Commercial Bank Loans and The Money Supply

By J. A. Cacy

The lending activity of the nation's commercial banks has been unusually sluggish over the past year or two. Total bank loans in September of **1976** were only moderately higher than a year earlier. The growth in the narrowly defined money supply, **M1** (i.e., publicly held currency plus demand deposits), also has been on the weak side during the past year. **M1** increased 4.3 per cent in the year ending September **1976,** which is below the rate that would be expected during a period of substantial economic growth accompanied by a sizable, if diminished, inflation rate.

Some observers have argued that the weakness in the growth rate of the narrowly defined money supply is closely related to the sluggish behavior of loans at commercial banks. This article examines the relationship between bank loans and **M1.** The first section discusses possible theoretical reasons why the behavior of the two variables may be closely related. Next, the actual behavior of bank loans and **M1** during the last 25 years is examined to determine whether or not the two variables have behaved in similar ways. Finally, the article examines the behavior of bank loans, bank credit, and the broader measures of the money supply to determine if any of these variables show common behavior patterns.

THEORETICAL RELATIONSHIP BETWEEN LOANS AND MONEY

Observers who claim that the behavior of the narrowly defined money supply is closely related to that of commercial bank loans hold that **M1** tends to increase when loans are increasing and to decline when loans are declining. These observers offer several reasons for expecting the close relationship to exist. Some of these reasons are potentially valid, while the validity of others is questionable.

Certain observers, for example, appear to argue that **M1** and loans are *necessarily* related because the public cannot increase its **M1** balances unless banks make loans. It is true, of course, that commercial bank lending is an important source of potential increase in **M1.** When banks make loans, the proceeds may be and frequently are used by the public to augment its **M1** balances.

Bank lending, however, is only one of several sources of potential increase in the narrowly defined money supply. Another source is the investing activity of commercial banks. As in the case of loans, when banks acquire investments, such as U.S. Government securities, the public may use the proceeds to augment its **M1** balances. A third source of potential increase in money balances is the asset-acquiring activities of the Federal Reserve System. When the Federal Reserve buys U.S. Government securities, the proceeds potentially may be used by the public to add to its **M1** balances.

Potential increases or decreases in **M1** balances, therefore, result from changes in the assets — investments as well as loans — held by the nation's banking system, i.e., the Federal

Reserve and commercial banks. When the banking system adds to its assets, a potential increase in M1 occurs; and when the banking system reduces its assets, a potential decline in M1 occurs. Of course, these changes in M1 may not always materialize because the public may not add to M1 balances when the banking system acquires assets. Instead, the public may add to its time deposits or to other non-M1 liabilities of the banking system.'

The potential change in M1 that results from a change in bank loans during a particular time period can be seen by examining the consolidated balance sheet of the banking system. The assets of the banking system consist of Federal Reserve assets and commercial bank credit—that is, loans plus investments. Liabilities may be broken down into M1 and non-M1 liabilities. The potential increase in M1 during the year ending in June 1976 was $42.5 billion, as the assets of the banking system increased by that amount. (See Table 1.) Of the total increase in assets, only $9.8 billion was accounted for by an increase in bank loans. The largest single positive influence on M1 was the $24.0 billion rise in bank investments.[2]

Because bank lending is only one of several sources of potential increase in the money supply, M1 can increase even though loans do not. Also, loans may increase while M1 remains unchanged. Thus, the behavior of M1 is not *necessarily* related to bank lending activity.

Nevertheless, there are several reasons that a close relationship may exist between loans and M1. One reason is that banks typically require their business loan customers to hold compensating balances. Such balances may be related to the size of the customer's loan so that as loan amounts rise and fall, compensating demand balances rise and fall. Since these compensating balances are included in the money supply, their sensitivity to changes in loan volume may result in a correlation between the money supply and bank loans.

Another factor that would lead to a correlation between the money supply and bank loans is that the demand for money balances may tend to rise and fall in line with the demand for loans at banks. For example, during an economic upturn, rising consumer and business spending may be financed in part by loans from commercial banks. At the same time, the expanding economy may lead the public to add to its money balances. Also, during an economic downturn, the public may be inclined to reduce its indebtedness to commercial banks; and the low economic growth rate may reduce the public's need for money balances. Thus, the demand for bank loans and money balances may rise and fall together and may tend to cause a close correlation between bank loans and the money supply.

Finally, the conduct of monetary policy may tend to produce a correlation between bank loans and the money supply. Monetary authorities may tend to accommodate an expansion of bank loans by increasing reserves during periods in which bank loans are expanding. Increasing bank reserves, in turn, may give rise to increasing money balances. By the same token, when bank loans are falling the Federal Reserve may respond by reducing bank reserves, giving rise to a decline in money balances. Therefore, to the extent that

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[1] Changes in M1 balances may occur in the absence of changes in the loans and investments and other assets of the banking system. For example, when business firms redeem their large CD's, they may place the proceeds in M1 balances. In this case, M1 increases even though there has been no rise in earning assets. Of course, the reduction in large CD's and the increase in MI balances may have an indirect impact on commercial banks. It may, for example, increase the required reserves of commercial banks and induce banks to reduce their earning assets.

[2] Table 1 shows that M1 did not increase by the amount of the rise in banking system assets because a $30.4 billion increase in non-M1 liabilities absorbed most of the rise in assets. Thus, M1 increased only $12.1 billion ($42.5 billion minus $30.4 billion).

Table 1
CONSOLIDATED BALANCE SWEET
U.S. BANKING SYSTEM (FEDERAL RESERVE AND COMMERCIAL BANKS)
(In Billions of Dollars)

ASSETS			LIABILITIES		
Levels as of June 1976					
Federal Reserve Assets:			Money Supply (M1)		302.4
U.S. Govt. securities	95.6				
Other assets	26.8		Non-M1 Liabilities:		
Total		122.4	Time deposits other		
			than large CD's	399.2	
Commercial Bank Credit:			Large CD's	69.2	
Loans	511.7		Other liabilities	99.4	
Investments	236.1		Total		567.8
Total		747.8			
Total Assets		870.2	Total Liabilities		870.2
Changes During Year Ending June 1976					
Federal Reserve Assets:		8.7	Money Supply (M1)		12.1
Commercial Bank Credit:			Non-M1 Liabilities:		
Loans	9.8		Time deposits other		
Investments	24.0		than large CD's	46.0	
Total		33.8	Large CD's	−13.1	
			Other liabilities	− 2.5	
			Total		30.4
Total Assets		42.5	Total Liabilities		42.5

monetary policy accommodates alterations in bank loans, a correlation between bank loans and the money supply may result.

In brief, compensating balances, demand factors, and the conduct of monetary policy may possibly result in a close correlation between bank loans and the money supply. Whether or not such a correlation has resulted from these or other factors is examined in the following section.

HISTORICAL RELATIONSHIP BETWEEN LOANS AND M1

Some broad similarities may be observed between the behavior of bank loans and M1 during the past 25 years. Both M1 and total bank loans, as well as business loans, have increased steadily throughout most of the period from 1952 through the early part of 1976. (See Chart 1.) The increase in loans indicates that commercial bank lending activity has been an important source of potential increase in M1. From 1952 through 1975, for example, total loans increased $448 billion and accounted for about 70 per cent of the rise in the assets of the banking system.

