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# Macroeconomic Factors Behind the Fall in Farm Interest Rates

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## Abstract

Interest rates on agricultural loans are determined by factors primarily outside of the agriculture sector in national and international credit markets. This report discusses the macroeconomic factors behind the fall in agricultural interest rates in 2001 and the farm interest rate outlook for 2002. The author found that the sharp easing in monetary policy and lower business credit demand were primarily responsible for the fall in interest rates. The fall in interest rates was also aided in the second half of 2001 by a rise in the consumer savings rate, a moderate fall in short-term inflationary expectations, and a loosening of foreign monetary policies.

Farm interest rates are likely to move downward in the first half of 2002. Lower farm interest rates are expected from the following economic conditions: (1) continued low inflation, (2) a slightly higher consumer savings rate, (3) weak overall business credit demand, (4) slow economic growth in general, (5) gradual increased willingness of depository institutions to lend, (6) continued foreign monetary policy easing, and (7) possible additional Federal Reserve easing of monetary policy. In addition, farm interest rates will be under downward pressure from the large fall in bank fund costs in 2001. Farm interest rates are expected to rise mildly in the second half of 2002.

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## Introduction

Interest rates on agricultural loans are determined by factors primarily outside agriculture in national and international credit markets. Of the \$869 billion raised in U.S. credit markets in 2000, only 1.3 percent was agricultural credit (Federal Reserve Board of Governors). In the first quarter of 2000, interest rates on non-real-estate and real-estate farm loans at commercial banks averaged 9.6 and 9.4 percent, respectively. By the third quarter of 2001, non-real-estate agricultural loans fell to 7.3 percent while those on real-estate agricultural loans fell to 8.0 percent.

The two most important macroeconomic factors behind the fall in interest rates were an aggressive easing of U.S. monetary policy by the Federal Reserve Board in 2001 and much lower credit demand by business. The fall in interest rates also has been aided in the second half of 2001 by a rise in the consumer sav-

ings rate, a loosening of foreign monetary policies, and a moderate fall in short-term 1-year-ahead inflationary expectations in 2001Q4.

The purpose of this article is to discuss factors that influence interest rates in general and those for the agricultural sector specifically. The first part discusses how interest rates are determined in credit markets. Interest rate determination and movements are analyzed using a credit market or loanable funds framework. Based on this framework, the factors causing the fall in interest rates since 2000Q3 are analyzed. This is followed by discussion of the farm interest rate outlook for 2002. The report closes with a look at why interest rates on agricultural loans at commercial banks adjust somewhat slowly to changes in interest rates in the macroeconomy.

## Interest Rates Are Determined by Supply and Demand In Credit Markets

The interest rate paid by the borrower is the price of credit, as determined in credit markets by the collective actions of suppliers and demanders of credit. Credit markets determine interest rates and risk premiums on debt that equate the overall supply and demand for credit. The market interest rate may be broken down into a real return (the debt instrument's return in terms of stable purchasing power) and an inflationary expectations return (a return to compensate the lender for changes in a dollar's purchasing power over time). The real rate of interest is the return to the lender for forgoing the purchase of goods and services in the current period for the promise of higher consumption of goods and services in future periods.

An increase in inflationary expectations will cause nominal interest rates to rise. A rise in inflationary expectations causes the supply of credit at all nominal interest rates to fall, due to the lower expected real return to domestic and foreign savings in the United States. Likewise, the demand for credit on the part of business firms will increase with a rise in inflationary expectations, since for any nominal interest rate the expected real cost of borrowing falls.

The Federal Reserve Flow of Funds Accounts historically track the flow of funds among households, nonfinancial business firms, financial institutions, government (Federal, State, and local), the Federal Reserve Board, and the foreign sector in credit markets. The Flow of Funds Accounts allow us to examine how various sectors with deficits or surpluses in their net savings (total sectoral gross savings minus investment in real assets) finance their deficits or surpluses. The accounts are especially useful in analyzing sectoral behavior that causes changes in real interest rates (Van Horne, 1994; Polakoff, et al., 1981; Teplin, 2001).

Credit markets determine not only the level of interest rates, but the relationship between interest rates on various debt instruments as well. Differences in interest rates for securities or loans of comparable maturity are determined by differences in tax treatment, liquidity, transaction costs, and default risk. Factors specific to agricultural loans—such as loan default risk, the quality of collateral, average loan size, and loan liquidity—influence the size of overall premiums charged on agricultural loan rates relative to nonagricultural inter-

est rates. In the long term, interest rates paid on agricultural debt and returns to owners of agricultural resources must earn returns commensurate with the risk involved in agriculture and risk-adjusted returns available in the nonagricultural sectors in order to attract and maintain funds to the agricultural sector.

