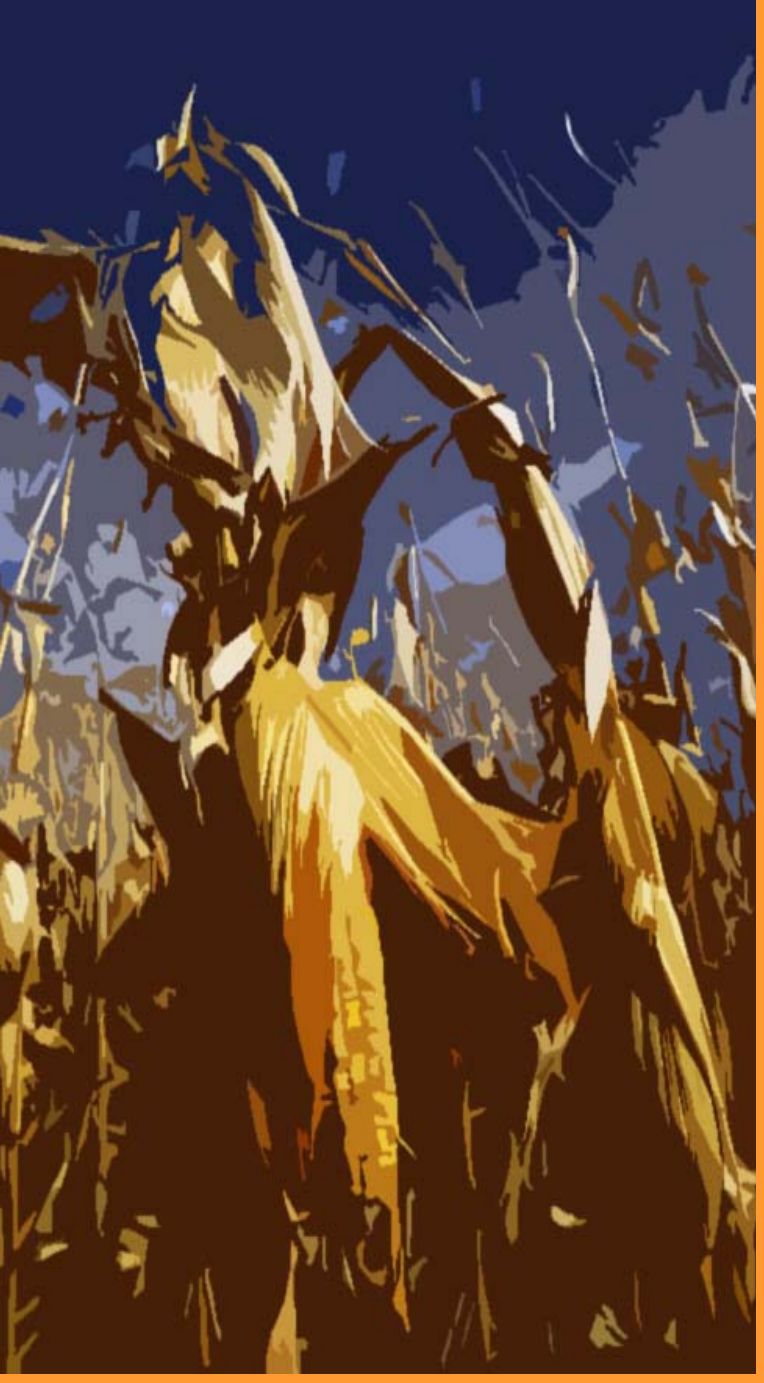

Rethinking US Agricultural Policy:

Changing Course to Secure Farmer Livelihoods Worldwide

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Changing Course to Secure Farmer Livelihoods Worldwide

Disastrously low prices are plaguing farmers worldwide. A deliberate shift in American agricultural policy in the 1990s has paved the way for these depressed crop prices with no mechanisms in place to change the situation. Prices declined after 1996 because that year's Farm Bill dropped several traditional, crucial safeguards for managing supply and supporting prices.

Conventional wisdom suggested that American agriculture could look forward to a sound future of expanding demand for farm exports. It was thought that the agricultural industry had developed enough to fend for itself, unfettered by restrictive government programs. That wasn't how it worked out.

Since US policies influence the fate of farmers well beyond our borders, policy approaches addressing the needs of US farmers should recognize our larger global influence.

This study

- Explores why the changes in US policy brought about by the 1996 Farm Bill produced declining revenues;
- Demonstrates that the solution to global low prices involves considerably more than just eliminating subsidies; and
- Introduces a policy blueprint that would raise crop prices universally, thus contributing to a healthy and vigorous worldwide agricultural industry.

Changing US policy alone cannot solve the global crisis in agriculture, but it is an important step toward a global cooperative solution that can benefit farmers around the world.

September 2003

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EXECUTIVE SUMMARY

Perhaps at no other time in history has so much attention from outside the United States been focused on what is ostensibly a domestic matter—US agricultural policy. And with good cause. Since the late 1980s, but particularly since 1996, the US government's official policy has been to permit, even encourage, a free fall in domestic farm prices while simultaneously promoting rapid liberal trade measures to open new markets for US products.

US farmers, the intended beneficiaries of these policies, have languished, despite official rhetoric to the contrary. Meanwhile, major agribusinesses have thrived, while aggregate US exports remained flat, and farmer income from the marketplace declined dramatically. The precipitous decline in prices of primary commodities, especially grains, is providing agribusiness and corporate livestock producers access to agricultural commodities at below the cost of production, consolidating their control over the entire production and marketing chain.

Today, farmers the world over face an agricultural crisis of immense scope and gravity.[1] Plummeting world prices have followed the US lead, where prices of primary agricultural exports (corn, wheat, soybeans, cotton, and rice) declined by more than 40 percent since 1996. US farmers continue to be forced off the land despite a massive infusion of government payments intended to compensate for lower prices. The impact on farmers in other countries has been even more devastating. From Haiti to Burkina Faso, the Philippines to Peru, these unprecedented low prices have destroyed livelihoods and reaped a harvest of desperation, hunger, and migration.

Solutions to this alarming predicament for the world's farmers depend entirely on how one interprets and understands the responses to two key questions: How do farmers' planting decisions respond to price signals? How do their domestic and export customers respond to price signals? In answering these questions, this paper demonstrates that, in the aggregate, neither crop supply nor crop demand is very responsive to changes in price. A thorough analysis of the historical data on US policy and its influence reveals the truth of what impact that policy has had on farmer incomes. Farmers have tended to respond by doing what they know best: plant and produce more food, guaranteeing their continued financial distress.

Clearly, stopping this cycle requires more than most critics of US policy suggest: that merely eliminating direct payments to farmers will help in the quest to raise farmer incomes via the market.

Instead, a thoughtful examination shows conclusively that government must play a major role in helping to manage excess capacity if prices are to be held within a band that is reasonable for both producers and consumers. Government policy must continue to keep the engine of the agricultural train running ever more efficiently through its investment in research, extension, technology, credit and marketing, but it must also be willing to slow down the train through the careful and judicious application of a variety

[1] See, for example, *Rigged Rules and Double Standards: Trade, Globalisation, and the Fight Against Poverty*, Oxfam International, 2002, especially pp. 115-117.

of policy tools, many of which were abandoned in the 1990s.

US policy makers bear much of the responsibility for bringing about the alarming conditions facing world agriculture today. So it is obvious that policy makers must respond with fresh thinking and a willingness to consider alternative approaches. This paper explores alternative scenarios for the future, based on simulations of policy instruments and their impacts on prices and production levels. Finally, it offers a blueprint of policy options that enhances farmer livelihoods in the US and around the world.

Impact of US Subsidies

Efforts to decipher the causes of the present crisis have cast a spotlight on one of the US's most visible and, for most, egregious examples of hypocrisy and double-speak: the extremely high level of US government payments to farmers while simultaneously encouraging other countries to reduce domestic agricultural supports. Although these payments have technically fallen within our support reduction commitments under the World Trade Organization (WTO), they have risen dramatically since 1996 and stand as a testament to US admonitions to "do as I say, not as I do," when it comes to trade liberalization. The severe drop in farm income that would have occurred in the absence of this compensation has been cushioned by these payments, which exceeded $20 billion annually for the last several years.

Lacking comparable support from their own governments, farmers in the developing world find themselves experiencing the full force of the price reductions. Meanwhile, farmers in other subsidizing countries, such as the European Union (EU), complain that the US policies amount to unfair trade advantages. Negotiations within the WTO to come to a common Agreement on Agriculture are completely bogged down as a result, with positions hardened on all sides. While specifics may differ, many point accusingly at the US for what are perceived as serious violations of the principles of free trade in agriculture.

How Did We Get Here? Policy Choices Dictate Prices and Payments

The crisis agriculture faces today is no accident. It is the direct result of expanding productive capacity while ignoring the need for policies to manage the use of that capacity. US officials replaced mechanisms for supporting prices and managing aggregate supply with a sudden preference for an unregulated free market. The outcome has been disastrous but predictable. US farm policy removed set-asides, crop reserves, and price support tools, leaving no way to deal with low prices, except for emergency government payments to compensate for farmer income losses.

As price supports were phased out and eventually replaced with marketing loans and income support payments, crop prices tumbled to depths not seen since the 1970s. Even when crop stock levels diminished, tighter market conditions did not lead to normally predictable higher prices. This would be a red flag in any industry, and it is an indication of the significant dangers that current US policy has created. Long-standing expectations about just how low prices could be driven are now in question, with no real bottom in sight and thus, no pressure to drive up prices despite tight world supply. Many agricultural experts feel that the extraordinary agribusiness consolidation now occurring has discouraged the normal price increases that would accompany tight supplies.

