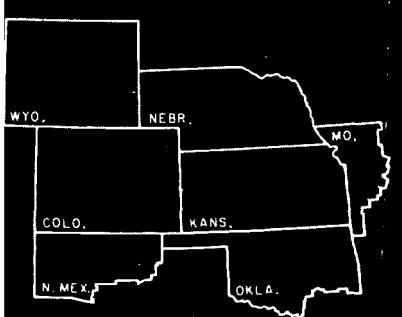

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FEDERAL RESERVE BANK OF KANSAS CITY

MONEY—A CHANGING CONCEPT ON A CHANGING WORLD

By Carl M. Gambs

> ***It is a singular and, indeed, a significant fact that, although money was the first economic subject to attract men's thoughtful attention, and has been the focal centre of economic investigation ever since, there is at the present day not even an approximate agreement as to what ought to be designated by the word. The business world makes use of the term in several senses, while among economists there are almost as many different conceptions as there are writers upon money.***
>
> ***A. P. Andrew'***

The money stock has been given increasing attention in recent years. Both the Federal Reserve and the public currently closely observe the rate at which the quantity of money is growing. Accompanying this increased attention to money is a recognition that there is considerable disagreement as to how money should be defined. As the above 1899 statement by A. P. Andrew demonstrates, this disagreement is far from new.

While the nature of the disagreement over the definition of money has changed since 1899, disagreement seems always to have been present.[2] In 1974 the Board of Governors of the Federal Reserve System, recognizing the importance of this problem, appointed the Advisory Committee on Monetary Statistics (generally termed the Bach Committee after Professor G. L. Bach, the chairman) to examine some of the issues involved. The Bach Committee's report was released in June 1976,[3] but given the extent of disagreement on the subject, its conclusions are unlikely to greatly reduce the controversy over the definition of money.

An increasing source of difficulty in defining money is the rapid change taking place in the nation's payments system.[4] Payments system change was also a major factor at the time that Andrew was writing, but has not been an

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1 A. P. Andrew, "What Ought to be Called Money," *Quarterly Journal of Economics.* Vol. 13 (January 1899), p. 219.

2 For an excellent discussion of both historical and current controversies regarding the definition of money, see Milton Friedman and Anna J. Schwartz, *Monetary Statistics of the United States* (New York: National Bureau of Economic Research, 1970), pp. 93-189.

3 Board of Governors of the Federal Reserve System, *Improving the Monetary Aggregates, Report of the Advisory Committee on Monetary Statistics.* Washington, D.C., June 1976.

4 It is probably more accurate to refer to "payments systems," as there are currently a number of alternative ways of making funds transfers. The term "payments system" is used here to include all systems for making funds transfers, including those which may only be implemented in the future.

important source of controversy since the 1930's. The final thud of the 19th century saw radical changes in the monetary system of the United States, particularly in the domestic payments system. On the eve of the Civil War (January 1860), the American money stock—defined to include specie, bank notes, and bank deposits--consisted of $186 million in gold, $184 million in bank notes, and $241 million in bank deposits.[5] During and after the War, the composition changed drastically. Bank deposits increased from 38.6 per cent of money holdings in 1860 to 54.7 per cent in 1867, and to 68.6 per cent in 1875. By 1899, deposits had risen to 81 per cent of all money holdings.[6] While we do not have data on either the quantity of demand deposits or the volume of payments by check during this period, this movement from currency to bank deposits was indicative of the shift that took place in the payments system toward the making of payments by check.

In spite of this shift, there was a general reluctance to include demand deposits in the money supply. It is not clear to what extent late 19th century economists realized that this change was taking place. Since they did not have published figures on the money stock, they were not aware of the precise degree to which changes were occurring. Perhaps the changes taking place were recognized, but a kind of intellectual inertia caused the economists of the day to prefer the traditional definitions which excluded deposits. At any rate, there seems to have been a general reluctance to expand the definition of money to include bank deposits,[7] just as many economists are reluctant to modify today's commonly accepted definitions.

There is at least some reason for believing that changes in the payments system currently taking place will be every bit as significant as the changes of the 19th century. It is widely believed that the United States is in the early stages of movement toward an electronic funds transfer system (EFTS)—a system where many—perhaps most—payments would be made in respbnse to electronic instructions rather than instructions written on a paper check.

While there are very wide differences of opinion as to the likely speed and extent of EFTS development, there seems to be very little reason for doubting that another change in the payments system is well underway. Until recently, with the minor exception of traveler's checks, payments could be made only with currency and commercial bank checking accounts. It is now increasingly possible to make payments from other types of accounts—commercial bank savings accounts, accounts at savings and loan associations (S&L's), mutual savings banks (MSB's), credit unions (CU's), and even certain mutual fund accounts. In addition, an increasing proportion of purchases is being made with credit cards.

In light of these developments, it seems useful to attempt to consider whether these changes, like the changes of the late 19th century, will require modifications in our

5 Jack Lewis Rutner, "Money in the Antebellum Economy: Its Composition, Relation to Income and Its Determinants" (unpublished Ph. D. dissertation, University of Chicago, June 1974), pp. 182-83.

6 Post-Civil War monetary statistics, as compiled by Friedman and Schwartz, are in U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Edition, Part 2* (Washington, D.C.: Government Printing Office, 1975), pp. 992-93.

7 "On the other hand, the stretching of the word (money) to make it cover such means of trade as bank deposits and bills of exchange presents itself as even more objectionable, primarily because it is in the highest degree discordant with the traditional way of employing the term, and must inevitably tend therefore to arouse suspicion, provoke antagonism, and entail misunderstanding, and because at the same time there are plenty of other expressions, such as 'currency,' 'circulating medium,' and 'means of payment,' which can be used quite as effectively to represent the same all-inclusive concept," Andrew, p. 226.

H. Parker Willis, one of the leading monetary economists of the day, was contending as late as 1925 that even bank notes were not money. H. Parker Willis and George W. Edwards, *Banking and Business* (New York: Harper and Brothers, 1925), pp. 96-37.

concept of money. This article discusses the implications of payments system changes for the various definitions of money published by the Federal Reserve System. Also considered is the degree to which the usefulness of current definitions is likely to be reduced and the extent to which simple modifications of these definitions can restore that usefulness.

