CHAPTER 8

The U.S. Agricultural Sector

In 2005, the Federal government spent approximately $20 billion on agricultural support payments in a sector forecast to produce approximately $270 billion of output in 2005. In addition, the United States maintains barriers to the import of some commodities, and these barriers raise the domestic prices of these commodities relative to world prices. To what extent do these payments and trade barriers serve a public purpose? Are they needed to maintain a healthy U.S. agricultural sector? Could alternative policies achieve this goal? This chapter addresses these and other questions.

Today's agricultural commodity support programs are rooted in the landmark New Deal legislation that followed the agricultural depression of the 1920s and 1930s. These programs were designed to sustain prices and incomes for producers of cotton, milk, wheat, rice, corn, sugar, tobacco, peanuts, and other crops, at a time when a large portion of the U.S. population was engaged in farming. Changing economic conditions and trends in agriculture since then suggest that many of the original motivations for farm programs no longer apply. For example, the increasing reliance of farm families on income earned from sources other than their farms and a shift toward market-oriented farm policies have made farms and commodity markets less vulnerable to adverse price changes than before. These changes imply that moving away from traditional commodity support programs today would have a much smaller impact on farm household income than in previous decades. Nonetheless, substantial government support of agriculture remains.

A more economically efficient farm policy would reflect contemporary economic conditions, environmental needs, and public values. Economic efficiency would be served by policies that are cost-effective and that give farmers greater opportunity to respond to market signals. Revising government policy to better meet these objectives would help unleash more of the innovative energy that has long characterized American agriculture. U.S. agriculture can successfully compete in a global marketplace that has been freed of domestic support and barriers to trade. The key findings of this chapter are:

- Most farmers do not benefit from commodity subsidies.
- Support to agriculture can be provided in many forms that are potentially less market- distorting than existing commodity subsidies.

The U.S. Farm Sector Has Evolved Dramatically Over Time

In the 1930s, farms accounted for a sizable share of U.S. employment and gross domestic product (GDP), but per capita farm income was only one-third the per capita income of the remaining population. Commodity programs were intended to reduce this disparity by sustaining farm household income, particularly in the face of adverse changes in agricultural prices. For instance, in the early 1930s farm household incomes were at the mercy of year-to-year fluctuations in farm prices. Commodity price support programs, which provided *price floors* (minimum prices) for agricultural producers, effectively insured them against adverse price swings. Proponents of these programs argued that they had macroeconomic benefits because they maintained rural purchasing power in times of general economic weakness. Many of today's basic Federal farm policies were established in the 1930s, and at the time, they were reasonably matched to this overall economic picture. Since that time, however, the U.S. agricultural industry has evolved dramatically.

As Table 8-1 shows, in the 1930s farm households accounted for 25 percent of the U.S. population and generated approximately 8 percent of GDP. Today they account for only 1 percent of the population (25 times lower than in 1930, as a percentage of total population) and generate approximately 1 percent of GDP. Over the same period, the rural share of the population has fallen far less (approximately two times lower than in 1930, as a percentage of total population), suggesting that rural areas are less dependent on farming's contribution to the rural economy. Our agricultural sector is still vital to our country, but due to both growth in other sectors of the economy and rapid gains in agricultural productivity that have lowered the prices of agricultural products, it has become a smaller share of the U.S. economy.

Astonishing progress in agricultural productivity growth likely explains much of the structural change in U.S. agriculture (Chart 8-1). Growth in agricultural total factor productivity averaged 2.1 percent annually between 1950 and 2002. In comparison, productivity growth in private nonfarm business over the same period averaged 1.2 percent annually. Technological progress and growth in farm productivity permit a smaller labor force to supply the agricultural needs of the country at ever lower cost. As a result, agriculture's contribution to total U.S. GDP has declined over time even though physical production has been rising (Chart 8-2).

TABLE 8-1.— *100 Years of Structural Change in U.S. Agriculture*

	1900	1930	1945	1970	2000
Number of farms (millions)	5.7	6.3	5.9	2.9	2.1
Average farm size (acres)	146	151	195	376	441
Average number of commodities produced per farm	5.1	4.5	4.6	2.7	1.3
Farm share of population (percent)	39	25	17	5	1
Rural share of population (percent)	60	44	36[b]	26	21
Farm share of workforce (percent)	41	22	16	4	2
Farm share of GDP (percent)	na	8	7	2	1[c]
Off-farm labor[a]	na	100 days	27%	54%	93%

na= not available.

[a]Off-farm labor measures the extent to which members of farm households work in other sectors besides farming. 1930, average number of days worked off-farm; 1945, percent of farmers working off-farm; 1970 and 2000, percent of farm households with off-farm income.

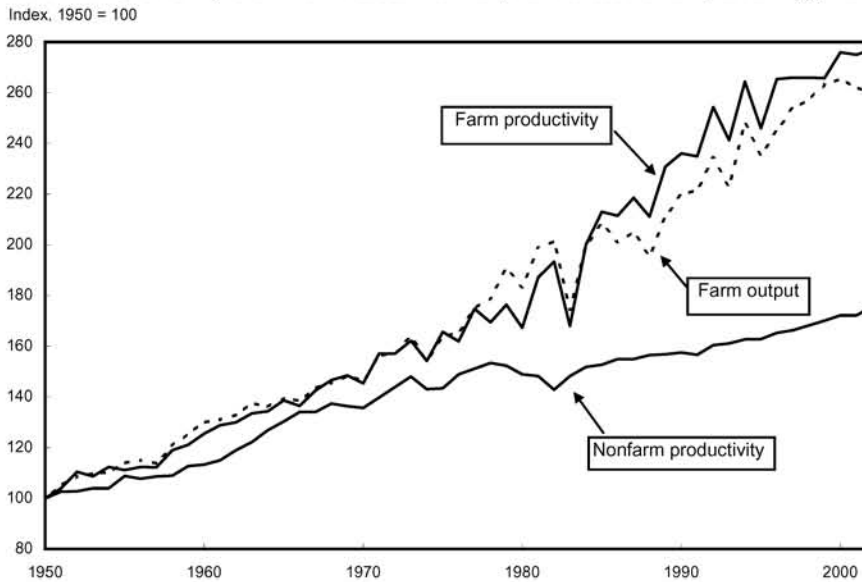
[b]Data for 1950.