Other similarities exist between the behavior of bank loans and M1. For example, the upward trends of both loans and M1 are slowed or interrupted from time to time. Moreover, in

Chart 1
COMMERCIAL BANK LOANS AND THE MONEY SUPPLY
1952-76

Billions of Dollars
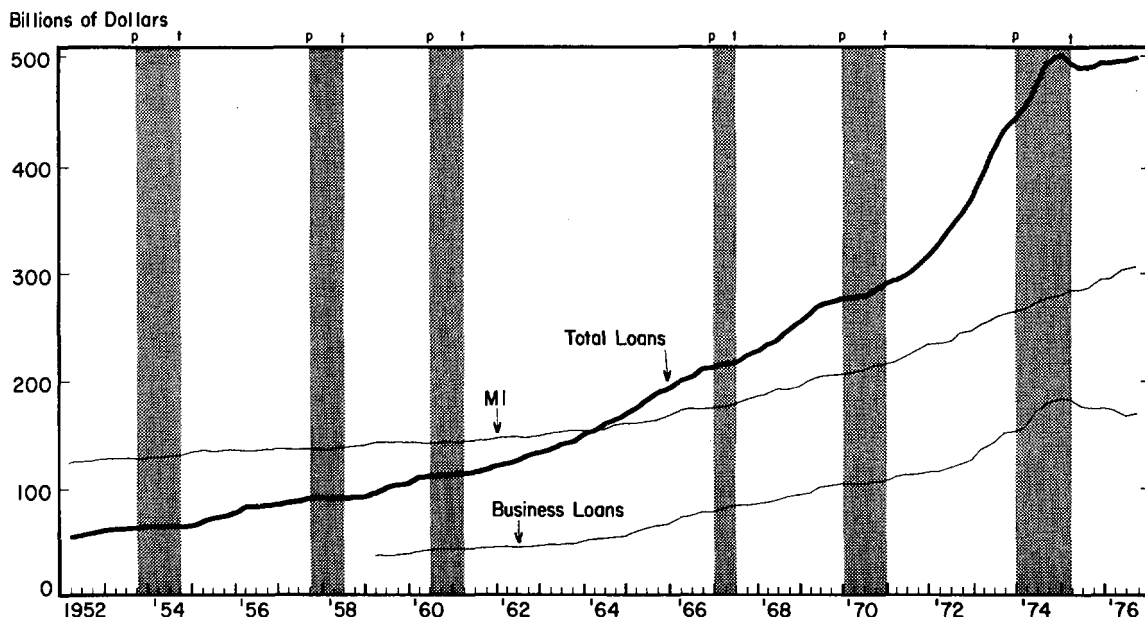
NOTE: The shaded areas in Charts 1, 2, and 3 pertain to recessions, with the p's and t's at the top of the charts referring to peaks and troughs of business cycles. With two exceptions, these reference periods are designated by the National Bureau of Economic Research (NBER). The first exception is the early-1967 period, which is included here because the behavior of financial variables was quite similar to other recessionary periods. The second exception is that while the NBER has not yet designated a trough for the current recession, the trough is shown here as the first quarter of 1975.

both cases, these interruptions are associated with business cycles, as may be seen in Chart 2, which shows the growth rates of total loans and M1. The growth rates of both of these variables decline for several quarters prior to the onset of economic recessions. Also, for both loans and M1, growth rates tend to accelerate during the first few quarters of economic recoveries.

Beyond these broad similarities, however, the behavior of bank loans and M1 is not closely correlated. For example, the statistical correlation between simultaneous movements in the growth rates of these two variables is quite low. Specifically, for a regression involving the current growth rates of M1 and bank loans

from the first quarter of 1950 through the second quarter of 1976, the coefficient of determination, R^2, is only .10. (See Table 2.) This means that movements in the growth rate of loans during any quarter explained only about 10 per cent of the movements in the growth rate of M1 during the same quarter. Regression analysis shows further that M1 and business loans are not correlated at all, as the R^2 between the growth rates of the two variables is zero.'

The contrasting behavior of the growth rates of loans and M1 is illustrated by their movements during the 1973-75 recession and subsequent period of economic recovery.

Chart 2
GROWTH RATES OF BANK LOANS AND THE MONEY SUPPLY
Quarterly Averages, 1952-76
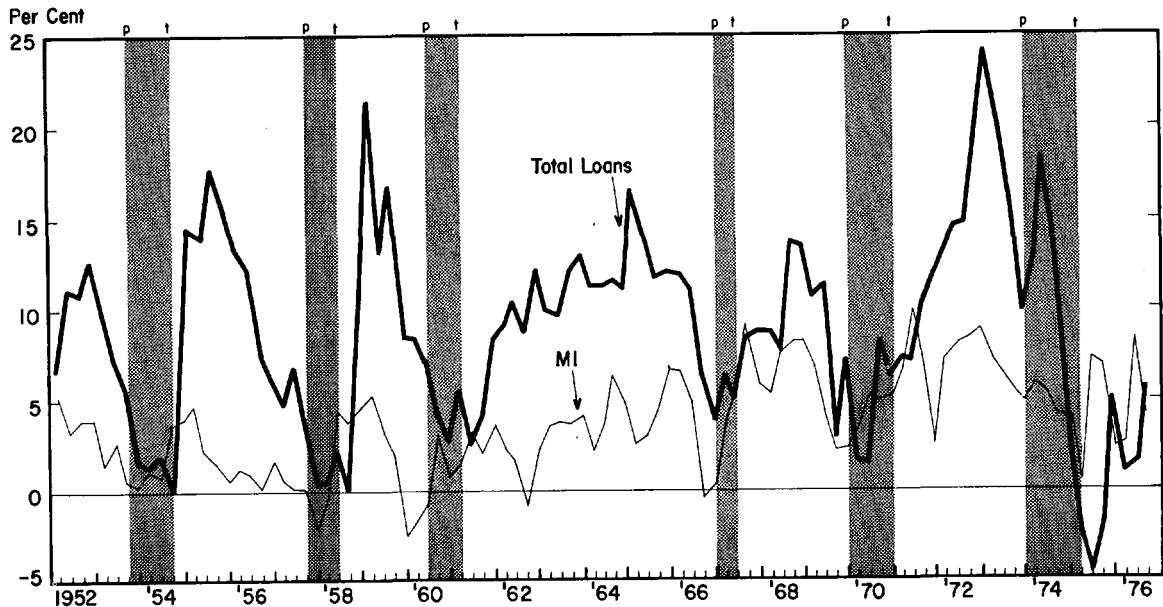
During the recovery, the money supply grew more rapidly than during the recession. In contrast, bank loans grew much more slowly during the recovery than during the recession. In the recovery period from the first quarter of 1975 through the third quarter of 1976, M1

grew at an annual rate of 5.3 per cent, compared with 4.1 per cent in the recessionary period from the fourth quarter of 1973 through the first quarter of 1975. The recovery growth rate of loans was 1.1 per cent, compared with the recession growth rate of 9.1 per cent.