The Exportation of Poverty

Finally, US pressure to open new markets resulted in the removal of tariffs and

quotas protecting price levels in fragile agricultural sectors throughout the developing world. Dumping of US products increased along with a chorus of voices claiming unfair trade practices. A recent (2003) paper from the Institute for Agriculture and Trade Policy estimates that dumping levels, or the extent to which the export price is below the actual cost of production, are astounding: 25 to 30 percent for corn, 40 percent for wheat and an unconscionable 57 percent for cotton.[2]

Less understood is the complex relationship between subsidies and prices. Subsidies are US government payments made directly to producers. Most critics of these payments, which nearly tripled since the key turning point of 1996, point to their role in increasing production, thereby glutting the market and forcing prices lower. Instead, this study provides evidence to show that the relationship is far from a linear one, with the reality far more complex than many would have us believe. US production of the eight major crops[3] increased as land previously idled by government set-aside programs was brought back on-line. In the absence of traditional supply management and price support tools, prices declined sharply. Faced with drastic impacts on net farm income, the US government responded by paying farmers compensatory sums to help close the gap. These payments began as so-called "emergency payments," in response to the first market shock in the late 1990s. By 2002, it had become clear that farmers and the rural banking sector would not be able to survive on incomes derived solely from the market. Direct payments decoupled from planting and production decisions were reinstated. Additional direct payments are automatically triggered as prices decline, so that subsidies are both fixed and automatic. If this practice does not change, one can expect US government outlays for farm programs over the next ten years (2003 to 2012) to exceed $247 billion.[4]

Consolidation Aided by US Payments and Low Prices

Yet even with these enormous sums being pumped into the system, farmers are failing. For many, the payments do not close the gap between the cost of production and the market price, and the distribution patterns only reinforce the long-standing bias in US agriculture for bigger, less diversified farms. USDA figures show, for example, that between 1993 and 2000, the US lost nearly 33,000 farms with annual sales under $100,000.[5]

Some might argue that, painful as it is, these "adjustments" to the market are essential to re-balance supply and demand in US agriculture. This is simply not so. The number of farms and farmers continues to decline, but the amount of cropland in production remains relatively constant, as seen in

[2] *US Dumping on World Agricultural Markets*, Institute for Agriculture and Trade Policy, 2003. Available at www.tradeobservatory.org.

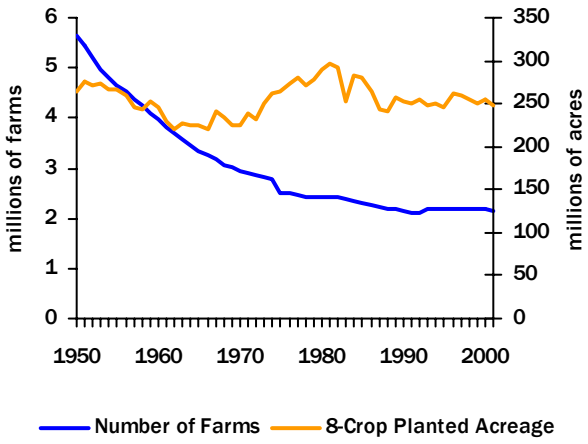
[3] Eight major crops—corn, soybeans, wheat, grain sorghum, barley, oats, cotton, and rice—account for about 74 percent of total cropland in the US. These same crops are the primary "program" crops and receive about 70-80 percent of all government payments. Five crops—corn, wheat, cotton, soybeans, and rice—figure prominently in world export markets and account for over 75 percent of total US crop exports.

[4] Estimates of federal outlays are from the March 2003 Congressional Budget Office (CBO) baseline of Commodity Credit Corporation (CCC) and Federal Crop Insurance Corporation (FCIC) projections. These estimates include price and income support programs, export credit programs, conservation programs, and crop insurance programs but do not include other programs authorized in the Farm Bill, such as nutritional assistance (e.g., Food Stamps).

[5] Calculation by *Public Citizen* from data provided in the US Department of Agriculture Farms and Land in Farms Reports. "Farms and Land in Farms," USDA National Agricultural Statistics Service, Feb. 2001; "Farms and Land in Farms Final Estimates 1993-1994," USDA NASS, Jan. 1999; "Farms and Land in Farms Final Estimates 1988-1992," USDA NASS, Jul. 1995; Cited in "Down on the Farm: NAFTA's Seven-Years War on Farmers and Ranchers in the US, Canada and Mexico," Public Citizen, 2001.

Figure 1

Number of US Farms and US Cropland Planted to the Eight Major Crops, 1950-2001



Since 1950, the number of farms in the US has steadily declined from nearly 5.5 million to under 2 million today.

Despite a loss of more than half of the farms, total cropland devoted to major crops has remained relatively constant in the 250 million acre range. The current average cropland acreage per farm is 2.5 times the level it was in 1950.

Not reflected in this graph is the impact of production technologies over time, allowing ever higher levels of production from the same number of acres and fewer farmers.

Source: USDA, National Agricultural Statistics Service

Figure 1. New production technologies are increasing productivity on those cropland acres, further expanding production.

The unchecked continuation of this trend will surely result in an agriculture dominated almost exclusively by large, highly-mechanized farms planted fencerow to fencerow with the scant selection of crops such operations produce best: corn, wheat, rice, cotton and soybeans. In other words, the policies of the 1990s accelerated the changes in the composition of our farm sector and the degree of its consolidation (including within agribusiness).

Diversified, independent, owner-operated farms are rapidly disappearing, as seen in Figure 1. Many of the remaining small farms may well be controlled by large agribusiness firms through contract production. Such a future spells ruin for farm-dependent rural communities and small and moderate-size farms within the US and around the world. The future is especially grim for the 2.5 billion people in developing countries who depend on agriculture for their livelihoods. Continued access to markets and fair prices for their products means the difference between sustainable livelihoods and disaster.

Eliminating US Subsidies is Not Enough

The elimination of domestic subsidies is the key issue dominating international negotiations on US agricultural policy. While some in the European Union or Cairns Group countries demand an end to US subsidies as a point of fairness or to equalize perceived market advantage, the developing world seeks an end to these subsidies as a point of survival. The goal, well beyond that of merely ending direct payments to US farmers, is to restore a measure of sustainability for the world's poorest farmers for whom receiving better prices—that is, fairer prices—in the marketplace is absolutely critical.

One seemingly rational theory is that the elimination of subsidies will force US farmers to confront the disciplines of the market

and respond. It is thought that once the cushion of subsidies is removed, the market will force a reduction in US supplies and a subsequent price increase. Just as low US prices have been transmitted around the world, so would the higher prices, ultimately benefiting agriculturally-dependent countries throughout the world.

However, two separate models testing this scenario reveal a surprising outcome. The removal of subsidies, while causing significant repercussions for farmer income in the US, would not reduce overall US production in a timely fashion or result in substantially higher prices either domestically or on the world market. While prices for cereals in particular would rise over time, the magnitude of the rise (only three percent by the year 2020) means this option does not represent any reasonable or timely improvement for the livelihoods of the world's poorest farmers.

Turning to the US, the consequences of instituting such a policy change are so dramatic that this option is not likely ever to have real political viability in its most absolute form. The drastic reduction of between $11 and $15 billion in net farm income from the average of $48 billion projected under present policies would have enormous repercussions for the rural banking system and, more broadly, for rural economies. This loss of between 25 and 30 percent of net farm income would result directly from the elimination of direct government payments, and crop producers would bear a disproportionately large portion of the drop in income. The decline in income would occur at a time when many feel US agriculture is already in crisis.

Under the more likely scenario of staged reductions in payments, net farm income continues to drop, largely because of the fundamental inability of the sector to self-correct in time. Even in an environment of chronically low prices and farm income, farmlands do tend to stay in production, and aggregate production does not decline enough to drive up prices in any appreciable sense. There would, however, be some adjustments in the mix of crops planted, with cotton and rice losing ground to corn, wheat and soybeans. Some advantages would accrue to cotton and rice farmers in competing countries by reason of the reduced exports in these US crops, but this benefit would not likely persist for long. After a portion of the land in other countries is switched to cotton or rice in response to higher prices, prices would again face downward pressure.

Blueprint of a Workable Alternative

No one policy instrument can be said at this point to hold the key to resolving today's crisis, though several tool combinations hold promise. Their choice and application should result from a careful balancing that seeks to do in concert what none could accomplish alone. This study has identified and conducted a preliminary analysis of a set of policy instruments with potential to increase market prices to a reasonable and sustainable level and effectively manage the excess capacity in US agriculture. This set includes a combination of (1) acreage diversion through short-term acreage set-asides and longer-term acreage reserves; (2) a farmer-owned food security reserve; and (3) price supports.

Acreage Set-Asides. The main objective of annual acreage set-asides is to avoid or to reduce the current tendency toward very low prices by inducing farmers to idle a portion of their working cropland. Longer-term land retirement in the form of a Conservation Reserve Program—a tool already in use—would serve to curb excess productive capacity. Farmers could select some of the most environmentally sensitive cropland and thus ease the environmental burden caused by farming activities

Inventory Reserves. The second policy element, a food stock or inventory management reserve program, would reduce the occurrence and modify the size of price spikes for major commodities. In exchange for a storage payment, farmers would enroll a share of their production in an on-farm storage program when prices are below a threshold level. When prices rise above the threshold, producers would be provided with an incentive to sell their reserves until the price dropped.

Price Supports. The third policy element, price supports, would provide an added measure to help avoid price collapses. Government price supports would be activated through government stock purchases triggered when prices fall below a threshold level, or when set-asides "miss" a low price event.

The authors used a simulation model to examine the impacts of this specific combination of policy measures on production levels and prices. The results of simulating these policy changes are remarkably clear: not only would total cropland planted to the eight major crops drop by 14 million acres in the first year, but prices for the major commodities would increase from a low (for soybeans) of about 23 percent to more than 30 percent for corn, with rice and wheat not far behind. The general increase in the prices of all commodities would lead to net farm income levels close to and above that obtained through a continuation of the status quo, while at the same time reducing government payments significantly below the status quo projections, saving about $10 to $12 billion per year.

Beyond these advantages, production levels could be managed by the diversion of acreage away from traditional tradable crops and toward a non-food, non-tradable crop, such as a bioenergy-dedicated crop like switchgrass, a perennial grass native to the US with high cellulose content.[6] When the annual set-aside was replaced with an incentive to develop a bioenergy-dedicated crop in the simulation model, results demonstrated overall levels of price increase comparable to those achieved by the set-aside policy. This illustrates that annual set-asides, while convenient, would not have to be a necessary component of the program.

Further, results similar to those demonstrated by introducing switchgrass could also be achieved by expanding the acreage enrolled in the Conservation Reserve Program (CRP). Such an approach may also contribute additional environmental benefits. Moreover, if necessary, land diverted to bioenergy-dedicated crops or placed in the CRP could be brought back into production of major crops if unexpected weather or other events jeopardizes the supply of food or demand conditions warrant.

Because the US is a major crop exporter and price leader, this policy blueprint would have immediate impacts, though over the short run. To sustain the improvement in farmer income over the long term, the US would have to be joined by other major agricultural players.

A Farmer-Oriented Agricultural Policy

This illustrative policy blueprint is described as "farmer-oriented," because fair prices from the marketplace would contribute less to concentration and consolidation of corporate control over the farm-to-consumer chain. Net farm income for the US agricultural sector as a whole would be approximately the same as under the scenario of continued present policies, yet independent diversified family farmers would once again

[6] Switchgrass can either be co-fired with coal to produce electricity, while reducing the level of pollutants released into the atmosphere, or it can be processed into ethanol for the production of fuels with consequent environmental benefits.

have every reason to believe they could continue in farming, preserving their rightful role in the production of our food. Family farmers would have more hope for better incomes than under the often-unfair subsidy based system.