CURRENT DEFINITIONS OF MONEY

Three approaches to the definition of money have been widely used. The traditional approach has been to define money as those assets which can be used to purchase goods and services or to pay debts—that is those assets which serve as media of exchange. A second approach, suggested by Milton Friedman, would define money as those assets which serve as a "temporary abode of purchasing power"—that is assets which are held during relatively brief periods when an individual or firm has receipts exceeding expenditures. The third approach is not always explicitly stated, but has been widely used in monetary research and seems to have been extremely important to the Bach Committee. This approach would define money as the aggregate or aggregates which are highly correlated with gross national product or some other measure of economic activity. Presumably this approach rests on the belief that the money stock thus defined would be of greater value in the formulation of stabilization policy.

The Federal Reserve System regularly publishes data for five alternative money stock definitions. Multiple measures are published because there are differences of opinion as to what is the appropriate basis for defining money and because there is a good deal of uncertainty as to what empirical definition best fits the various theoretical approaches. Since the Federal Reserve has only limited access to data for many nonmember institutions, the money stock definitions are inadequate in some instances.

M1, which consists of currency and demand deposits other than those held by commercial banks and the U.S. Government, corresponds to the traditional medium of exchange approach to the money supply. It does not, however, include one familiar medium of exchange, traveler's checks.[8]

M2 is M1 plus time and savings deposits of commercial banks other than large negotiable certificates of deposit (CD's) at weekly reporting banks. M3 is M2 plus deposits at MSB's, S&L's, and CU's. M4 is M2 plus large negotiable CD's and M5 is M3 plus large negotiable CD's. These four definitions reflect to some extent the "temporary abode of purchasing power" approach, as well as the belief of many economists that one or another of these magnitudes is more closely related to GNP than is M1.[9]

The "temporary abode of purchasing power" approach seems to have been more discussed than used in formulating M2 through M5. These definitions all contain certain components which are ordinarily held for long periods of time and exclude other items which fulfill the "temporary abode" function. It seems

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8 The largest U.S. issuer of traveler's checks is not a commercial bank and thus does not report to the Federal Reserve (or any other bank regulator). At one time, bank-issued traveler's checks were a part of the money supply. The two major banks in the traveler's check business now use holding company subsidiaries to issue them. Thus, they are not liabilities of the bank and not part of the money supply.

9 There has apparently never been an exhaustive study of the numerous possibilities to determine empirically which definition of money has been most closely related to economic activity in the past. There have, however, been a number of limited attempts in this direction. See Milton Friedman and David Meiselman, "The Relative Stability of Monetary Velocity and the Investment Multiplier in the United States, 1897-1958," in Commission on Money and Credit, *Stabilization Policies* (Englewood Cliffs, N.J.: Prentice-Hall, 1963), pp. 242-46; Frederick C. Shadrack, "An Empirical Approach to the Definition of Money," in Federal Reserve Bank of New York, *Monetary Aggregates and Monetary Policy* (New York, 1974); Edward F. Renshaw, "A Note on Economic Activity and Alternative Definitions of the Money Supply," *Journal of Money, Credit and Banking*, Vol. 7 (November 1975), pp. 507-13.

clear, for example, that long-term bank CD's do not serve as a temporary abode of purchasing power, yet, with the exception of CD's larger than $100,000 they are included in all of the broader definitions. Moreover, the similar instruments of S&L's and MSB's are included in M3 and M5. On the other hand, large negotiable certificates of deposit clearly serve as a temporary abode of purchasing power for large corporations, but have been excluded from the most widely used definitions.[10] Since existing definitions do not consistently reflect the "temporary abode of purchasing power" approach, this article concentrates on the implication of changes in the payments system for the medium of exchange and correlation with economic activity approaches to the money stock.

It should be noted that there are other changes taking place which have implications for the definition of the money supply which are beyond the scope of this article. Perhaps the most important of these is the change in the composition of the time deposit portion of M2, which once consisted entirely of household savings deposits but now includes large quantities of business savings deposits and long-term time deposits.[11]

MAJOR CHANGES IN THE PAYMENTS SYSTEM

The Extension of Payment Accounts To New Institutions

Historically, commercial banks have been the only financial institution to provide a deposit account which could be used to pay third parties. From 1933 to 1972 these payments could be made only from noninterest bearing demand deposit accounts.[12] Since 1972, there have been a number of innovations which have allowed other institutions to offer close substitutes for bank checking accounts.

NOW Accounts. In 1972, following a favorable court decision, MSB's in Massachusetts began offering NOW accounts to their customers. These accounts are legally savings deposits but allow the customer to withdraw funds by writing a "negotiable order of withdrawal (NOW)." Since a NOW looks, and more importantly, functions like a check, NOW accounts are—from the point of view of the customer—an interest bearing checking account.

Since their legal status was similar to that of Massachusetts MSB's, savings banks in New Hampshire followed the Massachusetts example within a few months. A 1973 act of Congress limited interest bearing NOW accounts to these two states and extended the power to offer them to commercial banks and savings and loan associations. More recently, the power to issue NOW accounts was extended to financial institutions in the rest of New England (Maine, Vermont, Rhode Island, and Connecticut), effective March 1, 1976, and there is some Congressional sentiment for extending them nationwide. The maximum interest rate which can be paid on NOW accounts is uniform for all offering institutions at 5 per cent, ¼ per cent less than thrift institutions are permitted on regular savings accounts and the same as commercial bank savings accounts.

The evidence from Massachusetts and New Hampshire suggests that the introduction of NOW accounts into a market does not lead to

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10 This exclusion appears to be due to the influence of Milton Friedman (Friedman and Schwartz, pp. 170-71), who argues that negotiable CD's are more like commercial paper than like other types of time deposits. Accepting this argument might, however, imply including commercial paper in money, rather than excluding large CD's.

11 For a detailed discussion of this point see Steven M. Roberts, "Developing Money Substitutes, Current Trends and Their Implications for Redefining the Monetary Aggregates," Board of Governors of the Federal Reserve System, Advisory Committee on Monetary Statistics—Staff Paper No. 8 in Staff Papers to accompany the *Report of the Advisory Committee on Monetary Statistics* (forthcoming).

