U.S. Agriculture and the Macroeconomy

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ABSTRACT

The farm economy and the general economy are so closely linked that economic conditions and policies beyond the farm gate can affect agriculture's well-being as strongly as farm programs which focus on individual commodities. Macroeconomic conditions and policies affect demand for farm products and, thus, farmers' revenue as well as the cost of farming. Longrun trends in the general economy suggest that future growth in domestic demand will not be sufficient to eliminate excess farm production. A macroeconomic policy mix of fiscal stimulus combined with monetary restraint is harmful to agriculture and other interest-sensitive, export-dependent, or import-competing sectors--at least in the short run.

KEYWORDS: Fiscal policy, macroeconomics, monetary policy, multiplier.

INTRODUCTION

From a policy perspective, one of agriculture's most important features is its integration into the broader economy here and in other countries. The linkages between the farm economy and the macroeconomy are so close that conditions and policies beyond the farm gate can have as much or more effect on agriculture's well-being as traditional farm programs which focus on individual commodities.

Farmers purchase more than four-fifths of their production items from outside the sector. They sell most of their production to the nonfarm economy and a substantial amount to international markets. Interest payments--the farmer's biggest cash production expense and, thus, a major factor deciding net income--are partly determined by conditions in national financial markets and are influenced by macroeconomic policies.

Farming has always been tied to the larger economy. But the nature of the relationship has been altered during recent decades by several developments:

- The world economy has grown more interdependent. The output of the world economy doubled from 1960 to 1980, the volume of all world trade quadrupled, and the volume of agricultural trade more than doubled. The United States accounts for about 25 percent of the world's economic output and about 35 percent of the industrialized nations' output. The value of agricultural exports rose from 14 percent of U.S. farm cash receipts in 1960 to about 30 percent in 1980.

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- The interlocking of the world economy and the associated development of global capital markets means that business cycles, like most other economic phenomena, are no longer confined to national economies; they are international. Since farm exports depend so heavily on economic conditions abroad, global business cycles, which are closely tied to U.S. economic conditions, have a major impact on demand for U.S. farm products. This is important because 2 out of 5 U.S. crop acres harvested now produce for export.

- Farmers have become more dependent on purchased inputs. The costs of many of these items are determined outside the farm sector, primarily by factors affecting the general economy.

- Farmers have become heavy users of capital-intensive technology and more of that physical capital is financed by debt. About 75 percent of farmland purchased also is debt-financed. The interest cost alone of farm debt rose from 5 percent of farm expenses in 1960 to 16 percent in 1982, as both debt levels and interest rates rose substantially. Thus, farmers are increasingly affected by developments in the general economy that determine the availability of loanable funds and level of interest rates.

The net result of these developments is that macroeconomic forces regularly influence farmers' production costs, the demand for their products, their competitiveness in domestic and international markets and, ultimately, their income levels and wealth.

FACTORS AFFECTING ECONOMIC GROWTH

In the long run, economic growth is primarily determined by growth in labor and productivity. But macroeconomic policy--both monetary and fiscal--also plays a role in economic growth.

Labor and Productivity

Economic growth (real GNP) is, by definition, the product of growth in the employed labor force and in output per worker (productivity) (2). While growth in the labor force is a result of a complex mixture of demographic and socio-economic factors, growth in productivity is largely a result of capital formation and technological advances. Longrun trends in the U.S. economy suggest that real gross national product (GNP) can potentially expand about 3 percent per year--based on labor force growth of just over 1 percent and productivity gains of just under 2 percent. Empirical evidence suggests that the elasticity of farm-level demand with respect to income is about 0.4, other things being equal (1). Thus, the 3-percent annual growth in potential real GNP implies an underlying trend growth in domestic demand measured at the farm level of about 1.2 percent per year. This is significantly below the nearly 2-percent annual trend increase in total factor productivity for agriculture. This basic domestic supply-demand imbalance implies that farmers are dependent on world markets for demand growth.

Macroeconomic Policies

Macroeconomic policies have important impacts on resource allocation and efficiency, affecting longrun potential GNP. Tax and spending policies can be

geared to provide increased incentives to work, produce, save, and invest, and they also help to determine the level of Government expenditures and revenues.

Credit policies partly control the supply of money in the economy. But they also can b designed to reduce regulation and subsidies in financial markets, thereby freeing resources for more efficient uses. On the international side, trade policies can raise real world economic output and incomes by allowing countries to best utilize their resources through the principle of comparative advantage.

Macroeconomic policies--both here and abroad--can raise potential economic growth by encouraging higher participation in the labor force, increased accumulation of productive physical capital, increased investment in research and development, and a more efficient allocation of international resources. Raising the longrun trend in growth of potential U.S. real GNP just 1 percentage point--from 3 percent to 4 percent--would be expected to increase real demand at the farm level by about $2 billion at the end of 10 years. Further improvements would also come from increased world economic growth and export demand.