[c]Data for 2002.

Sources: Department of Agriculture (Economic Research Service) and Department of Commerce (Bureau of Economic Analysis).

Chart 8-1 **Farm Sector Inputs, Output, and Total Factor Productivity**

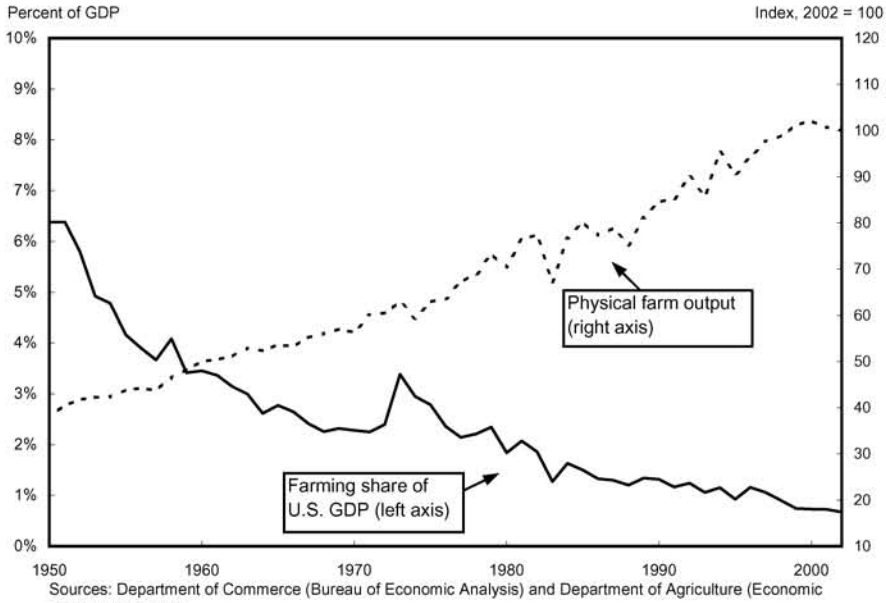
Gains in farm productivity have driven increases in farm output and exceed nonfarm productivity gains.



Sources: Department of Agriculture (Economic Research Service) and Department of Labor (Bureau of Labor Statistics).

Chart 8-2 **Farming Output and Share of U.S. GDP**

Farm output has increased, while farming as a share of U.S. GDP has declined.



Sources: Department of Commerce (Bureau of Economic Analysis) and Department of Agriculture (Economic Research Service).

The Average Farm Payment Recipient Is No Longer Poor

Fifty years ago, average household income for the farm population was approximately half that of the general population. Today, however, the average farm household tends to be better off than the average American household; in 2004, farm households earned about 35 percent more than the U.S. average household income.

While on average farm households earn more than other Americans, the relative contribution of farm income (income from farming activities, including crop, livestock, and other farm-related income, and government farm support payments) to total farm operator household income (income from all sources—farm and nonfarm—that is earned by a household that operates a farm) varies by farm size. Households operating the "rural residence farms" (Table 8-2 shows the farm size classifications) earn more than the U.S. average family income even though their net cash income from farming is negative (that is, the expenses from operating the farm exceed the gross revenues) on average. The income from these farms is unlikely to be sufficient to support a family, and households operating these farms receive their income from other sources. Households operating intermediate farms have on average positive net cash income from their farming operations, but most household income comes from sources other than farming. Households

operating commercial farms have average household income over three times higher than the U.S. average family income in 2004, with most of their income coming from farming.

Production and Government Payments Are Concentrated on Large Farms

The structure of farming continues to move toward fewer, larger operations producing the bulk of farm commodities, complemented by a growing number of smaller farms earning most of their income from off-farm sources. As Table 8-3 shows, most farms in the United States are still small farms or "rural residence farms," but they produce only a small share of total agricultural output and receive only a small share of direct agricultural subsidy payments. Most production and government payments are now associated with intermediate and commercial farms, particularly the latter, which account for a relatively small percentage of the total number of U.S. farms but receive over half of direct payments.

TABLE 8-2.— *Farm Income and Farm Operator Household Income by the USDA Farm Size Classification, 2004*

Item	Rural residence farms	Intermediate farms	Commercial farms	All farms
Farm operator households (total number)	1,373,956	529,071	157,795	2,060,822
Average gross cash per farm income per farm operator household (dollars)[a]	15,343	73,053	751,696	86,540
	Percent of average gross cash farm income per farm operator household by source			
Crop, livestock, and other farm-related income	*91.8*	*92.7*	*95.5*	*94.5*
Government payments	*8.2*	*7.3*	*4.5*	*5.5*
	Average per farm operator household (dollars)			
Total cash farm expenses	15,980	58,423	525,655	65,902
Net cash farm income	-638	14,630	226,041	20,638
Farm operator household income[b]	75,316	64,789	191,115	81,480

Source: Department of Agriculture (Agricultural Resource Management Survey).

[a]Gross cash farm income is income from crop, livestock, and other farm-related income, including agricultural subsidy payments.

[b]Farm operator household income is income from all sources, farm and nonfarm related, earned by the farm household.

Note: **Rural residence farms.** Small farms with agricultural sales less than $250,000—whose operators report they are retired or have a major occupation other than farming. Rural residence farms also include limited-resource farms, regardless of the occupation of their operator. (Limited-resource farms have sales less than $100,000 and are also operated by households with low household income during the two previous years.)

Intermediate farms. Small farms with sales less than $250,000—whose operators report farming as their major occupation. This category excludes farms classified as limited-resource farms, even if their operators report farming as their major occupation.

Commercial farms. These comprise farms with annual sales of $250,000 or more.

TABLE 8-3.— *Distribution of Agricultural Production and Government Payments by the USDA Farm Size Classification, 2003*[a]

Item	Rural residence farms	Intermediate farms	Commercial farms
Farms (number)	1,429,953	502,771	188,095
Farms (percent of total farms)	67	24	9
Percent of total value of agricultural production	9	19	72
Percent of total direct government payments received	17	32	51

Source: Department of Agriculture (Agricultural Resource Management Survey).