US government outlays could drop by more than $10 billion per year, certainly good news for taxpayers. And most importantly, perhaps, it would discourage dumping US products into vulnerable developing countries. Higher prices would be transmitted to the world market, helping to restore the prosperity for rural economies on which national economic development relies.

Conclusion

It is time to acknowledge that the low-price US farm policies benefit agribusinesses, integrated livestock producers, and importers, but are disastrous for the market incomes of crop farmers in the US and around the world.

Any policy that fosters continued low prices for staple foods is a guarantee of continued crisis and worldwide distress. Since US policy affects farmers well beyond our borders, the welfare and future of those farmers must be part of the vision in crafting new approaches. It is time for a new Farm Bill for the world. All major exporting countries must recognize that they too bear a heavy responsibility to cooperate with the US in such an effort. US policy changes alone may yield positive results in the short run, but more permanent benefits will require international policy efforts.

High prices alone will not guarantee sustainable livelihoods for the world's poorest farmers. A range of national and international policies, from credit, land, technology and transportation to tariff protection and access to markets, are essential if agricultural production is to bring a better future for farmers. It is certain that in the absence of higher prices for producers, the US is exporting poverty, while jeopardizing its own diversified family farm base.

Current WTO rules do not expressly prohibit the use of price support and production control policy mechanisms considered in this paper. Instead, WTO commitments place a cap on the overall level of farmer payments. These mechanisms included in the policy blueprint are not in line with mainstream trade liberalization thinking. WTO promotes policy choices that rely on the assumption that some "invisible hand" in agricultural markets will move the sector—prices, supply, demand, income, structure, distribution, and the works—to a higher plane if left to the devices of the free market.

Ending today's crisis must become the most urgent mandate of those who write the rules governing domestic and international agriculture and trade policy. The way out lies not in more of the same but in a balanced application of policy measures left discarded in our headlong rush to an imagined "free market" in agriculture.

Farmer prosperity in the US and the developing world is not only possible, it is achievable. It can be ours at less cost and within a shorter time span than the hoped-for benefits of liberalized agricultural trade promised by the wealthy nations of the world to their developing country counterparts. The choice is ours to make: whose future will be protected, and what kind of global food system will be the outcome of US agricultural policy?

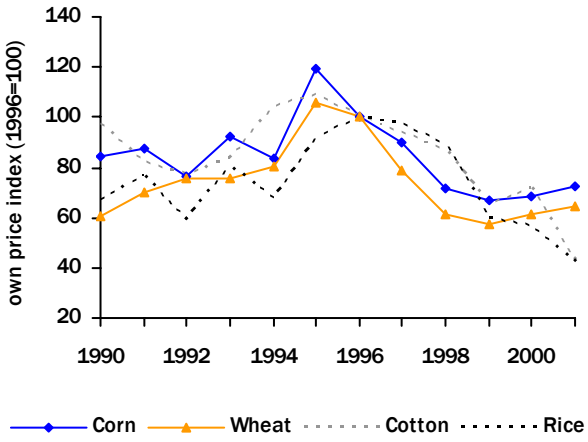
AGRICULTURE IN CRISIS

World crop prices have declined dramatically since the mid-1990s. In the US alone, prices dropped by more than 40 percent since 1995/1996. Figure 2 shows the indexed US price of four major crops that figure prominently in US crop exports: corn, wheat, cotton, and rice. The average price of the eight major crops for the 1999-2001 period was about 20 percent below the price level for the 1985-1995 period.[7] With average weather and yields, crop prices are not expected to increase significantly in the near future.[8]

As an acknowledged price leader in several key commodities and a major agricultural exporter, the US has played a dominant role in agricultural trade throughout much of the past 50 years, particularly in corn, wheat, cotton, rice, and oilseeds. During much of the last century, a major goal of US policy was to keep agricultural production in check by the use of such controls as annual and long-term acreage set-asides and management of crop inventories held by the government. This system offered incentives for farmers to participate in supply management programs.

Figure 2

Indexed US Market Prices for Corn, Wheat, Cotton, and Rice (1996=100)



Since 1996, US crop prices have generally declined about 40 percent.

Corn, wheat, cotton, and rice were selected because they figure prominently in US crop exports. These four crops plus soybeans, grain sorghum, barley, and oats—which are the eight major US crops—account for about three-quarters of US cropland and are the primary program crops, receiving about 70 to 80 percent of all government payments.

While not included in this figure, the magnitude of price drop for other major crops has been very similar to those illustrated.

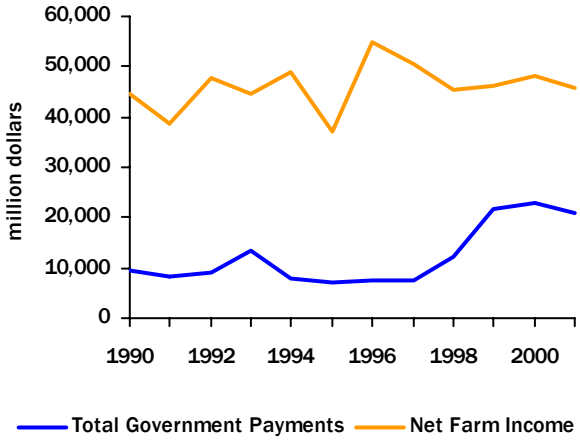
Source: USDA, Economic Research Service

[7] Eight major crops—corn, soybeans, wheat, grain sorghum, barley, oats, cotton, and rice—account for about 74 percent of total cropland in the US. These same crops are the primary "program" crops and receive about 70-80 percent of all government payments. Five of these crops—corn, wheat, cotton, soybeans, and rice—figure prominently in world export markets, and account for about three-quarters of US crop exports by volume.

[8] See, for example, the ten-year projections for major agricultural sector variables provided by the US Department of Agriculture, the Congressional Budget Office, and the Food and Agricultural Policy Research Institute (FAPRI).

Figure 3

Total US Government Agricultural Support Program Payments and Net Farm Income, 1990-2001



Net farm income includes farm marketings and government payments minus total costs.

Between 1996 and 1999, total government payments increased from under $8 billion to well over $20 billion.

From 1990-1998, government payments were about 20 percent of net farm income. From 1999-2001, government payments were 47 percent of net farm income.

Despite government payments that have tripled since 1996, net farm income declined 16.5 percent between 1996 and 2001.

Source: USDA, Economic Research Service

In recent years, however, US policy took a distinct turn in direction. It now relies on exports as the driving force of the agricultural sector. Underpinning this approach is a new-found preference for a completely unregulated free market. The objective is to allow markets to drive prices as low as they need to go in order for the US to out-compete foreign producers and capture a larger share of the world market.

Low Prices Trigger Large Government Subsidies

In response to plummeting prices triggered by the radical changes it introduced in 1996, Congress decided to pay US farmers ever-increasing amounts of direct emergency payments to compensate for low market income. Through much of the 1990s, US government agricultural subsidies ranged from $7 billion to $13 billion. As commodity prices continued to decline, government payments tripled, rising to well over $20 billion by 1999. Despite these record-level payments, net farm income in the US declined 16.5 percent between 1996 and 2001.[9] See Figure 3.

In 2001, government payments to farmers amounted to an astounding 47 percent of farmer income, up from about 20 percent in the 1990s. Despite this enormous infusion of cash, farmer income declined steadily during the same period, and many US farmers are under increasing financial stress.

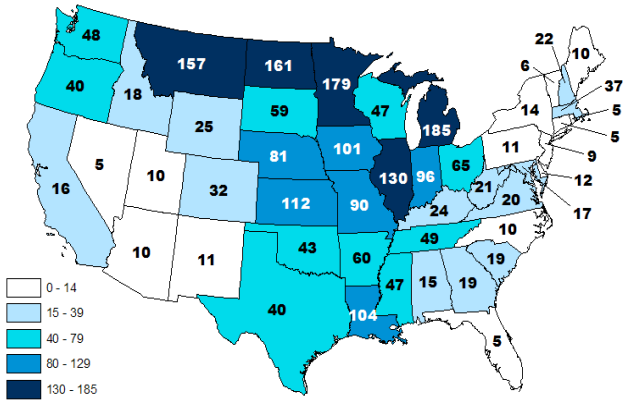
Low Prices Hurt All Farmers

As Figure 3 indicates, the magnitude of government payments to farmers since 1998 obscures the stunning drop in net farm income from market receipts. Moreover, despite their size, the government payments did not improve net farm income during the period. Figure 4 shows government payments as a percentage of net farm income for each state in 2001. The government accounted for more than 40 percent of net farm income in nearly half of the states, and eight states received payments that were more than 100

[9] Net farm income provides a measure of returns to land, operator labor, and management.

Figure 4

US Government Agricultural Support Program Payments as a Percentage of State Net Farm Income, 2001



In 2001, eight states received government payments that were *more than 100 percent* of their net farm income (NFI).

Government payments were more than 40 percent of NFI in 21 of 48 states.

The states that experienced the largest percentage of their income from government programs are also the nation's biggest crop-producing states. This further illustrates the level of dependence of US crop farmers on government subsidies for income.

Source: USDA, Economic Research Service

percent of their net farm income. The states experiencing the largest percentage of income from government programs are also some of the nation's biggest crop-producing states, illustrating the dependency of US crop farms on government subsidies.