THE IMPACT OF BUSINESS CYCLES

Although the economy's longrun trend rate of growth has been about 3 percent, significant business cycle fluctuations have occurred about every 3 to 5 years. In the short run, the economy can grow above potential during an expansion phase (with significant inflationary pressures) and fall below potential during a contraction (generally with disinflationary pressures). During the seventies and the early eighties, the economy operated below full potential most of the time. The gap between potential and actual real GNP reached a record $181 billion in the first quarter of 1983--a shortfall of about 11 percent (fig. 1).

Major factors responsible for the shortfall included oil price shocks, weak productivity growth, high interest rates, and back-to-back recessions. This implied about a 4.5-percent shortfall in domestic real farm-level demand from its longrun potential, or about $2 billion in foregone real agricultural output.

Inventory-Accelerator Investment Cycles

The U.S. economy experiences two types of business cycles, which have different impacts on agriculture. Inventory-accelerator investment cycles occur as a result of the tendency of firms to overproduce and build inventories in response to increases in final demand. When inventories become too burdensome relative to final sales, firms cut production and employment while they deplete inventories to more desirable levels--and the cycle starts over again.

Sometimes exogenous shocks can set off an inventory investment cycle. The farm export boom of the midseventies provides a good example. In response to sharp increases in export demand, farmers increased production.

The farm input and transportation sectors likewise raised production and employment, which then fed into other sectors. When anticipated longrun increases in exports failed to extend beyond the seventies, input suppliers, farmers, and shippers found themselves in a dramatic oversupply position. At such a point, farm policies can be used to initiate resource adjustments and move the sector toward equilibrium. The recent PIK program was an attempt to help farmers to bring supplies back in line with demand. However, should export demand remain sluggish, further resource adjustments may be necessary.

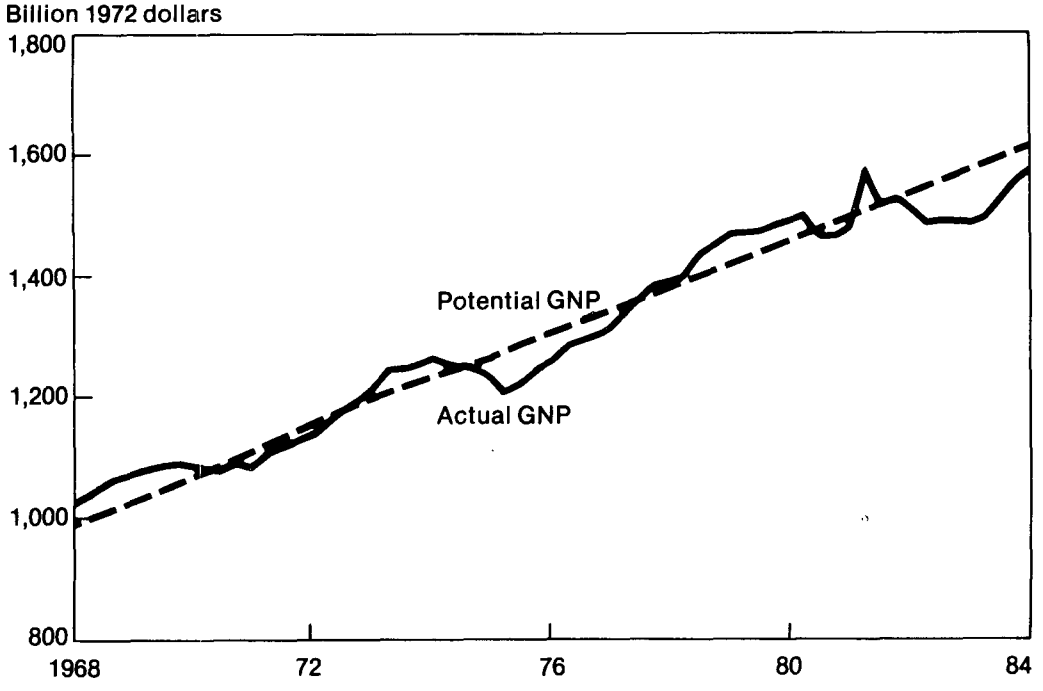
Monetary Cycles

Monetary cycles also play a role in the shortrun business cycle. As the economy expands towards full employment, labor and product markets tighten and inflation tends to accelerate. For a given level of the money supply measured in current dollars, a higher price level reduces its real (deflated) value--causing interest rates to rise. Final demand for interest-sensitive sectors such as consumer durables, housing, and business fixed investment weakens. Production and employment cutbacks in these sectors eventually lower final demand for other products and the economy slips into recession. As slack develops in labor and product markets, inflation eases (although with a time lag due to downward price and wage rigidities), causing real money balances to be higher than otherwise. This, in turn, lowers interest rates and causes a rebound in those same interest-sensitive leading industries and the cycle starts over again. Although monetary cycles used to be exacerbated by regulated ceilings on interest rates--which caused a near shut-off of credit flows to certain sectors--recent deregulation of financial markets has mitigated this problem.