While the growth rates of bank loans and M1 are not closely related, there is some correlation between the two variables. An examination of Chart 2 suggests that a time lag may be

3 The R^2's in Table 2 are for single variable regressions in which a current money supply variable was regressed on a current asset variable. For example, one regression had M1 as the dependent variable and loans as the independent variable. The original data were seasonally adjusted quarterly data for the period from the first quarter of 1950 through the second quarter of 1976. The observations that entered the regressions were differences between the actual and trend growth rates of the variables. Trend growth rates were determined by regression analysis. For example, the trend growth rate of M1 is defined as:

$$\Delta \ln M1^T_t = \ln M1^T_t - \ln M1^A_{t-1}$$

where $\ln M1^A$ is the natural logarithm of the actual level of M1 and $\ln M1^T$ is the predicted value of the regression equation:

$$\Delta \ln M1_t = a + b \ln M1_{t-1} + u_t.$$

This procedure allows the trend growth rate to change through time. In the case of MI, for example, the trend

growth rate increases from 2.0 per cent in the first quarter of 1950 to 6.3 per cent in the second quarter of 1976.

The series used in the regressions — the difference between actual and trend growth rates — have zero means and have no trend. However, the series do contain cycles. as no attempt was made to remove serial correlation. It should be noted, also, that the residuals of the regressions in Table 2 are serially correlated.

In addition to the regressions in Table 2. regressions were run using growth rates ($\Delta \ln$) as observations. In most cases, the growth rate regressions produced higher R^2's than the regressions reported in Table 2. However, the growth rates do, in most cases, contain trends which contribute to the higher R^2's.

Table 2
R^2 FOR REGRESSIONS OF VARIOUS MONEY SUPPLY MEASURES ON BANK LOANS, INVESTMENTS, AND BANK CREDIT

Dependent Variables	Independent Variables			
	Total Loans	Business Loans	Investments	Loans Plus Investments
M1	.10	.OO	.10	.29
M2	.00	.OO	.42	.45
M4	.09	.06	.30	.63

NOTE: M1 consists of demand deposits of commercial banks other than domestic interbank and U.S. Government less cash items in process of collection and Federal Reserve float; foreign demand balances at Federal Reserve Banks; and currency outside the Treasury, Federal Reserve Banks, and vaults of commercial banks. M2 consists of M1 plus savings deposits, time deposits open account, and time certificates of deposit other than negotiable CD's of $100,000 of large weekly reporting banks. M4 consists of M2 plus large negotiable CD's.

involved in the relationship. Note, in particular, the tendency for a turnaround in the loan growth rate to lag a turnaround in the money growth rate. This tendency is especially evident during periods in which the growth rate of M1 is accelerating after having been declining. Typically, these turning points in the growth rate of M1 are near the peaks of business cycles. During the first part of the periods of accelerating M1 growth, the growth rate of bank loans typically either declines or does not change much. The growth rate of loans does not begin accelerating until some time after Ml's growth rate has undergone a reversal of direction.

The recent behavior of total loans and M1 illustrates the tendency for the turnaround in the loan growth rate to lag behind the turnaround in the money growth rate. As usual, the growth rate of M1 began declining several quarters prior to the onset of the 1973-75 recession, which began in the last

quarter of 1973. Ml's growth rate declined throughout the recession (surprisingly, since M1's growth rate usually begins accelerating well before the end of recessions) and bottomed out in the first quarter of 1975, the recession's final quarter. In the second quarter of 1975, the growth rate of money accelerated sharply, and grew much more rapidly in both the second quarter and the third quarter of 1975 than in any quarter during the recession. The loan growth rate, however, instead of accelerating during the second quarter of 1975, continued to decline, with total loans falling during both the second and third quarters of 1975.

Statistical analysis supports the impression gained from Chart 2 that a time lag may be involved in the relationship between bank loans and M1. The analysis shows that movements in the growth rate of M1 during any quarter can explain about 29 per cent of the movements in the growth rate of loans two quarters later.[4] This moderately high correlation between current money supply movements and future movements in loans may be due to a tendency for M1 movements to lead movements in the general business cycle and for the cycle to coincide with or lead movements in bank loans.

RELATIONSHIP BETWEEN BANK CREDIT AND THE MONEY SUPPLY

As pointed out earlier, increases in the money supply may potentially arise when banks add either to their loans or their investments.

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[4] The 29 per cent is the R^2 from a regression involving time lags. The general form is:

$$\Delta \ln L_t^D = t \, (\Delta \ln M1_{t-2}^D)$$

where the superscript D denotes differences between actual and trend growth rates. Similar multivariate regressions with up to four lagged MI variables increase the R^2 to as high as 35 per cent. Regressions with loans instead of M1 lagged—of the form

$$\Delta \ln M1_t = t \, (\Delta \ln L_{t-2})$$

have R^2's of less than .10 per cent, regardless of the number of lagged loan variables involved (up to four lagged variables).

Chart 3
GROWTH RATES OF BANK CREDIT AND THE MONEY SUPPLY, M4
Quarterly Averages, 1952-76
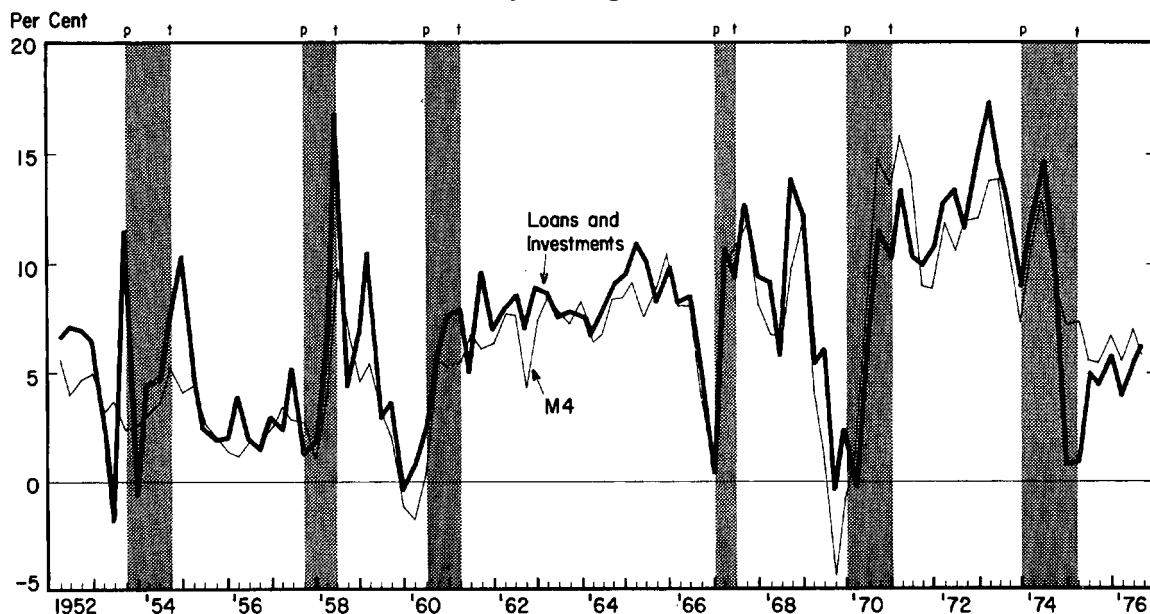
Thus. one would expect the correlation between total bank earning assets—i.e., loans plus investments — and M1 to be closer than the correlation between any component of earning assets — such as loans or investments — and money. This expectation turns out to be correct. The R^2 between the growth rates of earning assets during any quarter and the growth rate of M1 in the same quarter is **29** per cent, compared with **10** per cent between loans and M1, and **10** per cent between investments and M1. (See Table **2.**)