In addition to commercial banks, other agricultural lenders are influenced greatly by general financial conditions and returns available in the nonagricultural sector. The Farm Credit System borrows directly in money and capital markets at interest rates only slightly above comparable Treasury securities. Life insurance company mortgage lending to agriculture is influenced by competing yields on corporate bonds, overall funds available for lending, and the liquidity needs of life insurance companies.

The primary suppliers of credit have been households and depository institutions. Households supply funds by lending their household savings in credit markets. Deposit institutions expand the supply of funds through increasing their holdings of interest-earning debt securities and loans. Depository institutions typically expand their holdings of loans and securities by issuing deposit liabilities, which also increases the money supply.

Businesses are the primary demander of credit, which is used to finance business investment not funded through retained earnings or through the issuance of additional equity securities. Business firms borrow funds expecting to earn sufficient returns such that, by undertaking the investment, stockholders' or business owners' wealth increases. The government sector (combined Federal, State, and local) is a net supplier of credit when it collectively runs a budget surplus. The budget surplus is typically used to retire debt or to purchase other securities. The foreign sector is a net supplier of credit to the United States when the U.S. imports more than it exports, since foreign credit is necessary to finance the U.S. trade deficit.

Over the past 30 years, the government and foreign sectors have been large net demanders and net suppliers of funds at various times. For example, through most of the 1980s and into the mid-1990s, government was a large net demander of funds in credit markets

before becoming a large net supplier of funds in the late 1990s and early 2000s. Likewise, the foreign sector has been a very large net supplier of credit to the United States from the mid-1980s to the present after being a net demander of funds for most of the 1970s and early 1980s.

When the real supply of credit available contracts relative to the real output of the economy, real interest rates normally rise. The relative supply of credit can contract due to (1) a fall in the household savings rate, (2) a tightening of monetary policy (which reduces the

extension of bank credit by depository institutions), (3) an increase in the desire of the nonbank public to hold more money balances (instead of directly or indirectly lending their savings in credit markets), (4) a fall in the overall government budget surplus, or (5) a greater reluctance on the part of foreigners to purchase U.S. financial assets. Likewise, a rise in business borrowing relative to the economy's overall output will place upward pressure on interest rates. In this case, higher interest rates are required to encourage greater consumer or foreign savings to enter U.S. credit markets and depository institutions to expand bank credit.

## Credit Market Developments in 2000 and 2001

Interest rates fell sharply in the second half of 2000 and in 2001, reflecting slower growth in real economic output and overall credit demand, as well as a major easing of monetary policy (fig. 1).<sup>2</sup> Slower economic and credit growth in the second half of 2000 put immediate downward pressure on interest rates, by lowering interest rate expectations for 2001 and 2002. Real economic growth slowed from 4.0 percent in the first half of 2000 to 0.8 percent in the first half of 2001, and fell 0.6 percent in the second half of 2001 (fig. 2).

Private nonfinancial credit growth (households and nonfinancial businesses) slowed from 10.1 percent (on an annualized seasonally adjusted basis) in the first half of 2000 to 8.0 percent in the first half of 2001. Growth in credit to nonfinancial business slowed from 11.9 percent to 6.5 percent over this period. Growing foreign demand for U.S. financial assets through increased foreign capital inflows further pushed interest rates lower.

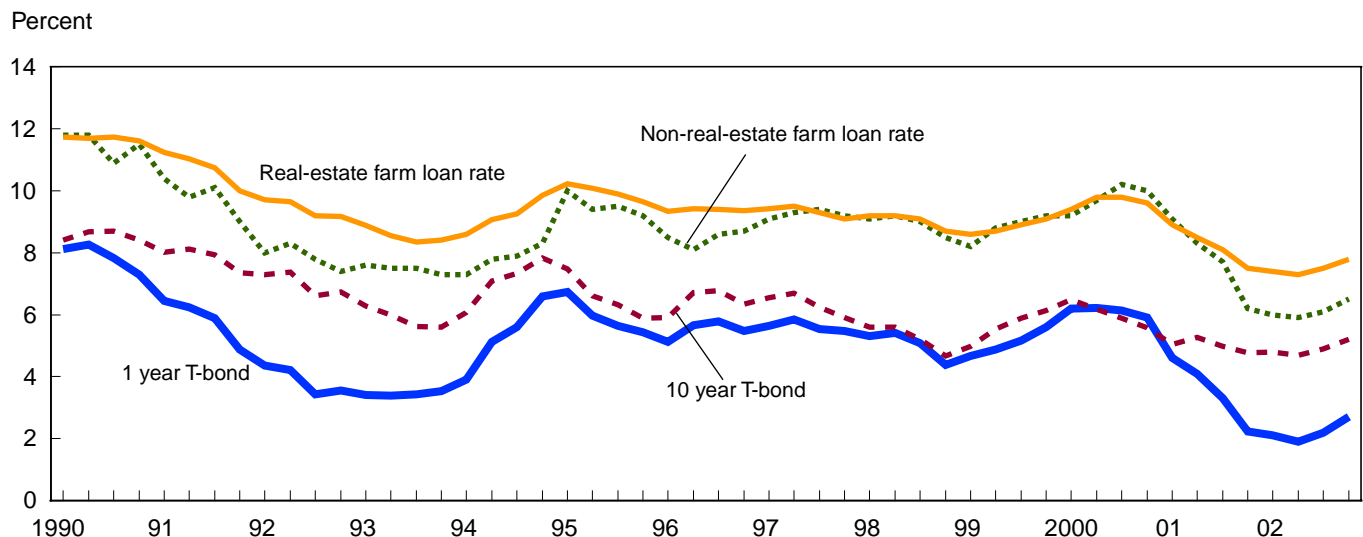
<sup>2</sup> The average non-real-estate farm loan rate series is reported in table 1E of the *Agricultural Finance Data Book* and is based on data on bank lending activity from the first full week of the second month of each quarter. The real-estate farm loan rate is reported in table IIID of the *Agricultural Finance Data Book* and is the average of the five agricultural district surveys of the most common long-term farm real-estate loans charged in each district.