Monetary cycles and policy shocks have a strong shortrun impact on agriculture. Interest rates affect domestic demand for crop inventories, influence investment in livestock herd expansion, and help to determine foreign exchange rates and, thus, export demand. Also, the debt structure of agriculture makes farm expenses sensitive to interest rates. High interest rates put the farm sector in the double bind of reduced demand but increased costs. Finally, monetary shocks often cause overshooting of commodity prices and associated asset values. Clearly, agriculture is very sensitive to monetary developments.

Figure 1

Actual and potential real gross national product



Modifying Business Cycles

Rather than being either inventory-accelerator or monetary in nature, most business cycles are a combination of both. Countercyclical macroeconomic policies can, in principle, be pursued in order to stabilize the business cycle. Because fiscal and monetary policies do have dramatic shortrun expansionary or contractionary impacts on the economy, they can be coordinated to dampen economic fluctuations. Fiscal and monetary policies can be gradually tightened as the economy expands towards full capacity in order to prevent an inflationary boom and gradually loosened during recessions in order to prevent a deflationary bust. Unfortunately, this "fine tuning" is very difficult to apply in practice. Policy initiatives that are delayed by political disagreement or encounter an economic time lag often have unintended consequences such as further stimulating the economy during an expansion or slowing it during a contraction.

Business Cycles and Agriculture

The response of the farm economy to business cycles differs from that of other sectors. When economic contraction weakens final demand in other sectors, firms tend to reduce output and employment. Prices for finished consumer goods tend to be extremely sticky--that is, they are slow to change--at least in the short run. Only after a prolonged period of weak demand do manufacturers reduce their prices, eventually reducing their excess inventories and restoring market equilibrium. This is in direct contrast to primary extractive industries such as farming, forestry, fishing, and mining, where prices adjust rapidly to changes in demand. Raw commodity prices are often determined in competitive auction markets or have contracts written for shorter duration than for finished goods.

In agriculture, resources are inflexible in the short run. There are few alternative uses for farmland and specialized capital equipment. Further shortrun output rigidities are due to time lags in the biological nature of agricultural production. For example, demand may increase during one growing season, but the farmer cannot increase output until the next.

A second and related factor is that modern farming is capital intensive. Agriculture uses nearly three times more capital per unit of output than other businesses. Also, the capital-to-labor ratio is twice as high. Consequently, when the economy weakens and the demand for farm commodities declines, prices tend to adjust more rapidly than output because of relatively high fixed costs. In agriculture prices adjust to changes in demand, while in other sectors output adjusts. Because of the inelastic supply, farm output price volatility is passed through to volatility in factor returns--including net farm income. Only after a prolonged period of weak demand does agriculture adjust output, sometimes with the help of Government programs. Price volatility is the rule rather than the exception for raw industrial inputs--including agricultural products (fig. 2). Variations in weather and export demand also contribute to agricultural price volatility. Evidence suggests that the flexibility of aggregate real farm prices with respect to growth in real GNP is about 1.5--other things being equal. Thus, a 10-percent change in real GNP will, on average, lead to a 15-percent change in aggregate real farm prices. Of course, price response varies among individual commodities. For example, demand for consumer durables often leads a recovery, cotton demand is typically concurrent, and livestock demand may lag until the second year of the recovery. Although Government programs can help smooth out this volatility somewhat, no program can totally insulate agriculture from these economic fundamentals.

Recent history provides an excellent example of agriculture's response to the business cycle. During recovery from the 1973-75 recession, fiscal policy was gradually tightened while monetary policy was gradually loosened. This policy mix kept real interest rates low and led to a vigorous economic expansion until 1979. At that point, the economy was operating close to full capacity and the earlier monetary stimulus initiated a high and rising wage-price spiral, with little room for further real growth. Monetary policy was then tightened in order to reduce inflation; real interest rates rose; and the economy plunged into recession in early 1980 and didn't fully recover until 1983. The world economy followed a similar pattern--although lagging the U.S. cycle. The low real interest rates during the 1976-79 recovery caused the value of the dollar to fall in foreign exchange markets, just as the high real interest rates during the ensuing recession caused the dollar to rise (fig. 3). Also, fiscal policy became expansionary in 1981. Taxes were cut and consumer spending and business investment increased. These policies were especially expansionary in light of the deficit (fig. 4), discussed below.