The correlation between bank credit and **M2** also may be expected to be higher than the correlation between bank credit and **M1**. This is because increases in bank earning assets may potentially be used by the public to augment its time deposits as well as its **M1** balances. Whether **M1** balances or time deposits (except large CD's) are augmented, **M2** will increase because time deposits other than large CD's are included in **M2** along with **M1**. Also, because

funds arising from increases in earning assets may be placed in large certificates of deposit rather than **M2** balances, and because **M4** is defined as **M2** plus large CD's, the correlation between bank credit and **M4** should exceed that between bank credit and **M2**. These expectations are confirmed by statistical analysis. Table **2** shows that movements in the growth rate of bank credit explain 45 per cent of the movements in M2, while the R^2 between credit and **M4** is 63 per cent.[5] The high correlation between bank credit and **M4** may be observed in Chart **3.** which plots the growth

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[5] The R^2's reported in Table 2 are for current period regressions. Regressions involving time lags give somewhat different results. When **M2** or M4 is regressed on past values of investments or bank credit, the R^2's are lower than reported in Table 2. Similarly, when investments or bank credit is regressed on past values of M2 or M4, the R^2's are lower than in Table 2. However, when loans are regressed on past values of M2 or M4, the R^2's are somewhat higher than reported in Table 2. This result is similar to that reported for loans and M1 in the text.

rates of the two variables for the 1952-76 period.

Somewhat surprisingly, a fairly close relationship was found between commercial bank investments and M2. (See Table 2.) Movements in the growth rate of investments account for about 40 per cent of the movements in M2. Since the R^2 is relatively high between investments and M2, and low between investments and M1, investments and the time deposit component of M2 must be highly correlated. And, when the time deposit component of M2 is regressed on investments, an R^2 of 45 per cent is produced. Evidently, during periods when banks are aggressively adding to their investment portfolios, the funds provided to the public .are more likely to be used to add to time deposits rather than to M1 balances. An alternative interpretation of the statistical results is that banks are more likely to acquire investments when their time deposits increase than when their demand deposits increase.

SUMMARY

Many observers of financial developments argue that the behavior of the narrowly defined money supply, M1, is closely related to the behavior of commercial bank loans. According to this argument, M1 tends to increase when loans are increasing and to decline when loans are declining. Some observers appear to argue further that M1 and loans are necessarily related because the public cannot increase its M1 balances unless banks make loans.

This article points out that while increases in bank loans may be and frequently are used by the public to augment M1 balances, bank lending activity is only one of several sources of potential increase in M1. For example, when banks increase their investments, a potential increase in M1 occurs because the increase in investments provides the public with funds that may be used to add to money balances. For this reason, M1 may increase even though bank loans do not, and M1 may remain unchanged while loans increase. Thus, the behavior of M1 is not *necessarily* related to bank lending activity. Nevertheless, several factors *may* produce a close correlation between the two variables. These factors include compensating balance requirements, demand factors affecting both loans and M1, and the conduct of monetary policy.

An examination of the historical relationship between loans and M1 over the past 25 years uncovered some broad similarities between the behavior of the two variables. Both variables have trended upward during the 1952-76 period and commercial bank lending activity has been an important source of potential increase in M1. Furthermore, the upward trends for both Ml and loans have been interrupted from time to time and in both cases these interruptions have been associated with the business cycle.

Beyond these broad similarities, however, the behavior of bank loans and M1 has not been closely correlated during the 1952-76 period. The statistical. correlation is quite low between movements in the growth rate of M1 during any period and movements in the growth rate of loans in that same period. The correlation is somewhat higher when the existence of a lagged relationship is recognized. Even so, the correlation is only moderately high.

Furthermore, statistical analysis shows that the correlation is also quite low between growth rates of bank loans and the broader measures of the money supply, such as M2 and M4. As would be expected, on the other hand, a somewhat higher correlation was found between bank credit, which includes both loans and investments, and various measures of the money supply. The correlation between bank credit and M4 is quite high.

The Concept of Private Income

By Robert D. Auerbach and Jack L. Rutner

There are a number of frequently used measures of aggregate income or output for the U.S. economy. One of these is gross national product (GNP), which is the one most commonly cited. Other less frequently cited aggregates are net national product (NNP) and national income (NI). None of these concepts of income, however, measure the income of the private sector alone since they also include the income of the government sector.

There are occasions, though, when a definition of income is needed that excludes the government sector. Such instances arise when one wishes to measure, and perhaps forecast, the demand for goods and services by the private sector, such as money balances, durable goods, vacations, etc.' Indeed, the appropriateness of a definition of income that excludes the government sector was originally suggested by Milton Eriedman and David Meiselman in connection'with the estimation' of the demand for money by individuals in the private sector.² For estimating such a demand function, it may

be appropriate to have a measure of income of only the private sector.

The purpose of this article is to describe and develop a concept of income of the private sector. The concept of private income outlined here is the total income of individuals including transfers and net of taxes plus undistributed corporate profits. The first section of the article indicates how this concept can be derived from the GNP accounts. The second section provides an analysis of how private income has behaved in the post-World War II period relative to other commonly used measures of aggregate income.

6NP AND ITS RELATION TO PRIVATE INCOME

The GNP Accounts

To describe the concept of private income, it is useful to begin with an examination of the GNP accounts. For reference, Table 1 presents a summary of the U.S. national income and product accounts for 1975 as published recently by the U.S. Department of Commerce in the **Survey** of **Current Business.**

The basic purpose of the GNP accounts is to provide a continuing measure of the gross expenditures on final goods and services of the U.S. economy. The underlying rationale of the accounts is embedded in an accounting relationship in which payments equal either receipts or income from the sale of final goods and services. Reflecting this accounting equality, GNP can be computed in one of two

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[1] Of course, for items where a composite demand by the private sector and the government exists, account must also be taken of the government sector.

[2] Friedman and Meiselman, "Reply to Ando and Modigliani and to Prano and Mayer," *American Economic Review.* September *1965.* See also Robert D. Auerbach, "The, Income Effects of the Government Deficit," unpublished Ph.D. dissertation, University of Chicago, 1969.