[a]See bottom of Table 8-2 for the definitions of the USDA Farm Size Classifications, but with the inclusion of farms organized as nonfamily corporations or cooperatives, as well as farms operated by hired managers.

The United States is not the only country in which subsidy payments are concentrated among a relatively small portion of farms receiving commodity subsidy payments. Data on the distribution of payments by farm size are relatively hard to come by for most European Union (EU) countries. However, in 2001 in France, farms of approximately 500 acres or more represented 2 percent of farms and received 11 percent of direct payments for arable crops (grains and oilseeds), while small farms (25 to 50 acres) represented 19 percent of farms but received 7 percent of direct payments for arable crops. While the EU is currently in the process of converting most of its various forms of direct farm payments into "single farm payments" that will be largely independent of production, the direct farm payments will be based on payments historically received by a farm. Hence, it is likely that direct payments to European farmers will remain concentrated among a relatively small portion of farms.

Issues in Current U.S. Farm Policy

In the United States, producers of bulk commodities, such as cash grains (wheat, rice, and corn), cotton, oilseeds, and peanuts, and producers of several other minor crops are eligible for commodity support in various forms, including fixed direct payments, countercyclical payments, and marketing loan program benefits (whose particulars will be discussed in a later section). Dairy, sugar, and (until 2004) tobacco prices are also supported through production and import control programs.

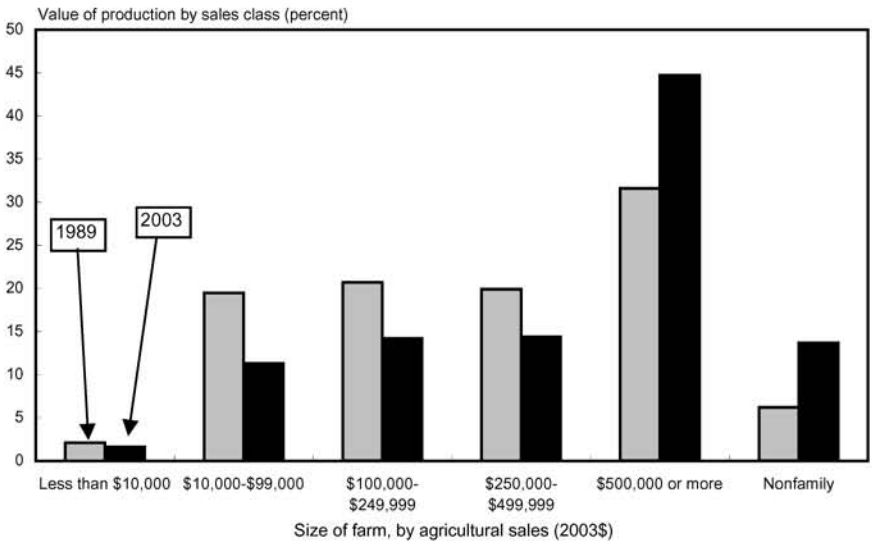
Agricultural Production and Farm Program Benefits Are Increasingly Concentrated

Because of differences in farm size and types of commodities produced across farms, the distribution of government payments is unbalanced. Among the factors affecting the allocation of government payments are farm size (acreage), location, and types of commodities produced.

Less than half of the Nation's 2.1 million farms receive government payments—only 40 percent received government payments (including income support and conservation payments) in 2003. Direct government payments on crops eligible for commodity support reach only about 500,000 farms (around 25 percent of all farms). Even for farms that receive payments, government payments typically represent a small share of gross farm income (revenue from farming activities, including crop, livestock, and other farm-related income, and government farm support payments) and an even smaller share of farm operator household income. Government payments accounted for only about 5 percent of receipts for commercial farms (Table 8-2).

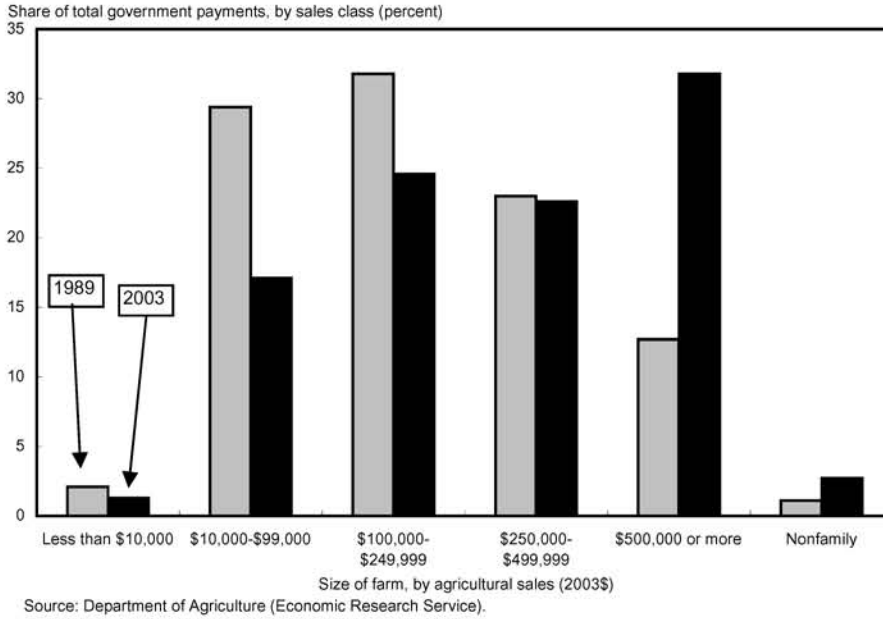
Most program payments go to larger farms, because program commodity production is concentrated on larger farms. While commercial farms received approximately half of government payments in 2003, they accounted for only 15.5 percent of farms receiving payments, and the average household income of their operator is almost three times higher than U.S. average household income. The largest of the commercial family farms (those with gross annual sales of $500,000 or more) received 27 percent of payments even though they account for 5.5 percent of farms receiving payments. Some of the largest farms in terms of value of production produce livestock or fruits and vegetables and thus may not receive any government program payments. As Charts 8-3 and 8-4 show, both production and program payments have become increasingly concentrated over time, with notable shifts toward larger farms even over the last decade.