12 A limited number of MSB's were also authorized to offer demand deposit accounts.

consumers immediately moving their funds en masse from checking to NOW accounts. However it does suggest that NOW accounts are likely to eventually become the predominant type of household payment account. Since ownership of NOW accounts is limited to individuals, sole proprietorships, and nonprofit organizations, only the approximately $2 billion in demand deposits owned by these groups (of $6 billion in total demand deposits) in the two states was eligible for conversion to NOW accounts.[13] By June 30, 1976, total NOW account deposits in Massachusetts and New Hampshire had reached $1.2 billion, and were still growing at the rate of more than 70 per cent per year. Unfortunately, it is impossible to accurately estimate the extent to which these funds came from demand deposit accounts and the extent to which they came from savings accounts at commercial banks or thrift institutions.[14]

The inability to estimate the sources of funds which have gone into NOW accounts has serious implications for any attempt to include them in money stock estimates. Under current practice, NOW accounts are not included in M1. Thus, to the extent that funds have moved out of demand deposits into NOW accounts, current M1 data underestimate the growth of medium of exchange money. NOW accounts at commercial banks are in M2, while M3 includes NOW accounts held at thrift institutions. If all NOW balances had come from demand deposits, adding total NOW account balances into M1 would give a series which would be historically consistent. To the extent that NOW deposits have come from savings accounts, this procedure would lead to an exaggerated picture of the rate of growth of M1, since some of the growth would merely represent a transfer of funds from savings to NOW accounts without any change in the character or activity of the funds. Treating NOW accounts as demand deposits would also affect the rate of growth of M2, since some NOW funds have moved from thrift savings accounts to NOW accounts. Only M3 is unaffected by the existence of NOW accounts.

It should be noted that NOW account totals are not yet large enough to create a serious problem. Total New England NOW accounts were only $1.5 billion as of July 30, 1976. Since NOW balances have built up gradually over a 4-year period, their effect on the rate of growth of the monetary aggregates has been extremely small. However, if NOW accounts are legalized for the entire nation, it would present serious complications for money stock measurement. Consumers now hold approximately $80 billion in demand deposits, much of which—based on the New England experience—is likely to be converted to NOW accounts along with some portion of consumer savings accounts.

Credit Union Share ***Drafts.*** Many credit unions have recently begun offering their customers the ability to make funds transfers with a check-like instrument called a "share draft." In August of 1974, the Administrator of the National Credit Union Administration granted three Federal CU's temporary authority to begin offering share drafts. These three CU's were joined by two state CU's in a 6-month pilot program. While the authority to offer share draft accounts is still officially temporary, additional CU's were allowed to offer share draft accounts following the end of the pilot program. As of July 1976, 193 Federal

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13 John D. Paulus, Effects of *"NOW"* Accounts on *1974-75* Commercial Bank Costs and Earnings, Staff Economic Study No 88, Board of Governors of the Federal Reserve System, 1976, p. 2.

14 Paulus estimates that about 80 per cent of NOW balances have come from demand deposits. This estimate is probably too high, as it rests on the assumption that all funds in active NOW accounts (those on which drafts are drawn) came from demand deposits. However, some active NOW accounts almost certainly represent the combination of what were previously separate checking and savings accounts and others are known to be the funds of households who previously had accounts only at thrift institutions and purchased money orders in lieu of using a checking account. See Paulus, Effects of *"NOW"* Accounts . . . . pp. 9-12.

credit unions and a substantial number of state CU's were offering share drafts.

Share draft accounts are usually interest bearing. However, "dividends" (interest) are most commonly paid on the minimum account balance. Thus, while credit unions paying dividends in the fourth quarter of 1975 had an average stated rate of 5.67 per cent, the average rate paid was only 2.04 per cent of total share draft balances.[15] Legally, share drafts are a payable through draft like the drafts widely used by insurance companies and other corporations. Unlike NOW account drafts, which clear like checks and are eventually returned to the account holder, share drafts normally do not move beyond the bank through which they are payable. That bank, in the majority of cases, is not the bank at which the credit union keeps its regular working balance. The funds are subsequently transferred from the credit union's account at its own bank to the paying bank. The information on the draft is processed electronically and transmitted to the CU or its servicing organization on magnetic tape. Thus, the customer receives only a statement rather than a cancelled check, although he does make a carbonless paper copy at the time of writing the draft.

As of July 1976, the 193 Federal CU's offering share draft accounts had $72 million in these accounts. While this is a miniscule amount compared to commercial bank demand deposit accounts or even NOW accounts, the total in both state and Federal credit unions probably exceeds $100 million. As roughly 99 per cent of credit unions are not yet offering these accounts, there is clearly room for considerable expansion.

The American Bankers Association and several state bankers associations and individual commercial banks have recently filed law suits asking that share drafts be prohibited on the grounds that there is no legal authority for them to be offered. The NOW account experience would seem to suggest that if these legal actions are successful, credit unions may still be able to obtain the legislative authority necessary to continue offering share drafts.

The money supply implications of share draft accounts are precisely the same as for NOW accounts. Since they provide a substitute for demand deposits, their continued exclusion from M1 and M2 underestimates the growth of medium of exchange money. Simply adding them to demand deposits will not, however, be fully satisfactory, since some portion of these funds would otherwise have been in savings accounts at CU's or other institutions. Unfortunately, there is currently not enough data to include total share draft accounts in any money stock definition narrower than M3, since there are no available estimates of share draft accounts at state credit unions.

Thrift Institution Checking Accounts. In several states, MSB's have long had the power to issue checking accounts. Recently, state chartered MSB's and S&L's have been granted the authority to offer checking accounts in Connecticut, Maine, and New York, and state chartered S&L's have been given the authority to offer noninterest bearing NOW accounts in Illinois. The long-run importance of these accounts will obviously depend on the future status of NOW accounts, although in Connecticut, thrift checking account balances on June 30 were nearly double NOW account balances. There is ample reason to believe that thrift institutions might eventually acquire a substantial share of household checking-type accounts in the states where they are allowed to issue them. The fact that a very large portion of households choose to bank on the basis of locational convenience suggests that, in the long run, thrifts might obtain a market share proportionate to their share of offices.

Thrift checking accounts clearly should be included in M1, although it is difficult to do so as long as the necessary data are not regularly reported. These deposits are like thrift NOW

15 CUNA Research Division, Share-Drafts *vs.* ***NOW*** *Accounts.* Credit Union Research Bulletin No. 182, Madison, Wisc., April 1976, p. 7.

accounts in that they currently are in neither M1 nor M2. In the past it has been impossible to determine the size of checking account balances at mutual savings banks because both checking accounts and escrow accounts at many institutions have been identically reported as demand deposits. Continued growth of thrift checking accounts will imply a shifting of funds from commercial banks to thrifts and will lead to M1 and M2, as currently reported, growing at slower rates than they would otherwise.