Table 1
SUMMARY NATIONAL INCOME AND PRODUCT ACCOUNTS, 1975
(In Billions of Dollars)

Compensation of employees	928.8	Personal consumption expenditures	973.2
Wages and salaries	806.7	Durable goods	131.7
Disbursements	806.7	Nondurable goods	409.1
Wage accruals less disbursements	.0	Services	432.4
Supplements to wages and salaries	122.1		
Employer contributions for social insurance	59.7	Gross private domestic investment	183.7
Other labor income	62.5		
		Fixed investment	198.3
Proprietors' income with inventory valuation and		Nonresidential	147.1
capital consumption adjustments	90.2	Structures	52.0
		Producers' durable equipment	95.1
Rental income of persons with capital consumption		Residential	51.2
adjustment	22.4		
		Change in business inventories	−14.6
Corporate profits with inventory valuation and			
capital consumption adjustments	91.6	Net exports of goods and services	20.5
Profits before tax	114.5		
Profits tax liability	49.2	Exports	148.1
Profits after tax	65.3	Imports	127.6
Dividends	32.1		
Undistributed profits	33.2	Government purchases of goods and services	339.0
Inventory valuation adjustment	−11.4		
Capital consumption adjustment	−11.5	Federal	124.4
		National defense	84.3
Net interest	74.6	Nondefense	40.1
		State and local	214.5
NATIONAL INCOME	1,207.6		
		Addendum:	
Business transfer payments	6.3		
Indirect business tax and nontax liability	138.7	Net exports of goods and services	20.5
Less: Subsidies less current surplus of government		Net foreign investment	11.9
enterprises	2.0	Personal transfers to foreigners	0.9
Statistical discrepancy	4.4	Interest and transfers paid by foreigners	
		less capital grants received by U.S.	7.6
CHARGES AGAINST NET NATIONAL PRODUCT	1,355.0		
Capital consumption allowances with capital			
consumption adjustment	161.4		
CHARGES AGAINST GROSS NATIONAL PRODUCT	1,516.3	GROSS NATIONAL PRODUCT	1,516.3

ways: by summing the values of expenditures of all final products sold, as illustrated on the right side of Table 1; or by summing the receipts or gross income from these sales, as illustrated on the left side of Table 1.

As illustrated by Table 1, national income is a narrower measure than GNP. The difference arises because GNP as derived on the right side of the accounts is essentially a consolidated sales figure of all final goods and services sold,

while NI equals only the value of final goods and services produced in the current period. This difference between the value of goods sold and goods produced, which is shown in Table 1 as adjustments to NI, does not represent income earned by factors of production for producing the current period's output. One such adjustment, for example, is called depreciation and shown in Table 1 as capital consumption allowances and represents the

using up of output from a previous period.' In order to avoid double counting output from two different periods, depreciation is subtracted from GNP to obtain NI.

When this adjustment and others[4] are made to NI on the left side of the accounts, the total exactly balances with the product side of the accounts. In other words, total charges against GNP—including factor costs and other costs--exactly equal GNP derived via the right side of the accounts. The concept of net national product is obtained by subtracting one of these items of adjustment, i.e., depreciation charges, from GNP.

The Derivation of Private Income

As indicated earlier, the concept of private income described here is the income of persons including transfers and net of taxes plus undistributed corporate income. Income accruing to the government sector, both federal and state and local governments, is explicitly excluded in deriving private income. Since the totals of the income and product sides of the GNP accounts are exactly equal after making certain adjustments, private income can be obtained by subtracting government income from either side of the accounts.

Table 2 shows the relationship of private income to GNP in 1975, together with the various categories that comprise private income. Many of the categories are identical to those in Table 1. They have simply been rearranged to reflect the separation of the

accounts into personal, corporate, and government income. Other categories, however, as well as the values for certain categories, do not appear in the summary accounts of Table 1. Rather, they are contained in supplemental sector accounts, which are published in considerable detail along with the GNP accounts by the U.S. Department of Commerce.

Private income derived from the left side of the GNP accounts consists of disposable personal income plus corporate retained income.[5] As shown in Table 2, disposable personal income amounts to personal income minus personal tax and nontax payments. Personal income includes most of the items shown previously in Table 1, such as compensation of employees, proprietors' income, rental income, dividends, and net interest.[6] Also included are transfer payments from government and businesses, which are considered income received by persons even though they are not related to the sale of goods and services. Contributions to social insurance are also deducted under the assumption they are government income and not savings to the private sector. Finally, personal taxes and nontax payments are deducted to arrive at disposable income. Tax payments are deducted because they represent income accruing to the government sector.

Corporate retained income consists of retained corporate profits whether in the form of cash or invested in inventory or equipment. Corporate dividends, as indicated above, are

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3 Output from a previous period which is not consumed in that period is an addition to the stock of wealth.

4 Other adjustments are made for indirect business taxes, business transfer payments, current surplus of government enterprises less subsidies, and for an item called statistical discrepancy. The presence of the statistical discrepancy arises because of the different methods of accounting used to arrive at the right and left sides of the national income and product accounts. It is used as a balancing item to reconcile both sides. As a technical matter, NNP (GNP less depreciation) is larger than national income because it includes indirect business taxes (sales and property taxes).

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5 The statistical discrepancy must be added or subtracted from one side of the accounts in order that both balance, so that private income could also arbitrarily include the statistical discrepancy. Without some additional evidence as to the source of the discrepancy, there is no basis for making a decision as to which side of the accounts the discrepancy is to be assigned.

6 The value of net interest received by persons shown in Table 2 is different from the net interest received by all factors of production, which as shown in Table 1 is corrected for inter-sector transfers.

Table 2
RELATION OF PRIVATE INCOME TO GNP, 1975
(In Billions of Dollars)

Disposable personal income		1,058.1	Personal consumption expenditures		973.2
Personal income	1,226.9		Net private domestic investment		22.3
Compensation of employees	928.8				
Proprietors' income	90.2		Net foreign investment		12.0
Rental income	22.4				
Dividends	32.1		Personal transfers to foreigners		0.9
Net interest received by persons	87.9				
Transfers to persons	185.2		Deficit of government		64.4
By business	6.3				
By government	168.9		Government purchases of goods		
Less employee and employer			and services	339.0	
contributions to social insurance	109.7		Interest and transfers paid by		
Less wage accruals plus disbursements	0.0		government to foreigners less		
			capital grants received by U.S.	7.6	
Less personal tax and nontax payments	168.8		Less government net income	282.2	
Retained corporate income		10.3	PRIVATE INCOME		1,072.8
Undistributed corporate profits	33.2		Government net income		282.2
Inventory valuation adjustment	−11.4				
Capital consumption adjustment	−11.5		Capital consumption allowances		161.4
Statistical discrepancy		4.4			
PRIVATE INCOME		1,072.8			
Government net income		282.2			
Personal tax and nontax payments	168.8				
Corporate tax payments	49.2				
Indirect business taxes	138.7				
Contributions to social insurance	109.7				
Wage accruals less disbursement	0.0				
Less government transfers	168.9				
Less interest paid	13.3				
Less subsidies plus surplus of					
enterprises	2.0				
NET NATIONAL PRODUCT		1,355.0			
Capital consumption allowances		161.4			
GROSS NATIONAL PRODUCT		1,516.3	GROSS NATIONAL PRODUCT		1,516.3

shown as part of personal income. Corporate tax payments are not treated as part of corporate income because they represent income received by the government sector. Thus, adding the value of disposable personal income to corporate retained income (plus a minor statistical discrepancy item) yields the concept of private income.

