Invited Presentation

Recent Macroeconomic Developments and Their Impact on Agriculture

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The U.S. is nearing the end of its ninth recession since the Second World War. This recession was caused by events outside of the agricultural sector, and the recovery will be due to factors outside the sector. Yet agricultural production, costs, and income will be affected by general economic conditions. This paper reviews current general economic conditions and examines their implications for the agricultural sector.

The U.S. economy is probably nearing the end of the ninth post–World War II recession. On 25 April 1991 the National Bureau of Economic Research (NBER) Business Cycle Dating Committee set July 1990 as the peak of the last expansion. The expansion lasted 92 months—more than twice as long as the typical postwar expansion—and was the second-longest expansion on record. The transition to a recession was gradual; the economy had been growing slowly for at least 18 months previous to the peak. Four major forces contributed to this relative sluggishness and, ultimately, to the onset of the recession. The importance attached to any one factor varies with the analyst.

1. The Federal Reserve monetary tightening in 1988 and early 1989 began to substantially affect the economy in 1989 and 1990.
2. Credit became less available—even more so than *might* be associated with a monetary tightening.
3. As the economy slowed in early 1990, worldwide credit conditions tightened, driving up long-term interest rates, especially.
4. Iraq invaded Kuwait, driving up world oil prices and driving down consumer and business confidence.

The Role of Monetary Tightening

Primary among the reasons for slowing growth was monetary tightening beginning in early 1988. From the beginning of 1987 through the first half of 1988 real GNP grew at about a 5% annual rate. The inflation rate, measured by consumer prices excluding food and energy, was slightly above 4% at the beginning of 1987 and near 5% by the middle of 1988. With this backdrop, the Federal Reserve launched a preemptive and largely successful campaign to reduce underlying inflationary pressures in the economy.

In simple aggregate demand and supply terms, there are two ways to reduce the price level (or slow its growth): either (1) reduce aggregate demand (or slow its growth), or (2) increase aggregate supply (or increase its growth). In the short and intermediate run the Federal Reserve affects the price level through aggregate demand. Although monetary policy may ultimately affect aggregate supply through its effects on interest rates and capital accumulation, these changes in aggregate supply are not measurable in the short and intermediate run.[1] So monetary tightening, from the outset, was intended to reduce the rate of growth of real economic activity by reducing aggregate demand. The notion underlying the policy was that gradual monetary tightening might slow the economy gradually, bringing real growth to more sustainable rates without precipitating a recession. This was dubbed the "soft landing" scenario.

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[1] Money-supply changes are generally thought to influence real growth in the short and intermediate term. In the long term, real growth is usually thought of as determined by supply factors such as labor-force growth, technological innovation, and the like. These are not thought to be highly sensitive to money-supply changes. Thus, in the short run, monetary policy is thought to have nonneutral effects (it can affect real output), while in the long run it is thought to be neutral (it can only affect the price level).

Monetary Transmission Mechanisms

There is still some controversy about the channels through which the Federal Reserve actually reduces aggregate demand in the short and intermediate run. Mauskopf presents an overview of the "mainstream" macroeconometric approach to monetary transmission mechanisms in the short and intermediate run. In this approach, monetary policy works through the money market. Changes in real money balances affect spending through interest rates. Specifically, the Federal Reserve changes the money supply, which changes short-term interest rates and leads to changes in long-term rates, the cost of capital, the present value of wealth, and the exchange rate. This chain of reasoning is generally called the monetary transmission mechanism. Kahn presents some evidence that the full effect of a 1 percentage point rise in the federal funds rate will be felt only after at least 18 to 24 months. Thus, monetary policy appears to act with a considerable lag.[2]

Starting in the spring of 1988, the federal funds rate rose from about 6½% to above 9½% by the spring of 1989. Although the funds rate then stopped rising and declined somewhat through the rest of 1989, it remained about 1¾ percentage points above the early 1988 levels throughout mid-1990. The rising funds rate in 1988 and early 1989 and its relatively high level through 1990 clearly played a strong role in slowing the economy to below-potential growth.