Money Market Mutual Funds. One of the more interesting financial innovations of the 1970's has been the development of the money market mutual funds. These funds hold portfolios of short-term corporate and government securities and bank CD's. Individual buyers of these funds can thus obtain returns which are not available without a substantial investment (as in the case of CD's larger than $100,000). Small businesses and institutions which might be large enough to acquire the types of instruments held by money market funds apparently find that it is less costly to use a fund than to manage their own holdings of such instruments.

Since 1974, an increasing number of these funds have allowed fund owners to redeem their shares by writing a check. These checks, which are drawn on a bank account arranged by the fund, typically can be written for any amount in excess of $500. As of June 30, 1976, funds with this option had $2.1 billion of the $3.4 billion in assets of all money market funds. Most of the rest of the funds allowed withdrawals by wire transfers, a method which may be superior for many holders.

Money market funds benefited during their early history from the unusually high rates then being paid on short-term money market instruments. These funds have not, contrary to the expectations of some observers, experienced extremely sharp declines with the subsequent fall in short-term interest rates, although they are currently experiencing little or no growth. Their inherent advantages — allowing small holders to obtain returns not directly available to them and providing diversification with low transactions costs — make it seem likely that they will continue to grow over the long run. Furthermore, there is no technical reason why these funds could not allow checks to be drawn on them in much smaller amounts. Nor is there any reason why the check-writing option need be restricted to money market funds. Even with current restrictions, these funds would seem to meet most criteria for money. The liabilities of money market funds are not, however, included in any of the currently published definitions of money, although their holdings of bank deposits are. If the minimum size check which can be drawn should be reduced, the case for treating them as money would be strengthened.

While these accounts have received much less attention than NOW accounts and share drafts, they are currently more important quantitatively. Incorporating them into money stock estimates would be considerably more difficult, however, since these institutions, unlike the issuers of NOW and share draft accounts, do not report regularly to the financial regulatory agencies.

The Increased "Moneyness" of Savings Accounts

It has been the traditional practice to include demand deposits, but not other deposits, as money when using a medium of exchange criterion. Changes occurring in the nature of savings accounts, both at commercial banks and at thrift institutions, are making this practice increasingly untenable. A number of regulatory changes in recent years have made it possible for households to use savings accounts for third party payments. These changes mean that funds transfers are increasingly being made with assets not included in M1, but rather with regular savings accounts at banks and S&L's. Thus, the medium of exchange criterion for defining money is becoming increasingly difficult to apply.

Bill Paying Services. In April 1975, S&L's were given the power to offer bill paying services from savings accounts. A similar power was granted to commercial banks in September 1975. While these services have generated relatively little activity to date, they are serving as partial substitutes for checking accounts where in use.

Telephone Transfers. In April of 1975, the Board of Governors of the Federal Reserve System reversed a long-held position and allowed banks to transfer funds from an individual's savings account to a checking account on the basis of a telephone authorization. This action followed the development of telephone transfer services by some thrift institutions and nonmember banks. While telephone transfers are not widely used, they are being offered by a number of banks and they are clearly reducing the barriers between savings and checking accounts.

Automatic Transfers to Cover Overdrafts. A proposal currently under consideration by the Board of Governors might make the distinction between savings and demand deposits much less important—except for the lower reserve requirements on the former. This proposal would allow an arrangement whereby funds would automatically be transferred in multiples of $100 from a savings account to a checking account when the balance in the checking account reached zero or some other predetermined level. Were it not for the restriction that transfers be in $100 multiples, depending on the pricing of transfers, the transfer privilege might well lead to the use of zero balance checking accounts, with funds being transferred to cover every check. Such a procedure would allow banks to reduce the quantity of funds which must be held in required reserves. Under the regulation proposed, 30 days' interest would be lost on any funds transferred, so these accounts would have a much lower yield than do NOW accounts. The yield would probably be more like the yield on CU share draft accounts.

The transfer privilege would also reduce the usefulness of the traditional M1 definition, because substantial quantities of demand deposits would likely move into savings accounts. Simply including savings accounts in M1 would not be totally satisfactory, because the majority of funds in savings accounts would not have come from demand deposits. This is not a problem with M2 when the savings accounts are at commercial banks. However, such accounts might be set up at thrift institutions (especially since it might not be necessary to forego 30 days' interest on transfers from thrift accounts). To the extent that thrift accounts are used in this way, only M3 would be unaffected.

Savings and Loan EFTS Projects. Thrift institutions outside of New England are generally prohibited from offering checking or similar accounts. The prohibition has led a number of S&L's to attempt to develop electronic substitutes. The Federal Home Loan Bank Board has authorized S&L's to set up "remote service units" (RSU's) on an experimental basis. RSU's are off-premise terminals which may be used by either one or several institutions. They may be located in a public area such as an airport, but most commonly have been placed in supermarkets. S&L's probably gained an early lead over commercial banks in this area because most S&L's already were handling their savings accounts "on line" and because of their strong desire to tap the checking account market. More recently, commercial banks have been prevented from setting up similar operations in a number of states because of court decisions that remote terminals were subject to state branching laws. (Federal S&L's, unlike national banks; are not subject to state branching laws.)

The Federal Home Loan Bank Board reports that as of May 1976, 85 Federal S&L's were operating RSU's at 234 different locations.[16] (Some locations have several terminals, as at least one S&L is placing them at individual

supermarket check-out counters.) These RSU's handled more than 56,000 transactions in May, with approximately three-quarters of the transactions being withdrawals and the remainder deposits. The dollar volumes of deposits and withdrawals were approximately $2.7 million and $2.0 million, respectively. While RSU's have not turned S&L savings accounts into checking accounts, they have made these accounts much more accessible.

The effect of S&L EFTS projects on the various money stock concepts is similar to the other innovations already discussed. To the extent that these projects allow people to substitute an account with an S&L for a checking account, it reduces the usefulness of the current M1. And since S&L accounts are not in M2, this aggregate is also reduced in usefulness.