Agricultural conditions followed about the same pattern as the general economy, except for weather-induced fluctuations in crop yields. As the domestic economy expanded during 1976-79, so did demand for farm products. Also, strong world economic growth combined with a weak dollar boosted export demand. When the world plunged into recession in 1980, domestic as well as foreign demand weakened, and farm exports were further hurt by the strong dollar. As agricultural output did not decline, farm prices plummeted even further while costs continued to rise due to high interest rates and time lags (about 2-3 years) between the onset of recession (1980) and the eventual reduction in

Figure 2

Implicit price deflators for GNP and farm output

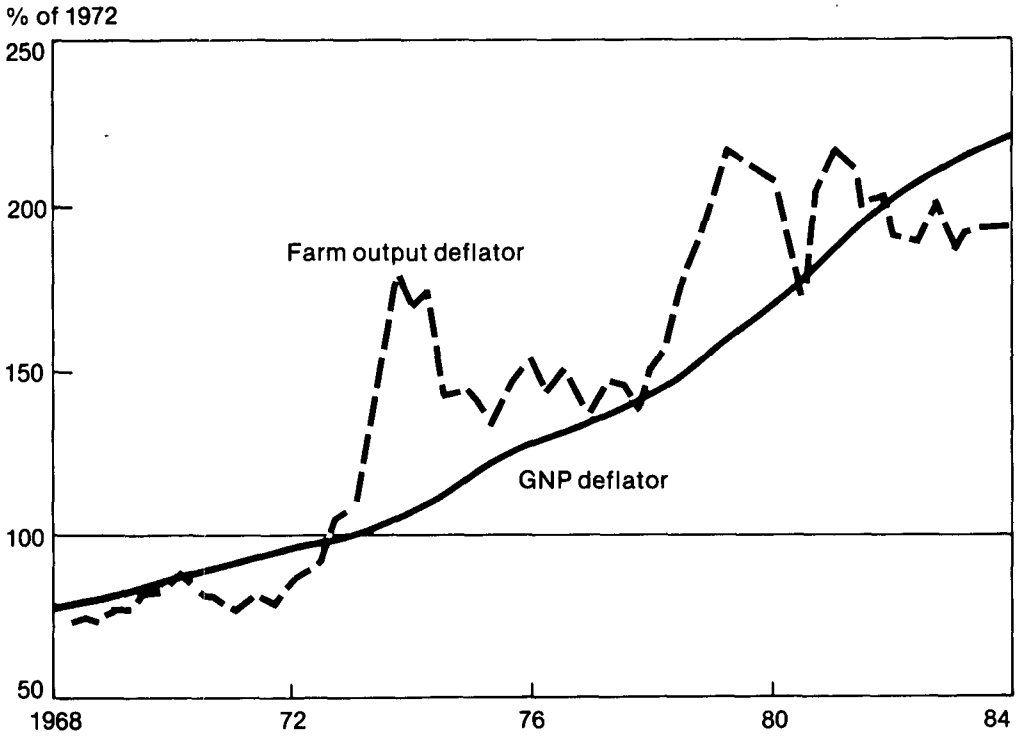


Figure 3

Foreign exchange value of the U.S. dollar

Weighted index (percent of 1970)