Since January 2001, the Federal Reserve Board has eased monetary policy by lowering its Federal funds interest rate target (the interest rate on deposits held at Federal Reserve banks primarily by depository institutions) by 4.75 percentage points (475 basis points) in 11 separate moves. This reduced other interest rates by lowering the expected level of the Federal funds rate for 2001 and 2002 and encouraged more rapid expansion in the supply of money and credit by depository institutions. M2 (currency, depository institution transactions-type deposits, and highly liquid nontransaction deposits) grew 8.7 percent in 2001, after growing 5.9 percent in the second half of 2000.

The flow-of-funds data for 2001Q3 indicate that growth in private credit demand slowed further while household savings and the money supply expanded sharply. Private U.S. nonfinancial credit grew 6.9 percent in 2001Q3, after growing 8.0 percent in the first half of 2001. Credit of nonfinancial business firms grew at a seasonally adjusted annual rate of 5.3 percent, compared with 6.5 percent in the first half of 2001. The personal savings rate increased to 3.7 percent in 2001Q3 from 1.1 percent in 2001Q2, leading to a \$203-billion increase in household savings in 2001Q3. The rise in the personal savings rate, while influenced by the personal income tax rebates and the economic disruptions following September 11, also

Figure 1

### Farm loan rates at commercial banks are likely to fall through the first half of 2002



Source: Board of Governors.

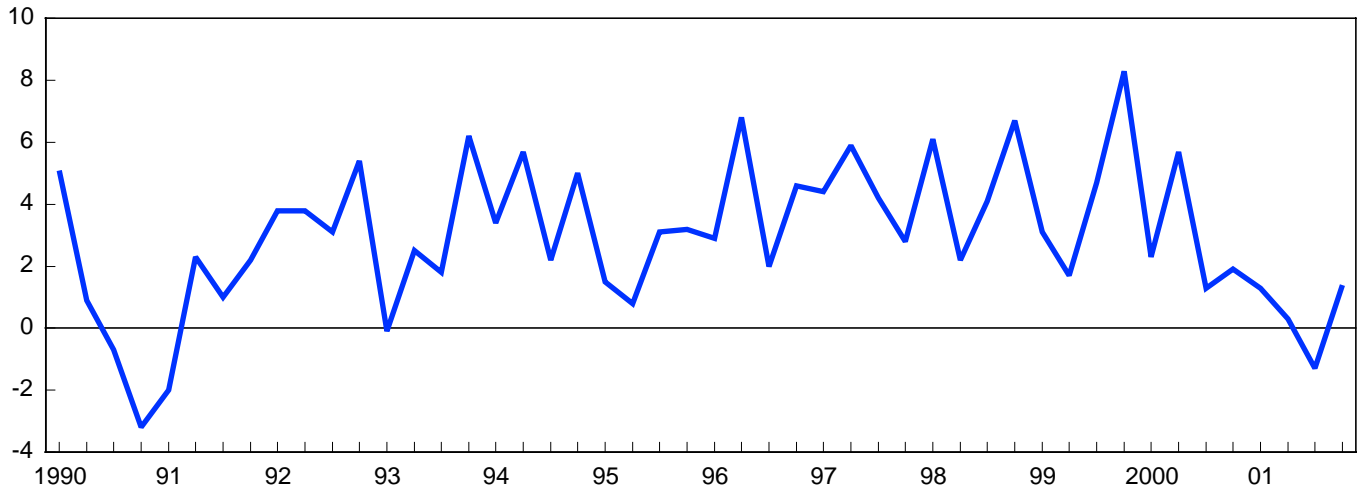
reflected the impact of a rising unemployment rate, lower consumer confidence, and falling consumer wealth over most of 2000 and 2001. In addition, consumer credit demand grew 1 percent slower in

2001Q3 than 2001Q2. A cut of 75 basis points in the Federal funds rate in 2001Q3 encouraged M2 to grow at an 11.2-percent annualized rate as bank credit expanded rapidly.