Chart 8-3 **Value of Agricultural Production by Farm Size (1989 versus 2003)**
Agricultural production is shifting toward larger farms.



Note: Non family farms comprise those farms organized as nonfamily corporations or cooperatives, as well as farms operated by hired managers.
Source: Department of Agriculture (Economic Research Service).

Chart 8-4 **Government Commodity Payments by Farm Size (1989 versus 2003)**
Government commodity payments are shifting toward larger farms.



Source: Department of Agriculture (Economic Research Service).

The share of program participants is highest in regions where production of corn, oilseeds, wheat, rice, and cotton is concentrated. Cotton and rice farms reported the highest average payment level. In 2003, cash grain (wheat, rice, corn, barley, oats, and sorghum) and soybean farms received 49 percent of total payments even though they represented only 21 percent of the value of total agricultural commodity sales. Farms that receive no payments typically specialize in the production of nonprogram commodities such as meats, vegetables, fruits, and nursery products.

Farmers Today Have Many Options for Managing the Risks They Face

Farmers face many risks. The uncertainties of weather, crop yields, prices, government policies, global markets, and other factors can cause wide swings in farm income. Furthermore, farm income is more variable than income from off-farm activities.

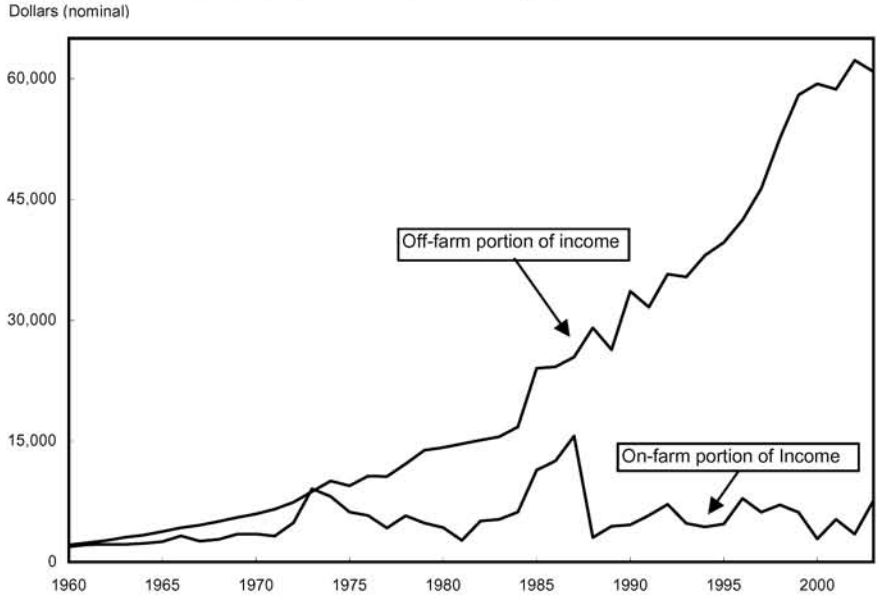
Risk management involves choosing among many options for reducing the financial effects of such uncertainties. In addition to participating in government commodity programs that are available for certain commodities, farmers today have private options for managing risk that were not available when commodity price support programs were introduced. For instance, the

growth of futures and options markets provides a market-based method for farmers to protect themselves against short-term price declines. Other private means to stabilize farm incomes include saving, borrowing, diversifying among different types of crops and livestock, contracting farm output with processors at assured prices, crop insurance and total revenue insurance, utilizing a wide range of farm management practices that reduce crop loss (e.g., irrigation, pesticide use), leasing out farmland, and taking advantage of expanded opportunities for earning nonfarm income.

The sources of income for farm households are increasingly diversified, which means many of them are less vulnerable to the volatilities of farm income. By 2000, 93 percent of farm households earned off-farm income, including off-farm wages, salaries, business income, investments, and Social Security. Off-farm work has played a key role in raising farm household income, which, as already noted, now exceeds the national average. Chart 8-5 shows the increasing importance of nonfarm income for farm households in the United States.

While farm household incomes have become more diversified, farm operations have become increasingly specialized: In 1900, a farm produced an average of about five commodities; by 2000, this average had fallen to about one per farm. This change reflects not only the production and marketing efficiencies gained by concentration on fewer commodities, but also the effects of farm

Chart 8-5 **Composition of U.S. Farm Household Income by Source (household average)**
The ratio of off-farm income to on-farm income has been rising over time.



Source: Department of Agriculture (Economic Research Service).

price and income policies that have reduced the risk of depending on returns from only one crop or just a few crops. Farms would likely cope with decreases in commodity subsidies by increasing the number of different commodities they produce and by the other income stabilizing strategies already discussed.

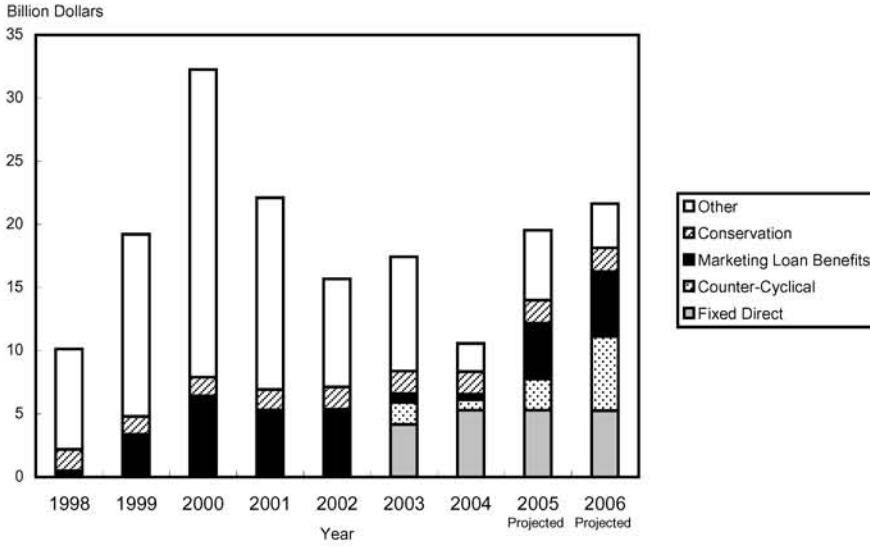
Economic Costs of Commodity Support Programs

Despite the decreasing share of agriculture in U.S. GDP, the decreasing share of farm income in total farm household income, and despite the fact that the average farm household is no longer poor, U.S. farmers continue to receive billions of dollars in subsidy payments from U.S. taxpayers every year (Chart 8-6). Total payments to farmers from the Federal government were approximately $20 billion in 2005 and are projected to be approximately $21 billion in 2006. This constitutes about 6 percent of the U.S. Federal budget deficit for 2005 of $319 billion.