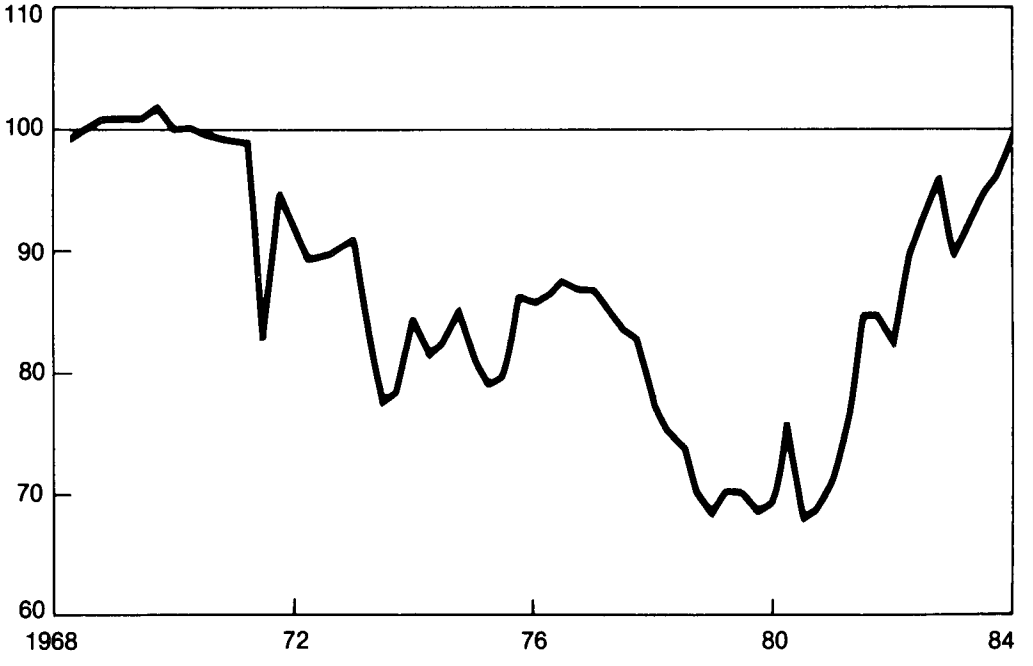
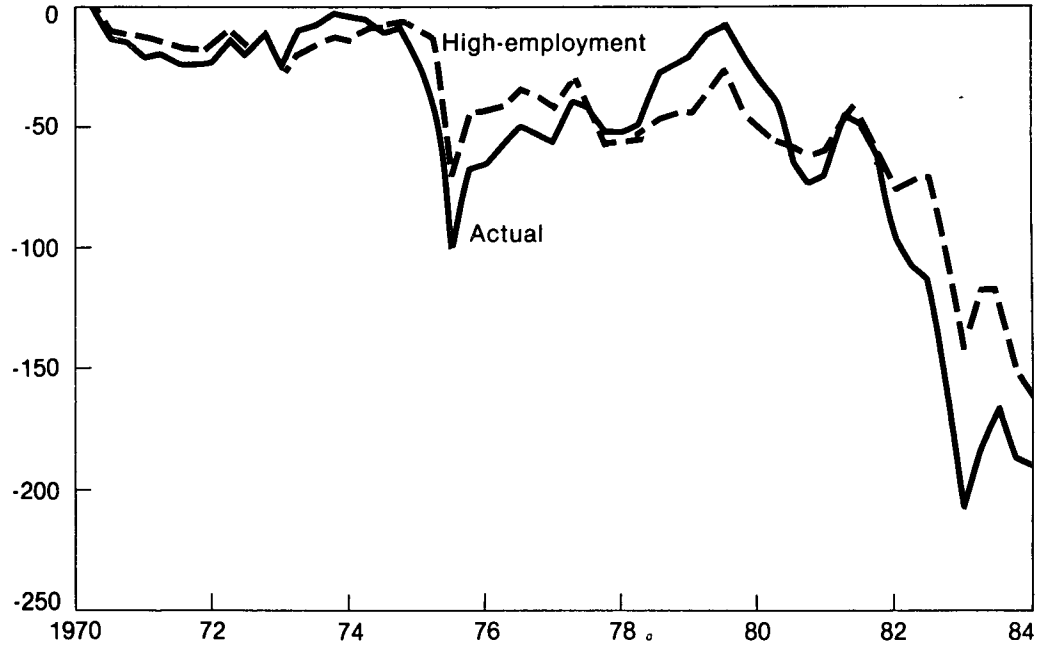


Figure 4

Actual and high-employment Federal deficit

Billion dollars



general inflation (1982-83). This is a typical overshooting phenomenon--raw commodity prices respond quickly to monetary shocks but manufactured input prices respond with a lag. As mentioned earlier, real farm prices and incomes are very sensitive to monetary shocks. Real net farm income measured in 1972 constant dollars dropped nearly in half from its peak of $19.8 billion in 1979 to $10.7 billion in 1982.

THE MACROECONOMIC OUTLOOK AND AGRICULUTRE

Current forecasts for the rest of 1985 and 1986 show disposable income up moderately, implying a modest increase in consumer demand for food and beverages (a 1-percent increase in real per capita income results in approximately a 0.3- to 0.4-percent increase in food demand). However, not all of the increase in demand will be felt at the farm gate, and it will vary from commodity to commodity. A large portion of the increase will be allocated to restaurant spending and other marketing service additions to raw farm products. Nevertheless, continued economic recovery will most likely generate some increase in domestic farm-level demand.

The outlook for a sustained, strong U.S. recovery is still clouded by concerns over the large Federal deficit. Continued restraint in the growth of the money supply, combined with a large demand for both public and private credit, suggest that real interest rates will remain high. This could eventually weaken economic growth in coming years and dampen domestic demand for farm products. So far, about one-half of the Federal budget deficit is being financed by increased net capital inflows from abroad. This implies an equal but opposite current account deficit--largely consisting of a huge negative trade balance. Foreign savings are coming in to finance the shortfall of domestic savings (a Federal budget deficit represents dissaving) so that, in effect, the trade deficit is a reflection of the unmonetized budget deficit. Unless fiscal policy is tightened or monetary policy is loosened, the U.S. recovery will remain dependent on foreign capital. This means that recovery will continue to be unbalanced, largely bypassing export-dependent or import-competing industries--including agriculture. Real gross national product will continue to increase, but the sectoral mix will continue to shift away from interest-sensitive and trade-oriented sectors.

The value of the dollar is likely to remain high because of favorable returns on American investments and confidence in the U.S. economy. But this also means that U.S. products will remain relatively expensive to foreign customers. Over the past 2 years alone the United States has lost about $6 billion in foregone agricultural export sales just due to the appreciation of the dollar. It should be noted, however, that in the late seventies the dollar was unusually weak and exports were unusually strong.