Under the current US policy, the cost of producing major crops has been much higher than the prices charged for them.[10] As seen in Table 1, market prices in 2001 were 23 percent below the cost of production (total economic cost) for corn, 48 percent for wheat, 32 percent for soybeans, 52 percent for cotton, and 45 percent for rice. More significantly, even with the subsidies added to market income, returns for wheat, soybeans, and cotton were still well below the cost of production (19 percent for wheat, 12 percent for soybeans, and 27 percent for cotton). With the subsidies included, returns to corn were

Table 1

Per-Unit Market Prices, Total Average Cost of Production, and Government Payments for Selected Crops for 2000 and 2001

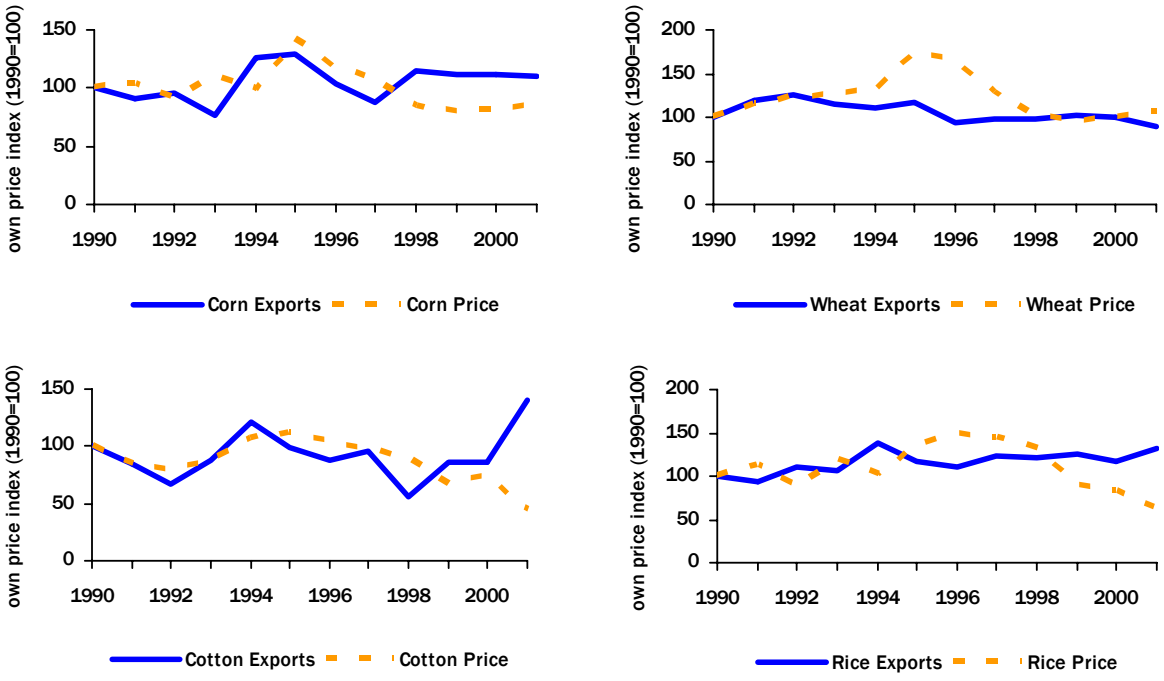
	Corn		Wheat		Soybeans		Cotton(1)		Rice	
	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001
Price	1.77	1.84	2.46	2.76	4.45	4.15	0.62	0.40	5.46	4.74
Total Avg. Cost of Prod'n	2.72	2.39	4.62	5.31	6.20	6.14	0.91	0.83	8.57	8.60
Average Gross Income	-0.95	-0.55	-2.16	-2.55	-1.75	-1.99	-0.29	-0.43	-3.11	-3.86
Government Payments	0.79	0.58	1.85	1.53	1.19	1.26	0.14	0.21	6.94	6.92
Average Net Income	-0.16	0.03	-0.31	-1.02	-0.56	-0.73	-0.15	-0.22	3.83	3.06

(1) Includes revenues from cottonseed
Source: USDA ARMS Production Costs and Returns

[10] The USDA's Economic Research Service estimates annual costs of production and returns by commodity. USDA Cost and Returns estimates are derived from Agricultural Resource Management Survey (ARMS) data. For more information on ARMS, see http://www.ers.usda.gov/briefing/ARMS/.

Figure 5

Indexed US Exports and Price for Corn, Wheat, Cotton, and Rice (1990=100)



one percent above costs while rice government payments more than compensated for the market losses (including government payments, rice revenues were 36 percent above the cost of production).

US Policy Distresses Farmers Worldwide

The negative effects of the US policy on agriculture are transferred to poor farmers outside the US through the operation of two sets of dynamics. The first is the downward pressure US prices put on world commodity prices. Low prices affect every other country, especially those driven by trade liberalization to reduce domestic and border protections for their agricultural sectors. Although the US does not hold a monopoly—it is one of a few major players in the oligopolistic world markets—low US prices consistently drive down world prices. Thus, our farm policy directly affects the livelihoods and sustainability of small farmers around the world. The persistent low corn, wheat, cotton, and rice prices illustrated for the US (shown previously in Figure 2) are indicative of world price trends for major grains, rice, and cotton.

The second dynamic is the role of low US prices in displacing exports and production from other countries. This impact affects all commodities somewhat but is of primary importance for cotton and rice. Figure 5 shows that US cotton prices declined about 70 percent since the mid-1990s. Since 1998, US cotton exports have soared, rising more than 80 percent in the last three years to their highest level in 75 years. The US share of world cotton exports has now risen to nearly 60 percent, compared to an average of less than 40 percent in the late 1990s (Meyer et

Box 1 — Farm Structure in the US

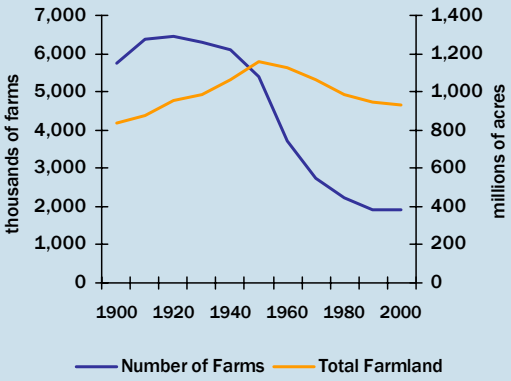
The structure of the farm sector of the US economy has undergone drastic changes over the past century. Because the farm structure both affects and is affected by public policy, it is important to briefly describe the current farm situation as pertaining to the number and size of farms, concentration of production, and tenure.

Farm production has become increasingly concentrated. The number of US farms peaked in 1920 at nearly 6.5 million farms but has fallen to under two million today. The number of acres in production continued to increase until the 1950s when 1.16 billion acres were in production. Since this peak, there has been a steady reduction in productive acres to today's level of 932 million acres. Average farm size has increased from 148 acres at the peak number of farms to 487 acres today.

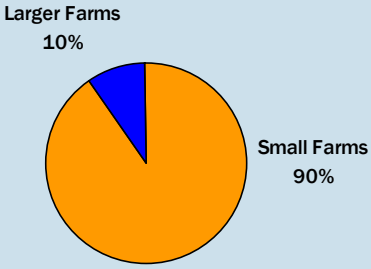
Although 90 percent of US farms are considered small farms—which are defined as those which have less than $250,000 in gross sales—they only account for 33 percent of total value of production. It is the larger farms, with gross sales greater than $250,000, which produce two thirds of agricultural goods on only 32 percent of agricultural land. Because small farmers account for two thirds of all agricultural land, they are important in any discussions regarding land use and the rural environment. Large farms receive about 47 percent of all government payments. This can be viewed as disproportionably large, if considering that large farms are only 10 percent of all farms. Alternatively, it can be viewed as disproportionably small, if considering that large farms account for 67 percent of all production.

In the 1998 Agricultural Resource Management Survey, most small farms did not report adequate income to cover expenses, therefore many small farm households rely upon off-farm income. The largest farms reported the most income after expenses.

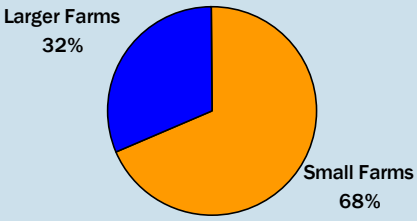
Number of Farms and Farmland Acreage in the US, 1900-2002



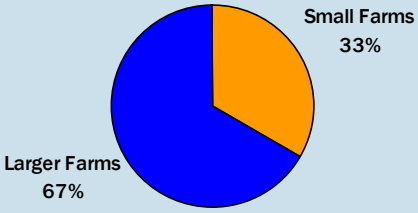
Percentage of Total Number of US Farms



Percentage of Total US Farmland



Percentage of Total US Production



al., 2003). It is important to note, however, that the US share of the world cotton market has grown primarily as a result of capturing much of the foreign demand growth during a period when foreign consumption has outpaced foreign production. Although less dramatic, US rice exports also increased as prices plummeted. This lends credence to those who argue that the US is not just offering, but dumping, commodities on the world market below the production cost to the detriment of small farmers worldwide.

Who are the True Beneficiaries of Low Prices?

Users benefit from these low prices, since US policy alters the normal requirement that the purchaser pay for the full cost of production. The users of US commodities are primarily large and often vertically integrated livestock operations, multinational agribusiness firms and importing countries (though it is often unclear whether importing country consumers directly benefit).

Integrated Livestock Producers Benefit

Government subsidies indirectly provide huge benefits to large and vertically integrated livestock producers, who purchase feed from the market at below production cost instead of growing it on-farm. This places small, diversified farmers at a competitive disadvantage, because they typically feed some crops to livestock on-farm. They thus absorb the full cost of production for the feed. In this way, low prices contribute to the growing pace of concentration in the livestock sector and the weakening position of small US farmers.[11]

A recent report by the USDA's Economic Research Service on Economic and Structural Relationships in US Hog Production illustrates the rapid changes in the livestock sector. Between 1994 and 1999, the number of hog farms in the US fell from more than 200,000 to fewer than 100,000. By 2001, the number had fallen to 80,000. Despite fewer hog farms, the number of hogs in the US did not decline, averaging about 60 million head. Thus unprecedented consolidation occurred in hog production during the 1990s. Over the past decade, the percentage of hog and pig inventory on farms with 2,000 head or more increased from 37 percent to nearly 75 percent. Just over half of all hogs and pigs were on farms with 5,000 head or more in 2001, compared with about a third in 1996.

Agribusinesses Benefit

Large, multinational agribusiness firms are able to purchase agricultural commodities from the market at prices below the cost of production. At the same time, the absence of supply control mechanisms ensures traders and processors an unrestricted availability of commodities. It also ensures input and machinery suppliers an inflated demand for their products, since the government no longer removes any acreage from production through set-asides.

Consumers (Domestic/Foreign) Benefit?

Whether consumers directly benefit from the policies that have fostered persistent low prices depends on the ability of the marketing system to transfer the lower prices to them. In some cases, agribusinesses and middlemen are able to capture some or all of the benefits of low prices. Thus it is difficult to predict whether consumers anywhere will realize benefits from lower prices. As prices fall, importing countries do require less foreign exchange to import commodities needed to feed the population, providing an opportunity for consumer benefits in those cases.

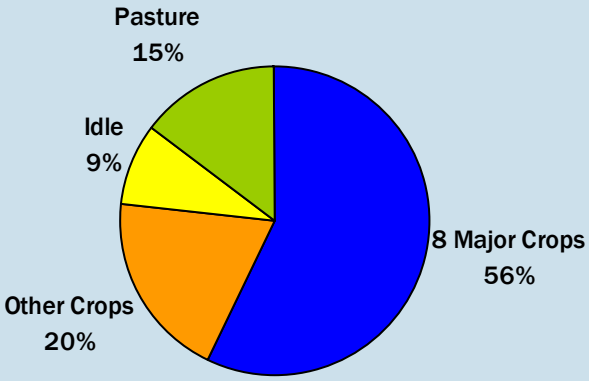
[11] For additional information about increasing concentration in the livestock sector, see Lamb (2002) and various publications and reports availale through USDA's Economic Research Service Briefing Rooms (e.g., http://www.ers.usda.gov/Briefing/Cattle/; http://www.ers.usda.gov/Briefing/Hogs/; http://www.ers.usda.gov/Briefing/Poultry/.