Credit Cards and Check Credit Plans

The fact that increased credit facilities reduce the demand for money has long been recognized.[17] Traditionally, credit facilities have been treated as a factor which could lead to shifts in the demand for money, but which need not be explicitly taken into account when estimating a demand for money function. Keynes suggested incorporating credit facilities directly into the analysis. Under his alternative treatment, unused lines of credit at commercial bankswould be included in the money stock.[18] This suggestion has, from time to time, been reiterated by others. Until relatively recently, overdraft accounts such as those long prevalent in Great Britain were virtually unknown in the United States. Over the last decade, however, "check credit" plans, as overdrafts are commonly called, have been set up by a large number of banks. Furthermore, the introduction of the bank credit card has provided bank customers with an alternative payment mechanism and the functional equivalent of overdrafts.

Unfortunately, at least for those who would like to take Keynes' approach, no data are available on total credit lines on either bank credit cards or check credit accounts. A reasonable estimate for bank credit cards is that credit lines total approximately $30 billion.[19] Commercial banks had $9.5 billion outstanding on credit cards (as compared to $2.8 billion outstandi'ng on check credit accounts) as of June 30, 1976. This implies unused bank credit card lines of about $20 billion. While this quantity is certainly substantial, it would probably be unwise to attempt to incorporate unused lines into the money stock. These lines of credit are in many cases granted and increased unilaterally by the credit card bank and may have little relationship to the amount of credit that the card holder is likely to use. Furthermore, these lines frequently serve merely as a signal to reexamine the card holder's credit standing before increasing the line rather than as a constraint on the amount of credit available.

That adding unused credit lines to the money supply would be a dubious practice can be seen by looking at the ratio of total debits to estimated unused lines on bank credit cards. In the year ending June 30, 1976, there was $22.9 billion extended on bank credit cards and $4.5 billion of credit extended on check credit plans. Dividing the $22.9 billion in debits on bank credit card plans by the $20 billion in estimated unused credit card lines gives a ratio of about 1.1, as compared to the ratio of debits to average balances in household checking accounts which is believed to be in the range of 20-25. Nevertheless, the continued growth and

16 Fifty-one state chartered institutions are also involved in these projects. The institutions with the largest operations are, however, generally federally chartered.

17 Irving Fisher, The Purchasing Power of Money (rev. ed.; New York: MacMillan, 1922), p. 81.

18 J. M. Keynes, A Treatise on Money. Vol. 1 (London: MacMillan, 1930), pp. 41-43.

19 The two major national bank credit cards reported a total of 42 million accounts as of March 31, 1976. If the average account has a credit line estimated to be about $700, total lines are approximately $30 billion.

use of credit card and check credit accounts is likely to make the relationship between any money stock measure and the level of economic activity less stable. Since the evidence suggests that both check credit and credit cards are widely used during periods of tight credit,[20] it is quite likely that the degree to which they substitute for money will vary cyclically.

Electronic Funds Transfer

Electronic funds transfer (EFT) developments are probably the most widely discussed innovations in the payments system today. While EFT is likely to have a substantial effect on the demand for money, its impact on the nature of money will likely be confined to the areas already discussed, particularly by facilitating the growth of overdraft accounts and by reducing whatever barriers remain between noninterest bearing checking accounts and interest bearing accounts.

If thrift institutions in most of the country continue to be barred from offering checking (or NOW) accounts, they are likely to attempt to gain entry into the payments system through an EFT system, since the legal barriers to their participation in electronic payments seem to be much less of a factor than they are in the area of paper payments. It has also been widely suggested that an EFT system will lead to a substantial increase in the use of overdrafts (check credit). The fact that float will be reduced or eliminated, it is argued, will increase the demand for overdrafts. And to the extent that EFT gives banks better control over overdraft accounts, it is likely to lead them to market them more aggressively.

To the extent that EFT developments lead to thrift accounts being used as transaction accounts, the volume of transactions conducted with M1 and M2 as currently measured will be reduced. If the development of an EFT system increases the use of overdrafts, it will strengthen the case for including them in the money stock. It will not, however, eliminate the problems with this approach.

CONCLUSIONS

Just as the 19th century changes in the way that payments were made required a broadened definition of the money stock, the changes currently underway will require a broadening of any definition based on which assets can serve as media of exchange. Only the broadest definitions, those which include the deposits of thrift institutions as well as those at commercial banks, are likely to be unaffected. Many policymakers and scholars prefer to use a narrower definition. They are likely to be increasingly faced with a dilemma as it is unlikely that it will be possible to develop any narrow money stock series which can be extended very far into the past and still be conceptually consistent. The problem that Andrew noted in 1899 seems likely to become more rather than less serious.

20 **Richard L. Peterson, "Factors Affecting the Growth of Bank Credit Card and Check Credit" (paper presented at the meeting of the American Finance Association, Atlantic City, N.J., September 16, 1976).**

Farm Real Estate Values

By Marvin Duncan

INTRODUCTION

While the combined ravages of inflation and recession cut heavily into the real and dollar values of most investment portfolios, farm real estate investments have performed particularly well in recent years. The rate of return on farm real estate (measured as combined income earnings and capital appreciation) has exceeded, by a substantial margin, the rates of return on common stock.[1] Since 1971, farm real estate values across the United States have doubled, while the prices of U.S. goods and services as measured by the GNP deflator—the broadest measure of U.S. price changes—have increased only 39.1 per cent (first quarter 1971—first quarter 1976). During this time, the Standard and Poor's Index of 500 stocks increased only 3.6 per cent (January 1971—January 1976).

Not since the mid-1960's has there been as much interest in changes in the value of farm real estate. Nonfarm and farm investors alike are actively interested in farm and ranch investment opportunities. The index of farm real estate value per acre has not declined, on an annual basis, since 1954 (Chart 1) and holders of farm real estate recently have seen their net worth position soar. This has enabled farm families to enlarge their farms and make capital purchases, but it has also created substantial estate planning problems for those owners. Additionally, higher land values present a serious barrier to those attempting to begin farming or ranching.

A better understanding of how farmland price values are derived can aid present owners and potential investors in making sound investment and business management decisions. Credit institutions face increased risk as both the total real estate loan size and loan per acre reach unprecedented levels. Information about the basis and duration of the current trend in farm real estate values and the probable future directions of factors affecting these values are of great importance to agricultural procedures, investors, and lending institutions.