Although the rise in the value of the dollar has had a negative effect on farm exports, it has also cut 2 to 4 percentage points off the general inflation rate through direct and indirect effects on the U.S. general price level, benefiting farmers from the cost side. Farmers purchase a significant amount of fertilizer, chemicals, and farm machinery from international sources. A strong dollar has held down cost increases of these inputs. The prices of internationally produced energy goods such as oil and natural gas also have been held down by the strong dollar. Nevertheless, although a strong dollar has a positive influence on the agricultural sector by moderating production costs, such benefits are at least partially offset by the negative impact of reduced export demand.

Foreign exchange rates are not the only determinant of demand for U.S. farm exports. Foreign economic growth is the major factor in total world trade and foreign exchange rates are more of a determinant of market share of that total.

As world gross domestic product (GDP), personal incomes, population, and employment generate increases in world demand for food, part of the increased demand will be met by larger imports from the United States and elsewhere. So far, the world recovery is lagging the U.S. recovery and is forecast to continue to lag in 1985. For the first 3 years of this decade, the European Community had an average real growth rate of 0.4 percent, compared to a trend of about 4 percent during 1960-79. Japan had a corresponding growth rate of 3 percent, less than half of the 7-percent trend shown by past performance. If trend levels had continued through 1983, U.S. grain and soybean exports would have been 10 million metric tons higher. It may be towards the end of the decade before the economies of major trading partners are fully recovered and substantial strengthening in agricultural exports is achieved. Also, developing countries were the fastest-growing markets for U.S. farm products in the seventies, partly due to their higher income elasticity of food demand and partly due to cheap credit at low (sometimes negative) real interest rates. Current debt constraints and slow economic growth are causing developing countries to curtail imports while they try to spur their own exports. This has further dampened U.S. agricultural exports.

Interest rates are expected to rise moderately in 1985 and 1986. This will likely raise farm costs because interest expense is a large share of total production costs. At recent levels, a 1-percentage point change in the average interest rate on outstanding farm debt would lead to about a $2-billion change in farm production expenses. However, it takes time for farmers to feel such an impact since the average interest rate on their debt (old and new) changes slowly. The high fixed interest expenses that many farmers now pay will continue to be a problem.

Inflation in the economy increases prices paid by farmers in about a 1-to-1 ratio on average, over time (fig. 5). Thus, the rapidly accelerating inflation in the late seventies was matched by rapidly accelerating farm costs. Similarly, the lessening in inflation has helped to slow rises in prices paid by farmers for nonfarm origin inputs to about 2 percent in 1983--the slowest increase in over 10 years.

At recent levels of production expenses, a 1-percentage-point increase in inflation will lead to about a $1.5-billion increase in farm production expenses. Thus, with a slight increase in inflation that is forecast for 1985 and 1986, farm costs should increase somewhat, too.

EFFECTS OF FISCAL AND MONETARY POLICIES ON AGRICULTURE

The mix of monetary and fiscal policies can have major implications for agriculture. Fiscal deficits can exert opposing influences on agriculture, depending on their source.

Fiscal Policy

The impact of the Federal budget deficit on agriculture and the general economy is a major concern. However, it is important to distinguish structural from cyclical Federal budget deficits. Cyclical deficits are largely passive in nature, being the result of automatic stabilizers built into expenditures

(such as unemployment compensation and food stamps) that automatically rise during recessions even as tax revenues fall. These deficits merely replace falling private demand with rising public demand and have little impact on interest rates or foreign exchange rates.

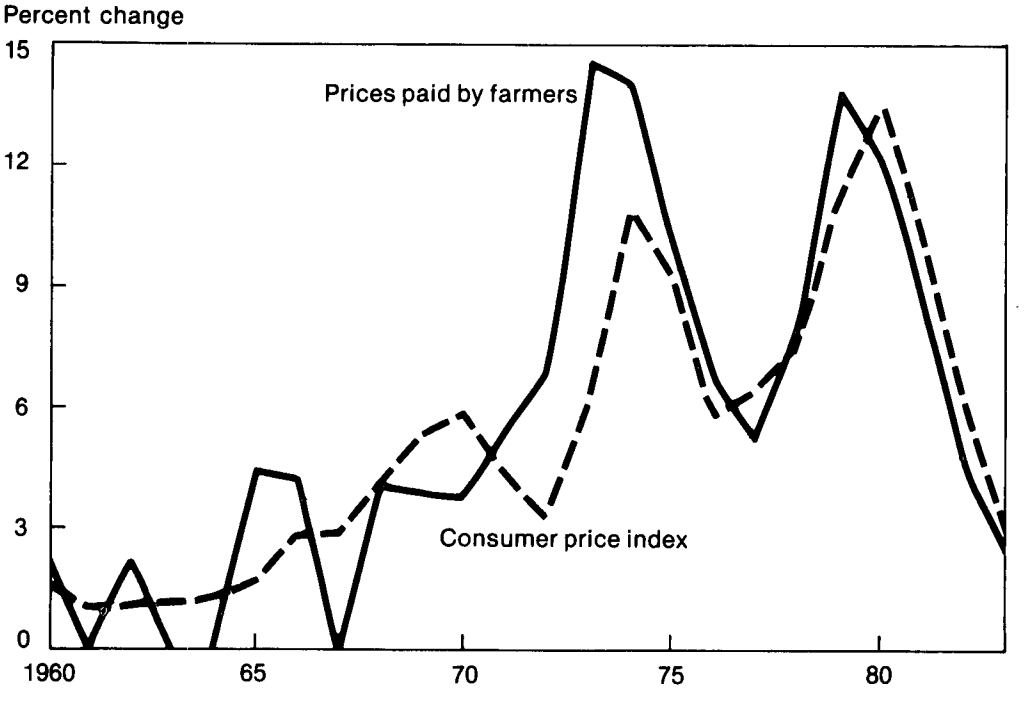
Conversely, a structural, or high-employment, deficit measures what the deficit would be if the economy were operating at full potential, and is a better measure of net fiscal stimulus than the cyclical deficit. High-employment deficits put upward pressure on interest rates as Government competition for funds crowds out other borrowing sectors such as investment and housing. Sectors that depend on exports or compete with imports are also crowded out as higher interest rates lead to higher foreign exchange rates, net foreign capital inflows, and an offsetting trade deficit.