Government net income, which consists of tax receipts less transfers, is shown on the left

side of Table 2. The components of government income also are shown.' When government net income is added to private income, the total equals net national product; and when capital consumption allowances (depreciation) are added to NNP, the total equals GNP.

The concept of private income can also be derived from the right side of the GNP accounts. Conceptually, the methodology is the same, i.e., to subtract from the accounts all income accruing to the government sector. Accordingly, private income includes personal consumption expenditures, net private domestic and foreign investments, personal transfers to foreigners, and the deficit of the government sector. The deficit of the government is obtained by subtracting government net income from government expenditures.[8] The resulting value of private income on the expenditure side of the accounts is exactly equal to the same concept on the income side. By the same token, when government net income and capital consumption allowances (depreciation)[9] are added to private income, the total equals GNP.

It should be mentioned that the computation of private income from the right side of Table 2 treats the government sector in a manner

analogous to the foreign sector. That is, just as imports are subtracted from exports, government receipts are subtracted from government expenditures. Viewing the government sector this way reveals why deficit spending by government is treated as a stimulant to private income during recessionary periods. In such periods, there is an attempt to stimulate income by increasing exports or by restricting the importation of goods produced abroad. Similarly, there is an attempt to increase sales to the government or reduce government receipts — namely, taxes.[10]

A further point is that the concept of private income derived here, because it excludes the government sector, is not a measure of the total expenditures on final goods and services in the economy. Indeed, the value of private income in 1975, which is estimated at $1,072.8 billion, would understate total expenditures on final goods and services as measured by NNP and GNP, which are valued at $1,355.0 billion and $1,516.3 billion, respectively. Private income also falls short of national income, valued at $1,207.6 billion in 1975. These aggregate measures, however, often have been used to help measure the demand for goods and services by the private sector. The following section, therefore, examines how these aggregate measures have behaved relative to private income.

THE BEHAVIOR OF PRIVATE INCOME

To examine the behavior of private income, values for the concept were calculated for the post-World War II period 1946-75. Table 3 contains these values calculated on an annual basis along with values for the major

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[7] Specifically. all personal, corporate, and indirect tax receipts are listed as part of government income along with government receipts arising from contributions to social insurance. Deducted from these receipts are government domestic transfer payments and interest paid by the government. Interest paid by the government excludes interest paid to foreigners, the latter being treated explicitly on the expenditure side of the accounts. Finally, the net income figure for government is actually domestic net income since it excludes capital grants received by the United States.

[8] Government expenditures include expenditures for goods and services and net government outlays to the foreign sectors. The value of such outlays to foreigners when added to net foreign investment and personal transfers to foreigners equals the net export of goods and services shown in Table I.

[9] Since capital consumption allowances are excluded from private income, the item net private domestic investment is used in Table 2 rather than gross private domestic investment as shown in Table 1.

[10] One cannot conclude, however, the precise magnitude or sign changes the government deficit or net exports will have on private income by looking only at these simple accounting identities. inasmuch as some other components of the accounting identity must also change, and this may have offsetting effects.

Table 3
PRIVATE INCOME, ANNUALLY 1946-75
(In Billions of Dollars)

| Year	Sources of Income			Final Sales				Total Private Income		
	Disposable Personal Income (Adjusted)	Net Corporate Retained Earnings	Statistical Discrepancy	consumption	Net Domestic Investments	Net Foreign Investments	Deficit of Government	Current Dollars	As a Per Cent of NNP	In 1972 Prices
1946	157.2	1.9	0.7	143.8	16.9	4.6	− 5.4	159.8	81.7	334.8
1947	166.6	4.6	1.8	161.7	16.8	9.0	−14.4	173.0	80.3	327.6
1948	185.3	9.7	−1.2	174.7	25.6	2.0	− 8.4	193.8	81.2	347.3
1949	184.8	9.6	1.0	178.1	13.3	0.6	3.4	195.4	82.8	351.0
1950	202.8	6.9	2.0	192.0	29.9	−2.1	− 8.0	21 1.7	80.7	372.8
1951	221.9	7.0	4.0	207.1	31.6	0.3	− 6.1	232.9	77.0	385.2
1952	233.1	7.5	2.7	217.1	22.5	−0.2	3.8	243.3	76.6	393.3
1953	246.7	6.4	3.3	229.7	21.7	−1.9	6.9	256.4	76.7	406.6
1954	251.4	7.9	3.0	235.8	19.6	−0.3	7.1	262.3	78.7	41 2.4
1955	268.6	12.3	2.5	253.7	33.1	−0.3	− 3.1	283.4	77.9	441.0
1956	285.7	9.8	−0.8	266.0	32.1	1.8	− 5.2	294.7	77.2	449.7
1957	301.0	9.2	−0.2	280.4	27.2	3.6	− 0.9	310.4	77.4	458.5
1958	31 1.2	7.1	1.7	289.5	17.8	0.1	12.6	320.0	79.1	462.9
1959	329.6	12.4	−0.2	310.8	31.5	−2.0	1.6	341.8	77.6	485.1
1960	342.0	11.0	−0.7	324.9	28.7	1.7	− 3.1	352.3	76.8	491.2
1961	355.2	10.8	1.6	335.0	25.2	3.0	4.3	367.6	77.5	506.8
1962	375.6	16.5	4.0	355.2	34.7	2.4	3.8	396.1	77.2	538.1
1963	393.4	17.9	3.7	374.6	38.0	3.2	− 0.7	41 5.0	76.5	555.3
1964	426.5	21.7	2.2	400.4	42.0	5.7	2.3	450.4	77.5	595.0
1965	460.5	27.1	0.9	430.2	54.5	4.3	− 0.5	488.5	77.5	633.2
1966	497.8	29.4	3.2	446.8	62.8	1.6	1.3	530.4	76.7	668.3
1967	531.3	26.7	1.7	490.4	53.8	1.2	14.2	559.7	76.7	688.3
1968	574.0	24.5	−0.6	535.9	57.7	−1.4	5.5	597.9	75.2	706.7
1969	61 4.8	19.2	−3.3	579.7	63.7	−2.0	−10.7	630.7	73.9	71 2.6
1970	669.4	10.5	−2.1	618.8	50.0	0.5	8.5	677.8.	76.0	732.7
1971	725.5	16.9	1.3	668.2	61.2	−3.2	17.6	743.7	77.1	769.4
1972	782.4	25.9	1.7	733.0	82.9	−9.0	3.1	810.0	76.0	810.0
1973	880.2	22.6	2.6	809.9	102.4	−0.6	− 6.3	905.4	76.1	861.0
1974	959.7	1.7	6.6	887.5	77.3	−3.0	6.3	968.0	76.0	829.8
1975	1,057.2	10.3	4.4	973.2	22.3	12.0	64.4	1,071.9	79.5	846.8

