passbook savings accounts. Furthermore, it can be used to distinguish between various systems producing different yields. The number of variables in this study was limited to four. Within this limitation, however, the standard activity pattern was effective both when used with model systems and when applied to actual savings institutions systems.

The use of model systems, applied to a standard activity pattern provided not only comparison of savings yield, but illustrated commonly used methods of calculating interest and variables. They facilitated communication between the investigator and the financial institution in clarifying any ambiguity as to the system employed by the institution.

The difference between savings programs employing the same nominal rate varied significantly in yield. Comparison of six month yield of regular passbook savings yield, based on 40 hypothetical model systems applied to a standard activity pattern, resulted in a difference of \$49.88. The highest yield was 171 per cent greater than the lowest.

The study does not necessarily reflect the magnitude of differences that might result with other account activity patterns. The standard activity pattern used was not developed to take advantage of the opportunities to show a maximum range of possible yields.

The standard activity pattern was found useable by savings institutions. All the respondents were able to calculate the savings yield that would be paid by their institution under the circumstances

posed in the activity pattern. Comparison of yield calculated by the seven savings institutions using the same standard activity pattern as that in the model systems resulted in a ~~\$38.22~~^{22.05} difference. The highest yield was ~~186~~⁶⁰ per cent greater than the lowest.

The study indicated the need for knowledge of and access to all facts relating to savings programs for the prudent saver to make accurate comparisons of gross yield. It also reflects the complexity of the problem that existing variations pose for those charged with educating consumers. The cost that such education would entail was not estimated, but it would be significant unless there is a considerable reduction in and standardization of terms, methods, and variables employed in savings programs.

RECOMMENDATIONS

As a result of this study and in view of the current economic factors affecting family finance, the following recommendations are suggested for further study:

(1) A survey of financial institutions offering savings programs should be conducted to ascertain the extent and variety of current methods of calculating interest and the variables employed which affect gross yield to the saver.

(2) A survey be conducted of consumer knowledge about savings programs and their understanding of the significance of the many systems offered them.

(3) A study to investigate the development of a standardized form of terminology relating to savings programs to describe in lucid

language all the characteristics of savings programs.

(4) A study into the possibility of developing full standardized disclosure guidelines for use in advertising, verbal communication, and printed material including all passbooks, certificates, receipts, or other contracts.

(5) Consider legislation comparable to "Truth in Lending" for savings programs to be known as "Truth in Savings."

ACKNOWLEDGMENTS

Grateful acknowledgment is made to Dr. Richard L. D. Morse, Professor and Head of the Family Economics Department for his guidance and encouragement during the preparation and writing of this manuscript.

Sincere appreciation is expressed to Mrs. Patty Annis, Assistant Professor of Family Economics and Mr. Donald F. Decou, Associate Professor of Economics for their service as members of my graduate committee.

The cooperation of Mr. Gerald E. Warren and Mr. John C. Kennedy of the National Bank of Detroit are gratefully acknowledged.

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APPENDICES

APPENDIX A
BOARD OF GOVERNORS
OF THE
FEDERAL RESERVE SYSTEM
WASHINGTON, D. C. 20551



ADDRESS OFFICIAL CORRESPONDENCE
TO THE BOARD

January 6, 1967.

Professor Richard L. D. Morse,
Department of Family Economics,
Kansas State University,
Manhattan, Kansas. 66502

Dear Professor Morse:

In accordance with your request to Governor Robertson of December 22, 1966, there is enclosed a copy of the Board's letter of December 16, 1966, to the presidents of all State member banks on the subject of financial institution advertising for funds.

In response to your question as to the meaning of "simple interest" as used in that letter, that term is intended to refer to the amount paid for the use of funds over a stated period based upon a percentage rate per year without any addition for interest on interest. In other words, it means interest that is paid only on the principal amount of a deposit, and not on interest that has accrued on the principal.

Very truly yours,


Merritt Sherman,
Secretary.

Enclosure

A P P E N D I X B

UNITED STATES SENATE

Committee on Banking and Currency

October 19, 1963

Dr. Richard L. D. Morse
Professor and Head
Department of Family Economics
Kansas State University
Manhattan, Kansas

Dear Dr. Morse:

In the Consumer Advisory Council report of October 1963, on page 64 are listed the Council's suggested items of disclosure on credit transactions. Item (5) calls for "the simple, nominal annual percentage rate...." Would you please advise me what meaning or significance the word nominal has in this definition? I assume you are speaking of the usual simple annual rate of interest. But I am puzzled as to the necessity of the word nominal in this statement. You use the same term in item c on page 63 and also in item a on page 64.

Sincerely,

s/ Charles H. Bradford

Charles H. Bradford
Minority Clerk

CHB:pb

(Source: 6, p. 1326)

October 25, 1963

Mr. Charles H. Bradford
Minority Clerk
United States Senate
Committee on Banking and Currency
Washington 25, D. C.

Dear Mr. Bradford:

I am pleased that you have asked for clarification of the use of the word 'nominal' as used in item (5) on page 64, item c on page 63 and item a on page 64.

I believe it would be incorrect to assume that nominal annual percentage rate is the same as the simple annual rate of interest, although to some people it does convey the same meaning. The nominal rate, however, is less likely to be misunderstood because it has a precise meaning applicable for financial arrangements involving irregular or any periodic regular time intervals.

"Nominal has been in use for many years. There are many citations for definition of 'nominal rates' which I could suggest from books on the mathematics of finance. I happen to have a book published in 1913 by Ginn and Company on The Mathematical Theory of Investment by Ernest Brown Skinner. The following is quoted from page 59:

23. Nominal and effective rates of interest. The two problems for which formulas (1) and (3) of the previous section are solutions make necessary a distinction between two

kinds of rates of interest when the conversion interval is less than a year, viz. nominal rate and effective rate. The nominal rate is the rate which would be realized if the interest received at the end of each conversion interval were not productively invested until the end of the year, while the effective rate is the total return on the unit principal for one year. For example, if \$100 were invested at 6%, payable semiannually, with the understanding that the rate per half year be one half the rate per year, the interest for the first half year would be \$3, and the amount available at the beginning of the second half year would be \$103. The interest on \$103 for the second half year would be \$3.09; so that the total amount at the end of the year would be \$106.09. The return on \$1 is, therefore, .0609, and the effective rate is 6.09%. If the \$3 received at the middle of the year had not been productively invested, the total amount at the end of the year would have been \$106, and the rate would have been 6%. This rate is the nominal rate. The nominal rate may also be defined as the product of the rate per conversion interval by the number of conversion intervals in a year. In the example, the rate per conversion interval is .03, and the number of conversion intervals in a year is 2, giving .06 as the nominal rate.

The second definition, which I have underlined for emphasis, is almost identical with that in item (5) on page 64 in which the words "periodic rate" have been substituted for Skinner's words "rate per conversion interval."

Probably one of the more distinguished writers of instalment credit and considered authoritative by many in the instalment credit business is Dr. M. R. Neifeld who published in 1953 Neifeld's Guide to Instalment Computations. It is published by Mack Publishing Company, Easton, Pennsylvania. Chapter 3 is entitled "Compound Interest, Nominal and Effective Rates of Interest." I think you will find Neifeld's discussion of nominal interest helpful and convincing that there is merit in distinguishing between simple interest and nominal interest. For your convenience I have selected quotations from pages 59 through 61 of Chapter 3.

Simple interest, as defined in Chapter II, is interest computed on a principal that does not change. ...

Compound interest is interest on interest. ...

Interest may be compounded at fractional periods within the year as well as annually. When interest is compounded in fractional periods of a year, a distinction is made between a nominal interest rate and an effective rate.

The nominal interest rate is the quoted annual rate which does not take into account that interest is compounded at intervals throughout the year.

The effective interest rate is the rate actually earned per year. ... An effective interest rate is also called a real interest rate, or a true interest rate. ...

Given the nominal interest rate i and the frequency of conversion p , the effective interest rate i can be found from the relation

$$1 = (1 + i/p)^p - 1$$

I call your attention to the advertised rate which appears periodically in the Wall Street Journal by a savings and loan association which pays interest daily. The ad reads: "Only Lytton Savings pays 4.85% a year compounded daily... returning you a full 4.97% in a year." (Wall Street Journal, Oct. 3, 1963) It is the intention of item c on page 63 to distinguish clearly between the 4.85 and the 4.97 by use of the word 'nominal,' which, by the above definition, would refer to the 4.85% and not the effective rate of 4.97%. Because this is a compound interest situation, simple interest would be inadequate or at least more difficult to defend.

The recommendation is that quoted rates be comparable with the nominal rates quoted to attract savings. If institutions 'borrow' savings from depositors at a nominal rate, is it not reasonable that they can lend at a nominal rate? The recommended method of quotation not only standardizes but neutralizes the quotation so that words employed for the identical mathematical operation do not vary according to whether the borrower is addressing the lender or the lender is addressing the borrower.

In closing you may ask if the expression "simple annual nominal percentage rate" is not redundant, and I might agree were it not for the fact that there seems to be a disposition to confuse nominal with effective. Hence, I defend including all of these words for emphasis.