In addition, these subsidy payments can cause market distortions by stimulating more production than would occur without the subsidies. To the extent that payments are tied to production and prices, they send market signals to farmers that differ from those they would receive from a market operating free from government intervention. These distorted price signals lead to an economically inefficient allocation of resources both within the agricultural sector and across other sectors of the economy. The link between agricultural support payments and markets varies among programs. For instance, fixed direct payments (FDPs) are based on a farm's historic production and are fixed lump-sum payments. Countercyclical payments (CCPs) are based on historic production but the per acre payment varies with changes in the current market price. Marketing loan benefits (MLBs) are calculated based on current production and prices. Although there is some debate over the relative levels of the market distortions caused by these direct payments, FDPs are generally believed to be minimally market-distorting per dollar of expenditure, followed by CCPs, and finally MLBs, which are generally perceived to result in the most market distortion per dollar of expenditure.

While these domestic support policies increase costs to taxpayers, they are only part of the support that agriculture receives and these other forms of support can also cause market distortions. In particular, for some commodities, market price supports such as tariffs impose additional costs on U.S. consumers of commodities by raising their domestic prices relative to world prices and thus reducing consumer purchasing power. Such support is especially high as a percentage of the value of the commodity in the case of sugar. Because of the U.S. tariff rate quota system on sugar imports, the domestic price of sugar has been approximately double world sugar price over the last few years. An estimate by the OECD found that the cost of U.S. sugar policies to U.S. sugar consumers due to increased sugar prices was $1.5 billion in 2004.

Chart 8-6 **Net Direct Payments to Farmers**



Source: Department of Agriculture (Farm Services Agency).

In general, U.S. commodity support programs promote overproduction of commodities in the United States and hurt countries that could benefit from exporting these commodities to the United States. The existence of these U.S. programs in turn has prompted some U.S. trading partners to insist that we reduce these market-distorting programs in exchange for concessions important to United States trade in services and manufacturing. At the same time, as discussed in the next section, U.S. agriculture increasingly depends on the availability of foreign markets.

This section focused on distortions of market for land-based food resources. For an example of government policy that increases economic efficiency through market-based management of marine food resources, see Box 8-3 at the end of this chapter.

Trade Policy Issues

The potential economic gains from further trade liberalization in agriculture as well as in manufactured goods and in services are large (see Chapter 7, The History and Future of International Trade, for more information). Trade ministers are working at the World Trade Organization to resolve differences about how to reform various protections for agriculture, a key issue that must be

addressed before negotiations in other areas can proceed. Areas of significant policy interest are the economic impacts of agricultural trade liberalization and the potential impact on the environment and the supply of amenities.

Trade Is Essential to the U.S. Agricultural Sector

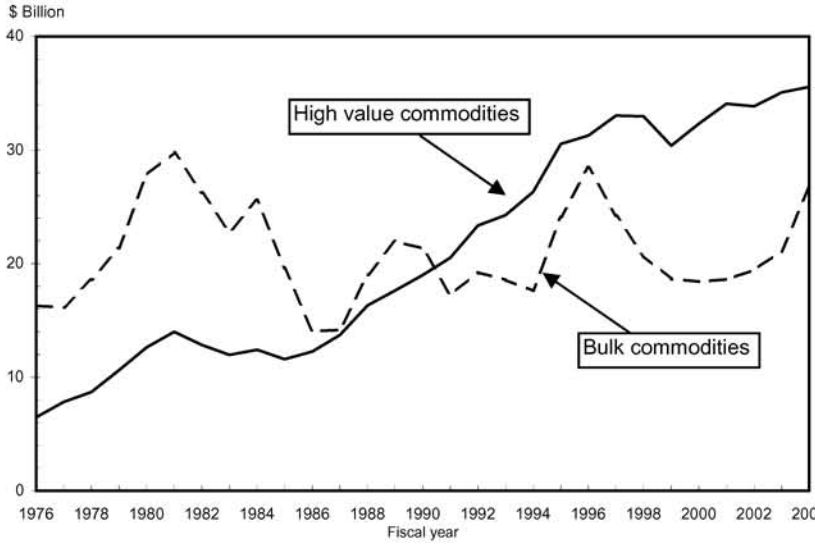
Trade is important for all major sectors of the U.S. economy, and agriculture is no exception. The quantity of agricultural goods exported from the United States has grown dramatically over the last half century, and is approximately eight times higher today than in 1950. With the productivity of U.S. agriculture growing faster than domestic food and fiber demand, U.S. farmers and agricultural firms rely heavily on export markets to sustain prices and revenues. U.S. export revenues have accounted for 20-30 percent of U.S. farm income during the last 30 years and are projected to remain at this level.

Nonsubsidized Commodities Now Account for Most of U.S. Agricultural Exports

Historically, bulk commodities—wheat, rice, coarse grains, oilseeds, cotton, and tobacco—accounted for most of U.S. agricultural exports. Because of a cost advantage due to favorable land resources and capital-to-labor ratios, the United States is comparatively better at producing these crops than many other countries. The adoption of biotechnology and consolidation of farm operations have further boosted productivity. Stagnant import demand in some major markets, however, has resulted in a shift in U.S. exports of grains and oilseeds. Over the last decade, the share of U.S. bulk commodity exports shipped to developed countries dropped from 43 to 34 percent. Fast-growing developing countries are the prospective future markets for U.S. bulk crops and other farm exports. China, for example, is now the largest importer of U.S. soybeans, having surpassed the EU.