Figure 2

**GDP growth slowed and turned negative**

Percent



Source: Bureau of Economic Analysis.

## Fall in Nominal Interest Rates Dominated by Reduction in Real Interest Rates

Nominal interest rates can be divided into a real (inflation expectations adjusted) component and an expected inflation component. Since 1999, short-term (1-year-ahead) inflationary expectations have been relatively stable. The Philadelphia Federal Reserve's Survey of Professional Forecasters and the Blue Chip Economic Indicators surveys of economists showed that although inflationary expectations for the year ahead moved significantly downward in 2001Q4, short-term inflationary expectations have been stable over the last 3 years by historical standards. As measured by the CPI-U from the Survey of Professional Forecasters,<sup>3</sup> the median 1-year-ahead forecast for inflationary expectations has varied over a range of only 0.55 percentage points over the last 3 years (fig. 3). Given the relative stability of short-term inflationary expectations, the vast majority

of the fall in nominal short-term interest rates since 2000Q1 reflects declines in real short-term rates.

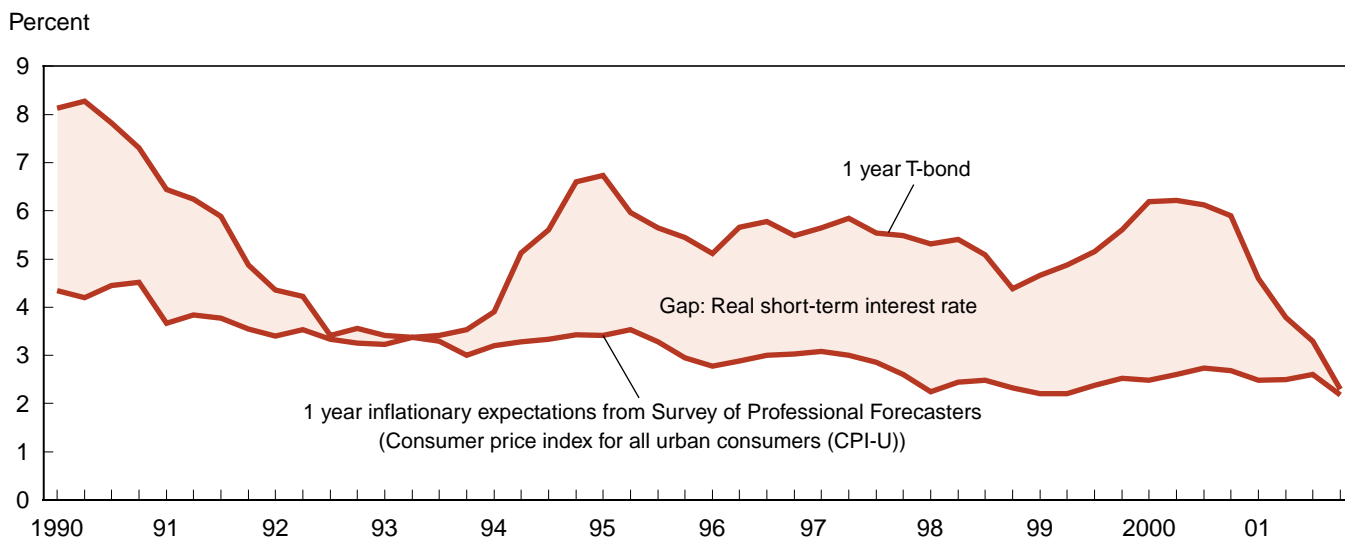
As noted above, short-term inflationary expectations fell significantly in 2001Q4. The Survey of Professional Forecasters and the Blue Chip Economic Indicators showed a 0.3- to 0.5-percent drop in inflationary expectations for the GDP and CPI deflators for 2002 in their November 2001 forecasts (compared with their August forecasts). The fall in short-term inflationary expectations reflected actual and anticipated softening in labor and capital goods markets, sharply lower energy and other raw material prices, and a continued strong U.S. dollar.