The Role of the Credit Crunch

Throughout the first half of 1990 considerable attention was given to the notion of supply restrictions on credit, popularly known as a credit crunch. It is difficult to find evidence of such a crunch in the indicators routinely scanned by economists. The measured slowdowns or outright declines in bank lending were obviously insufficient evidence since declines in volume could represent either supply restrictions or demand declines.

Even direct survey evidence of tightening credit conditions is insufficient. The results of the periodic Senior Loan Officer Opinion Survey on Bank Lending Practices conducted by the Federal Reserve for the last year or so have continually shown tighter lending practices, both in terms of rates charged and increased loan collateral requirements. However, it is usual in a slower-growing economy for banks to be more reluctant to lend to firms whose future earnings stream may be more suspect. Meltzer, among others, has suggested that the credit situation is just what is meant by a tight monetary policy.

Very recent work by Bernanke and Blinder provides some evidence for the Meltzer position. Bernanke and Blinder suggest that monetary policy usually affects the composition of bank assets, leading to the conclusion that the reduction in bank lending beginning in the spring of 1990 is consistent with the usual experience. In particular, they find that for about the first six months after the tightening, the decline in bank assets is concentrated in securities. Two years after the inception of tightening, however, almost all of the decline in bank assets shows up in bank loans. This evidence suggests that the monetary tightening that began in 1988 could reasonably be associated with the apparent sharp reductions in bank lending in 1990.

This issue is important to what might be called "real time policy analysis." If less credit is available than is typically the case, a more aggressive monetary loosening than might otherwise be pursued may be called for. However, if the credit situation is "normal" for recessions, then perhaps no extra monetary easing is necessary. In addition, if there is no credit crunch, then no additional steps, such as reductions in reserve requirements or providing regulatory relief (easier enforcement of regulations), will have to be taken. How this debate is resolved in "real time" is important to the overall economy and to the agricultural sector.

The Federal Reserve appears to have accepted the position that traditional monetary tightening has been accompanied by something unusual on the credit-supply side. Unfortunately, the situation was (and remains) too fluid to ascertain exactly what was (and is) going on. Not all of the data represent responses to policy. Money-growth and credit-growth statistics were (and continue to be) contaminated by unusual financial flows associated with the contraction in the thrift industry and the operation of the Resolution Trust Corporation. In addition, throughout 1990, banks were likely also reducing their loan portfolios in an attempt to meet higher international capital adequacy standards set in the Basle framework.

In response to this complicated set of circumstances, the Federal Reserve has continued to move cautiously. The Federal Reserve acknowledged in

[2] Mauskopf shows that a phased-in increase in the money supply that has the effect of lowering the federal funds rate by about 1 percentage point initially continues to raise real GNP relative to a base path for about three to four years. However, by the fifth year, as wages and prices adjust, real GNP falls below the base. This evidence also suggests a considerable lag in the effects of monetary policy.

July 1990 that there was some unusual tightness in financial markets beyond what might be expected from the then current level of the federal funds rate. The Federal Reserve lowered the funds rate by 25 basis points.

Monetary easing began in earnest in the last quarter of 1990 after the signing of the new budget agreement and signs that employment was falling substantially. The Federal Reserve took steps to ease the credit crunch in addition to operating through the typical monetary mechanism. To ease the credit crunch, in December, the Federal Reserve eliminated the 3% reserve requirement on nonpersonal time deposits and net Eurocurrency liabilities. Lower reserve requirements reduce costs to depository institutions, encouraging them to lend. The Fed reduced the funds rate several times during the last quarter and continued reducing the rate well into the spring of this year. Most recently, the funds target appears to be about 5¾%, about 2½ percentage points below July 1990's target.