NOTE: Components may not sum to total due to rounding. Also, disposable personal income (adjusted) is adjusted to exclude interest paid by consumers and personal transfers to foreigners.

components of private income." As is apparent from Table 3, private income has risen

11 The values of private income in Table 3 exclude personal transfers to foreigners. Hence, the value of private income shown for 1975 ($1,071.9 billion) is $0.9 billion less than the value shown in Table 2. This treatment was suggested in Friedman and Meiselman, "Reply to Ando and Modigliani and to Prano and Mayer."

throughout the period although it has a somewhat different pattern of growth than other measures of income. Prior to the Korean war private income averaged about 81 per cent of NNP. Since that time, however, reflecting the growth of the government sector, private income has averaged only about 77 per cent of NNP, although in 1975 private income jumped

Chart 1
REAL AND NOMINAL PRIVATE INCOME
(Quarterly, 1947-75)

Billions of Dollars
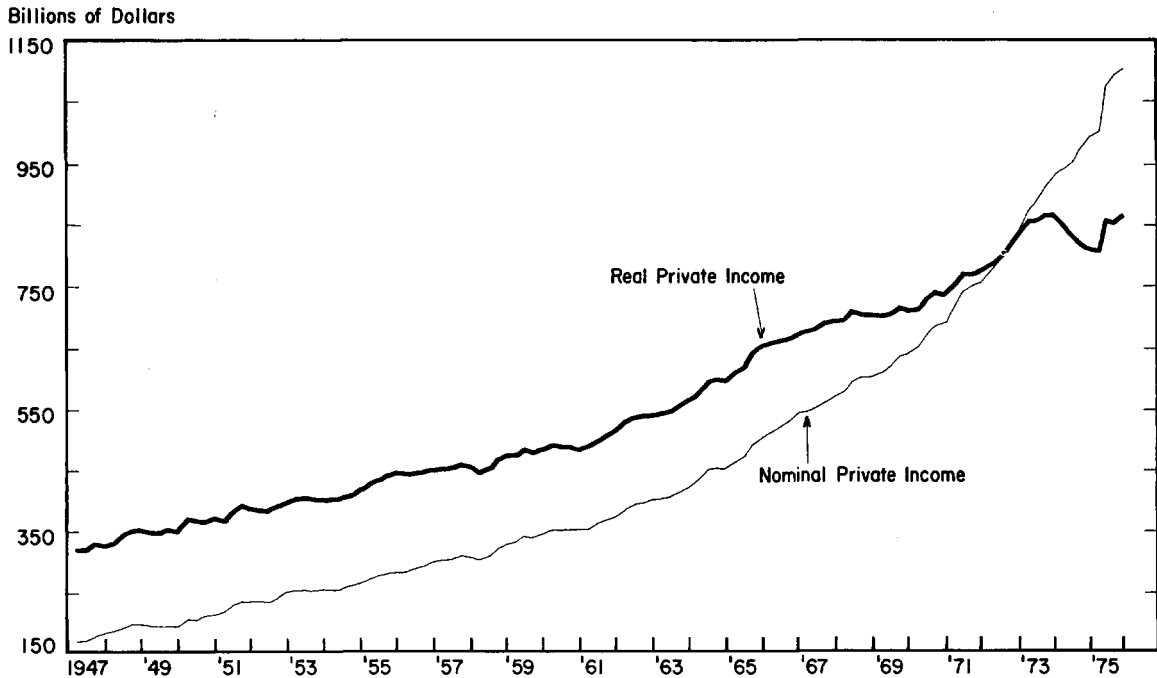
SOURCE: See text.

to 79 per cent of NNP. For the entire postwar period, private income has varied from a high of 83 per cent to a low of 73 per cent of NNP.

The rising values of several measures of aggregate expenditures on final goods and services in recent years have partly reflected inflationary factors. The impact of rising prices on these variables has led increasingly to the use of "real" values, i.e., values deflated to account for an increase in prices. The last column in Table 3, therefore, also provides annual values for private income calculated in constant dollars.[12]

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[12] The methodology employed to arrive at the real values is described in the appendix.

The distorting effect that changes in the price level have had on private income may be seen in Chart 1. The level of private income is expressed in both current and real terms and is displayed on a quarterly basis for the 1947-75 period. As is clearly shown, the rapid price increases since the late 1960's have led to a sharp rise in private income expressed in current dollars. In contrast, gains in real private income have been relatively more moderate. Since price changes have tended to obscure the underlying behavior. of real private income, real values are subsequently employed in comparing private income with other income measures.

Chart 2 shows the behavior of real private income relative to three other measures of real

Chart 2
FOUR MEASURES OF REAL INCOME
(Quarterly, 1947-75)
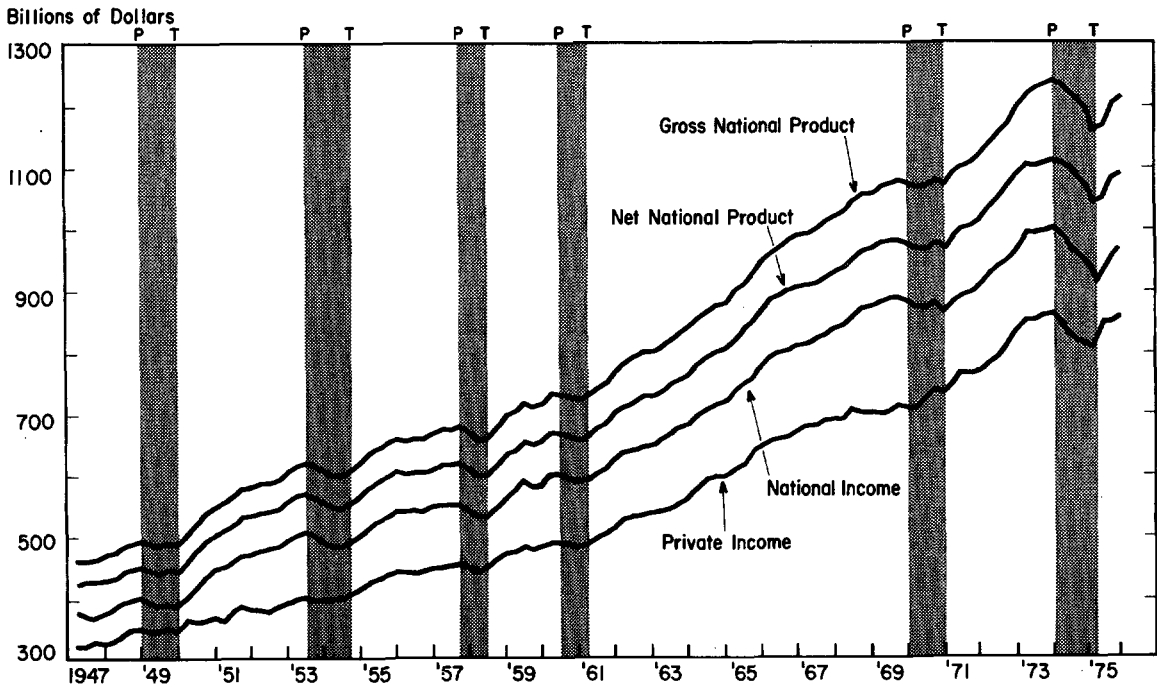
SOURCE: Real GNP, NNP, and NI: **Survey** of **Current Business, U.S.** Department of Commerce, Washington, D.C., January and July 1976; Real Private Income: see text.
NOTE: The shaded areas in this chart pertain to recessions, with the p's and t's at the top of the chart referring to peaks and troughs of business cycles.

aggregate income: **GNP, NNP,** and **NI.** As is readily apparent, there is a similar upward trend in each of the four measures during the entire **1947-75** period. Closer inspection, however, indicates some dissimilarities between real private income and the other series.