Survey data indicate that long-term inflationary (10-year) expectations have remained virtually unchanged at 2.5 percent since the second quarter of 1998. Therefore, the fall in long-term interest rates since 2000 is almost entirely a fall in real long-term interest rates (fig. 4). More stable short- and long-term inflationary expectations have resulted largely from favorable energy and productivity shocks and a strong U.S. dollar, as well as belief in the Federal Reserve's ability and willingness to maintain low inflation. The fall in real lending rates for borrowers, including farmers, should encourage increased real borrowing over time.

<sup>3</sup> The Survey of Professional Forecasters is a survey of economic forecasters employed predominantly by large financial and nonfinancial firms. Forecasts for key real, inflation, and financial variables are prepared on a quarterly basis with median and mean average forecasts from the survey compiled by the Federal Reserve Bank of Philadelphia. More information on the survey can be obtained from the Philadelphia Reserve Bank website and from the article by Dean Croushore, "Introducing: The Survey of Professional Forecasters," from the *Business Review*, Federal Reserve Bank of Philadelphia (Nov.-Dec. 1993), pp. 3-13.

Figure 3

### Nominal and real short-term interest rates fell sharply in 2001

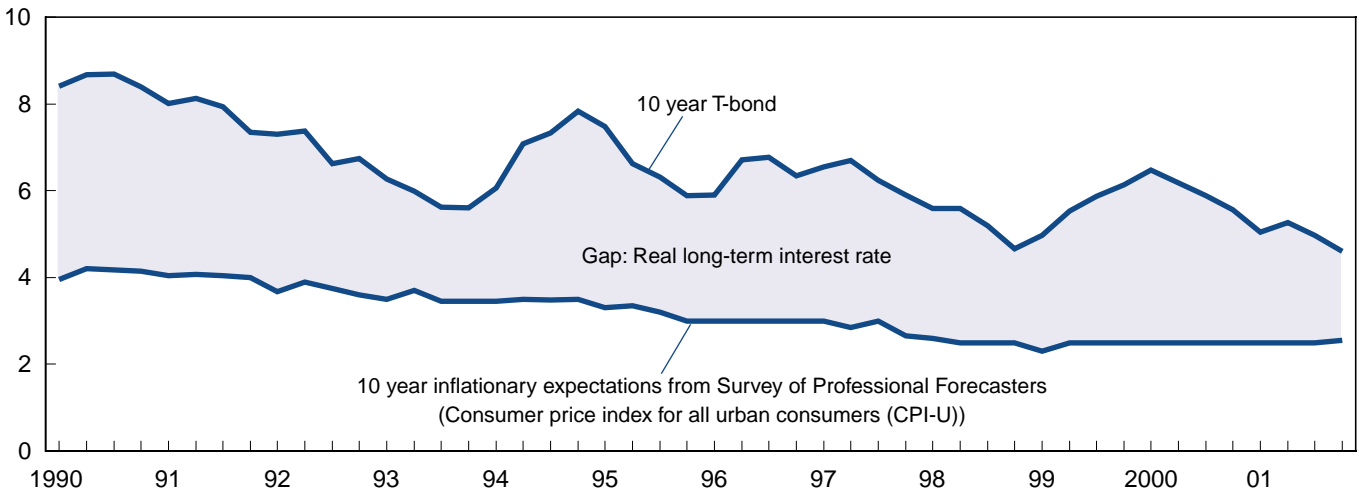


Sources: Philadelphia Federal Reserve's Survey of Professional Forecasters (inflationary expectations) and Board of Governors (1 year T-bond).

Figure 4

### Nominal and real long-term interest rates have fallen sharply since 2000

Percent



Sources: Philadelphia Federal Reserve's Survey of Professional Forecasters (inflationary expectations) and Board of Governors (10 year T-bond).



## Nominal and Real Interest Rates Likely To Fall in First Half of 2002, but Rise Slightly in the Second Half

Interest rates were extremely volatile in the fall of 2001, with weekly swings of 10 or more basis points in long-term bond yields. This heightened uncertainty in the economic outlook created extra volatility in credit markets, especially for long-term bond yields. Heightened economic uncertainty and volatility in credit markets has increased the difficulty in forecasting movements in interest rates, especially long-term interest rates. For example, the 10-year Treasury bond rates moved up approximately 80 basis points between early November 2001 and late January 2002, reflecting an improving short-term U.S. economic outlook and a continued high degree of economic uncertainty as to the likely strength of the economic rebound. Nonetheless, this analyst and other economists and forecasters (such as Stephen Roach at Morgan Stanley; Latta, Newport, and Mak at DRI; and Anthony M. Santomero of the Federal Reserve Board) believe the recovery in the first half of 2002 is likely to be quite subdued. If the first-half recovery is weak, interest rates are likely to be under downward pressure from both supply and demand factors.