The Role of International Credit Conditions

In early 1990, long-term interest rates began to rise, even though short-term rates remained stable. The primary reason for the increase was a general worldwide tightening of credit conditions. German long-term interest rates rose about 2 percentage points, which is generally attributed to an increased demand for financial capital associated with the expected rebuilding of the economy of the former German Democratic Republic. In 1989, the West German government ran a surplus equal to about 0.2% of its GDP. That surplus became a deficit of about 3% of GDP in 1990.

In addition to the increased demand for financial capital worldwide, Japanese monetary policy tightened, largely as a result of increased fears of rising inflation. Some of that concern was due to a jump in oil prices in the very beginning of 1990, which added to the interest-rate increases by raising inflation expectations and perhaps increasing uncertainty premiums.

The Role of the Iraqi Invasion

On 2 August 1990 Iraq invaded Kuwait and oil prices jumped. In mid-July, the price of a barrel of West Texas intermediate crude oil was in the middle teens. The price jumped throughout the fall, peaking above $40 a barrel in mid-October. Consumer-confidence indexes, which had been relatively flat going into July, plummeted for three months, reaching lows not seen since the depths of the 1982 recession. About $25 billion in income was transferred from the U.S., a net oil importer, to oil-exporting nations, which drained consumer and business purchasing power.

Whether the economy would have entered a recession without the oil price run-up and Iraq's invasion of Kuwait is debatable. Some analysts have argued that because the NBER chose July as the peak, and therefore the month in which the recession began, the oil-price shock was not the reason the economy entered a recession. A moment's reflection should suggest that argument is somewhat suspect. The NBER looks to "depth, diffusion, and duration" of a downturn to decide whether it qualifies as a recession (Zerwitz). Clearly, the months after the peak—the fall and early winter—were affected substantially by the run-up in oil prices and the decline in consumer confidence, both of which resulted from the Iraqi invasion of Kuwait.

How Does This Recession Compare?

Accepting July 1990 as the previous business cycle peak (the NBER has denoted the third quarter of 1990 as the business cycle peak quarter), how does this recession compare? Real GNP fell at an annual rate of 2.8% in the first quarter of 1991, following a 1.6% decline in the fourth quarter of 1990. From the third quarter of 1990, real GNP is down about 1% (not at an annual rate). The average peak-to-trough decline in real GNP during post–World War II recessionary periods is about 2.6%.

Should real GNP flatten out, or even grow slightly, in the second quarter of 1991, it would appear from the evidence presented above that the recession was mild by historical standards. An alternate measure of real GNP, which will become the official standard in November 1991, also confirms that the recession was mild. The Bureau of Economic Analysis (Department of Commerce) publishes a subset of National Income and Product Accounts measured in constant 1987 prices in addition to the current official measures presented in constant 1982 prices. In 1987 dollars, the decline in real GNP is about 1½% for the fourth quarter of 1990 and the first quarter of 1991, slightly more than the 1982 dollar decline.

The NBER pays little attention to real GNP when it judges where the economy is in the business cycle. It pays more attention to the collection of four monthly indicators called the coincident index. Table 1 shows the declines in the coincident index that have occurred since 1948.

Table 1. Declines in the Coincident Index during Recessions

Peak Month	Duration of Recession (Months)	Percent Decline
11/48	11	−11.0
7/53	10	−9.5
8/57	8	−11.2
4/60	10	−6.3
12/69	11	−5.9
11/73	16	−14.1
1/80	6	−6.2
7/81	16	−10.3
7/90		−6.8*

*Decline calculated using data through April 1991.

Using the coincident index, the depth of this recession looks somewhere between mild and average. And, even if April is determined to be the trough month, the recession will be very close to the eleven-month average duration of postwar recessions.

A Regional View of the Recession

Casual economic analysis of recessions usually includes statements such as "Region XX has been hit hard by the recession." This is not quite right. It may be better to say "Region XX has been an important contributor to the overall recession." In the case of the Northeast, it has been a substantial contributor to the sluggishness in 1989 and the current downturn. Well before the general economic recession, the Northeast, particularly New England, was showing signs of economic distress.