Box 2 — Land Use in the US

Over half of the more than two billion acres in the US is either agricultural or forest land. The other half includes urban areas, parks, swamps, deserts and other unusable land. Agricultural lands account for 455 million acres and include crop land in use, idled land, and pasture land. Pasture and idled land make up 24 percent of all agricultural land.

The eight major crops in the US include corn, soybeans, wheat, barley, oats, cotton, rice and sorghum. These eight crops cover 259 million acres or 74 percent of all crop land in production. Grains and cereals are grown primarily in the Midwestern part of the country. Cotton and rice are grown primarily in the Southern U.S.

Distribution of US Agricultural Land Usage

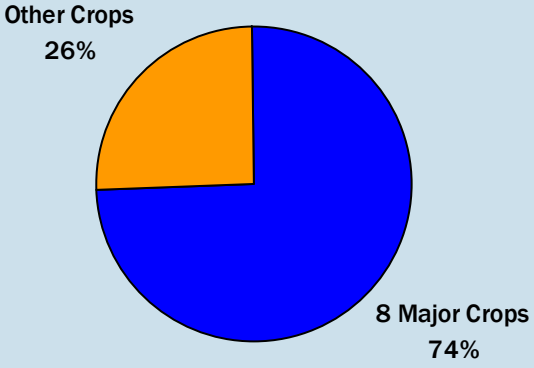


Land Use in the US

Total US Land, 1997 *(1,000 acres)*	2,263,254
Total in Agriculture and Forestry	1,096,588
Total Agricultural Land	455,052
8 Major Crops	258,800
Other Crops	89,901
Idle	38,839
Pasture	67,512
Total Forest Land	641,536
Grazed	140,361
Not Grazed	501,175

Source: USDA, Economic Research Service

Distribution of Total US Cropland



WHY ARE WE IN THIS MESS?

The current crisis in American agriculture is the result of deliberate changes in US policies. The US has continued the policy of expanding productive capacity, but it has discarded protective devices to manage the use of that capacity. This section reviews the changes leading to the current situation of low prices and high income-support subsidies.

The primary lesson to be gathered from the history of US farm policy is that agricultural markets do not tend to self-correct. Rather, when prices are low, production does not decline enough on its own. Nor does domestic demand or even export demand increase enough to rebalance markets and allow farmers to earn a living—that is, a profit—from selling their products.

Agricultural Policy History in a Nutshell

US agricultural policy has heavily influenced two important aspects of US crop agriculture: growth in its capacity to produce and the proportion of productive capacity used.

From its birth as a nation, the US pursued policies that promoted phenomenal growth in productive capacity, supported by the taxpaying public. In the 19th century, government chose to expand the frontier by distributing land to would-be farmers virtually free of charge.

Once most of the land was put into production, US taxpayers bankrolled a system of research stations and extension services to generate and disseminate new technologies. The system has been a tremendous success. It continues to ensure that each new generation of Americans will have access to ample quantities of safe food at reasonable prices.

The other side of the coin is that publicly-sponsored research and extension services contribute to price and income problems. Clearly, neither the US nor the rest of the world would be facing today's low prices and failing small farms if the cumulative growth in agricultural productivity had not taken place.

From the 1930s through most of the 20th century, US policies included a variety of programs that address the price and income problems arising out of our immense and fully utilized productive capacity. Most programs involved some combination of income support, price support and stabilization, production management, demand enhancement, import restriction, or conservation. Appendix A contains brief descriptions of policies implemented at one time or another under these programs along with a few specific examples. The list is not exhaustive.

The capacity to produce is not a mandate to use it fully. For example, in the manufacturing sector, between 15 and 25 percent of productive capacity is intentionally idled at any given time by reason of market supply and demand conditions (Economic Report of the President, 2003). But unlike firms in other industries, individual crop farmers do not have the ability to influence the total supply of output. Nor have farmers been successful in organizing self-help supply management schemes to adjust output to the needs of the market.

Thus, the traditional role of the federal government was to do for agriculture what it could not do for itself: manage productive capacity to provide sustainable and stable prices and incomes. Until the mid-1980s (and

beyond, in some cases), the primary focus of US agricultural policy was on production management programs and price support and stabilization programs.

Production Management Programs

In effect, the Secretary of Agriculture decided how much productive capacity should be left unused each year. The government employed several devices to manage supply, but usually farmers were asked to idle various amounts of acreage. Such an approach is far from exact. For one thing, in contrast to manufacturing tractors, where the number to be built can change daily or weekly, the Secretary of Agriculture has only one opportunity per year to influence how productive capacity is to be used for next year's crop. Factors such as weather and slippage resulting from the idling of the least productive land make estimating annual production a very difficult process.

But even if mistakes occurred, adjustments could be made the following year, and the market was aware of this option. So if, in a given year, yields were high, inventories increased, and prices declined, the market responded to the high probability that a set-aside would be imposed the next crop year. Without a set-aside or similar mechanism, crop demanders will delay purchases in a high-yield year because they believe that crop prices will be as low or lower again next year.

Despite their built-in complications, supply management policies have historically prevented the chronic overproduction and depressed prices that would have occurred from a full use of agriculture's productive capacity all the time.

Price Support Programs

Price support programs put a floor under major-crop prices. So if the Secretary erred in setting aside too little acreage because of above-average yields or unusually low demand, prices were prevented from plummeting uncontrollably. The price floor was equal to the loan rate for a crop, that is, the per unit value of the crop used as collateral under a government loan. For example, if the government values a crop of 1,000 bushels of corn at a loan rate of $2 per bushel, the price floor for the crop would be $2. When the loan comes due, the farmer could "give" the grain to the government in full payment of the principal and interest on his loan, thereby receiving the $2 loan rate as the "price" for his crop. If the market price were above the loan rate plus interest, the farmer had the option of paying off the loan, plus interest, and selling his crop at the higher market price. The use of a high loan rate, especially if there are no means to manage supply, can lead to an excessive accumulation of government stocks, along with expensive storage costs.

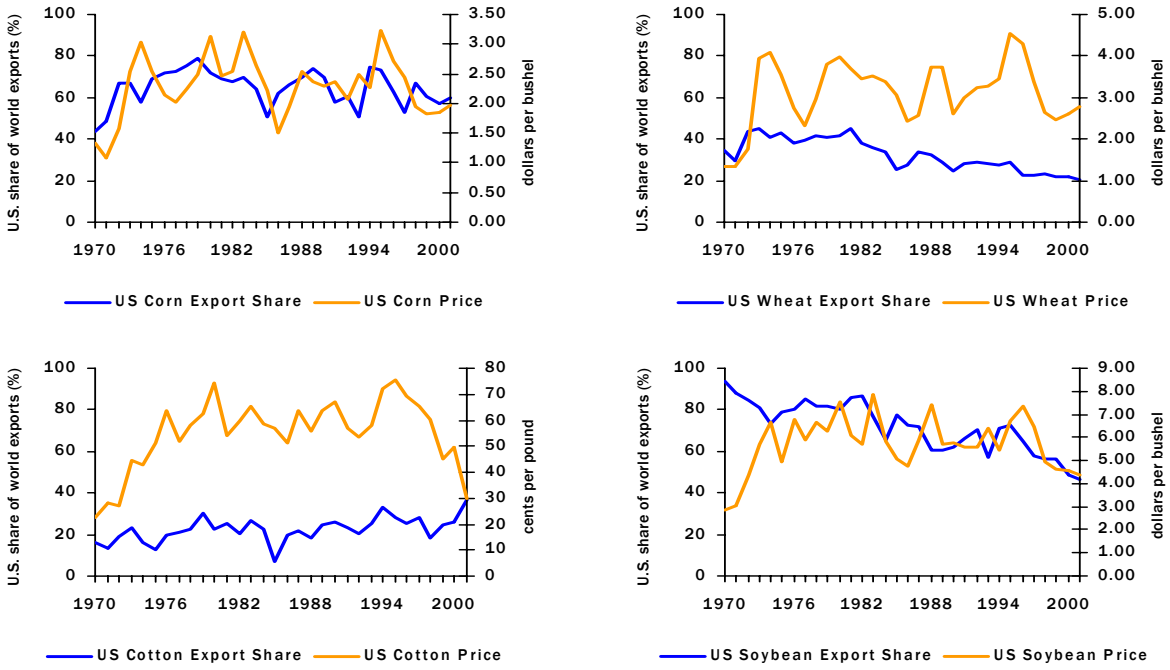
Policy Shift Toward Freer Markets

Over the last two decades, the goal to ensure growth in productive capacity has remained, but the protection of prices and farmer incomes through managing the capacity has not. Rather, the government has placed its reliance on the free market to determine prices and to make direct payments to support farmer incomes during times of low prices. To absorb excess inventory, US policy shifted away from production management and price support and toward demand expansion—especially export demand. Advocates of freer markets and trade liberalization were successful in persuading policy makers to encourage lower prices by reducing crop price supports, expecting that a barrage of exports would follow. It was expected that by modifying the "government intervention" of price supports, the US agricultural sector would quickly adjust to the greater export volume and farmers would reap the benefits of the export boom.

Since the mid-1980s, the United States has deliberately attempted to reduce market

Figure 6

US Exports and Share of World Exports for Corn, Wheat, Cotton, and Soybeans, 1970-2001



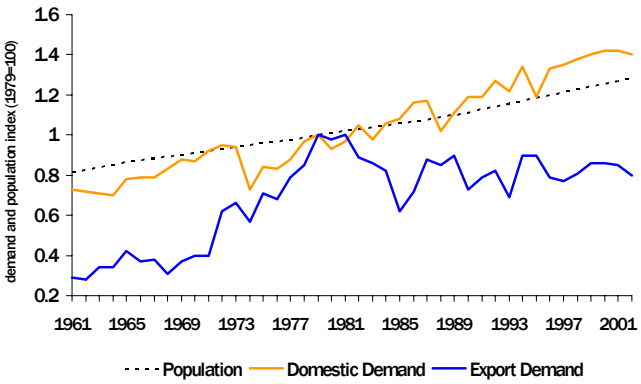
prices for commodities in pursuit of increasing US competitiveness in export markets. Emphasis on trade liberalization and the need to comply with international trade agreements further contributed to full-scale endorsement of this objective.