On the supply side, six main factors are expected to place mild downward pressure on interest rates in the first half of 2002: (1) continued low inflation, (2) an expected mild rise in the consumer savings rate out of personal disposable income, (3) gradual increased willingness of depository institutions to lend, (4) the likelihood of continued foreign central bank easing of their monetary policies, (5) slow economic growth in general, and (6) possible additional Federal Reserve easing of monetary policy. Meanwhile, given large overall excess capacity both domestically and abroad coupled with depressed profits, business capital spending is likely to be weak until final demand strengthens for at least a couple quarters. Weak foreign credit demand and continued foreign central bank easing should encourage additional foreign credit flows into the United States.

Inflation—as measured by the broad GDP, PCE (personal consumption expenditures), CPI, and PPI finished goods deflators—is expected to remain very low in the first half 2002. Declines in producer prices that occurred in the second half of 2001 were broad-based, extending well beyond energy and food prices.

Therefore, most economists surveyed in the January 2002 *Blue Chip Economic Indicators* expected increases in producer prices to be very small in the first half of 2002, which should keep increases in final goods prices low. In addition, growth in employment costs—as measured by the employment cost index—slowed in the second half of 2001. Given excess capacity in most industries, business profit margins will continue to be squeezed. Very low inflation in late 2001 and early 2002 should keep short-term inflationary expectations low for the remainder of 2002.

An expected upturn in the personal savings rate is an additional factor expected to put downward pressure on interest rates in early 2002. The consumer savings rate is likely to rise significantly in the first half of 2002. Consumer spending will be constrained by less pent-up demand for auto-and housing-related consumer durable goods, high consumer debt burdens, rising unemployment, and smaller holiday bonuses due to lower business profits and lower stock prices in 2001. A higher personal savings rate will increase the consumer purchases of financial assets and push interest rates lower.

Expected negative growth in real business capital spending in the first half of 2002 should also place downward pressure on interest rates. Given substantial excess capacity in most industries, along with depressed profits, business capital spending is likely to continue to decline until final demand strengthens substantially. Business confidence has improved much less than consumer and investor confidence (Roach, 2002). Subdued business confidence is an additional factor likely to slow the rebound in business capital spending and inventory rebuilding in 2002. Business capital spending for higher risk firms continues to be constrained by tight credit standards in credit markets.

Over the course of 2002, risk spreads on business loans and corporate bonds over comparable Treasury securities should narrow, in response to increased bank liquidity, which gradually increases the willingness of banks to expand business lending. Lower real interest rates and gradually improving corporate balance sheets and liquidity should also put downward pressure on risk premiums in credit markets

When the Federal Reserve eases monetary policy, depository institutions have more nonborrowed reserves with which to expand their asset holdings of loans and leases, security holdings, and cash balances. In response to increased holdings of bank reserves, depository institutions normally increase their holdings of securities much more rapidly than loans and leases. Higher security holdings increase overall bank liquidity and help cushion bank income in the event of increased loan defaults. Bank security holdings rose 7.7 percent in 2001, after increasing 3.1 percent, on a seasonally adjusted annualized basis, in the second half of 2000. In contrast, bank loan holdings rose just 5.8 percent in 2001, after increasing at a 9.1-percent annualized rate in the second half of 2000. Typically, after increasing their holdings of securities, banks gradually increase their willingness to make loans, thus lowering both interest rates and qualifying standards. Empirical evidence indicates that it takes approximately three quarters for an easing in monetary policy to promote stronger loan growth (Bernanke and Blinder, 1992).

Since the end of August 2001, most developed country central banks have eased their monetary policies and lowered their short-term interest rate targets. For example, from the end of August 2001 to the end of January 2002, the European Central Bank (ECB) lowered its major short-term interest rate target to 3.25 percent from 4.25 percent while the Bank of England lowered its key short-term interest rate to 4.00 percent from 5.00 percent. Over this time period, the Canadian Central Bank lowered its short-term interest rate target to 2.00 percent from 4.00 percent. Japan maintained its short-term interest rate target near zero and has tried to increase bank liquidity. Easing of monetary policy by most large foreign central banks is expected to continue through the first half of 2002. Continued easing of monetary policy in the United States or abroad will

increase the supply of credit worldwide and put downward pressure on worldwide interest rates.

Overall foreign demand for funds raised either abroad or in the United States will continue to be weak. Specifically, credit raised in U.S. financial markets by foreign firms fell at an 8.4-percent annualized rate in the first three quarters of 2001. Real foreign growth is expected to remain slow in 2002, with most of the pickup in world growth occurring in the second half of the year. Slower foreign and U.S. growth, and the sharp easing of U.S. monetary policy in 2001, has allowed significant easing of monetary policy by foreign central banks.