A SOCIOECONOMIC PERSPECTIVE

Widespread ownership of farm and ranchland has been a U.S. Government policy since the founding of the Republic.[2] By 1800, land in the Ohio country was being distributed under a system of federal land credit and sold in tracts as small as 320 acres. Subsequent

[1] Based upon the Standard and Poor's Composite Index.

[2] Philip M. Raup, "Societal Goals in Farm Size," *Size, Structure, and Future of Farms* (Ames, Iowa: CARD, Iowa State University, 1972), pp. 1-8.

legislation provided for smaller minimum tract size and preferential treatment for squatters in the sale of public land. The Homestead Act of 1862, and its later modifications, made vast areas of the U.S. heartland available for settlement to those who otherwise would have been unable to own land.[3]

This policy proved attractive to U.S. citizens and to immigrants. Thus, while personal freedom motivated immigrants, the availability of inexpensive land was a strong attraction for both. Out of this background, then, it should not be surprising that American farmers and ranchers have clung tenaciously to their property during periods when the returns to their labor and management, as well as income returns attributable to land, ranged substantially below those offered by other investment opportunities.

Consumption Outputs of Land

The farm or ranch is a multi-product firm—producing not only products to be sold, but also a stream of tangible and intangible benefits. In an implicit—and usually subconscious–discounting process, the discounted value of the stream of these benefits is equated with the discounted value of the stream of income foregone as a result of continuing in farming or ranching.

Smith and Martin have suggested that cattle ranchers may not be profit maximizers.[4] Once a certain level of monetary income has been achieved, the rancher is satisfied to forego additional income, preferring to continue his ranch enterprise as a home and way of life. These researchers were able—with 73 per cent accuracy—to categorize ranchers into those who would consider selling their ranches and those who would not, based only on attitudes toward landownership and ranch life. The strength of ranchers' attitudes toward land was the key to understanding why most ranchers did not act as "economic men."

How does one account for attitudes toward the land and rural values in predictive and explanatory models of farm real estate values? The answer is that they are implicitly taken into account by generally assuming that such values explain part of farm real estate demand. The extremely difficult empirical questions related to quantifying such values are usually not confronted; instead they are usually assumed to explain a constant proportion of demand.

Short-Term Resource Fixity – Long-Term Returns

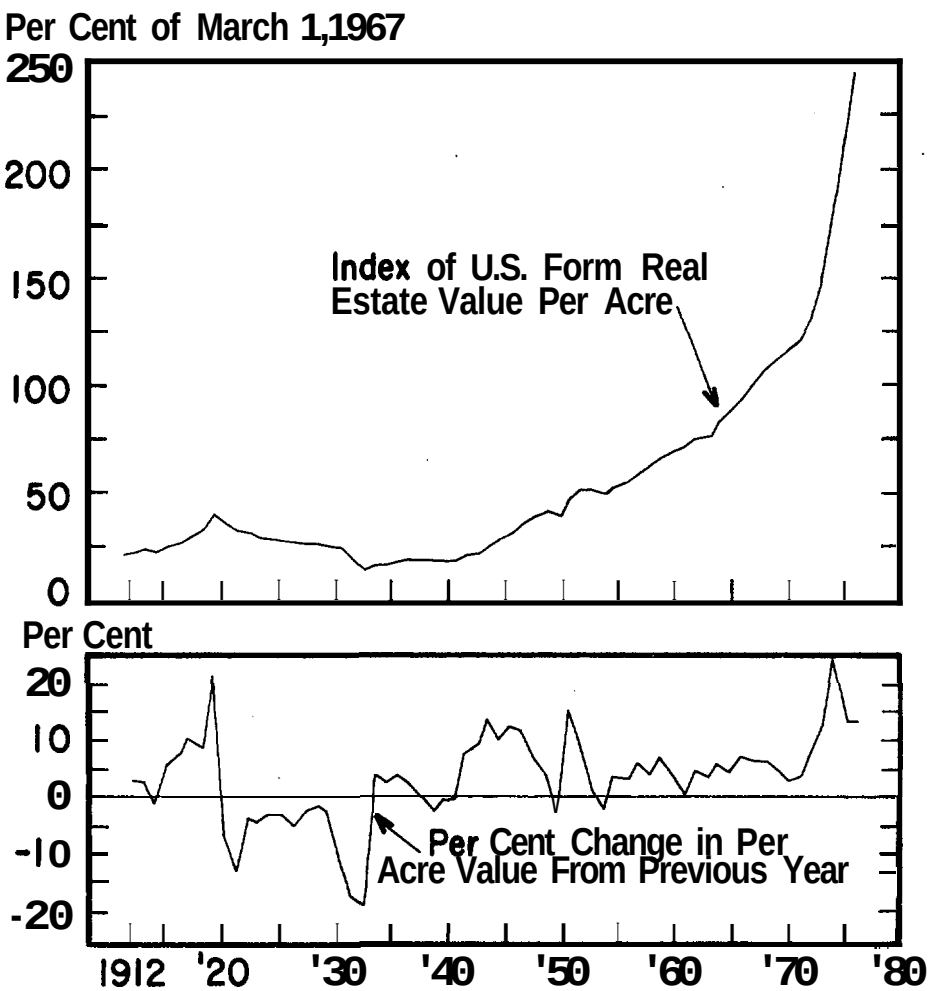
Farmers and ranchers may continue to accept below-normal returns to labor and management for reasons other than their attitudes toward the land and rural values. Resource fixity may be an answer in the short term. Capital investment and equipment and livestock needed to operate a farm or ranch is specialized and thus has a low use value in an alternative business. Despite what may be inadequate returns in agriculture, disinvesting and entering another occupation may result in even lower net returns—when capital losses from disinvestment are considered. Thus, until the salvage or resale value of the equipment and livestock equals or exceeds its use value in agriculture, the resources are effectively locked into that use.

A long-term answer can be found in the calculation of net returns in agriculture. Characteristically, the total net return to the farm operator represents what is left after deducting farm operating expenses and adjusting for net changes in farm inventories. This net return frequently is too low to justify continuing the operation. However, farmers and ranchers typically build substantial net worths over time. When these wealth benefits are taken into account, an entirely different

3 Murray R. Benedict, *Farm Policies in the United States. 1790-1950* (New York: Twentieth Century Fund, 1953).

4 Arthur H. Smith and William E. Martin, "Socioeconomic Behavior of Cattle Ranchers, with Implications for Rural Community Development in the West," *American Journal of Agricultural Economics,* Vol. 54, No. 2 (May 1972), pp. 217-25.