Comparing the experience in Northeast employment with overall employment from 1988 is revealing. Table 2 shows the comparison.

Table 2 shows that total employment in the Northeast grew very slightly between 1988 and 1989, while overall U.S. job gains were strong. In addition, construction and manufacturing jobs were declining in the Northeast two years before jobs in these sectors fell overall.

Why has this happened? Moscovitch provides a useful framework for examining this issue. Primarily, he points to overbuilding as the culprit. In his analysis, a deterioration in the Northeast's manufacturing base during the middle 1980s was masked by an unsustainable construction boom that ended in late 1987 or 1988. With high vacancy rates, the demand for new building dropped dramatically, not only causing construction layoffs, but layoffs in support industries as well.

Table 2. Nonfarm Payroll Employment Changes in the United States and the Northeast (Thousands of Jobs)

	Change from April to April		
	1988–89	1989–90	1990–91
Total			
United States	3,112	1,936	−1,212
Northeast	285	−207	−487
Construction			
United States	54	129	−519
Northeast	−29	−93	−112
Manufacturing			
United States	190	247	−855
Northeast	−81	−212	−215
All other			
United States	2,868	1,560	162
Northeast	395	98	−160

Declines in the profitability of the financial sector, beginning with the sharp stock market retreat in October 1987, also contributed to the slowdown in the Northeast. Declines in construction and real estate loans in the Northeast were also important contributors to the overall slide in bank lending.

What Is Ahead?

There is widespread agreement among macroeconomic forecasters that sustainable employment and production gains are coming in the second half of this year. Several fundamental forces point in this direction. Two of the major reasons for expecting a recovery are simply the reversal of the causes that helped slow the economy in the first place. First, monetary policy has eased substantially. Second, oil prices have dropped to around $20 a barrel, and consumer and business confidence have reverted to levels more associated with current economic conditions. From last October, the federal funds rate has fallen more than 2 percentage points. Long-term rates have fallen less, but are down about 1 percentage point from October.

Forward-looking statistics are pointing to a recovery beginning sometime in the next few months. Building permits have risen for three straight months and the stock market is up about 15%. While the old chestnut that the stock market has predicted 14 of the last 9 recessions is true, it has an excellent track record in predicting recoveries. A convenient summary of individual leading statistics (the S&P 500 is one component) is the Department of Commerce's Index of Leading Economic Indicators. Although the index is not, as is popularly suggested, the "government's main economic fore-

casting gauge," it is a useful summary of statistics that suggests where the economy is headed. The index has risen for four straight months. A rule of thumb used by some analysts associates a recovery with three straight monthly increases in the leading index. Under that rule, the economy is headed for recovery.

Some coincident indicators are showing signs that the recovery is imminent. Industrial production rose in April—the first increase in seven months—and increased again in May. Nonfarm payroll jobs increased slightly in May. Personal income, a component of the Commerce Department's coincident index, rose in May, and the overall coincident index rose in May for the first time since June 1990. In sum, the first indications of a recovery are showing up in the monthly statistics. A few months of mixed economic signals are likely, and some sectors are likely to recover more quickly than others. Nevertheless, recent economic indicators are pointing to an economic recovery.

The administration's February forecast, which is very close to current private forecasts, predicts a 0.3% decline in real GNP for the entire year of 1991 but includes about 0.9% growth measured from the fourth quarter of 1990 to the fourth quarter of 1991. For next year, the forecast is for faster than 3% growth as the economy rebounds from the recession. It is worth noting that, historically, the average growth in real GNP in the four quarters after the trough of a recession is slightly higher than 6%. Thus, rather than a rosy scenario, the administration's outlook is fairly conservative.