The significance of the use of the word 'nominal' is implied in the above. However, there may be other aspects of this matter that have escaped my attention since I am consumer oriented.

If I can be of further service, I hope you feel free to write me.

Sincerely yours,

Richard L. D. Morse
Member

Office Address:

RLDM:ela

cc: Consumer Advisory
Council Members

institutions to any suggestion that they cease advertising the annual rate and show only dollars per hundred earned on \$100 saved in monthly instalments--an unheard of suggestion. In fact the emphasis savings institutions are giving to the effective rather than the nominal rates indicates the temptation to expose the most favorable image and points up the need to standardize terms. The advertisement exhibited on page 34 not only dramatizes the two rates, but demonstrates that financial institutions are capable of disclosing annual rates, figuring interest daily, and allowing deferred and irregular payments.

3. "Disclosure of both dollars and rates would result in confusion for the consumer." Dr. Johnson, student of the finance industry, has challenged the validity of this author's method of teaching students to inquire as to the dollar cost, dollar monthly payments and the simple nominal annual rates. "Introduction of a second price system in the form of percentages hinders, rather than aids, the consumer's decisions. ...Clearly, the only valid measure of value is the total time price as mirrored in the monthly dollar payment." (3, p. 8) His position runs contrary to that of textbook writers, consumer finance teachers, home economists, and specialists in many state Cooperative Extension Services, who have stressed the importance of consumers knowing the simple annual rate, and in most cases have supplied formulas to assist in computing the "true" annual rate. It also runs contrary to Dr. Johnson's own position when he was writing for a consumer-oriented publication. (7, p. 617-620)

1/This is further developed in Morse's Letter to the Editor (5)

ASSOCIATION NAME AND CITY OF HOME OFFICE	COMING		GOING		STAYING
	APPROXIMATE INTEREST RATE PER YEAR	DOES THE ASSOCIATION PAY INTEREST DAILY?	DOES THE ASSOCIATION PAY INTEREST DAILY?	DOES THE ASSOCIATION PAY INTEREST DAILY?	
AMERICAN SAVINGS OF SAN FRANCISCO	4.85%	YES	NO	NO	4.94% Quarterly
CITIZENS FEDERAL SAVINGS SAN FRANCISCO	4.85%	YES	NO	NO	4.94% Quarterly
FIRST SAVINGS SAN JOSE	4.85%	YES	NO	NO	4.94% Quarterly
GUARANTY SAVINGS SAN JOSE	4.85%	YES	NO	NO	4.94% Quarterly
S. F. FEDERAL SAVINGS SAN FRANCISCO	4.85%	YES	NO	NO	4.94% Quarterly
SECURITY SAVINGS SAN FRANCISCO	4.85%	YES	NO	NO	4.94% Quarterly
EUROPEA FEDERAL SAVINGS SAN FRANCISCO	4.85%	YES	NO	NO	4.94% Quarterly
LYTTON SAVINGS PALO ALTO	4.85%	YES	YES	YES	365 TIMES Daily
BAYVIEW FEDERAL SAVINGS SAN FRANCISCO	4.85%	YES	NO	NO	4 TIMES Quarterly
FRESNO GUARANTEE SAVINGS FRESNO	4.85%	YES	YES	NO	4 TIMES Quarterly

These savings associations are alike in three major respects. They are the biggest in savings in Northern California. They all offer insured safety on savings accounts. They are all excellent places to save. They do differ, however, in one major way. They are not equally profitable for you. It's easy to see where Lytton Savings gives you more... coming, going and staying!

COMING: Columns one and two are easy to understand. Column three, however, shows that nine of the associations do not give you interest from the day your funds are received. Your funds wait until the first of the next month to start earning interest. Not so at Lytton. We pay interest from the day funds are received. Worth coming to Lytton for.

GOING: Column four shows that when you take money out, none of the associations only pay you the interest you have earned if you withdraw at their convenience, which is no more than four times a year! You can lose a lot of interest this way! But Lytton Savings gives you more. We pay you all the interest you have earned to the exact day of withdrawal, when your funds have been in the association for six months. Worth going to Lytton for!

STAYING: What happens when you leave your funds for a full year with any of these 10 largest associations in Northern California? Check columns five and six. It shows that because we compound interest daily, 365 times a year, you receive a big 4.94% when our current annual rate of 4.85% is compounded daily and maintained for a year! Now that's worth staying for! All things considered, it's easy to see where you do make more... coming, going and staying, at Lytton Savings and Loan Association of Northern California.

You'll find the Lytton Savings' home office at University and Emerson, Palo Alto, 326 0602. Our branch office is at 5050 Broadway, Oakland, 652 8401. Obviously you really should find us. Now shouldn't you!

Funds received or postmarked by the 12th of April earn from the first of April.

APPENDIX B
SAVINGS ACCOUNT DATA SHEET

59

Passbook Accounts

I. Savings Institution

NAME _____
STREET _____
CITY _____ STATE _____ ZIP _____
INSURED _____ BY _____
CHARTER: Federal _____ State _____
MEMBER: Federal Reserve System _____
Federal Home Loan Bank System _____
Other _____

II. Rate of Return (If fully comply with stated rules)

Nominal Annual Rate _____
Effective Annual Rate _____
Bonus Interest: Yes _____ NO _____
Nominal annual rate _____
Effective annual rate _____
Minimum balance above which interest will not be paid _____
Split rate balance requirements _____

III. Liquidity

Minimum Amount Required To Open Account _____
Minimum Amount Required to Maintain Account _____

IV. Method of Computing Interest

daily _____
weekly _____
monthly _____
quarterly _____
semi-annually _____
other _____

Interest Payable

monthly _____
quarterly _____
semi-annually _____
annually _____
other _____

Dates of Interest Periods _____

Method of Computing Interest (cont.)

Dates Interest Payable _____

Interest Mailed to Customer _____

Interest Credited to Account _____

Optional _____

Date Opening Deposit Begins to Earn _____

Grace Days for Deposit

none _____

1st to 3rd _____

1st to 10th _____

1st to 15th _____

day of deposit _____

other _____

Based On:

calendar days _____

business days _____

Restrictions to grace day interest _____

Grace Days for Withdrawals

none _____

one _____

two _____

three _____

five _____

other _____

Account Balance on which Interest is Calculated

low balance for period _____

LIFO(last in, first out) _____

FIFO(first in, first out) _____

FIFO (applied to opening balance, then subsequent deposits) _____

day of deposit to day of withdrawal _____

V. Incentive Gift Bonus

Yes _____ No _____

Cash (amount) _____

Gift Item (specify) _____

Trading stamps(how many) _____

Other _____

Requirements to Receive Bonus _____

VI. Other

Postage paid on deposits _____

Postage paid on withdrawals _____

Limit on number if withdrawals _____

penalty for excess withdrawals _____

Passbook loans available _____

Is interest exempt from state tax? _____

REMARKS

SAVINGS ACCOUNT DATA SHEET

Special Savings Accounts*

I. Savings Institution

NAME _____
STREET _____
CITY _____ STATE _____ ZIP _____
INSURED? _____ BY _____
CHARTER: Federal _____ State _____
MEMBER: Federal Reserve System _____
Federal Home Loan Bank System _____
Other _____

II. Type of Savings Account (Name) _____

III. Rate of Return (If fully comply with rules)

Nominal Annual Rate _____
Effective Annual Rate _____
Bonus Interest Rate _____
Nominal annual rate _____
Effective Annual Rate _____
Rate Applicable if Option of Account Withdrawn _____

IV. Liquidity

Minimum Amount Required to Open Account _____
Minimum Balance Required to Maintain Account _____
Minimum Amount Required For Addition to Account _____
Qualifying Period to Receive Interest
none _____
30 days _____
90 days _____
6 months _____
9 months _____
other _____

Liquidity (cont.)

63

Qualifying Period to Receive Bonus Interest

30 days _____

90 days _____

6 months _____

9 months _____

Other _____

Withdrawal Notice Required

None _____

10 days _____

30 days _____

90 days _____

Other _____

Penalty for Failure of Withdrawal Notice _____

V. Method of Computing Interest

Simple Annual Interest _____

Interest Compounded

Daily _____

Monthly _____

Quarterly _____

Semi-annually _____

Other _____

Interest Payable

Monthly _____

Quarterly _____

Semi-annually _____

Annually _____

Other _____

Interest Begins

Day of deposit _____

Beginning of Present period _____

Beginning of next period _____

Other _____

Dates of Interest Payment Periods _____

Dated Interest Payable _____

Method of Computing Interest (cont.)

Accrued Bonus Interest Payable

End of Qualifying Period _____

Interest period following qualifying period _____

Other _____

] Grace Days for Deposits

None _____

1st to 3rd _____

1st to 10th _____

1st to 15th _____

Day of deposit _____

Other _____

Based on

Calendar days _____

Business days _____

Restrictions to grace day period _____

Grace Days for Withdrawals

None _____

One _____

Two _____

Three _____

Five _____

Other _____

Account Balance on Which Interest is Calculated

Low Balance for period _____

LIFO (last in, first out) _____

FIFO (first in, first out) _____

FIFO (applied to opening balance, the subsequent deposits) _____

Day of deposit to day of withdrawal _____

Interest Paid

By mail _____

Credited to account _____

Other _____

VI. Incentive Gift Bonus

Yes _____ NO _____

Cash (amount) _____

Incentive Gift Bonus (cont.)