Despite the popular misconception among economic experts that these policies have been the source of great export growth, exports have not generally increased at all. The export boom did not materialize. In fact, as Figure 6 shows, the US share of world wheat and soybean exports has been declining steadily for the last 30 years. Corn exports have remained relatively flat, although variable. And contrary to expectations, corn exports have actually tended to increase during periods of higher prices and decrease in periods of lower prices, since the US is the world's residual corn supplier. Although the behavior of cotton typically is somewhat different, US cotton exports typically are more responsive, but even they did not "boom" as price support levels were reduced.

When the export boom did not occur, proponents of freer markets argued that the remaining government price support and supply control programs were putting a crimp on exports. In fact, a growing number of economists held the belief that commodity programs were relics of the past. It was assumed that because agriculture is less of a force in the economy today (only 2 percent of the population lives on farms, as compared with 25 percent in the 1930s), farmers are more likely to respond to low prices because they purchase more of their fertilizer and fuel rather than produce it on the farm. This thinking led gradually to the conclusion that government intervention in the agriculture sector was no longer needed. It was thought that intervention was a hindrance to realizing

Figure 7

Indexed US Domestic and Export Demand for the Eight Major Crops and US Population, 1961-2002 (1979=100)



The trend for US exports of the eight major crops has been flat since the early 1980s.

Domestic demand for major crops has increased steadily, outpacing growth in US population due to recent increases in non-food demands.

the full income potential of the agriculture sector. At the same time that conventional wisdom about the price responsiveness of the agricultural sector was shifting, the agribusiness lobby was gaining power and influence. The growing influence of the agribusiness lobby has outpaced that of grassroots farm organizations.

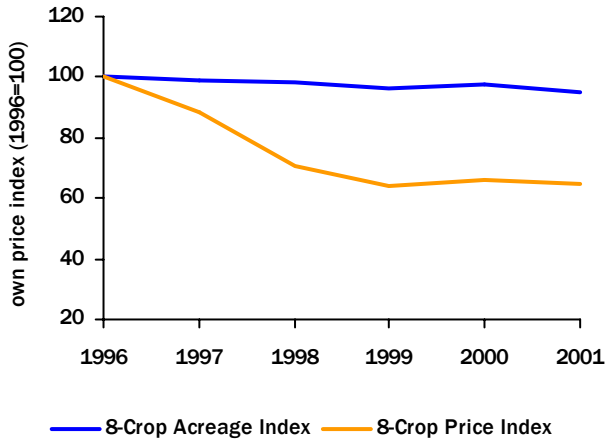
The result of this thinking was the 1996 Farm Bill, which removed all vestiges of government price supports and annual supply controls. The 1996 Farm Bill was debated and passed during a period of very high prices and high optimism for growth in the US agricultural sector. In 1995, prices of most major crops—corn, wheat, cotton, grain sorghum, oats, and barley prices—were at their all-time record highs. The high prices were primarily a result of tight world markets, compounded by weather conditions in the US that resulted in 1995 yields that were well below trend levels. At the time, USDA forecasters were projecting tremendous growth in US crop exports for the foreseeable future.

Exports of soybeans, and especially cotton, did increase and actually exceeded projections during recent years. But that was not the case for most other crops. As shown in Figure 7, the trend of US exports for the eight major crops taken together continued to be flat after 1996. The skyward export trend in the 1970s, while perhaps burned into minds, does not reflect recent reality. Domestic demand, which has grown faster than US population because of non-food demand, has been the driving force for major-crop demand for the last quarter century.

With the removal of the set-aside program, acreage previously withheld from production was freed up. With no mechanisms for acreage reduction to manage supply, the immediate response was an increase in crop acreage. It was no surprise that acreage planted to the eight major crops increased over six percent (over 15 million acres) the year the set-aside policy was removed. Inventory adjustments and world conditions staved off massive price declines, but only until 1998. Thereafter prices plummeted, and government subsidies ballooned to compensate for lost market income. Even as prices declined, the previously idled acreage that came into production in 1996 remained in cultivation. Since 1996, the indexed market price for the eight major crops

Figure 8

Indexed US Market Price and Acreage for the Eight Major Crops (1996=100)



Since 1996, crop prices have generally declined nearly 40 percent.

Even in the face of dramatic and persistent low prices, aggregate crop acreage has declined very little and very slowly.

Source: USDA, Economic Research Service

has declined by nearly 40 percent (See Figure 8). Radically lower prices did not appreciably cut the aggregate crop acreage remaining in use.

Another feature of the 1996 policy—elimination of price supports—has had the effect of sustaining the persistence of low prices. Current US agricultural policy is left with nothing to limit the downward price spiral. Even successive yearly reductions in grain stocks have not had the expected price-enhancing impacts of yesteryear. In the current environment, market participants know that no supply management programs can be used next year to raise prices. So crop demanders do not bid up prices to secure future grain needs. They rightly expect, with all-out production, prices will be as low or lower next season. Over the last five years, market participants have been more and more comfortable with less and less grain in the granary at the end of the crop year. Hence, prices have fallen much farther than they would have under similar stock conditions before 1996.

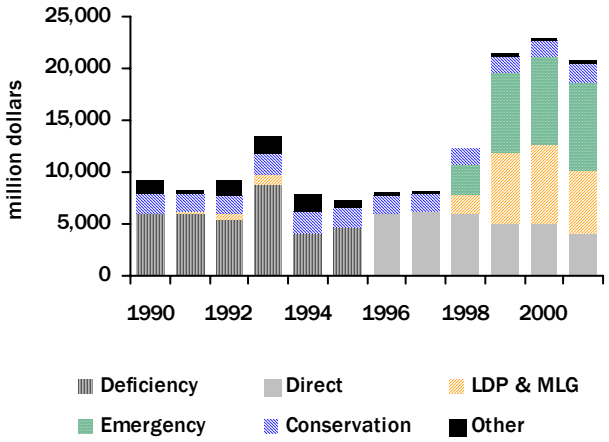
Prior to 1996, government commodity payments were generally used as financial incentives to encourage farmers to participate in supply management programs. Since 1996, government commodity payments are strictly income support payments. The Congressional response to the massive price slide was to institute record-level payments to farmers to partially compensate for lost income. Annual commodity program payments by program are presented in Figure 9. Beginning in 1998, subsidies to farmers increased by 250 percent over the period 1990-1997. Post-1997 subsidies took the form of unanticipated loan deficiency payments (LDPs), marketing loan gains, and ad hoc/emergency/disaster payments.[12]

Low prices triggered high subsidies in the US, not the reverse, as many believe. While some blame high US subsidies for low prices, the data clearly show the opposite: that higher and higher subsidies were authorized in response to lower and lower prices and incomes. The problem is not the income-

[12] While not part of this analysis, there is even conjecture that the elimination of price support mechanisms has allowed an increasingly oligopolistic grain industry to depress prices deliberately and arbitrarily.

Figure 9

US Government Commodity Payments by Program, 1990-2001



Prior to the 1996 Farm Bill, the largest share of government payments were deficiency program payments. Total government payments in the early 1990s averaged $7 billion to $8 billion annually.

In the 1996 Farm Bill, the deficiency program was eliminated in favor of a declining direct payment program. Additional program support through the marketing loan program and ad hoc emergency (direct) payments brought total payments for the eight major crops above $19 billion.

Source: USDA, Farm Service Agency; APAC Databook

support payments that were added by recent legislation but the supply control and price-supporting mechanisms that were taken away.

Low prices would not be a problem if demand increased enough to compensate for the lower per-unit price. But this is not the case. Despite record-level government payments, farm income continues to slide downward as farmers receive less and less of their income from the market (see Figure 4 showing government payments as a percentage of net farm income by state in 2001). Even as prices plummeted—making US commodities more competitive in world markets and giving rise to dumping on world markets below the average cost of production—exports remained flat.

On a Downhill Road with No Brakes

The 1996 real-time test of free markets in agriculture flopped. Small farms are failing in droves, and those that remain are in severe distress. Under the current legislation—extended in the 2002 Farm Bill with the addition of a new income support program that automates the "emergency" payments when prices are low—the accelerator works but the brakes have been disconnected. The goal of growth in productive capacity remains, but the goal of protecting farm prices and incomes by managing the level of production has been abandoned. While the large government payments to producers may have hindered the adjustment process, it is necessary also to recognize that adjusting to the low prices implies a further drop of at least $10 to $12 billion in annual net farm income. This loss of income would have devastating consequences for rural communities and small farmers.

Why Agricultural Markets Do Not Self-Correct

As seen above, once production increased and prices fell, there were no policy mechanisms in place to limit the downward spiral. The agriculture sector did not self-correct as the framers of this new policy had

predicted. Though the ambitious export projections of the mid-1990s did not materialize, agriculture could have been spared if, like other industries, its markets could self-correct. In other words, if the assumption was correct that farmers are more price responsive, then they would cut back production on their own, causing a recovery in prices. But that didn't happen. As seen, the government's response to low prices was to pay out record subsidies to compensate for lost income created by low prices. The cause of the low prices was the elimination of government price support and acreage reduction programs. The farmers were simply cultivating more cropland than the market could handle.

The overriding problem is that agricultural markets do not self-correct. Why? Other industries self-correct. Why doesn't agriculture? If that were known, perhaps future policy dead ends can be avoided.

The self-correction issue is so important in the case of crop agriculture because market disruptions occur so frequently. Weather-based fluctuations in yields are an obvious market shock. US yields affect domestic supply, and yields in importing countries and export-competitor countries affect US export demand. The effects of weather shocks on yields and most other short-run influences on agricultural markets tend to be random from one year to another.

A longer term, more predictable force that affects agricultural markets is that productivity growth tends to outstrip the traditional slower growth in food demand. Domestic demand for agricultural products in a country like the US grows with population but, unlike the demand for cars, houses, clothes and most other product categories, doubling a consumer's income will have a minor impact on his demand for food. Likewise, the rate of growth in export demand over time has been disappointing, especially in the case of grains. If the growth in demand for agricultural products kept up with production, low farm prices and incomes would be much less of an issue.

In the agricultural sector, productivity-enhancing technologies are quickly adopted, increasing supplies and putting downward pressure on prices. The lower prices, in turn, become further incentives to adopt more cost-reducing technologies, and prices continue their slide. In this way, production agriculture is under constant price pressure, with periods of brief reprieve generally the result of disasters or other random events. Given that food is essential for life, it is urgent that the productive capacity of agriculture continue to stay well ahead of immediate needs. Most agree that this important part of agricultural and food policy should be continued, despite its severe downward pull on farm prices. The mere presence of low prices is not the problem. What matters is how consumers respond in terms of the amount they are willing to buy and how producers respond in terms of the amount they are willing to produce next season. If consumers bought more of the lower priced goods and producers cut their production, excess inventories would quickly vanish and prices would arrive at profitable levels once again.