Chart 1
U.S. FARM WEAL ESTATE VALUES



SOURCE: U.S. Department of Agriculture.
NOTE: Excludes Alaska and Hawaii. Data unavailable prior to 1912.

income picture emerges. If these net worths were used to purchase annuities with annual payments over the family units' expected lifetimes, and the annual annuity payments were added to net income, the sum would be large enough to result in a rational choice to continue farming or ranching. A study of wheat farmers' net returns during 1967-71 calculated — for full owner-operators in the Central Plains — an annual income of $5,385.[5] But, when a $22,200 annual annuity payment (or wealth component) was added, the $27,585 annual income probably equaled or exceeded that available in other occupations.

[5] P. Weisgerber, "The Impact of Wealth Benefits on Farm Returns in the Wheat Area," *Agricultural Finance Review*, Vol. 34 (July 1973), pp. 31-34.

LAND MARKET CHARACTERISTICS

Agriculture is often characterized as the best current example of a perfectly competitive industry. But it does not follow that all submarkets within that industry are competitive. The land market, though embodying some characteristics of a perfectly competitive market, lacks others. Although two tracts of Mississippi River bottomland may be physically indistinguishable, they are both far different in physical characteristics and productive capacity from grassland in the Kansas Flint Hills. Even within a community, tracts of similar soil type and productive capacity may be viewed as different because of location—proximity to a market road or town, for example. Thus, the competitive market requirement of homogeneous good may not hold true even within a small area.

The competitive market requirements of many producers (sellers) and an inability of the individual producer (seller) to affect product supply—and thus market prices—are valid for land only at a broad, national market level. Within a community, however, there are typically few sellers and presently many potential buyers. Although the quantity of land offered for sale at a given time may vary according to market conditions, it typically represents a relatively small proportion of the total land within a defined area. Thus, even one additional tract offered for sale may significantly affect the current supply of saleable land—and possibly the price—in that area.

Finally, the competitive assumption of perfect knowledge by both buyers and sellers in the marketplace is typically not true in the case of land. The typical land buyer does not have full and complete knowledge of the characteristics contributing to the value of all tracts of land nationally, or even within a small market area. Land buyers and sellers typically enter the market only occasionally, and despite the use of real estate brokers, have a limited knowledge of the market. It is still true that most land is sold in small, localized markets where the assumptions of perfect competition are violated. It follows, then, that the price of the land may, or may not, equal its value as determined by the discounted sum of its future earnings. Occasionally, land sells for less, but in the recent past it may more often have sold for more.

FUTURE INCOME DETERMINES LAND VALUE

Over any reasonable planning horizon land must derive its value from its earning capacity. The value—and a reasonable price for land—must equal the sum of the discounted future returns to land (the capitalized value of land). These future returns flow not only from products grown on the land. They also come from mineral or oil extraction, capital appreciation of land resulting from higher expected earnings or inflation, shifts of land to higher uses such as urban development, and the impact of tax legislation on landowners. Differences of opinion exist as to the exact derivation of the returns to be discounted, however. Generally, production and management costs, as well as a reasonable charge for family labor, are deducted from the gross receipts per acre. The remaining, or residual, receipts are attributed to the land and become the value to be discounted. However, the prices of management services and family labor can vary according to basic assumptions about their value. Another measure of the return to land is the prevailing cash rent (net of any production costs) commanded by the type of land in question. The available data indicate that, though cash rents have been increasing in the past few years, the ratio of rent to value has declined in most sections of the country, an indication that land values have risen faster than rents.

The capitalized value of any given tract of farm real estate can vary substantially, based on whether a prospective buyer assumes an

Table 1
DISCOUNTED PRESENT VALUES UNDER THREE ASSUMPTIONS AT THE END OF 20 YEARS

	Constant Return, Constant Land Value 5% Discount Rate	Increasing Return For First 4 Yrs. (20%/Yr.) Constant Return (50.00/Yr.) For Next 16 Yrs., Constant Land Value 5% Discount Rate	Increasing Return (6%/Yr.), Increasing Land Value (6%/Yr.) 5% Discount Rate	Constant Return, Increasing Land Value (6%/Yr.) 5% Discount Rate
Net Return				
First Year	$ 50.00	$ 53.00	$ 53.00	$ 50.00
20th Year	50.00	50.00	160.36	50.00
Cumulative Present Value Of Net Returns	623.11	725.86	1,106.43	623.11
Present Discounted Value Of Land Held 20 Years	376.89	376.89	1,208.74	1,208.74
Combined Discounted Present Values	1,000.00	1,102.75	2,315.17	1,831.85

SOURCE: William D. Crowley, "Actual Versus Apparent Rates of Return on Farmland Investment," **Agricultural Finance Review,** Vol. 35 (October 1974), p. 56.
NOTE: For the formulas used to derive the data in this table, see Technical Appendix at the end of this article.

increased rate of return to land will continue far into the future or whether it will be limited to a few years. An incorrect assumption about the duration of increases in returns to land can cause a buyer to pay more, or less, than actual returns would justify. The capitalization rate used also influences the estimated current value of real estate. Since the capitalization rate is subjective, one buyer might use the current interest rate on Federal Land Bank loans, viewing that as an opportunity cost. Another buyer might assume a lower opportunity cost and thus assign a higher capitalized value to the same price of property.

Simple discounting of future earnings has come into some disrepute as a means for determining market value of farm real estate. However, certain modifications in the discounting process can restore much of the usefulness. The technical appendix at the end of this article discusses a number of these modifications. Table 1 illustrates the impact on present discounted value of various assumptions about future returns to land and sale prices.[6] As a result, prospective buyers and sellers are able to determine ranges within which the actual value of farmland may fall.