Gift Item (specify) _____

Trading Stamps (number) _____

Other _____

Requirements to Receive Bonus _____

VII. Miscellaneous

Postage Paid on Deposits _____

Postage Paid on Withdrawals _____

Is Interest Exempt from State Tax _____

REMARKS

SAVINGS ACCOUNT DATA SHEET

Savings Certificates*I. Savings Institution

NAME _____
STREET _____
CITY _____ STATE _____ ZIP _____
INSURED? _____ BY _____
CHARTER: Federal _____ State _____
MEMBER: Federal Reserve System _____
Federal Home Loan Bank System _____
Other _____

II. *Type of Certificate (Name) _____
Certificate DenominationsIII. Rate of Return (If fully comply with rules)

Nominal Annual Rate _____
Effective Annual Rate _____
Bonus Interest Rate
Nominal annual rate _____
Effective annual rate _____

Rate applicable if portion of certificate amount withdrawn after maturity
date _____

IV. Liquidity

Maturity Date of Certificate

90 days _____
6 months _____
1 year _____
3 years _____
5 years _____
Other _____

Qualifying Period for Bonus Interest

6 months _____
1 year _____
3 years _____
5 years _____
Other _____

Liquidity (cont.)

Withdrawal Notice Required

10 days _____

30 days _____

60 days _____

Other _____

Penalty for failure of withdrawal notice _____

Can certificate be redeemed before maturity? _____

Penalty for redemption before maturity _____

V. Method of Computing Interest

Minimum Amount Required for Certificate _____

Simple Annual Interest _____

Interest Compounded

daily _____

quarterly _____

semi-annually _____

Other _____

Interest Payable

quarterly _____

semi-annually _____

annually _____

at maturity _____

other _____

Dates of interest payment periods _____

Dates interest payable _____

Interest Begins

day of deposit _____

beginning of present period _____

beginning of next period _____

other _____

Bonus Interest Payable

maturity date _____

interest period following maturity date _____

other _____

Bonus interest paid retroactive to date of deposit _____

Other _____

Interest Paid

by mail _____

credited to passbook savings account _____

rate for passbook account _____

optional _____

VI. Incentive Gift Bonus

Yes _____ No _____

Cash (amount) _____

Gift Item (specify) _____

Trading Stamps (number) _____

Other _____

Requirements to Receive Gift _____

VII. Miscellaneous

Exempt from state tax _____

REMARKS

DEPARTMENT OF FAMILY ECONOMICS
JUSTIN HALL

Dear

The enclosed material is a portion of a study we are conducting to gain an understanding of terms used to describe the characteristics of savings programs.

The purpose of this study is to sharpen our understanding by observing the difference in yield produced by introducing the various characteristics, singly and in combination, to a given format. This format standardizes account activity and the nominal annual rate. A careful search of advertising and a preliminary survey of financial institutions to learn about the prevailing characteristics of savings programs provided the basis for selecting the characteristics.

We would appreciate your assistance with this project because the very essence of this study concerns our ability to communicate.

We have developed some hypothetical models of yield resulting from various methods, one of which might fit your situation. Even if one does not fit your situation, the set will demonstrate the approach we are taking to identify the key characteristics of savings programs and the effect on yield under given conditions.

Would you indicate what method of calculation your bank uses, and if one of our models fits your situation, please identify it. If it does not, would you use the universal form to (1) describe the characteristics of your regular passbook savings program and (2) apply your method to the standardized activity pattern showing the amount of interest such a program yields.

Enclosed is (A) a description of the standardized activity pattern, "Comparative Savings Yield on Regular Passbook Savings Accounts", (B) a set of models which illustrate selected methods of calculating yield, (C) a set of definitions, (D) a summary of the yield produced by the models, and (E) two copies of a universal form for your use.

Your cooperation will be most sincerely appreciated. We do not presume to be experts in this field but are concerned, as undoubtedly you are, about the accuracy of communicating information about savings programs.

Yours truly,

Jackie Pinson
Graduate Research Assistant

Enclosures

COMPARATIVE SAVINGS YIELD ON REGULAR PASSBOOK SAVINGS ACCOUNTS

The problem of determining the yield from regular passbook savings accounts has prompted this investigation of the methods used for calculation of yield.

Given the annual percentage rate, one cannot always determine the yield without additional information. Certain variables such as grace days, frequency of compounding and treatment of account activity result in varying yields for a given pattern of account activity.

A preliminary investigation of the more frequently used methods of calculating savings yield suggested the construction of a hypothetical activity pattern for the purpose of comparing the dollar yield assuming specified variables and methods of calculation.

STANDARDIZED ACTIVITY PATTERN

Date	W/drawal	Deposit	Interest	Balance	Int. Memo
1-1-70				1,000.00	
1-10-70		2,000.00			
2-6-70		1,000.00			
3-5-70	1,000.00				
3-20-70	500.00				
3-30-70	500.00				
4-1-70					
7-1-70					

Five methods of calculation are used: low balance, FIFO (applied to beginning balance), FIFO, LIFO, and day of deposit to day of withdrawal. Each is used with an identical pattern of account activity for a six month period. The amount of money deposited and withdrawn during the period is constant as is the times of each activity. The assumed annual percentage rate is six per cent. Four variables are employed: frequency of compounding, frequency of crediting, grace days and penalties for an excess number of withdrawals during a stated time period.

A set of models is attached. Each model specifies the method of calculation and variables used.

A summary chart has been prepared showing the comparative yield obtained by use of these models.

DEFINITION OF METHODS USED FOR DETERMINING
YIELD ON REGULAR PASSBOOK SAVINGS ACCOUNTS

- Low Balance: yield is calculated on the low balance for the stated period.
- FIFO: (applied to the beginning balance): yield is calculated from day of deposit to the end of the period. Withdrawals are charged against the beginning balance of the period and then to subsequent deposits.
- FIFO: yield is calculated from day of deposit to the end of the period. Withdrawals are charged against the first deposit of the period and to subsequent deposits.
- LIFO: yield is calculated from day of deposit to the end of the period. Withdrawals are charged against the latest deposit of the period and then to the next latest deposits.
- Day of Deposit to Day of Withdrawal: yield is calculated for actual number of days funds remain in the account.

OTHER DEFINITIONS

- Yield: gross income derived by the customer from his savings account for a stated period.

SUMMARY

COMPARATIVE SAVINGS YIELDS

Methods of Calculation (\$)					
Combination of Variables	Low Balance	FIFO Beg. Bal.	FIFO	LIFO	Day Dep. to Day Withdrawal
QQO	44.93	52.44	53.93	58.44	75.30
QQLOP	59.95	55.44	56.94	61.44	78.30
QQLOM	59.95	56.28	57.77	62.28	79.13
QQO3	44.93	59.20	60.69	65.20	75.46
QQLOP3	67.46	62.20	63.70	68.20	78.46
QOOX	44.42	51.93	53.42	57.93	74.79
QSO	29.97				
					Code Combination of Variables
QSLOP	59.95				
QSO3	29.97				QQCompounded quarterly, credited quarterly
QSLOP3	59.95				QSCompounded quarterly, credited semi-annually
QSOX	29.46				SSCompounded semi-annually, credited semi-annually
SSO	29.75				ONo grace days
SSLOP	59.51				LOP10 deposit grace days, 1st - 10th of period
SSO3	29.75				LOM10 deposit grace days, 1st - 10th each month
SSLOP3	59.51				33 withdrawal grace days, end of period
SSOX	29.25				XPenalty for withdrawals, more than two per month

Code Combination of Variables

QQ		Compounded quarterly, credited quarterly
QS		Compounded quarterly, credited semi-annually
SS		Compounded semi-annually, credited semi-annually
O		No grace days
10P		10 deposit grace days, 1st - 10th of period
10M		10 deposit grace days, 1st - 10th each month
3		3 withdrawal grace days, end of period
X		Penalty for withdrawals, more than two per month

Example:

QQLOP Compounded quarterly,
 Credited quarterly
 10 deposit grace days,
 1st to 10th of period

UNIVERSAL FORM

Characteristics

Method of calculation _____

Frequency of compounding _____

Frequency of crediting _____

Number of deposit grace days _____

Number of withdrawal grace days _____

Penalty for excess number of withdrawals _____

Standardized Activity Pattern

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1-1-70				1,000.00	
1-10-70		2,000.00			
2-6-70		1,000.00			
3-5-70	1,000.00				
3-20-70	500.00				
3-30-70	500.00				
4-1-70					
7-1-70					

Comments

MODELS OF PASSBOOK SAVINGS YIELD
BASED ON A
STANDARDIZED ACTIVITY PATTERN
USING SELECTED METHODS
OF CALCULATION

**THIS BOOK
CONTAINS
NUMEROUS PAGES
WITH DIAGRAMS
THAT ARE CROOKED
COMPARED TO THE
REST OF THE
INFORMATION ON
THE PAGE.**