If this adjustment could take place in the agricultural sector, there would be no fundamental price and income problem. This is exactly the way it works in most product-producing industries: consumers buy more and producers provide less in response to a drop in prices or increase in inventories or a drop in sales. Prices rise and profitability reappears. But as we have seen, neither the quantity of crops demanded nor the quantity supplied is significantly responsive to changes in price, so timely market self-correction does not take place. Total annual output remains relatively constant irrespective of prices, the level of subsidies, or other sources of revenue.

Even when individual farmers go bankrupt, total output changes very little. In contrast to other industries, where a plant closure

Box 3 — Food Consumption Patterns

Although food demand in all countries is fairly inelastic, consumers in poorer nations tend to be more responsive to price and income changes. As the incomes of poorer consumers rise, they will shift their consumption away from lower valued goods and toward higher valued goods. Richer consumers are already consuming greater quantities of higher valued goods, such as meat and dairy, therefore, an income change does not affect their consumption levels as dramatically. Likewise, when there is a change in commodity prices, poorer consumers respond by substituting expenditures between foods, whereas richer consumers are less likely to alter their food group choices when prices change. In this manner, poorer consumers are said to be more income and own-price elastic than richer consumers. But because food is a necessity, food demand is considered inelastic at any income level, as compared to other non-necessity goods.

A study by Regmi analyzed the consumption responsiveness of 115 countries by dividing them into three groups: high, medium and low income. The results confirm the hypothesis that poorer nations are more elastic in food demand. The table below shows that low-income nations have an own-price elasticity of –0.75, meaning that for a one percent increase in food price, they will reduce the amount consumed by 0.75 percent. High-income nations have an own-price elasticity of -0.3 for food. This means that they will only reduce their consumption of food by one-third of a percent when food prices rise by one percent.

Similarly, as incomes rise in poorer nations, they spend a greater portion of the increase on food, with an elasticity of 0.73. High income nations have a much lower income elasticity of 0.29. The decreasing elasticity of food as incomes rise results in poorer nations spending more than half (55 percent) of their income on food while richer nations spend 16 percent (Regmi et al.). The poor tend to concentrate their diet on the cheapest food source, but as incomes rise, consumers diversify their consumption into other food groups. Therefore, some commodities such as meat and fish have a high elasticity for lower income nations, but basic necessities like rice and flour have a lower elasticity. The table below provides estimated elasticities for a variety of commodities in poorer nations.

Region	Commodity	Own-Price Elasticity	Income Elasticity	Source
Low Income (32 countries)	Food	-0.75	0.73	Regmi et al.
Medium Income (41 countries)	Food	-0.60	0.58	Regmi et al.
High Income (26 countries)	Food	-0.30	0.29	Regmi et al.
Brazil (low income)	Vegetables		0.82	Costa
Brazil (low income)	Meats		0.64	Costa
Malaysia	Bread	-1.04	0.53	Abdullah et al.
Malaysia	Rice	-0.30	0.31	Abdullah et al.
Malaysia	Flour	-0.48	0.43	Abdullah et al.
Vietnam (Red River)	Rice	-0.92	0.43	Minot and Goletti
Turkey	Bread	-1.07	0.38	Akbay and Boz
Indonesia	Corn	-0.26		RAP
Indonesia	Cassava	-0.39		RAP
Indonesia	Soybeans	-0.78		RAP

Abdullah, NMR, AAA Rahman, A Radam and AZ Baharumshah. (1999) Demand and Prospects for Food in Malaysia, Paper presented at the Seminar on Repositioning the Agriculture Industry in the Next Millennium, organized by Centre for Policy Studies in Serdang, Malaysia, 13 -14 July.

Akbay, C and I Boz. (2001) Food Consumption Patterns of Socioeconomic Groups: An Application of Censored System of Equations, presented at the ERC/METU Conference in Ankara, Turkey, Sept 10-13.

Costa, Fabiano. (2001) Changes in Food Consumption Patterns in Brazil, Food and Agribusiness Research, Issue 019-2001, June.

Minot, N and F Goletti. (1997) Impact of Rice Export Policy on Domestic Prices and Food Security: Further Analysis Using the Veit Nam Agricultural Spatial Equilibrium Model (VASEM), International Food Policy Research Institute, July 9.

Regmi, A, MS Deeepak, JL Seale Jr. and J Bernstein. (2001) Cross-Country Analysis of Food Consumption Patterns, Changing Structure of Global Food Consumption and Trade, ERS WRS-01-1.

RAP Publication. (1999) Livestock Industries of Indonesia Prior to the Asian Financial Crisis, Food and Agriculture Organization of the UN, no. 37, Dec.

means a reduction in industry size because the land and other assets are sold to a different industry, crop acreage typically remains in production. It is merely tilled by someone else. A farm sale does not typically reduce the size of the agricultural industry. In fact, output per acre may actually increase because the new owner is a better manager or is better capitalized.

The bottom line is this: regardless of the cause of decline in revenue, total crop output declines very little in response. Self-correction works no better on the demand side than on the supply side. To establish an agricultural policy based on the assumption that free market adjustments will occur within a reasonable time is not only naïve and ill-advised, it simply will not work.

US PRICES MATTER

US prices for major commodities have a direct influence on world prices. This section shows the strength of that influence and the impact of low US prices on small farmers and developing nations. In one sense, this is a foregone conclusion, because if the US price did not affect world prices, and specifically prices in developing countries, then other countries wouldn't be complaining about US subsidies or any US agricultural policies.

US Commodity Price Leadership

Current international grain markets are oligopolistic, that is, a few dominant sellers influence the market. One, or a small number of powerful sellers, sets the price and allows smaller suppliers to sell as much as they choose at that price. Several studies have used oligopoly models to describe the international agricultural commodity markets (McCalla, 1966; Alaouze et al., 1987; Bredahl and Green, 1983; Mitchell and Duncan, 1987).[13] In these models, the US is described as a price leader, influencing the world price by its domestic price. Small suppliers face a perfectly price elastic export market, wherein they can sell as much as they can export at the leader-influenced price. The price leaders are "residual suppliers," making up the difference in satisfying import demand not met by the other exporters. Small exporters set their price slightly lower than that of the price leaders. Importers view price leaders as a last-resort seller at the highest price.

According to Mitchell and Duncan, who conducted extensive tests based on an oligopolistic model, the volume of a non-dominant nation's exports does not depend on world demand. It can export all available crops at a given price. Conversely, the price leader's export volume rises and falls with world import demand. If world demand increases, it will increase its export volume. In times of contracting world demand, its exports diminish first.

Mitchell and Duncan concluded that the US exhibited price leadership in the rice and coarse grain markets. In a later update of the Mitchell and Duncan studies, Hellwinckel and De La Torre Ugarte (2003), in recording an additional 20 years of data, found that the US serves the role of price leader in the corn, rice and cotton markets.

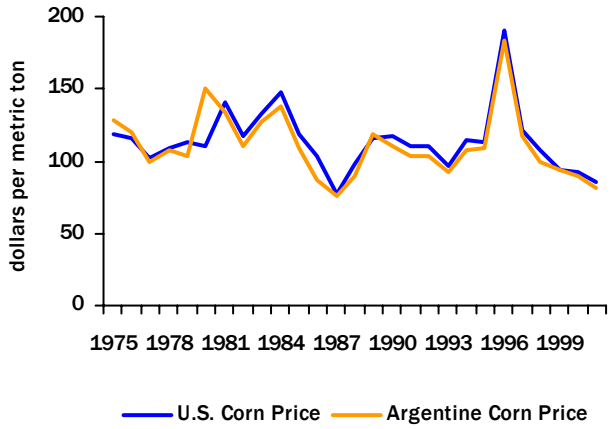
US Price Influence: Supporting Evidence from Specific Countries

One need only observe the behavior of corn and rice to conclude that the US impacts world prices, whether or not it is dominant by volume in a particular commodity. This section describes how US price leadership interrelates with major agricultural exchanges in other countries, specifically, the extent to which US corn prices affect corn prices in major corn export countries and in major corn import countries. Data and evidence on the price of US rice are also introduced. While the US is a major exporter of corn, its export market share for rice is much smaller. These two extreme cases show the

[13] Even though international grain markets are oligopolistic, models that show benefits of freer trade tend to assume atomistic competitive markets.

Figure 10

US Corn Price and Argentina Corn Price



There is a very strong relationship between the US corn price and Argentina's corn price. Results of a price regression model indicate that after accounting for US corn stocks-to-use, a one percent increase in the US price of corn results in a one percent increase in the Argentine corn price.

The prices reported are the Argentina Buenos Aires FOB port price and the US Gulf ports export price.

range of US influence on prices in other countries.

The Case of Corn

About 25 percent of US cropland is planted to corn, yielding 9 to 10 billion bushels per year valued at about $20 billion. About 20 percent of US corn is exported. Corn not exported is used for domestic demands or stored for later use. Even though exports do not dominate US corn demand, US corn exports far outstrip corn exports of all other countries. In 2001, the US accounted for two-thirds of world corn exports.[14]

Relationship to Argentina Corn Price Argentina—which accounted for about 12.5 percent of world corn exports in 2001—is America's primary competitor on the world corn export market. Figure 10 shows the price charged by the two countries since 1975. The Buenos Aires FOB port price and the US Gulf Port price seldom show much of a differential.

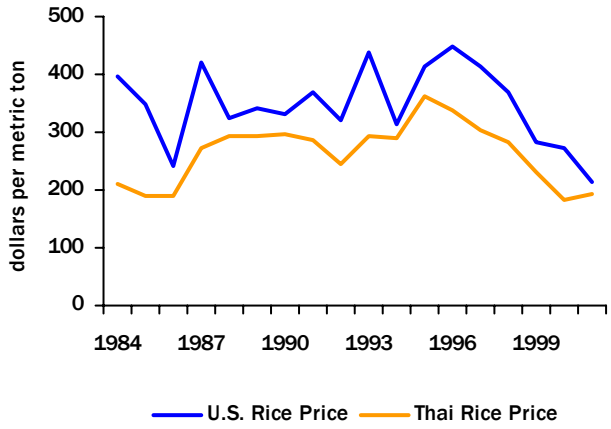
A model was developed to determine the influence of the US corn price and the US stocks-to-use ratio on the Argentine corn price. According to the model results, 84 percent of the variation in the Buenos Aires price was directly related to the Gulf Port price. A one-percent increase in the US price of corn results in a one-percent change in the Argentine price.