In the 1990s, U.S. exports of high-value products—meats, poultry, live animals, meals, oils, fruits, vegetables, and beverages—showed steady growth, while exports of bulk commodities tended to fluctuate more widely, particularly in response to changes in global supplies and prices (Chart 8-7). As population and incomes rose worldwide in the 1990s, U.S. exports of high-value products (HVPs) expanded in response to demand for greater diversification of diets. In fiscal 1991, HVP exports exceeded exports of bulk products for the first time (in terms of value). Notwithstanding that producers of HVPs receive little in the way of commodity subsidy payments compared to producers of bulk commodities, HVP exports have continued to exceed bulk exports, regardless of overall growth of U.S. agricultural trade.

Chart 8-7 **Value of U.S. Agricultural Exports of Bulk and High-Value Commodities**
High value commodities are now a greater share of U.S. agricultural exports.



Note: Bulk commodities are wheat, rice, coarse grains, oilseeds, cotton, and tobacco. High-value products are meats, poultry, live animals, meals, oils, fruits, vegetables, and beverages.
Source: Department of Agriculture (Economic Research Service).

Trade Agreements Promote Reform of U.S. Commodity Support Programs

The November 2001 declaration of the World Trade Organization's (WTO) Fourth Ministerial Conference in Doha, Qatar, provides for negotiation on a range of subjects, including the reform of agricultural and trade policies among all 149 members. This 2001 declaration was further supported by the March 2005 ruling of the WTO Dispute Settlement Body against certain U.S. cotton program subsidies.

The United States has implemented free trade agreements with several countries, and has negotiated and is currently negotiating free trade agreements with various additional countries (see Chapter 7, The History and Future of International Trade, for further information); all of these agreements call for increases in market access, both for agriculture and for other goods and services. As an example of the impact of these types of agreements, the North American Free Trade Agreement (NAFTA), implemented in 1994, has spurred market integration among businesses and communities in Canada, Mexico, and the United States, with research showing that NAFTA boosted agricultural trade substantially above levels that would have occurred without the agreement. Trade negotiations provide an opportunity to remove market distortions and increase market access for U.S. exports including agricultural exports.

Benefits of Agricultural Trade Liberalization

At a global level, agricultural land and other resources are used most efficiently when farmers in each country face the same price signals. Prices are the market's way of indicating how much of each crop is produced, how it is produced, and where it should be produced in order to achieve the most efficient production patterns and the best, least-cost outcomes for consumers. Trade barriers, export subsidies, and domestic support programs distort the price signals that farmers receive and limit the potential economic gains that consumers and producers can obtain from trade. Trade liberalization that removes or at least lowers these distortions is motivated by the prospects of economic gains from trade (as in the example in Box 8-1 on New Zealand's experience with trade liberalization).

Empirical evidence suggests that global agricultural policy distortions impose substantial costs on the world economy. One study finds that agricultural tariffs, domestic subsidies, and export subsidies could leave world agricultural prices about 12 percent below levels otherwise expected in an intervention-free market. Because U.S. tariffs, domestic support, and export subsidies are relatively low compared to some other OECD countries, most of the benefits for the United States would come from our trade partners' policy reforms. A new study shows that global reform of agricultural and food trade policy would provide roughly 60 percent of the global gains from merchandise (agricultural and manufactured goods) trade reform—$180 billion of a total of approximately $290 billion (in 2001 dollars) by 2015. Even though agriculture is a relatively small portion of world output, agriculture is more protected than other sectors, which accounts for the significant contribution of agricultural trade liberalization to the benefits of total trade liberalization.

U.S. agriculture will continue to be competitive if global agriculture policy distortions are eliminated. According to the same study, with removal of all global agriculture policy distortions U.S. farm exports would increase by 12 percent in volume and the value of U.S. agricultural exports would continue to exceed the value of farm imports to the United States. With global agriculture and food reform, average annual agricultural production growth in the United States would continue to be positive.

Even though the net gains from removal of domestic supports would likely be positive, their removal would likely come with some costs. For example, a portion of domestic support payments are included in the value of farmland and other farm assets, thereby distorting their values. These asset values can decrease in sectors where the subsidies are reduced. However, if the market-distorting subsidies can be replaced by less-distorting payments—in particular, payments that are not closely tied to market prices or quantities, such as lump sum payments—the adverse impacts on farm asset values should be minimized.

Box 8-1: New Zealand's Abolition of Agricultural Subsidies

The farming sector in New Zealand now has negligible subsidies. Historically, assistance to New Zealand farmers was low until the 1970s, when it started to increase dramatically. The support policies of the seventies and early eighties shielded the rural economy from adopting efficient practices, increased transaction costs, and undermined the farm sector's capacity to adjust successfully to international market demands.

Within a broad package of reforms to New Zealand's economy in the 1980s, subsidies to agriculture were abolished in 1985. The reforms had an immediate and widespread effect on agriculture and the rural economy: farm incomes fell, farm input costs (particularly fertilizers) increased, farm profitability declined, the farm debt burden rose, and land values fell. Farmers' problems were compounded by low international prices for some agricultural products during the middle and late 1980s and increasing interest rates. The slower pace of reform for the manufacturing sector and the ensuing appreciation of the real exchange rate made the adjustment process of rural households more acute than the withdrawal of agricultural support would have caused on its own.

Within five years, however, the economy picked up, farm incomes had fully recovered and fears of a rural collapse never materialized. Rural population and farm households proved resourceful in adapting to the changes that swept the sector. Despite the early problems, few farmers were forced to leave their land. The rural economy and the agricultural sector as a whole have become more efficient, and competitive. Farmers have had to become more responsive to world price signals and have shown that they are able to explore and develop new niche markets. A research paper estimated that the annual rate of productivity growth was approximately 50 percent higher during 1985-1998, compared to that of 1972-1984. The level of producer support in New Zealand is now the lowest across member countries of the OECD, domestic and world prices are aligned, and government payments are only provided for pest control or relief against climate disasters. Even with low levels of government support, it is estimated that agriculture accounted for 7 percent of New Zealand's GDP over 2002-2004 compared to 8 percent over 1983-1985, and with a post-liberalization high of 9 percent in 2001. Agriculture accounted for 43 percent of New Zealand's total exports in 2004.