**THIS IS AS
RECEIVED FROM
CUSTOMER.**

LOW BALANCE METHOD

75

Compounded quarterly at 6%
Credited quarterly
No grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	14.79
4- 1-70			14.79	2,014.79	30.14
7- 1-70			30.14	2,044.93	

$$1) \quad 1,000.00 \times .06 \times \frac{90}{365} = 14.79$$

low balance first quarter
equals opening balance

$$2) \quad 2,014.79 \times .06 \times \frac{91}{365} = 30.14$$

second quarter interest

44.93

Total yield

Compounded quarterly at 6 %
Credited quarterly
10 deposit grace days (1st to 10th of period)
No withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	29.59
4- 1-70			29.59	2,029.59	30.36
7- 1-70			30.36	2,059.95	

$$1) \quad 2,000.00 \times .06 \times \frac{90}{365} = 29.59$$

low balance equals
March 30 balance

$$2) \quad 2,029.59 \times .06 \times \frac{91}{365} = 30.36$$

second quarter interest

59.95

Total yield

LOW BALANCE METHOD

76

Compounded quarterly at 6%

Credited quarterly

10 deposit grace days (1st to 10th of each month)

No withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	29.59
4- 1-70			29.59	2,029.59	20.36
7- 1-70			30.36	2,059.95	

$$1) \quad 2,000.00 \times .06 \times \frac{90}{365} = 29.59$$

low balance equals
March 30 balance

$$2) \quad 2,029.59 \times .06 \times \frac{91}{365} = 30.36$$

59.95

second quarter interest

Total yield

Compounded quarterly at 6%

Credited quarterly

No deposit grace days

3 withdrawal grace days (last three days of period)

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	14.79
4- 1-70			14.79	2,014.79	30.14
7- 1-70			30.14	2,044.93	

$$1) \quad 1,000.00 \times .06 \times \frac{90}{365} = 14.79$$

low balance equals
opening balance

$$2) \quad 2,014.79 \times .06 \times \frac{91}{365} = 30.14$$

44.93

second quarter interest

Total yield

LOW BALANCE METHOD

77

Compounded quarterly at 6%
 Credited quarterly
 10 deposit grace days (1st to 10th of period)
 3 Withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	36.99
4- 1-70			36.99	2,036.99	30.47
7- 1-70			30.47	2,067.46	

$$1) \quad 2,500.00 \times .06 \times \frac{90}{365} = 36.99$$

low balance equals
 March 20 balance

$$2) \quad 2,036.99 \times .06 \times \frac{91}{365} = 30.47$$

67.46

second quarter interest

Total yield

Compounded quarterly at 6%
 Credited quarterly
 No grace days

Penalty for excess withdrawals is 50 ¢ over 2 withdrawals per month

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	14.29
4- 1-70			14.29	2,014.29	30.13
7- 1-70			30.13	2,044.42	

$$1) \quad 1,000.00 \times .06 \times \frac{90}{365} = 14.79$$

low balance equals
 opening balance

$$2) \quad \text{less } 50\% \text{ penalty} \quad \frac{.50}{14.29}$$

second quarter interest

$$3) \quad 2,014.29 \times .06 \times \frac{91}{365} = 30.13$$

74.42

Total yield

LOW BALANCE METHOD

78

Compounded quarterly at 6%
Credited semi-annually
No grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	14.79
4- 1-70				2,000.00	15.18
7- 1-70			29.97	2,029.97	

- 1) $1,000.00 \times .06 \times \frac{90}{365} = 14.79$ low Balance equals opening balance
- 2) $1,014.79 \times .06 \times \frac{91}{365} = 15.18$ low balance plus interest on interest
- 3) 29.97 Total yield

Compounded quarterly at 6%
Credited semi-annually
10 deposit grace days (1st to 10th of period)
No withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	29.59
4- 1-70				2,000.00	30.36
7- 1-70			59.95	2,059.95	

- 1) $2,000.00 \times .06 \times \frac{90}{365} = 29.59$ low balance equals March 30 balance
- 2) $2,029.95 \times .06 \times \frac{91}{365} = 30.36$ low balance plus interest on interest
- 3) 59.95 Total yield

LOW BALANCE METHOD

79

Compounded quarterly at 6%
 Credited semi-annually
 No deposit grace days
 3 withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	14.79
4- 1-70				2,000.00	15.18
7- 1-70			29.97	2,029.97	

- 1) $1,000.00 \times .06 \times \frac{90}{365} = 14.79$ low balance equals opening balance
- 2) $1,014.79 \times .06 \times \frac{91}{365} = 15.18$ low balance plus interest on interest
- 3) 29.97 Total yield

Compounded quarterly at 6%
 Credited semi-annually
 10 deposit grace days (1st to 10th of period)
 3 withdrawal grace days (last three days of period)

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	29.59
4- 1-70				2,000.00	30.36
7- 1-70			59.95	2,059.95	

- 1) $2,000.00 \times .06 \times \frac{90}{365} = 29.59$ low balance equals March 30 balance
- 2) $2,029.95 \times .06 \times \frac{91}{365} = 30.36$ low balance plus interest on interest
- 3) 59.95 Total yield

Low Balance Method

80

Compounded quarterly at 6%

Credited semi-annually

No grace days

Penalty for excess withdrawals is 50% for each withdrawal over two per month

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	14.29
4- 1-70				2,014.29	15.17
7- 1-70			29.46	2,029.46	

$$1) \quad 1,000.00 \times .06 \times \frac{90}{365} = 14.79$$

low balance equals opening balanced

$$2) \quad \text{less } 50\% \text{ penalty} \quad \frac{.50}{14.29}$$

$$3) \quad 2,014.29 \times .06 \times \frac{91}{365} = 15.17$$

low balance plus interest on interest

$$4) \quad 29.46$$

Total yield

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	
4- 1-70					
7- 1-70					

LOW BALANCE METHOD

81

Compounded semi-annually at 6%
Credited semi-annually
No grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	
4- 1-70				2,000.00	29.75
7- 1-70			29.75	2,029.75	

1) $1,000.00 \times .06 \times \frac{181}{365} = 29.75$ low balance equals opening balance

29.75 Total yield

Compounded semi-annually at 6%
Credited semi-annually
10 deposit grace days (1st to 10th of period)
No withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	
4- 1-70				2,000.00	59.51
7- 1-70			59.51	2,059.51	

1) $2,000.00 \times .06 \times \frac{181}{365} = 59.51$ low balance equals April 1 balance

59.51 Total Yield

LOW BALANCE METHOD

82

Compounded semi-annually at 6%
 Credited semi-annually
 No deposit grace days
 3 withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	
4- 1-70				2,000.00	29.75
7- 1-70			29.75	2,029.75	

$$1) \quad 1,000.00 \times .06 \times \frac{181}{365} = 29.75$$

low balance equals
opening balance

29.75

Total yield

Compounded semi-annually at 6%

Credited semi-annually

10 deposit grace days (1st to 10th of period)

3 withdrawal grace days (last three days of period)

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	
4- 1-70				2,000.00	59.51
7- 1-70			59.51	2,059.51	

$$1) \quad 2,000.00 \times .06 \times \frac{181}{365} = 59.51$$

low balance equals
April 1 balance

59.51

Total Yield

LOW BALANCE METHOD

83

Compounded semi-annually at 6%

Credited semi-annually

No grace days

Penalty for excess withdrawals is 50¢ for each withdrawal over two per month

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	
4- 1-70				2,000.00	29.25
7- 1-70			29.25	2,029.25	

$$\begin{array}{l}
 1) \ 1,000.00 \times .06 \times \frac{181}{365} = 29.75 \\
 2) \ \text{less } 50\% \text{ penalty} \quad .50 \\
 \hline
 29.25
 \end{array}$$

low balance equals
opening balance

Total yield

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	
1-10-70		2,000.00		3,000.00	
2- 6-70		1,000.00		4,000.00	
3- 5-70	1,000.00			3,000.00	
3-20-70	500.00			2,500.00	
3-30-70	500.00			2,000.00	
4- 1-70					
7- 1-70					

FIFO APPLIED TO BEGINNING BALANCE

(First in, First out)

Compounded Quarterly at 6%
 Credited Quarterly
 No grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	41.42
2- 6-70		1,000.00		4,000.00	50.30
3- 5-70	1,000.00			3,000.00	35.51
3-20-70	500.00			2,500.00	28.85
3-30-70	500.00			2,000.00	22.19
4- 1-70			22.19	2,022.19	30.25
7- 1-70			30.25	2,052.44	

- 1) $1000.00 \times .06 \times 90/365 = 14.79$ (Anticipated interest for the quarter.)
- 2) $2000.00 \times 81/365 = 26.63$
- 3) $14.79 + 26.63 = 41.42$ (new anticipated interest)
- 4) $1000.00 \times 54/365 = 8.88$
- 5) $41.42 + 8.88 = 50.30$ (new anticipated interest)
- 6) $1000.00 \times 90/365 = 14.79$ (withdrawal charged against beginning balance)
- 7) $50.30 - 14.79 = 35.51$
- 8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)
- 9) $35.51 - 6.66 = 28.85$
- 10) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)
- 11) $28.85 - 6.66 = 22.19$
- 12) $2022.19 \times .06 \times 91/365 = 30.25$ (anticipated interest beginning second quarter)
- 13) $2022.19 + 30.25 = 2052.44$ (beginning balance for third quarter)