Over the course of 2002, U.S. economic growth is expected to accelerate, with most economists expecting moderate to strong growth in the second half of 2002. Stronger second-half growth is expected from the combined effects of lower interest rates, increased stability in equity markets, the working down of excess business inventories, the gradual reduction of business excess capacity, higher defense spending, lower tax rates, and slowly accelerating foreign growth. Furthermore, the balance sheets of businesses, consumers, and financial institutions were far better at the beginning of this economic downturn than at the beginning of the previous U.S. recession in 1990Q3.

The United States represents about one quarter of total world GDP. The U.S. recession has significantly reduced foreign growth, especially for those countries that are heavily dependent upon U.S. imports. The U.S. recession has reduced foreign growth by not only lowering the U.S. demand for imports but by depressing foreign equity prices and raising credit concerns for higher risk foreign borrowers. The dollar's large appreciation in the late 1990s and in the early 2000s raised the burden of dollar-denominated debt for for-

eign firms. Since the U.S. recession has been most pronounced in the manufactured capital goods and electronics areas, Asia and Western Europe—as major suppliers to the United States of capital goods and their components—have been especially hard hit.

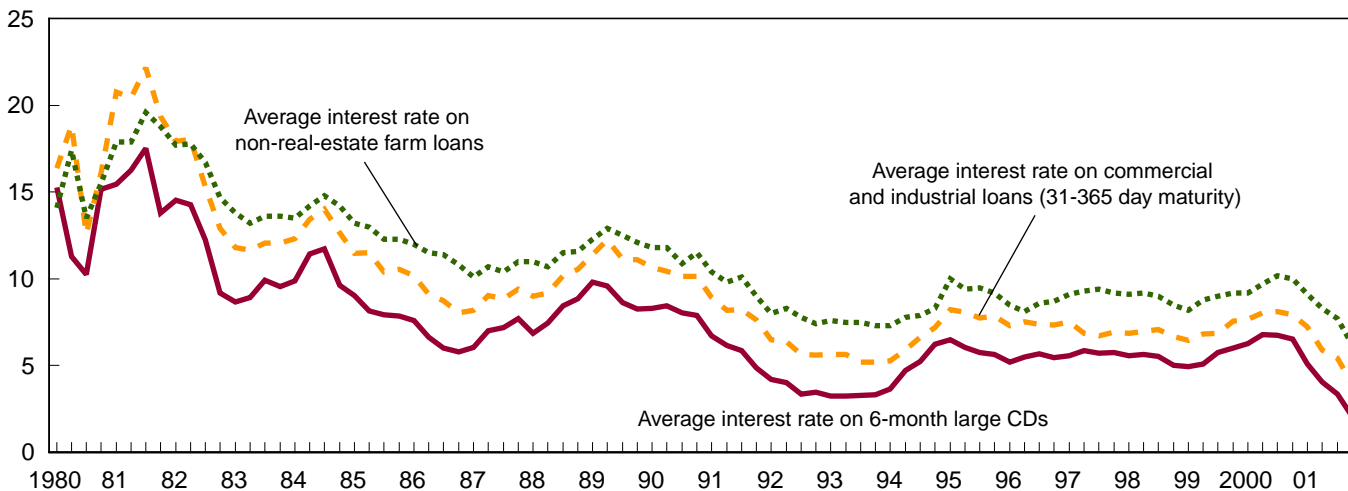
Against an expected backdrop of low real growth and very low inflation, additional Federal Reserve Board

easing is possible in the first half of 2002. A further lowering of the Federal funds rate would tend to push other money market yields and, to a lesser extent, bond market yields lower. The sharp decline in bank fund costs (as represented by the rate on large bank CDs) has led to large declines in loan rates on farm and nonfarm business loans (fig. 5).

Figure 5

### Sharply lower bank fund costs have pushed downward farm and nonfarm business loan rates

Percent



Source: Board of Governors.

## Farm Interest Rates Should Continue To Fall in the First Half of 2002

Both nonfarm and farm loan rates are expected to fall further in the first half of 2002, with interest rates on non-real-estate and real-estate farm loans projected to fall to 5.9 and 7.3 percent respectively by 2002Q2, (see footnote 2). Typically, interest rates on farm loans at commercial banks fall less than most nonfarm interest rates and adjust more slowly. Thus, when interest rates in the open market reach their low point, interest rates on farm loans normally continue to fall somewhat. However, in the long term, interest rates charged on farm loans must earn competitive risk-adjusted returns for lenders that are comparable to risk-adjusted returns from nonfarm loans and other financial assets.