The outlook for inflation is moderately good. For 1991, inflation is likely to average around 4% or less, as the economy has considerable slack. A reasonable estimate of the natural unemployment rate—the rate at which inflation is relatively constant—is about 5½%. The administration projects that the unemployment rate will average 6.7% this year and 6.6% next year. Blinder provides a convenient rule of thumb that a gap between the actual rate and the natural rate of this size is likely to reduce the inflation rate by a little more than 1 percentage point. Subtracting 1 percentage point from the 1990 4.1% rise in the GNP implicit price deflator or the 4.6% rise in the fixed-weight GNP price index gives a range for inflation between 3% and 3.5% for the next two years. The administration forecast for inflation is slightly higher than this over the next two years.

With economic activity at low levels and with inflation relatively quiet or headed down, interest rates could fall slightly in the next six months or so. However, if the recovery is robust, rates could rise slightly. Three-month Treasury bill rates have typically risen about 30 basis points in the first four quarters after a recession trough. Over a longer horizon, lower inflation would appear to point to lower nominal interest rates. Long-term rates appear likely to remain relatively stable, but the underlying factors appear to point to continued slight declines—especially if inflation continues to be moderate.

What Are the Risks?

As with any forecast about where the economy is headed, there is always uncertainty about a forecast. Much of the uncertainty appears to focus on international developments. The widespread weakness in Europe and the growth slowdown in Japan were largely expected. Recent OECD (Organization for Economic Cooperation and Development) forecasts point to recoveries in the European countries in recession, with most of the growth occurring late in this year and recoveries extending through 1992. However, there is a risk that European economies have deeper recessions and that Japan has a more serious slowdown than currently predicted. Slower foreign growth would reduce demand for U.S. exports and slow growth in the U.S.

Movements in the exchange rate pose a risk to the overall economy, but for moderate movements in the exchange rate, the short-term risk is relatively small. This is primarily because the exchange rate affects the volume of exports and imports with a considerable lag. Brayton and Mauskopf (1985) provide simulation evidence from the Federal Reserve's MPS model that points to a lag of 8 to 12 quarters before there is a substantial movement in the real net export balance from a maintained 10% change in the exchange rate.

Projecting exchange-rate movements is fraught with forecasting peril. Different methods for predicting rates lead to different predicted directions of movement. A recent OECD *Main Economic Indicators* suggests that, relative to purchasing power parity (PPP) rates, the dollar is about 40% to 50% undervalued with respect to the German mark and about 40% undervalued with respect to the yen. If exchange rates tend to move toward their PPP values, these numbers suggest a rising dollar, on average, through the next two years. In passing, it is worth noting that *The Economist*'s McDonald's hamburger standard also is pointing to an undervalued dollar (about 13% with respect to the deutsche mark and 20% with respect to the yen).

Interest-rate differentials also seem to be pointing to dollar increases, although slight increases. If short-term U.S. rates rise somewhat with the

recovery, while rates abroad slide with their recessions, exchange rates could be headed up. However, that adjustment may have already taken place and may be the primary reason the dollar rise in the first half of this year erased the declines that occurred in the second half of 1990. Over a slightly longer horizon, U.S. rates appear to be headed somewhat lower, however, which could point to a longer-run tendency for the currency to fall slightly.

Expected movements in the trade balance provide some evidence that the dollar could decline somewhat. The improvement in the U.S. real net export balance—we achieved a small surplus in the first quarter, the first since 1983—will prove to be temporary. As the U.S. recovers, import demand will surge and bring back the chronic net export deficit. The widening net export deficit would then have a tendency to push the dollar down.

Agriculture and the General Economy

Changes in income, interest rates, and the exchange rate are three major channels through which general economic developments affect the agricultural sector. It is fairly well established that the domestic demand for food is income-inelastic, so that even declines in real income, such as have occurred in this downturn, do not affect demand very much. Of course, elasticities vary across commodities. Huang estimates nominal expenditure elasticities at 0.45 for meat, 0.63 for processed fruit and vegetables, but essentially zero for staples.

For dairy products—especially important to the Northeast—the estimated income elasticity is around 0.15. Fluid milk has an estimated elasticity very near zero, but both butter and cheese have estimated elasticities around 0.3. Despite the relatively low elasticities, the likely increases in income will provide some support for food demand. Nominal income is likely to grow around 3% to 4% this year, but around 7% or so in 1992.