FIFO APPLIED AGAINST OPENING BALANCE
(First in, First out)

Compounded Quarterly at 6%
Credited Quarterly
10 deposit grace days (1st to 10th of period)
No withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	44.38
2- 6-70		1,000.00		4,000.00	53.26
3- 5-70	1,000.00			3,000.00	38.47
3-20-70	500.00			2,500.00	31.81
3-30-70	500.00			2,000.00	25.15
4- 1-70			25.15	2,025.15	30.29
7- 1-70			30.29	2,055.44	

- 1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the first quarter)
- ✓ 2) $2000.00 \times .06 \times 90/365 = 29.59$ (earns from the 1st)
- 3) $14.79 + 29.59 = 44.38$ (new anticipated interest)
- 4) $1000.00 \times .06 \times 54/365 = 8.88$
- 5) $44.38 + 8.88 = 53.26$ (new anticipated interest)
- 6) $1000.00 \times .06 \times 90/365 = 14.79$ (withdrawal charged against beginning balance)
- 7) $53.26 - 14.79 = 38.47$
- 8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)
- 9) $38.47 - 6.66 = 31.81$
- 10) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)
- 11) $31.81 - 6.66 = 25.15$
- 12) $2025.15 \times .06 \times 91/365 = 30.29$ (anticipated interest beginning second quarter)
- 13) $2025.15 + 30.29 = 2055.44$ (beginning balance third quarter)

FIFO APPLIED TO OPENING BALANCE
(First in, First out)

Compounded Quarterly at 6%

Credited Quarterly

10 deposit grace days (1st to 10th of each month)

No withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	44.38
2- 6-70		1,000.00		4,000.00	54.08
3- 5-70	1,000.00			3,000.00	39.29
3-20-70	500.00			2,500.00	32.63
3-30-70	500.00			2,000.00	25.97
4- 1-70			25.97	2,026.24	30.31
7- 1-70			30.31	2056.28	

1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)

✓2) $2000.00 \times .06 \times 90/365 = 25.59$ (earns from the 1st)

3) $14.79 + 25.59 = 44.38$ (new anticipated interest)

✓4) $1000.00 \times .06 \times 59/365 = 9.70$ (earns from the 1st of Feb)

5) $44.38 + 9.70 = 54.08$ (new anticipated interest)

6) $1000.00 \times .06 \times 90/365 = 14.79$ (withdrawal charged against beginning balance)

7) $54.08 - 14.79 = 39.29$

8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)

9) $39.29 - 6.66 = 32.63$

10) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)

11) $32.63 - 6.66 = 25.97$

12) $2025.97 \times .06 \times 91/365 = 30.31$ (anticipated interest beginning second quarter)

13) $2025.97 + 30.31 = 2056.28$ (beginning balance third quarter)

FIFO APPLIED TO BEGINNING BALANCE
(First in, First out)

Compounded Quarterly at 6%
Credited Quarterly
no deposit grace days
3 withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	41.42
2- 6-70		1,000.00		4,000.00	50.30
3- 5-70	1,000.00			3,000.00	35.51
3-20-70	500.00			2,500.00	28.85
3-30-70	500.00			2,000.00	28.85
4- 1-70			28.85	2,028.85	30.35
7- 1-70			30.35	2059.20	

- 1) $1000 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)
- 2) $2000 \times .06 \times 81/365 = 26.63$
- 3) $14.79 + 26.63 = 41.42$ (new anticipated interest)
- 4) $1000 \times .06 \times 54/365 = 8.88$
- 5) $41.42 + 8.88 = 50.30$ (new anticipated interest)
- 6) $1000 \times .06 \times 90/365 = 14.79$ (withdrawal charged against beginning balance)
- 7) $50.30 - 14.79 = 35.51$
- 8) $500 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)
- 9) $35.51 - 6.66 = 28.85$
- 10) 500.00 withdrawal - no interest loss - falls in 3 day grace period
- 11) $2028.85 \times .06 \times 91/365 = 30.35$ (anticipated interest beginning second quarter)
- 12) $2028.85 + 30.35 = 2059.20$ (beginning balance third quarter)

FIFO APPLIED TO BEGINNING BALANCE
(First in, First out)

Compounded Quarterly at 6%

Credited Quarterly

10 deposit grace days (1st to 10 th of period)

3 withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	44.38
2- 6-70		1,000.00		4,000.00	53.26
3- 5-70	1,000.00			3,000.00	38.47
3-20-70	500.00			2,500.00	31.81
3-30-70	500.00			2,000.00	31.81
4- 1-70			31.81	2,031.81	30.39
7- 1-70			30.39	2,062.20	

1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)

2) $2000.00 \times .06 \times 90/365 = 29.59$ (earns from the 1st)

3) $14.79 + 29.59 = 44.38$ (new anticipated interest)

4) $1000.00 \times .06 \times 54/365 = 8.88$

5) $44.38 + 8.88 = 53.26$ (new anticipated interest)

6) $1000.00 \times .06 \times 90/365 = 14.79$ (withdrawal charges against beginning balance)

7) $53.26 - 14.79 = 38.47$

8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)

9) $38.47 - 6.66 = 31.81$

10) 500.00 withdrawal - no interest loss -- falls in 3 day grace period

11) $2031.81 \times .06 \times 91/365 = 30.39$ (anticipated interest beginning second quarter)

12) $2031.81 + 30.39 = 2062.20$ (beginning balance third quarter)

FIFO APPLIED TO BEGINNING BALANCE
(First in, First out)

Compounded Quarterly at 6%

Credited Quarterly

No grace days

Penalty for excess withdrawals = 50¢ for each withdrawal over two per month

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	41.42
2- 6-70		1,000.00		4,000.00	50.30
3- 5-70	1,000.00			3,000.00	35.51
3-20-70	500.00			2,500.00	28.85
3-30-70	500.00			2,000.00	21.69
4- 1-70			21.69	2,021.69	30.24
7- 1-70			30.24	2,051.93	

- 1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)
- 2) $2000.00 \times .06 \times 81/365 = 26.63$
- 3) $14.79 + 26.63 = 41.42$ (new anticipated interest)
- 4) $1000.00 \times .06 \times 51/365 = 8.88$
- 5) $41.42 + 8.88 = 50.30$ (new anticipated interest)
- 6) $1000.00 \times .06 \times 90/365 = 14.79$ (withdrawal charged against beginning balance)
- 7) $50.30 - 14.49 = 35.51$
- 8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)
- 9) $35.51 - 6.66 = 28.85$
- 10) $500.00 \times 81/365 = 6.66$ (withdrawal charged against first deposit)
- 11) $28.85 - 6.66 = 22.19$
- 12) $22.19 - 50¢ \text{ penalty} = 21.69$
- 13) $2021.69 \times .06 \times 91/365 = 30.24$ (anticipated second quarter)
- 14) $2021.69 + 30.24 = 2051.93$ (balance beginning third quarter)

FIFO METHOD
(First in, First out)

Compounded Quarterly at 6%
Credited Quarterly
No grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	41.42
2- 6-70		1,000.00		4,000.00	50.30
3- 5-70	1,000.00			3,000.00	36.98
3-20-70	500.00			2,500.00	30.32
3-30-70	500.00			2,000.00	23.66
4- 1-70			23.66	2,023.66	30.27
7- 1-70			30.27	2,053.93	

- 1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)
- 2) $2000.00 \times .06 \times 81/365 = 26.63$
- 3) $14.79 + 26.63 = 41.42$ (new anticipated interest)
- 4) $1000.00 \times .06 \times 54/365 = 8.88$
- 5) $41.42 + 8.88 = 50.30$ (new anticipated interest)
- 6) $1000.00 \times .06 \times 81/365 = 13.32$ (withdrawal against first deposit of period)
- 7) $50.30 - 13.32 = 36.98$
- 8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)
- 9) $36.98 - 6.66 = 30.32$
- 10) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)
- 11) $30.32 - 6.66 = 23.66$
- 12) $2023.66 \times .06 \times 91/365 = 30.27$ (anticipated balance beginning second quarter)
- 13) $2023.66 + 30.27 = 2053.93$ (beginning balance third quarter)

FIFO METHOD
(First in, First out)

Compounded Quarterly at 6%

Credited Quarterly

10 deposit grace days (1st to 10th of the period)

No withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	44.38
2- 6-70		1,000.00		4,000.00	53.26
3- 5-70	1,000.00			3,000.00	39.94
3-20-70	500.00			2,500.00	33.28
3-30-70	500.00			2,000.00	26.62
4- 1-70			26.62	2,026.62	30.32
7- 1-70			30.32	2,056.94	