The current policy mix of fiscal stimulus combined with monetary restraint is the exact opposite of the policy mix during the previous recovery. Rather than the strong growth, low interest rates, and weak dollar, followed by the rapid inflation during the 1976-79 recovery, current policies are expected to result in more moderate growth, higher interest rates, and a stronger dollar in the short term, but would be significantly less inflationary. Budget deficits resulting from a true countercyclical fiscal stimulus are likely beneficial to agriculture--at least in the short run--as they help shore up final demand during recessions with little or no impact on interest rates or foreign exchange rates. The longrun impact is likely neutral.

Conversely, structural deficits are likely detrimental to agriculture. In the short run, final domestic demand will be stronger, but because of higher interest

Figure 5

General inflation and prices paid by farmers



and exchange rates, export demand will be weaker. Furthermore, farm costs will be higher because of higher interest rates. The longrun impact is likely to be adverse. Domestic demand will be unchanged but export demand will be less and farm interest expenses will be higher, although the strong dollar will hold down prices for manufactured inputs.

Monetary Policy

A Federal deficit can be financed by monetizing it (printing more money) or by borrowing from private capital markets. Printing more money creates artificial demand and is a primary source of inflation. To minimize the danger of refueling inflation, especially after going through so much pain to get it under control, the Federal Reserve has chosen to hold down growth in the money supply. Hence, the deficit is being financed by the Government borrowing in the money market in competition with private borrowers. Federal borrowing in 1983 required approximately 40 percent of the $617.3 billion in loanable capital raised from domestic and foreign sources. By comparison, corporations borrowed just $57.4 billion and issued only $15 billion in new bonds. A large Federal deficit financed by borrowing rather than monetization increases competition for credit and drives up real interest rates.

Inflation is kept in check, but farmers feel the effects of high interest rates:

- Cash flow problems for heavily debt-leveraged farmers are increased.
- Economic growth and income growth are dampened, which reduces farmers' domestic sales.
- Competition for U.S. dollars in world markets drives up their value, makes U.S. exports more expensive to others, and thus reduces farm exports.
- Foreign capital is invested in the United States or in dollar accounts abroad; while this may appear beneficial in the short run, it reduces funds available in foreign countries to pay for imports and for their internal investment and growth, further reducing U.S. farm exports in the long run.
- The credit problems of debt-ridden countries worsen, making it more difficult for them to borrow for internal investment; the net result is reduced ability to import U.S. farm products.

The Monetary Control Act of 1980 provides a phased deregulation of U.S. financial institutions. The purpose of the Act (as well as followup legislation in 1982) is to provide a more market-oriented, competitive financial environment. This should increase economic efficiency, allowing funds to flow more smoothly to and from economic sectors, geographic locations, and individual enterprises according to their ability to earn competitive rates of return.

For agriculture, deregulation has led to a closer interlocking of rural credit conditions with national, rather than regional, financial markets. The agricultural sector is now less insulated from national monetary shocks, and increased interest rate volatility nationally has translated into increased volatility in local rates. Management strategies at rural banks must now include hedging against future changes in interest rates, as well as more traditional portfolio and balance sheet considerations. Also, the Farm Credit System

has always had access to national markets, while commercial rural banks have not. Thus, deregulation will make commercial banks more competitive than they used to be and should halt or reverse their recent trend of declining market share. Under deregulation, credit crunches--a shut-off of credit to certain sectors--are likely to be supplanted by general squeezes on all sectors. These squeezes will ration credit by price. Finally, financial deregulation means that U.S. agriculture will have to earn its access to credit in more direct competition with other sectors. This could contribute to a flow of excess resources out of the farm sector. The current Farm Credit System, by charging below-market interest rates, has contributed to excess agricultural production capacity.