STRUCTURAL CHARACTERISTICS OF AGRICULTURE

Different buyers assign substantially different values to the same farm real estate based on the assumptions they are willing to make about future returns to land, price trends, and capitalization rates. Assumptions aside, prospective buyers also can experience different net returns on property they presently operate. Herein lies a real dilemma for agriculture. Not only the residual return to land, but also most of the difference between gross returns and nonland production costs, tend to be

[6] For additional discussion on the use of modified capitalization formulas see William D. Crowley, "Actual Versus Apparent Rates of Return on Farmland Investment," *Agricultural Finance Review,* Vol. 35 (October 1974), pp. 52-58.

capitalized into the price of land. Consequently, land prices tend to adjust over time to a level at which the returns to land will equal the land cost for efficient sized farms and ranches.' But, land cost will likely exceed returns to land on farms and ranches below an efficient size.

The per unit cost of production for a farm operation may be reduced by moving to a size that incorporates both larger equipment and more acres of land. As a farmer increases the size of his operation from 320 acres to 480 acres, for example, a larger share of gross revenue could be available for allocation to land. Thus, in competition with a smaller farm, the farmer with an expanding operation could afford to pay a higher per acre price for the same land. The difference is determined by the net advantage in per unit cost of production the larger farm would hold over the smaller farm at the new scale of operation for each. Technological change in agriculture has made available equipment and techniques with the potential for reducing cost and increasing output. Thus, a farm employing the latest production technology will also, characteristically, enjoy a per unit of production cost advantage over the farmer employing an obsolescent production technology.

Some additional characteristics of competition in the agricultural industry create an upward bias in farm real estate values. Each farmer or rancher produces a homogeneous product, indistinguishable from others' products, and product prices are generally not affected by a single operator's production decision. Consequently, early innovators who adopt cost reducing technology (often increasing output) enjoy a competitive edge over other farm or ranch operators. Thus, there is an incentive for technological innovation, because the primary rewards are captured by the early innovators.

However, as the majority of producers adopt a new technology, total output may increase — resulting in a lower product price that may be only equal to the cost of production at the margin for the most efficient farmers. Thus, lower — rather than higher — land prices would be justified at an aggregate (industry) level. But, researchers have observed that land prices have generally advanced concurrently with technological advances. This theoretically unexpected outcome has generally been attributed to the impact of differential adoption rates of technology, government farm programs, and the interaction of government farm programs and technical advance.[8] The very strong export demand for U.S. farm products in recent years is probably an additional factor supporting land price increases. On balance, then, it is important to remember that the impact of technological innovation on land prices at the individual farm firm level may be quite different than that at the farm industry level.

Technological advances that reduce cost and increase output generally are available in large discrete units — a four-wheel drive tractor or an eight-row corn planter, for example. Purchasers of this technology frequently find they .are then able to substantially increase the size of their present operation without additional equipment purchases. When estimating the projected net returns to additional land purchased — the amount capitalized to determine maximum purchase price — characteristically, no charge for equipment amortization is made. Thus, since net returns to land are then substantially higher, it follows that established operators planning to expand by purchasing land are able to outbid prospective buyers who must spread all appropriate operating costs over the expansion acreage.

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7 For an excellent discussion of the policy implications see Luther Tweeten, *Foundations of Farm Policy* (Lincoln, Nebr.: University of Nebraska Press, 1970), pp. 178-82.

8 Walter E. Chryst, "Land Values and Agricultural Income: A Paradox?" *Journal of Farm Economics.* Vol. *47* (December 1965), pp. 1265-73.

Finally, not all farmers or ranchers produce at the least cost level for a given scale of operation. Differences in management skill, capital availability, weather, animal or plant disease, etc., can all result in higher per unit costs. Thus, among similar operations net returns to land can vary substantially. But, characteristically, land prices are determined by what the most efficient farmers or ranchers can afford to pay. Consequently, land is priced too high for all but the most efficient operator's.

CONCLUSION

Demand for farm real estate is a derived demand, generated by the demand for products produced on the land and future uses of the land. Consequently, farm real estate values differ between regions and over time, based on differences in product demand and land productivity as well as anticipated land use. However, substantial differences in perceived value also result from varying assumptions about the size and distribution of the future stream of annual returns from land, as well as from expected changes in land value. Additionally, attitudes of farmers and ranchers toward landownership provide support for land values, at any given level of net returns to land. Finally, technological innovation and economies of scale that reduce per unit costs of production provide a powerful upward bias—at a farm firm level—to farm real estate values. As a consequence, different prospective purchasers may compute substantially different capitalized values for a given tract of land offered for sale.

TECHNICAL APPENDIX

The formula used to compute the present value of a stream of future income is:

$$(1)\quad V = \frac{A_1}{(1+r)^1} + \frac{A_2}{(1+r)^2} + \ldots + \frac{A_n}{(1+r)^n},$$

where V = present value
A = net return to land
r = interest rate used to discount future earnings
n = number of years over which returns are discounted.

When it can be assumed that the net returns to land remain constant over time, that the discounted rate does not change, and that a very long investment period is considered, the formula reduces to the familiar:

$$(2)\quad V = \frac{A}{r}.$$

Though equation (2) is the more common formula, it is clearly not the appropriate one when net returns and land prices are changing. If a once and for all change occurs and returns are expected to continue at that new level in the future, the value of A can be adjusted to reflect this expectation. If, however, the value of A is expected to increase at a constant arithmetic rate. the formula becomes:

$$(3)\quad V = \frac{A}{r} + \frac{I}{r^2},$$

where I is the average expected annual increment of increased returns to land and A is the present average net return to land. It may, however, be more realistic to expect either an increase or decrease in the returns to land to continue for a specified number of years into the future. In that event, the formula becomes:

$$(4)\quad V = \frac{A}{r} + \frac{I_1}{(1+r)^1} + \frac{I_2}{(1+r)^2} + \ldots + \frac{I_n}{(1+r)^n},$$

Here, I assumes a specific value for each year in question ($I_1, \ldots I_n$).

The capitalization formula could be further modified to account for an increase or decrease in the future value of the property itself, in the event the buyer intended to resell after a

specified time period. The general form of the discounting formula

$$(5) \quad V = \sum_{t=1}^{n} \frac{A_t}{(1+r)^t} + \frac{V_{o+n}}{(1+r)^n}$$

can be modified. If the net rent is expected to change by S per cent each year, the A_t term can be replaced by $A_o\ (1+S)_t$ where A_o is the net rent at the beginning of year 1. Rents are assumed to be received at the end of the year. If the property value is increasing at a constant annual rate U, the term V_o can be replaced by $V_o\ (1+U)^n$, where n is the number of years the property is held.