- 1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)
- 2) $2000.00 \times .06 \times 90/365 = 29.59$ (earns from the 1st)
- 3) $14.79 + 29.59 = 44.38$ (new anticipated interest)
- 4) $1000.00 \times .06 \times 54/365 = 8.88$
- 5) $44.38 + 8.88 = 53.26$ (new anticipated interest)
- 6) $1000.00 \times .06 \times 81/365 = 13.32$ (withdrawal charged against 1st deposit)
- 7) $53.26 - 13.32 = 39.94$
- 8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against 1st deposit)
- 9) $39.94 - 6.66 = 33.28$
- 10) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against 1st deposit)
- 11) $33.28 - 6.66 = 26.62$
- 12) $2,026.62 \times .06 \times 91/365 = 30.32$ (anticipated interest beginning second quarter)
- 13) $2,026.62 + 30.32 = 2,056.94$ (beginning balance third quarter)

FIFO METHOD
(First in, First out)

Compounded Quarterly at 6%

Credited Quarterly

10 deposit grace days (1st to 10th of each month)

No withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	44.38
2- 6-70		1,000.00		4,000.00	54.08
3- 5-70	1,000.00			3,000.00	40.76
3-20-70	500.00			2,500.00	34.10
3-30-70	500.00			2,000.00	27.44
4- 1-70			27.44	2,027.44	30.33
7- 1-70			30.33	2,057.77	

- 1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)
- 2) $2000.00 \times .06 \times 90/365 = 29.59$ (earns from the first)
- 3) $14.79 + 29.59 = 44.38$ (new anticipated interest)
- 4) $1000.00 \times .06 \times 59/365 = 9.70$ (earns from the first of Feb)
- 5) $44.38 + 9.70 = 54.08$ (new anticipated interest)
- 6) $1000.00 \times .06 \times 81/365 = 13.32$ (withdrawal charged against first deposit)
- 7) $54.08 - 13.32 = 40.76$
- 8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)
- 9) $40.76 - 6.66 = 34.10$
- 10) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)
- 11) $34.10 - 6.66 = 27.44$
- 12) $2027.44 \times .06 \times 91/365 = 30.33$ (anticipated interest beginning second quarter)
- 13) $2027.44 + 30.33 = 2057.77$ (beginning balance third quarter)

FIFO METHOD
(First in, First out)

Compounded Quarterly at 6%
Credited Quarterly
No deposit grace days
3 withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	41.42
2- 6-70		1,000.00		4,000.00	50.30
3- 5-70	1,000.00			3,000.00	36.98
3-20-70	500.00			2,500.00	30.32
3-30-70	500.00			2,000.00	30.32
4- 1-70			30.32	2,030.32	30.37
7- 1-70			30.37	2,060.69	

- 1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)
- 2) $2000.00 \times .06 \times 81/365 = 26.63$
- 3) $14.79 + 26.63 = 41.42$ (new anticipated interest)
- 4) $1000.00 \times .06 \times 54/365 = 8.88$
- 5) $41.42 + 8.88 = 50.30$ (new anticipated interest)
- 6) $1000.00 \times .06 \times 81/365 = 13.32$ (withdrawal charged against first deposit)
- 7) $50.30 - 13.32 = 36.98$
- 8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)
- 9) $36.98 - 6.66 = 30.32$
- 10) 500.00 withdrawal - no interest loss fell in grace day period
- 11) $2030.32 \times .06 \times 91/365 = 30.37$ (anticipated interest beginning second quarter)
- 12) $2030.32 + 30.37 = 2060.69$ (balance beginning third quarter)

FIFO METHOD
(First in, First out)

Compounded Quarterly at 6%

Credited Quarterly

10 deposit grace days (1st to 10th of the period)

3 withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	44.38
2- 6-70		1,000.00		4,000.00	53.26
3- 5-70	1,000.00			3,000.00	39.94
3-20-70	500.00			2,500.00	33.28
3-30-70	500.00			2,000.00	33.28
4- 1-70			33.28	2,033.28	30.42
7- 1-70			30.42	2,063.70	

- 1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the period)
- 2) $2000.00 \times .06 \times 90/365 = 29.59$ (earns from 1st)
- 3) $14.79 + 29.59 = 44.38$ (new anticipated interest)
- 4) $1000.00 \times .06 \times 54/365 = 8.88$
- 5) $44.38 + 8.88 = 53.26$ (new anticipated interest)
- 6) $1000.00 \times .06 \times 81/365 = 13.32$ (withdrawal charged against 1st deposit)
- 7) $53.26 - 13.32 = 39.94$
- 8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)
- 9) $39.94 - 6.66 = 33.28$
- 10) 500.00 withdrawal - no loss falls in 3 day grace period
- 11) $2033.28 \times .06 \times 91/365 = 30.42$ (anticipated interest beginning 2nd quarter)
- 12) $2033.28 + 30.42 = 2063.70$ (beginning balance third quarter)

FIFO METHOD
(First in, First out)

Compounded Quarterly at 6%

Credited Quarterly

no grace days

Penalty for excess withdrawals is 50 cents for each withdrawal over two per month

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	41.42
2- 6-70		1,000.00		4,000.00	50.30
3- 5-70	1,000.00			3,000.00	36.98
3-20-70	500.00			2,500.00	30.32
3-30-70	500.00			2,000.00	23.16
4- 1-70			23.16	2,023.16	30.26
7- 1-70			30.26	2,053.42	

- 1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)
- 2) $2000.00 \times .06 \times 81/365 = 26.63$
- 3) $14.79 + 26.63 = 41.42$ (new anticipated interest)
- 4) $1000.00 \times .06 \times 54/365 = 8.88$
- 5) $41.42 + 8.88 = 50.30$ (new anticipated interest)
- 6) $1000.00 \times .06 \times 81/365 = 13.32$ (withdrawal charged against first deposit)
- 7) $50.30 - 13.32 = 36.98$
- 8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against first deposit)
- 9) $36.98 - 6.66 = 30.32$
- 10) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against 1st deposit)
- 11) $30.32 - 6.66 = 23.66$
- 12) $23.66 - 50¢ \text{ penalty} = 23.16$
- 13) $2023.16 \times .06 \times 91/365 = 30.26$ (anticipated interest beginning second quarter)
- 14) $2023.16 + 30.26 = 2053.42$ (beginning balance third quarter)

LIFO METHOD
Last in, First out)

Compounded Quarterly at 6%
Credited Quarterly
No grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	41.42
2- 6-70		1,000.00		4,000.00	50.30
3- 5-70	1,000.00			3,000.00	41.42
3-20-70	500.00			2,500.00	34.76
3-30-70	500.00			2,000.00	28.10
4- 1-70			28.10	2,028.10	30.34
7- 1-70			30.34	2,058.44	

- 1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)
- 2) $2000.00 \times .06 \times 81/365 = 26.63$
- 3) $14.79 + 26.63 = 41.42$ (new anticipated interest)
- 4) $1000.00 \times .06 \times 54/365 = 8.88$
- 5) $41.42 + 8.88 = 50.30$ (new anticipated interest)
- 6) $1000.00 \times .06 \times 54/365 = 8.88$ (withdrawal charged against last deposit)
- 7) $50.30 - 8.88 = 41.42$
- 8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against next to the last deposit)
- 9) $41.42 - 6.66 = 34.76$
- 10) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against next to the last deposit)
- 11) $34.76 - 6.66 = 28.10$
- 12) $2028.10 \times .06 \times 91/365 = 30.34$ (anticipated interest beginning second quarter)
- 13) $2028.10 + 30.34 = 2058.44$ (balance beginning third quarter)

LIFO METHOD
(Last in, First out)

Compounded Quarterly at 6%

Credited Quarterly

10 deposit grace days (1st to 10th of the period)

No withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	44.38
2- 6-70		1,000.00		4,000.00	53.26
3- 5-70	1,000.00			3,000.00	44.38
3-20-70	500.00			2,500.00	37.72
3-30-70	500.00			2,000.00	31.06
4- 1-70			31.06	2031.06	30.38
7- 1-70			30.38	2,061.44	

- 1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)
- 2) $2000.00 \times .06 \times 90/365 = 29.59$ (earns from the first)
- 3) $14.79 + 29.59 = 44.38$ (new anticipated interest)
- 4) $1000.00 \times .06 \times 54/365 = 8.88$
- 5) $44.38 + 8.88 - 53.26$ (new anticipated interest)
- 6) $1000.00 \times .06 \times 54/365 = 8.88$ (withdrawal charged against last deposit)
- 7) $53.26 - 8.88 = 44.38$
- 8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against next to last deposit)
- 9) $44.38 - 6.66 = 37.72$
- 10) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against next to last deposit)
- 11) $37.72 - 6.66 = 31.06$
- 12) $2031.06 \times .06 \times 91/365 = 30.38$ (anticipated interest beginning second quarter)
- 13) $2031.06 + 30.38 = 2061.44$ (balance beginning third quarter)

LIFO METHOD
(Last in, First out)

Compounded Quarterly at 6%

Credited Quarterly

10 deposit grace days (1st to 10th of each month)

No withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	44.38
2- 6-70		1,000.00		4,000.00	54.08
3- 5-70	1,000.00			3,000.00	45.20
3-20-70	500.00			2,500.00	38.54
3-30-70	500.00			2,000.00	31.88
4- 1-70			31.88	2,031.88	30.40
7- 1-70			30.40	2,062.28	

1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)

2) $2000.00 \times .06 \times 90/365 = 29.59$ (earns from the first)

3) $14.79 + 29.59 = 44.38$ (new anticipated interest)

4) $1000.00 \times .06 \times 59/365 = 9.70$ (earns from first of Feb)

5) $44.38 + 9.70 = 54.08$ (new anticipated interest)

6) $1000.00 \times .06 \times 54/365 = 8.88$ (withdrawal charged against last deposit)

7) $54.08 - 8.88 = 45.20$

8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against next to last deposit)

9) $45.20 - 6.66 = 38.54$

10) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against next to last deposit)

11) $38.54 - 6.66 = 31.88$

12) $2031.88 \times .06 \times 91/365 = 30.40$ (anticipated interest beginning second quarter)

13) $2031.88 + 30.40 = 2062.28$ (balance beginning third quarter)

LIFO METHOD
(Last in, First out)

Compounded Quarterly at 6%
Credited Quarterly
No deposit grace days
3 withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	41.42
2- 6-70		1,000.00		4,000.00	50.30
3- 5-70	1,000.00			3,000.00	41.42
3-20-70	500.00			2,500.00	34.76
3-30-70	500.00			2,000.00	34.76
4- 1-70			34.76	2,34.76	30.44
7- 1-70			30.44	2,065.20	

- 1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)
- 2) $2000.00 \times .06 \times 81/365 = 26.63$
- 3) $14.79 + 26.63 = 41.42$ (new anticipated interest)
- 4) $1000.00 \times .06 \times 54/365 = 8.88$
- 5) $41.42 + 8.88 = 50.30$ (new anticipated interest)
- 6) $1000.00 \times .06 \times 54/365 = 8.88$ (withdrawal charged against last deposit)
- 7) $50.30 - 8.88 = 41.42$
- 8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against next to last deposit)
- 9) $41.42 - 6.66 = 34.76$
- 10) 500.00 withdrawal - no interest loss-falls in 3 day grace period
- 11) $2034.76 \times .06 \times 91/365 = 30.44$ (anticipated interest beginning second quarter)
- 12) $2034.75 + 30.44 = 2065.20$ (balance beginning third quarter)

LIFO METHOD
(Last in, First out)

Compounded Quarterly at 6%
Credited Quarterly
10 deposit grace days (1st to 10th of period)
3 withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	44.38
2- 6-70		1,000.00		4,000.00	53.26
3- 5-70	1,000.00			3,000.00	44.38
3-20-70	500.00			2,500.00	37.72
3-30-70	500.00			2,000.00	37.72
4- 1-70			37.72	2,037.72	30.48
7- 1-70			30.48	2,068.20	

- 1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)
- 2) $2000.00 \times .06 \times 90/365 = 29.59$ (earns from the first)
- 3) $14.79 + 29.59 = 44.38$ (new anticipated interest)
- 4) $1000.00 \times .06 \times 54/365 = 8.88$
- 5) $44.38 + 8.88 = 53.26$ (new anticipated interest)
- 6) $1000.00 \times .06 \times 54/365 = 8.88$ (withdrawal charged against last deposit)
- 7) $53.26 - 8.88 = 44.38$
- 8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against next to last deposit)
- 9) $44.38 - 6.66 = 37.72$
- 10) 500.00 withdrawal - no interest loss-falls in 3 day grace period
- 11) $2037.72 \times .06 \times 91/365 = 30.48$ (anticipated interest beginning second quarter)
- 12) $2037.72 + 30.48 = 2068.20$ (beginning balance for third quarter)

LIFO METHOD
(Last in, First out)

Compounded Quarterly at 6%

Credited Quarterly

No grace days

Penalty for excess withdrawals is 50 cents for each withdrawal over two per month

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	41.42
2- 6-70		1,000.00		4,000.00	50.30
3- 5-70	1,000.00			3,000.00	41.42
3-20-70	500.00			2,500.00	34.76
3-30-70	500.00			2,000.00	27.60
4- 1-70			27.60	2,027.60	30.33
7- 1-70			30.33	2,057.93	

1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)

2) $2000.00 \times .06 \times 81/365 = 26.63$

3) $14.79 + 26.63 = 41.42$ (new anticipated interest)

4) $1000.00 \times .06 \times 54/365 = 8.88$

5) $41.42 + 8.88 = 50.30$ (new anticipated interest)

6) $1000.00 \times .06 \times 54/365 = 8.88$ (withdrawal charged against last deposit)

7) $50.30 - 8.88 = 41.42$

8) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against next to last deposit)

9) $41.42 - 6.66 = 34.76$

10) $500.00 \times .06 \times 81/365 = 6.66$ (withdrawal charged against next to last deposit)

11) $34.76 - 6.66 = 28.10$

12) $28.10 - 50\text{¢ penalty} = 27.60$

13) $2027.60 \times .06 \times 91/365 = 30.33$ (anticipated interest beginning second quarter)

14) $2027.60 + 30.33 = 2057.93$ (beginning balance third quarter)

DAY OF DEPOSIT TO DAY OF WITHDRAWAL METHOD
(Also referred to as Daily Interest, Day-in,
Day-out, Instant Interest)

Compounded Quarterly at 6%
Credited Quarterly
No grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	41.42
2- 6-70		1,000.00		4,000.00	50.30
3- 5-70	1,000.00			3,000.00	45.86
3-20-70	500.00			2,500.00	44.87
3-30-70	500.00			2,000.00	44.71
4- 1-70			44.91	2,044.71	30.59
7- 1-70			30.59	2,075.30	

1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)

2) $2000.00 \times .06 \times 81/365 = 26.63$

3) $14.79 + 26.63 = 41.42$ (new anticipated interest)

4) $1000.00 \times .06 \times 54/365 = 8.88$

5) $41.42 + 8.88 = 50.30$ (new anticipated interest)

6) $1000.00 \times .06 \times 27/365 = 4.44$ (withdrawal for actual number of days)

7) $50.30 - 4.44 = 45.86$

8) $500.00 \times .06 \times 12/365 = .99$ (withdrawal for actual number of days)

9) $45.86 - .99 = 44.87$

10) $500.00 \times .06 \times 2/365 = .16$ (withdrawal for actual number of days)

11) $44.87 - .16 = 44.71$

12) $2044.71 \times .06 \times 91/365 = 30.59$ (anticipated interest beginning second quarter)

13) $2044.71 + 30.59 = 2075.30$ (beginning balance third quarter)

DAY OF DEPOSIT TO DAY OF WITHDRAWAL METHOD
(Also referred to as Daily Interest, Day-in,
Day-out, Instant Interest)

Compounded Quarterly at 6%

Credited Quarterly

10 deposit grace days (1st to 10th of the period)

No withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	44.38
2- 6-70		1,000.00		4,000.00	53.26
3- 5-70	1,000.00			3,000.00	48.82
3-20-70	500.00			2,500.00	47.83
3-30-70	500.00			2,000.00	47.67
4- 1-70			47.67	2,047.67	30.63
7- 1-70			30.63	2,078.30	

1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated balance for the quarter)

2) $2000.00 \times .06 \times 90/365 = 29.59$ (earns from the first)

3) $14.79 + 29.59 = 44.38$ (new anticipated balance)

4) $1000.00 \times .06 \times 54/365 = 8.88$

5) $44.38 + 8.88 = 53.26$ (new anticipated interest)

6) $1000.00 \times .06 \times 27/365 = 4.44$ (withdrawal for actual number of days)

7) $53.26 - 4.44 = 48.82$

8) $500.00 \times .06 \times 12/365 = .99$ (withdrawal for actual number of days)

9) $48.82 - .99 = 47.83$

10) $500.00 \times .06 \times 2/365 = .16$ (withdrawal for actual number of days)

11) $47.83 - .16 = 47.67$

12) $2047.67 \times .06 \times 91/365 = 30.63$ (anticipated interest beginning second quarter)

13) $2047.67 + 30.63 = 2078.30$ (beginning balance third quarter)

DAY OF DEPOSIT TO DAY OF WITHDRAWAL METHOD
(Also referred to as Daily Interest, Day-in,
Day-out, Instant Interest)

Compounded Quarterly at 6%

Credited Quarterly

10 deposit grace days (1st to 10th of each month)

No withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	44.38
2- 6-70		1,000.00		4,000.00	54.08
3- 5-70	1,000.00			3,000.00	49.64
3-20-70	500.00			2,500.00	48.65
3-30-70	500.00			2,000.00	48.49
4- 1-70			48.49	2,048.49	30.64
7- 1-70			30.64	2,079.13	

1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)

2) $2000.00 \times .06 \times 90/365 = 29.59$ (earns from the first)

3) $14.79 + 29.59 = 44.38$ (new anticipated interest)

4) $1000.00 \times .06 \times 59/365 = 9.70$ (earns from first of Feb)

5) $44.38 + 9.70 = 54.08$ (new anticipated interest)