AGRICULTURAL IMPACTS ON THE GENERAL ECONOMY

Just as macroeconomic developments affect agriculture, agricultural developments and policies affect the general economy. For example, higher farm prices typically mean higher net farm income. As farmers spend their additional income (either on consumption goods or capital equipment), it multiplies through the general economy to bring about higher levels of aggregate production, income, and employment. Recent studies indicate that aggregate demand multipliers are about 2 to 1 for most of the economy, including agriculture. (Each $1 of additional demand generates about $2 in additional GNP.) Thus, at 1982 levels, each additional $1 billion in farm demand would likely generate 60-65,000 additional jobs annually. This is a rough estimate, as multipliers vary over the course of the business cycle and with the degree of stimulus. It is important to keep in mind that this impact is generated by raising farm prices and income through increased demand for farm products, rather than by restricting supply. A simple transfer of income would have little multiplier impact, as no net increase in demand would be generated.

Higher farm prices and incomes can also be generated by restricting supply. But reducing agricultural production might actually reduce real GNP, aggregate income, and employment in the rest of the economy. Farmers would have more real income, but other sectors would have less, at least in the short run. Agricultural supply restrictions redistribute a share of the total income pie to agriculture rather than increasing the total pie and may, in fact, reduce it. Estimates show that a 10-percent reduction in agricultural acreage would reduce input use about 6 percent in the short run, generating less income and employment in the associated industries, with negative multipliers through the general economy. Further losses in economic activity and income would occur in the transportation, processing, and marketing industries. These losses may not be offset by the positive job-creating impacts of the higher farm incomes. The net impact of higher farm incomes but lower associated industry incomes could be negative.

In summary, higher commodity prices that result from increased demand mean higher net farm incomes which, when spent, generate additional jobs nationally for additional net farm income. On the other hand, higher farm commodity prices that result from reducing output--with no changes in demand--result in higher net farm income, but the job-creating impacts of spending that income are offset by the job-reducing impacts of reduced production and reduced use of production inputs (fertilizer, fuel, seed, machinery, and the like).

A much larger (7-to-1) multiplier impact of higher farm income has been cited to support the argument that the Government could cure a recession by artificially supporting high farm commodity prices. Three points are relevant here:

- The forties study using those high impact multipliers was based on unique conditions of the Depression of the thirties.

- The high artificial price supports would have to be accompanied by supply reduction programs which would offset the job-creation impacts of the higher prices.

- The cost of artificial price supports would have to be paid by taxpayers and would be a Government-directed redistribution of income from taxpayers at large to farmers. The negative job-reducing impact of reducing income to taxpayers would offset jobs created by the higher farm prices, although the jobs would be in different industries.

CONCLUSIONS

Macroeconomic conditions and policies affect the demand (revenue) side of agriculture as well as the supply (cost) side. Given a low income elasticity of demand for farm products in the aggregate, longrun trends in the general economy suggest that growth in domestic demand will be insufficient to eliminate excess production. To alleviate this basic supply-demand imbalance, U.S. agriculture must either increase exports or reduce resource use and productive capacity.

- Trend growth in real per-capita income has been about 2 percent, the retail income elasticity of demand for food and beverages in the aggregate is about 0.4, and the farm-level aggregate GNP income-elasticity is about 0.4. Thus, a 10-percent change in real GNP will generate about a 4-percent change in aggregate farm-level demand while a 10-percent change in real per-capita income will generate a 4-percent change in retail food demand.

- Given these elasticities and population growing at 0.8 percent, annual trend growth in potential retail demand for food and beverages is about 1.6 percent.

- Measured at the farm level, trend growth in potential domestic total food demand is probably between 1.0 and 1.2 percent--well below the 1.6-percent trend growth in retail food demand.

- Trend growth in total factor productivity for agriculture has been about 2 percent.

- Under these conditions, aggregate supply will continue to outstrip domestic demand by almost 1 full percentage point per year.

Fiscal and monetary macroeconomic policies affect inflation and interest rates in the economy as well as influence the business cycle. Inflation and interest rates have a direct impact on the cost side of agriculture.

- Inflation in the general economy is passed through to prices paid by farmers in about a 1-to-1 ratio. At recent levels of production expenses, a 1-percentage-point change in the general inflation rate will lead to about a $1.5-billion change in farm production expenses (3).

- Current interest expenses of around $20 billion are about 15 percent of farm production expenses. A 1-percentage-point change in the average interest rate on outstanding farm debt will lead to about a $2 billion change in farm production expenses.

- High U.S. interest rates contribute to a strong dollar internationally. While this reduces export demand, it also reduces U.S. inflation and farm input costs. A 10-percent increase in the value of the dollar reduces general inflation about 1 percentage point.

- A macroeconomic policy mix of fiscal stimulus combined with monetary restraint is more harmful to agriculture (and other interest-sensitive or export-dependent sectors) than the opposite mix of fiscal restraint combined with monetary stimulus, at least in the short run.

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