During recessions, real private income often tends to remain more stable, or to fall by less, than the other three measures. In the **1953-54** recession, for instance, real **GNP, NNP,** and **NI** all declined until the second quarter of **1954,** whereas private income reached its low in the last quarter of **1953.** Moreover, the decline in

private income was much less than in the other three measures. In the **1957-58** recession, private income again declined moderately, while the declines in the other measures were much larger. In the **1960-61** recession and in the **1969-70** recession, private income actually rose somewhat compared to declines in the other measures. Only in the most recent and very severe **1974-75** recession did private income decline sharply along with the other three measures of income.

There were two other periods when real private income behaved atypically relative to

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Table 4
RATES OF CHANGE AND VARIABILITY OF FOUR MEASURES OF WEAL INCOME, 1947-75

Income Measures	Annual		Quarterly	
	Mean	Standard Deviation	Mean	Standard Deviation
Gross National Product	3.38	3.20	3.36	4.58
Net National Product	3.29	3.50	3.26	5.02
National Income	3.35	3.94	3.27	5.46
Private Income	3.44	3.16	3.43	5.82

CORRELATION OF RATES OF CHANGE OF FOUR MEASURES OF REAL INCOME, 1947-75

	Annual			Quarterly		
	GNP	NNP	NI	GNP	NNP	NI
Net National Product	.999			.996		
National Income	.982	.981		.956	.967	
Private Income	.842	.845	.844	,680	.681	,623

variability of the four income series as shown by their respective standard deviations. Using annual data, for example, private income is found to be the least variable; i.e., it only varied within±3.16 percentage points of its average rate of change. Using quarterly data, though, private income is found to be the most variable of the four income series.

The degree of correlation between the rates of changes in each of the four income measures is also shown in Table 4. On an annual basis, the correlation between private income and the other measures is quite high, although not as high as between each of the other three measures. On a quarterly basis, the differences are quite pronounced. GNP. NNP, and NI are all highly correlated with each other on a quarterly basis as they are on an annual basis. Private income, though, is much less correlated with GNP, NNP, and NI using quarterly data. These correlations suggest that for quarterly data at least 32 per cent of the deviation in real income is uncorrelated with deviations in the other measures of income; and, hence, these other measures may be inappropriate proxies for private income.

the other measures of real income. The first was during the Korean war (1951-52) and the second was in the midst of the Vietnam conflict (1968-69). During both of these periods, private income declined while the other measures of income increased. The decline of private income in these periods clearly reflected the increase in the government's share of income. In a sense, the increase in the government's share of income during these periods of military conflict could be viewed as if the private sector had purchased more government services in the form of defense.

Further evidence on the behavior of real private income relative to the other three income measures is contained in Table 4. As shown in the top portion of the table, the average rates of change of all four measures were very similar during the 1947-75 period, whether using annual or quarterly data. On the other hand, dissimilarities occur in the

SUMMARY

This article has described a concept of private income and its accounting as well as statistical relationships to other measures of income. Essentially, the concept includes income of individuals with transfers net of taxes plus corporate retained earnings. Income of the government sector, both federal and state and local governments, is explicitly excluded from private income. Compared to the other measures of income, real private income in most recessions tended to be more stable, or to fall by less, than the other three measures of real income. Moreover, during the entire 1947-75 period, the rates of change of real private income, although similar in average magnitude to the other measures of income, were found to be more variable when using

quarterly data than the other income measures. In addition, the correlation between real private income and each of the other three measures was also not particularly high.

Based on the national income accounts, it, appears that the concept of private income described here is a more precise measure of the income of the private sector than GNP, NNP, or NI. In addition, private income is not as highly correlated with these other measures of income and appears to follow a somewhat different cyclical pattern than they do. Hence, researchers interested in using a concept of income to analyze the behavior of the private sector may well find the concept of private income described here superior to these other measures of income.

APPENDIX

The Computation of Real Values of Private Income

The computation of private income in constant purchasing power was performed by applying price deflators to the different components of private income. This approach posed somewhat of a problem because not all of the appropriate price deflators for the components of private income exist. In those instances, the choice of the component deflators was made on a basis that was deemed to be the most appropriate and reasonable.

The following list is a summary of the methods used to compute the deflators for the major components of private income. The source of all data used is the **Survey of Current Business** published by the U.S. Department of Commerce.

Components of Real' Private Income	Methods of Computation
1. Real consumption expenditures..	From published data
2. Real net domestic investment	Real gross domestic investment less real capital consumption allowance
3. Real net foreign investment	Nominal net foreign investment/implicit deflator of imports
4. Real deficit.............	$(1) + (2) + (3) - (5) - (6) - (7)$
5. Real disposable personal income (adjusted)	Nominal disposable personal income (adjusted)/implicit deflator of disposable personal income
6. Real retained corporate earnings	Nominal retained corporate earnings/implicit deflator of business output
7. Real residual	From published data

The first four items pertain to the components of real private income appearing on the expenditure side of the accounts and the latter three items pertain to the income side. The price deflators for some items are taken directly from published data and for others the methods of computation are rather straightforward. In Item 3, for instance, nominal net foreign investment was divided by the implicit deflator of imports. A deflator for exports was also tried but it gave about the same results as the import deflator. In Item 5, the deflator on disposable personal income appeared most reasonable inasmuch as disposable,, ..personal income (adjusted) differs only slightly from total disposable personal income.

The computation that presented 'the;' most' difficulty was for the government deficit, Item 4. An attempt was originally made to deflate the deficit by the price at which the government purchases goods and services. This attempt resulted in some large' statistical errors so an alternative method was chosen.. The alternative method measures the deficit as the difference between the components taken from the income side, Items 5, 6, and 7, and the components excluding the deficit — taken from the expenditure side, Items 1, 2, and 3. Among the components from the income side is a residual, Item 7, which is analogous to the statistical discrepancy item. It should be pointed out that this indirect method of computing the real deficit, rather than some alternate direct method, will tend to cause any methodological errors present in other parts of private income to be contained in the real deficit.

The deflator for private income, as it turns out, is nearly identical to the deflator on consumption because private income is dominated by the consumption component.