6) $1000.00 \times .06 \times 27/365 = 4.44$ (withdrawal for actual number of days)

7) $54.08 - 4.44 = 49.64$

8) $500.00 \times .06 \times 12/365 = .99$ (withdrawal for actual number of days)

9) $49.64 - .99 = 48.65$

10) $500.00 \times .06 \times 2/365 = .16$ (withdrawal for actual number of days)

11) $48.65 - .16 = 48.49$

12) $2048.49 \times .06 \times 91/365 = 30.64$ (anticipated balance beginning second quarter)

13) $2048.49 + 30.64 = 2079.13$ (beginning balance third quarter)

DAY OF DEPOSIT TO DAY OF WITHDRAWAL METHOD
(Also referred to as Daily Interest, Day-in,
Day-out, Instant Interest)

Compounded Quarterly at 6%
Credited Quarterly
No deposit grace days
3 withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	41.42
2- 6-70		1,000.00		4,000.00	50.30
3- 5-70	1,000.00			3,000.00	45.86
3-20-70	500.00			2,500.00	44.87
3-30-70	500.00			2,000.00	44.87
4- 1-70			44.87	2,044.87	30.59
7- 1-70			30.59	2,075.46	

- 1) $1000.00 \times .06 \times 90.365 = 14.79$ (anticipated interest for the quarter)
- 2) $2000.00 \times .06 \times 81/365 = 26.63$
- 3) $14.79 + 26.63 = 41.42$ (new anticipated interest)
- 4) $1000.00 \times .06 \times 54/365 = 8.88$
- 5) $41.42 + 8.88 = 50.30$ (new anticipated interest)
- 6) $1000.00 \times .06 \times 27/365 = 4.44$ (withdrawal for actual number of days)
- 7) $50.30 - 4.44 = 45.86$
- 8) $500.00 \times .06 \times 12/365 = .99$ (withdrawal for actual number of days)
- 9) $45.86 - .99 = 44.87$
- 10) 500.00 withdrawal - no interest loss-falls in grace day period
- 11) $2044.87 \times .06 \times 91/365 = 30.59$ (anticipated interest beginning second quarter)
- 12) $2044.87 + 30.59 = 2075.46$ (beginning balance third quarter)

DAY OF DEPOSIT TO DAY OF WITHDRAWAL METHOD
(Also referred to as Daily Interest, Day-in,
Day-out, Instant Interest)

Compounded Quarterly at 6%

Credited Quarterly

10 deposit grace days (1st to 10th of period)

3 withdrawal grace days

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	44.38
2- 6-70		1,000.00		4,000.00	53.26
3- 5-70	1,000.00			3,000.00	48.82
3-20-70	500.00			2,500.00	47.83
3-30-70	500.00			2,000.00	47.83
4- 1-70			47.83	2,047.83	30.63
7- 1-70			30.63	2,078.46	

- 1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)
- 2) $2000.00 \times .06 \times 90/365 = 29.59$ (earns from the first)
- 3) $14.79 + 29.59 = 44.38$ (new anticipated interest)
- 4) $1000.00 \times .06 \times 54/365 = 8.88$
- 5) $44.38 + 8.88 = 53.26$ (new anticipated interest)
- 6) $1000.00 \times .06 \times 27/365 = 4.44$ (withdrawal for actual number of days)
- 7) $53.26 - 4.44 = 48.82$
- 8) $500.00 \times .06 \times 12/365 = .99$ (withdrawal for actual number of days)
- 9) $48.82 - .99 = 47.83$
- 10) 500.00 withdrawal - no interest loss falls in 3 day grace period
- 11) $2047.83 \times .06 \times 91/365 = 30.63$ (anticipated interest beginning second quarter)
- 12) $2047.83 + 30.63 = 2078.46$ (beginning balance third quarter)

DAY OF DEPOSIT TO DAY OF WITHDRAWAL METHOD
(Also referred to as Daily Interest, Day-in,
Day-out, Instant Interest)

Compounded Quarterly at 6%

Credited Quarterly

No grace days

Penalty for excess withdrawals is 50 cents for each withdrawal
over 2 per month

DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE	INT. MEMO
1- 1-70				1,000.00	14.79
1-10-70		2,000.00		3,000.00	41.42
2- 6-70		1,000.00		4,000.00	50.30
3- 5-70	1,000.00			3,000.00	45.86
3-20-70	500.00			2,500.00	44.87
3-30-70	500.00			2,000.00	44.21
4- 1-70			44.21	2,044.21	30.58
7- 1-70			30.58	2,074.79	

1) $1000.00 \times .06 \times 90/365 = 14.79$ (anticipated interest for the quarter)

2) $2000.00 \times .06 \times 81/365 = 26.63$

3) $14.79 + 26.63 = 41.42$ (new anticipated interest)

4) $1000.00 \times .06 \times 54/365 = 8.88$

5) $41.42 + 8.88 = 50.30$ (new anticipated interest)

6) $1000.00 \times .06 \times 27/365 = 4.44$ (withdrawal for actual number of days)

7) $50.30 - 4.44 = 45.86$

8) $500.00 \times .06 \times 12/365 = .99$ (withdrawal for actual number of days)

9) $45.86 - .99 = 44.87$

10) $500.00 \times .06 \times 2/365 = .16$ (withdrawal for actual number of days)

11) $44.87 - .16 = 44.71$

12) $44.71 - 50\text{¢ penalty} = 44.21$

13) $2044.21 \times .06 \times 91/365 = 30.58$ (anticipated interest beginning second quarter)

14) $2044.21 + 30.58 = 2074.79$ (beginning balance third quarter)

APPENDIX D

TITLE 12-- BANKS AND BANKING

Chapter II-- Federal Reserve System

Subchapter A-- Board of Governors of the
Federal Reserve System

(Regulation Q.)

Part 217-- Interest on Deposits

Section 217.148. Information regarding computation of interest on deposits.

Section 217.6 (f) of the Board's Regulation Q relating to payment of interest on deposits, provides:

(f) Accuracy of advertising. No member bank shall make any advertisement, announcement, or solicitation relating to the interest paid on deposits that is inaccurate or misleading or that misrepresents its deposit contracts.

Within the spirit of this provision and in order to avoid misunderstanding on the part of its customers, every member bank should inform the holder of a time or savings account at the time of the opening of such account as to the method that will be used in computing and paying interest on the account, including any provision for nonpayment of interest on deposits made after the beginning of an interest-payment period or withdrawn before the end of such period. In addition, if the bank subsequently makes a change in such method that will be less favorable to a depositor than the previous method, notice of such change should be mailed to each depositor at his last known address.

(12 U.S.C. 248 (i). Interprets and applies 12 U.S.C. 371a, 371b, and 461)

By order of the Board of Governors, February 12, 1970.

Source: Federal Register, Vol. 35, No. 39 -- Thursday,
February 26, 1970.

TRUTH IN SAVINGS

by

JACKIE M. PINSON

B. S., University of Wyoming, 1960

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

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1970

The intelligent and informed use of savings programs depends upon the saver's knowledge of how savings yield is computed and the factors that may affect total yield. Savings advertisements indicate the difficulties inherent in comparing savings programs, specifically: insufficient disclosure of factual information, non-standardized terminology, and numerous methods of interest calculation.

The objectives of this study were: (1) to develop a standard activity pattern for measurement of regular passbook savings yield, (2) to compare savings yield produced by model systems and (3) to test the standard activity pattern under systems in use by selected savings institutions.

A standard activity pattern was developed to control account usage by specifying dates and amounts of deposits and withdrawals.

Forty hypothetical model systems were constructed using five selected methods of interest calculation and four variables that could alter savings yield. The five methods of calculation selected were: (1) low balance, (2) FIFO applied to beginning balance, (3) FIFO applied to first deposits, (4) LIFO, and (5) day of deposit to day of withdrawal. The four variables applied to each method of calculation were: (1) frequency of compounding, (2) frequency of crediting, (3) number of grace days allowed, and (4) penalty assessment for excess withdrawals made during a stated period of time.

Seven savings institutions were surveyed to determine the reliability of the standard activity pattern as a means of measuring savings yield under systems in use by the savings institutions and for identifying their system.

Yield comparison of the 40 model systems ranged from \$29.25 to \$79.13; a difference of \$49.88. The highest yield was 171 per cent greater than the lowest. Comparison of yield calculated by the savings institutions ranged from ~~\$29.50~~^{36.67} to \$58.72; a difference of ~~\$29.22~~^{22.05}. The highest yield was ~~186~~⁶⁰ per cent greater than the lowest.

Without full disclosure of information concerning the method of calculation and variables, it was not possible to compare yield at competing financial institutions accurately. It is recommended that:

(1) a survey be conducted to ascertain the variety of systems in use by savings institutions, (2) a survey of consumer knowledge concerning savings programs be conducted, (3) an investigation be made in the development of a standardized terminology for use with savings programs, (4) a study be made for the purpose of developing full disclosure guidelines for use in advertising and other forms of communication relating to savings programs, and (5) consideration be given legislation comparable to "Truth in Lending" for savings programs.