Another important channel from macroeconomic conditions and the agricultural sector is the interest rate. There are a variety of reasons for its importance. First, interest expense is a large part of production expenses. After all the data are in, the agricultural sector is likely to have spent about the same amount on short-term interest payments in 1990 as it did on fertilizer, about 5% of total production expense. Interest on real estate loans accounts for about another 5% of total production expenses. Although the sector has been reducing debt—in 1990, debt should be about 70% of its 1983 peak—interest remains an important direct cost.

Preliminary results of ongoing analysis using the Terms of Bank Lending Survey from the Federal Reserve Board suggests that each percentage-point decline in commercial and industrial loan rates is associated with a 65 to 75 basis-point decline in rates facing farmers. Loan size—agricultural loans are clustered in the less-than-$10,000 category, while commercial and industrial loans are typically around $1 million—may go a long way toward explaining the differences. In addition, agricultural rates may embody some risk premium.

Second, interest rates (real interest rates) have an important influence on land values. The simplest model of farmland pricing suggests that the current value of farmland is closely related to the present discounted value of the stream of expected rents from the land. High real rates will be associated with lower farmland values. A decline in the value of farmland reduces farm wealth and constrains the ability to borrow.

Third, there is empirical work to suggest that the spread between spot commodity prices and futures prices is inversely related to real interest rates. Kitchen and Rausser use the theory of storage to examine expected commodity price changes and interest-rate changes, and present a summary and discussion of these relationships. They show, for example, that low price spreads are associated with high real interest rates.

A final variable that is of some interest to the agricultural sector is the exchange rate. As described above, there are reasonable macroeconomic arguments on both sides of the issue about where exchange rates are going, and the lags through which the exchange rate operates on the general level of exports and imports appear to be long.

The Economic Research Service (U.S. Department of Agriculture) calculates exchange rates for agricultural commodities by market and by competitors, which are published each month in *Agricultural Outlook*. Movements in the exchange rate for overall agricultural trade are highly correlated with movement in the overall trade-weighted value of the dollar, but the relationship is not proportional. For example, from March 1990 through March of this year, the real overall trade-weighted exchange rate is down about 12%; however, the trade-weighted rate for agriculture is down about 4%. Nonetheless, the prevailing exchange rates have tended to keep agriculture (and exports overall) competitive in overseas markets.

If these three variables—income, interest rates, and the exchange rate—provide the major channels through which macroeconomic policies affect ag-

riculture, then the short-term outlook described is at least modestly beneficial to the agricultural sector. Income growth is likely to resume and, if previous recoveries are any guide, accelerate for several quarters. Interest rates have fallen substantially, and if those declines have not yet filtered through to the rates facing agricultural borrowers, they are likely to do so soon. Given the mixed evidence on the future of exchange-rate movements, it is probably best to conclude on the weight of the available evidence that agricultural exchange rates are not likely to show strong movements in either direction.

Other factors may turn out to be more important to the sector than traditional macroeconomic conditions. The breakdown of the GATT, in which inabilities to reach agreement concerning agricultural trade played a key role, represents a threat to the decades-long trend toward freer trade. This breakdown represents a threat to the agricultural sector that stands outside of the normal scope of macroeconomic conditions. If the GATT ultimately founders on agricultural-trade issues, it is possible that overall levels of employment, prices, and production would be affected, reversing the usual direction of the linkages between the agricultural sector and the overall economy.

Summary

The U.S. economy is nearing the end of its ninth postwar recession. Recovering overall demand, interest-rate declines that have occurred since last fall, and moderate inflation should provide some support for the demand for agricultural products and for commodity prices, while allowing only modest increases or declines in interest expense. In the longer run, free-trade issues may turn out to be more important in determining the health of the agricultural sector than the short-term macroeconomic developments associated with the recession and the recovery.

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