With the removal of global agriculture policy distortions, U.S. consumers would face higher prices for those commodities that currently receive domestic support, such as grains, because their production would fall. U.S. consumers would face lower prices for a few products, such as sugar, that are currently protected by border measures and that will face increased competition from imports.

The recent study estimates that nearly half of the global income gains of approximately $290 billion would go to developing countries. Global reform thus becomes an effective supplement to, and in some cases a substitute for, less-effective development aid. Several recent studies conclude that global agricultural trade reform would reduce rural poverty in developing economies, both because in the aggregate these countries have a strong comparative advantage in agriculture and because their agricultural sector is important for income generation.

Trade liberalization would be particularly beneficial for the poorest countries, with several studies finding the potential of trade liberalization for manufactured and agricultural goods to lift hundreds of millions of people out of poverty. Debt relief and foreign aid can also help to reduce poverty, but trade is a far more powerful tool. One study finds that the payoff from agricultural trade liberalization to developing countries alone would be $54 billion (in 2001 dollars) by 2015, roughly equal to the current debt relief proposal of $56 billion. Furthermore, development aid does not always trickle down to the underprivileged. Agricultural liberalization is particularly important because roughly 75 percent of the world's poor live in rural areas, and because farmers and other low-skilled workers constitute the vast majority of the poor in developing countries. An open global market for agricultural goods would lead to greater crop specialization, increased agricultural exports, and higher farm incomes in poor countries.

Alternatives to Commodity Subsidies

Support to agriculture can come in many forms, not all of which are equally market-distorting. For example, some countries (including the United States) offer fixed payments to farmers, irrespective of what they produce. *Decoupled payments* are lump-sum income transfers to farm operators that do not depend on current or future production, factor use, or commodity prices. From an economic perspective, the best way to provide agricultural support would focus on forms of support that interfere less with market forces while achieving the desired policy objectives.

The WTO's Uruguay Round Agreement on Agriculture encourages countries to "decouple" support from the production of specific commodities by creating a "green box" category for agricultural support. The main criterion for a support program's eligibility to be included in the green box is that the program is "not more than minimally trade-distorting." Unlike the WTO's categories for support that is more trade-distorting, the green box is not subject to spending limits. Note that the term "green box" refers to potential trade-distorting impacts and not to environmental issues, although environmental programs may be included in the green box.

Besides including lump sum payments not tied to present or future prices or output, the green box includes payments for "doing something," such as conserving the soil. For instance, support can be shifted from payments based on commodity output to agri-environmental programs such as the U.S. Environmental Quality Incentive Program, which has provisions to pay farmers to adopt environmentally benign management practices. Payments can also be made for activities that benefit the entire farm sector. For example, investments in public goods like infrastructure for rural development (e.g., roads), agricultural research, market promotion, extension and teaching, as well as collecting and diffusing agricultural statistics and market information, are also included in the green box. Government support for activities that boost agricultural productivity in the United States relative to that in other countries can help to increase competitiveness of U.S. agriculture in world markets. The exemption of these decoupled payments from WTO payment ceilings provides members of the WTO with the flexibility to transfer income to their agricultural producers, but in a manner presumed to have minimal potential to distort production and trade.

While green box payments are not currently constrained by global trade rules, many countries argue that some of them distort production and trade and that their use should be limited. A recent study of the U.S. experience with decoupled payments finds that these payments have improved the well-being of recipient farm households, enabling them to comfortably increase spending, savings, investments, and leisure but with minimal distortion of U.S. agricultural production and trade.

Environmental Aspects of Agricultural Subsidies

In the 1980s, agri-environmental programs began to play a larger role in Federal farm policies, in part due to greater concern about environmental damage from agricultural production. While U.S. agri-environmental policies have long addressed the negative externalities of agricultural production, agri-environmental policy in a number of developed country members of the WTO is increasingly giving attention to the positive by-products of agriculture. Major US agri-environmental programs can be categorized as either incentive programs or cross-compliance mechanisms (see Box 8-2).

Agri-environmental incentive programs can be further categorized as follows:

- *Land retirement programs* remove land from crop production. In exchange for voluntarily retiring land, producers receive rental or easement payments plus cost sharing and technical assistance to aid in the establishment of permanent cover on the land. Economic use of the land is limited under retirement programs (e.g., the Conservation Reserve Program and the Wetlands Reserve Program). The bulk of U.S. agri-environmental programs expenditures fall in this category.

Box 8-2: Policy Mechanisms for Addressing Agri-environmental Issues

The United States and many other developed countries utilize a combination of programs to address agri-environmental issues:

- *Voluntary incentive-based programs. Agri-environmental incentives* are payments made to the farmer for the adoption of environmentally sound practices or to retire environmentally sensitive land from production. The advantage of incentives is that they increase the likelihood that farmers will adopt the desired practices or retire land. The disadvantage of incentives is the cost to taxpayers. Incentives can also have the effect of expanding production, so even if the disamenities (negative by-products of agricultural production) produced by each farm (or on each field) decrease, more farms (or fields) may now produce disamenities. For example, a business that would be unprofitable when subject to a tax may be made profitable through the payment of an incentive or a subsidy. While a tax may drive a business out of a competitive industry, an incentive may increase entry and induce expansion in competitive outputs. Nonetheless, while economic theory may suggest that taxes are the most economically efficient instrument to reduce pollution, they have seldom been used in agri-environmental programs at the Federal level in the United States. Note too that assessing taxes on the level of agricultural pollution is difficult due to its *nonpoint source* nature (that is, the originating source(s) of agricultural pollution cannot be easily pinpointed).
- *Regulation.* Regulatory requirements or standards represent an involuntary or mandatory approach to improving agri-environmental performance. Unlike policy choices in which farmer participation is uncertain, regulations require that all farmers participate. This feature can be particularly important if the consequences of not changing practices are drastic or irreversible. On the other hand, regulatory requirements are a blunt tool and can be the least flexible of all policy instruments. This regulatory instrument requires that producers reach a specific environmental goal or adopt specific practices without regard for cost or environmental effectiveness, which may vary significantly across farms, but are seldom known by regulators. Consequently, regulation can be less flexible and less efficient than economic incentives. Regulatory requirements are used sparingly in both the United States and the EU.
- *Cross-compliance.* Cross-compliance requires a basic level of environmental compliance as a condition for farmer eligibility for other government programs that farmers may find economically desirable, such as producer payments. Technically, cross-compliance is a voluntary instrument, but in practice it may not strictly be perceived by

Box 8-2 — *continued*

farmers as voluntary, particularly when the existing subsidy represents an important share of total farm income. Namely, it may be difficult for a farmer to forgo cross-compliance when the value of the existing subsidies exceeds the farmer's costs of adopting the mandated practices. An advantage of cross-compliance programs is that less government spending is required than with subsidies to address environmental problems. Disadvantages are that it will have a lesser impact on farms that are not traditional participants in commodity payment programs or in situations when program payments are lower than the costs to farmers of complying.