In the downward phase of the interest rate cycle, numerous factors prevent farm loan rates from falling as much or as quickly as interest rates in general. Rural banks are heavily dependent on consumer deposits (checking and savings accounts, plus time deposits of less than \$100,000) for the bulk of their loan funds. Rates paid on consumer deposits typically lag changes in open-market interest rates. In addition, changes in deposit interest rates typically affect loan rates at rural banks relatively slowly. Banks prefer to keep their small business loan rates more stable by determining their loan fund costs on an average cost-of-funds basis. Average cost-of-funds loan pricing helps stabilize interest rate margins between the expected return from lending and the average interest rate paid to depositors (Brady, 1985; Goldberg, 1982,

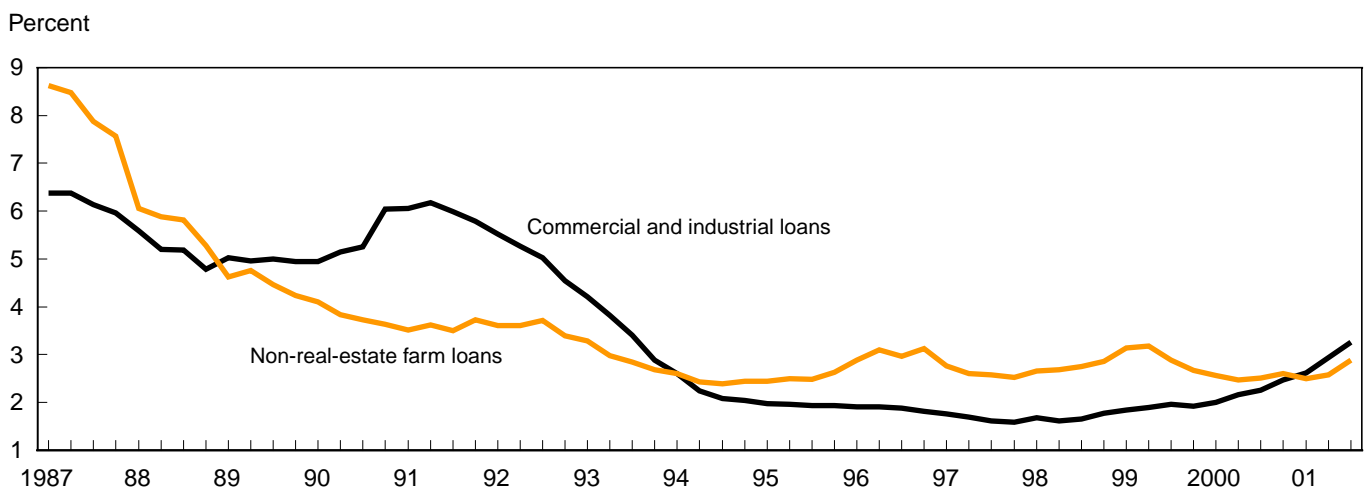
1984). Finally, because of the uncertain farm income outlook in 2002 and the tighter credit standards on general business lending in 2001, some mild increase in risk premiums on agricultural loans is likely through at least the first half of 2002. In times of economic slowdowns and borrower financial deterioration, it is more difficult to obtain loans from new creditors (Nakamura, 1991). Thus, borrower options are reduced, further driving up loan spreads.

Fortunately, for agriculture, recent agricultural loan performance has held up well in relation to nonagricultural business loans. Loan delinquency rates for agriculture have been relatively stable since 1998 while delinquency rates for non-real-estate business loans have moved upward during this period, especially during the current economic slowdown and recession (fig. 6). Given the Federal Government's commitment to supporting farm income and the likelihood of some overall improvement in export market conditions for U.S. agricultural products in 2002, a large rise in agricultural loan delinquency rates is not expected over the next year.<sup>4</sup> However, a small increase in the delinquency rate on farm loans in late 2001 and 2002 is likely, given the continued outlook for relatively low commodity prices.

<sup>4</sup>A loan is delinquent if interest payments are more than 30 days past due and is still accruing interest, or if the loan has been moved to nonaccrual status.

Figure 6

### Farm loan delinquency rates have been quite stable since the mid-1990s



Source: Board of Governors.

## Conclusion

Expected weaker overall growth in the demand for credit and increased overall supply of credit in domestic and foreign economies should place downward pressure on farm interest rates in the first half of 2002. The fall in farm interest rates since 2000 has been less than most interest rates due to the more sluggish adjustment in consumer deposit interest rates, the desire of banks to keep small business loan rates more

stable, and an expected mild increase in risk premiums on farm loans.

The fall in interest rates represents almost entirely a fall in real interest rates, which has lowered real borrowing costs for farmers. Farmers with desirable investment projects and strong overall cash flows may want to take advantage of favorable credit terms in 2002.

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