- *Working land conservation programs* support adoption and maintenance of land management and structural conservation practices on agricultural land, including crop and grazing land, and in some cases, forestland, in exchange for cost-shares or incentives (e.g., the Conservation Security Program and the Environmental Quality Incentive Program).
- *Agricultural land preservation programs* help retain land in agricultural production by purchasing the landowner's right to convert land to other uses (e.g., the Farm and Ranch Land Protection Program).

A requirement for agri-environment programs to be included in the WTO green box is that they have not more than "minimally" trade-distorting effects. With the exception of the Conservation Reserve Program (CRP) and other land retirement programs that likely reduce U.S. production, current U.S. cost-sharing, incentive payment, and technical assistance programs have a minimal effect on production, given that the focus of such programs is on environmental improvements rather than altering production. In contrast, the focus of complaints brought before the WTO to date on agricultural subsidy programs has been on programs that may have a tendency to increase production, not reduce it.

If new WTO negotiations produce an agreement to further reduce trade-distorting domestic support, countries may find it necessary to shift support from programs that are subject to reduction to programs that are exempt. This may include agri-environmental programs that qualify for inclusion in the WTO green box. Nonetheless, great care needs to be taken in designing programs to ensure that they indeed have only minimal trade-distorting effects (in particular, production-increasing impacts tend to be a source of international contention); there is no reason to assume that environmental programs will automatically fall in the WTO green box.

Conclusion

While the income of farm operator households is higher than the U.S. average, their household income is more variable than that of the average U.S. household because farm income is more variable than income from off-farm sources. Management of the risks faced by large commercial farms—who receive the biggest share of U.S. subsidy payments—may be best served by crop or revenue insurance and forward pricing through participation in futures and options markets. And if one of society's goals for agricultural subsidies is to support the nonmarket benefits of agriculture, then there are more efficient instruments than those that are coupled to commodity production.

If the intent of commodity support programs is to assist low-income households, then these programs are failing in this task today because the bulk of payments go to farm households with incomes above the U.S. nonfarm average. Furthermore, as world trade in agricultural products increases, food security for U.S. consumers becomes less dependent on domestic production and, consequently, on domestic commodity subsidies programs. Not only are domestic commodity policies—domestic support, market access, and export subsidies—not targeting vulnerable populations in the United States, these policies, as used by the United States and other countries, reduce farm income in poor countries.

Box 8-3: A Market-Based Approach to Reduce Overfishing

The Nation's marine fisheries are valuable resources, contributing $31.5 billion in value added to U.S. GDP, supporting 82 million recreational fishing trips, and providing 9.5 billion pounds of protein-rich food. Unfortunately, many of these fisheries suffer from overfishing, excessive harvest capacity, and low profitability. Limited Access Privileges (LAPs)—which give individual commercial or recreational fishermen, cooperatives, or communities the exclusive privilege of harvesting a share of the total allowable catch—are a market-based approach to addressing these challenges.

Under traditional management approaches, fishermen compete for a share of a common resource. This leads to a "race for fish" that results in short fishing seasons, higher harvesting costs, lower profits, overcapacity, poor product quality, and environmentally damaging fishing

Box 8-3 — *continued*

practices. Traditional approaches often mandate certain fishing gear, specify short fishing seasons, and impose other restrictions to limit overfishing. These restrictions are difficult to enforce, do not provide incentives for fishermen to reduce their catch, and impede the development of innovative technology and fishing practices.

LAP programs, which include individual fishing quotas (IFQs) as well as allocations to fishing cooperatives, communities, and potentially, recreational fishermen, do not suffer from these same problems. LAPs with transferable quotas provide fishermen with the incentive to harvest fish at minimal cost, thereby reducing fleet overcapacity and increasing profitability. Each fisherman in a LAP program cannot harvest more fish than his individual quota permits. This means that fishermen can adopt new fishing practices to reduce bycatch (i.e., unwanted or unintentional catch) without concern that they will lose target catch to competitors, and have a lot more choice about when to fish, allowing them to avoid hazardous weather and sea conditions and improve their profitability by fishing when prices are best.

LAPs have been implemented in eight U.S. fisheries since 1990. Commercial fishermen in these fisheries have seen increased profits, decreased harvesting costs, and a safer and more stable industry. For example, due to improved product quality under a LAP program, the Alaska pollock catcher/processor cooperative fleet harvest in 2001 yielded 49 percent more products per pound than in 1998, the last year of the "race for fish." IFQs in the Alaska halibut and sablefish fishery ended the race for fish and increased season length from less than 5 days to 245 days per year. Profits have increased due to lower operating costs and higher product prices, which have more than doubled because halibut now arrive to market fresh rather than frozen, thereby benefiting consumers. Harvesting costs in the mid-Atlantic surf clam and ocean quahog fishery have fallen by 46 percent since implementation of an IFQ system.

In September 2005, the President proposed legislation reauthorizing the Magnuson-Stevens Fishery Conservation and Management Act that would implement key elements of the President's 2004 Ocean Action Plan, including encouragement for fishery managers to use market-based management, such as LAPs. At the same time, the Administration pledged to work with regional fishery management councils to double the number of LAP programs by 2010, bringing at least eight new fisheries under market-based management. The Administration is also working with regional fishery managers to create guidelines for planning and implementation of future LAP programs.