Even trading practices of the major Argentine commodity exchange highlight the influence of US commodity prices. The primary commodity market in Argentina, the Mercado a Termino (MAT), operates on a schedule very similar to that of the Chicago Board of Trade (CBOT), despite a time zone difference of three hours. The MAT opens at 11:55 a.m. local time to ensure an opening 35 minutes prior to the CBOT's at 9:30 a.m.

[14] The second leading corn exporting country is Argentina, accounting for about 12.5 percent of world exports in 2001. Japan is the largest corn importer, purchasing 21 percent of all corn imports in 2001, followed by Korea (11 percent) and Mexico (7.5 percent).

Figure 11

US Rice Price and Thailand Rice Price



There is a strong relationship between the US rice price and the rice price in Thailand, the leading rice export country. Results of a price regression model indicate that a ten percent increase in the US price of rice results in a 4.7 percent increase in the Thai rice price.

The prices reported are the Texas Long Grain rice price (US) and the Grade B 100% rice price (Thailand).

local time, and it closes one hour before the CBOT. The opening and closing times of the MAT are adjusted by one hour twice annually to correspond with daylight savings time and standard time in the US, a practice otherwise rare in Argentina.

Relationship to Mexico and Philippines Corn Price A second model was used to examine the relationship of US corn prices to those of Mexico and the Philippines. The model compared the US corn stocks-to-use ratio with the Mexican price, the lagged Mexican price, and a dummy variable indicating pre-NAFTA and post-NAFTA years. Model results indicated that a ten-percent increase in the US corn stocks-to-use ratio translates to a six-percent decline in the Mexican corn grain price. A ten-percent increase in the price of US corn results in a 3.6 percent increase in the Philippine corn price.

The Case of Rice

The US is not a dominant exporter of rice by volume, yet is one of the most influential participants in the world rice market. America harvests between 3.0 and 3.5 million acres of rice, averaging about 200 million hundredweight with a value of $1 billion (less than two percent of the value of the eight major US crops). Just over half is consumed in the US (55 percent in 2002). The rest is exported. In 2001, the US was the third leading rice exporter but with only a 10 percent share, behind Thailand (31 percent) and Vietnam (14 percent). Six countries—Thailand, Vietnam, US, Pakistan, India, and China—accounted for about 80 percent of world rice exports in 2001 (Child, 2003).

A model was developed to track the relationship between the US and the Thai prices. The Texas Long Grain rice price (the major US rice port price) and the Thai Grade B 100% rice price are presented in Figure 11. Again, model results showed a strong correlation between the US price and the price of the leading competitor on that export market. Eighty-four percent of the variation in the Thai rice price could be explained by the Texas price and the US rice stocks-to-use ratio, and a ten-percent increase in the US price will result in a 4.7 percent increase in the Thai price. This correlation is compelling

evidence that even where the US is not a dominant exporter, its commodity exchanges influence world prices.

The Role of Prices in the Developing World

Fully 96 percent of the world's farmers live in developing countries. In 58 of these countries, including the world's poorest, with a population exceeding three billion, half or more of the work force is primarily dependent on agriculture (Tomich et al., 1995). The World Bank estimates that a ten-percent growth in agricultural production in these countries could reduce the number of people living under the poverty line by as much as six to ten percent. Clearly, policy changes in America designed to foster agricultural production in the poorest nations could help to improve the livelihood of a significant portion of the world population.

Of course, US policy is not the only factor influencing agricultural production in developing countries. Profitability, technology, credit, infrastructure, marketing efficiency, institutional development, all play a vital role. However, changes in most of these factors are not likely to be immediate and may take several years to have an impact.[15] On the other hand, changes in some factors, especially profitability, may have a direct and immediate impact on farmer welfare and agricultural growth. Receipt of higher prices by farmers in developing countries could improve the well-being of billions of people. Because most of these countries do not have the resources to import enough food, adequate domestic production is overwhelmingly essential. Earlier, evidence was presented showing the role the US plays as a leader in world agricultural commodity markets. It is clear that US prices impact international and domestic prices around the world. The extent to which prices in a particular country are influenced by US policy depends on the degree to which its economy is open to trade.

Farm Price Formation in a Small Country with an Open Economy

A "small" country, as used here, means one whose volume of imports or exports has no ability to impact world market price. Most developing countries are included in this category. A country is a "net importer" of a commodity when domestic production is not sufficient to satisfy domestic demand at a given price. An agricultural producer in a small net importing country will most likely price goods according to the following formula:

$$P_{producer} = (P_{world} + T_{transportation}) * (1 + t_{tariffs}) - M_{margin}$$

This means that the price a domestic producer receives can be approximated by taking the prevailing world price plus the cost of transporting the crop to the border or local port, or the border price. Taxes and/or tariffs are added to the border price to arrive at that producer's wholesale price. The wholesale price is reduced by an amount similar to what the intermediaries take as gross margin for marketing the farmer's production. The net result is the domestic producer's price. Using a similar logic, it is possible to approximate the price to consumers by adding, rather than subtracting, a marketing margin charged by intermediaries for taking the product to the corresponding market.

The price received by farmers could increase in several ways. First, it can follow rising world prices. Second, in the case of

[15] The most direct connection between US agricultural policy and developing countries is through prices and market access. While market access policies are certainly an important aspect of studying the impacts of US agricultural policy on developing countries (especially in the case of cotton), they are not the focus of this study. This effort deals exclusively with US commodity policies that directly affect government payments and programs directed to US farmers.

imported commodities, prices would increase as tariffs or other taxes increase. Third, the net price received by producers could increase if marketing charges decline. If the country's marketing system is such that the impact of higher world prices or higher tariffs is not transferred to producers, then intermediaries will have higher margins, and producers will not benefit at all.[16] As to producers in exporting countries, the formula can be simplified as follows:

$P_{producer} = P_{world} - M_{margin}$

Producers can raise prices to follow an increase in world prices. The farmers will not benefit, however, if the gain is appropriated by the intermediaries. For farmers to gain, the marketing system should provide for the transfer of a large share of the price increase to farmers.

Impact of Changing US Agricultural Policies

Higher US prices would have their most direct impact by closing the gap between the cost of production and the market price in the US. This, in turn, would reduce the amount of US commodity dumping that occurs as a result of current US agricultural policies. Higher prices would provide a more level playing field for export competitors, while at the same time increasing competition between US exports and local production in developing countries. Also, if the higher US prices are a direct consequence of reducing the production of major crops, the volume of US exports would also be reduced, opening export opportunities for other countries as well as opportunities for increasing local production.

The effects of higher world prices would not be uniform, either across crops or across countries. Consequences would vary, depending on the nature of the crop (food or nonfood); the orientation of the country as a net exporter or importer; the particular characteristics of the domestic agricultural sector; and the overall economic, social, and political structure of the country. Still, it is possible to identify how a redirection in US policy resulting in higher world prices could impact developing countries. Using the simplified version of the price formula ($P_{producer} = P_{world} - M_{margin}$), higher world prices for any of the major commodities will increase incomes for farmers around the world, as long as their internal marketing systems pass along a share to agricultural producers.

If higher prices are transferred to producers, the area planted to these crops is likely to increase as farmers react to the higher prices. The increase in planted acreage would come from shifting acreage away from staple crops, from acreage dedicated to other crops or to sustain livestock activities, or from acreage previously idle. The higher prices would thus trigger re-allocation of acreage from other uses into major crops. This would result in higher prices for the non-major crops as well, since their production would be reduced by the loss of acreage.

As acreage in other countries is shifted into major crops over time, the price gains could be erased altogether. In that case, the final outcome would be simply a worldwide reallocation of production without a significant price change. The net result to any particular country would depend on the duration of the price and income increases and the ability of its economy to use short-term gains to foster economic development.[17]

[16] The incentive for the marketing system to pass on higher world prices to producers is a primary concern. This incentive is largely based on the degree of competitiveness in the food marketing system, i.e., the number of firms, individual and collective firms' market power, etc. Though not the subject of this study, concentration, market share, oligopolies, and monopolies within the global food marketing system are very important issues to study and address.

[17] Though not the focus of the analysis presented in this study, this concern is a critical reason to examine the possibility and impacts of global cooperation in supply and inventory management over the long run, in addition to changes in US agricultural policy.

Moreover, as acreage shifts to the production of major crops, the prices of the other crops, especially staples, would rise as they become more scarce. Such a price increase could threaten the food security of a country. In the case of an exporter of major crops, a shift from acreage normally cultivated for domestic use to the production of exports could threaten the country's food supply. Shifts of acreage to major crops in countries with limited agricultural potential or those that are net importers of major crops could result in disaster.

Since many developing countries are deeply in debt, overwhelmed by imbalances in export revenues, or suffer from exchange rate instability, higher world prices would play a vital role. If such a country is an exporter of major crops, increasing foreign earnings could improve its overall ability to import staple foods. On the other hand, reallocating acreage into an export crop previously planted to crops for domestic use could diminish the availability of staples for the local population. As we have seen, in a net importing country, higher world prices could increase local production only if the marketing system transfers to farmers a significant share of the increase in world prices.

Impacts on Small Farmers and Less Developed Countries (LDCs)

The US, a first-tier commodity market, is one of the world's largest exporters of corn, rice, sugar and cotton. Not surprisingly, when the US releases those commodities onto world markets at prices lower than the cost of production, it has a powerful depressive effect on second-tier commodity markets. Though low prices affect all farmers, first-tier countries like those in North America and Europe are better positioned to protect their farmers from the adverse effects. First-tier farmers receive direct subsidies to compensate for the loss of income. Second-tier countries provide no such luxuries for their farmers. Chronically low prices can be devastating to farmer income and country-wide prospects for development.

Mexico: Corn Prices Halved, Tortilla Prices Doubled In Mexico, a second-tier country, depressed corn prices work a double curse. Corn is virtually a symbol of that country, so closely is it associated with the Mexican way of life. When the Mexican government opened its borders to inexpensive US and Canadian corn under the North American Free Trade Agreement (NAFTA), the price of corn plunged nearly 50 percent. Faced with half the price they were accustomed to receive, millions of Mexican farmers could not cover the costs of production. Many left their farms and migrated to cities to seek employment. Others expanded production where they could, even using erosive hillsides (Nadal, 2000).

It is important to note that despite the price plunge and out-migration, Mexican corn acreage and production levels remained nearly unchanged. Remaining farmers took over production and made less – or lost more – at the margin. At the same time, consumer prices for an important Mexican staple rose dramatically. NAFTA's requirement that Mexico remove the protection given to the production of corn tortillas meant that tortilla prices were free to skyrocket. And they did. Consumer prices for tortillas, the staple of the Mexican diet, rose 50 percent in Mexico City and even higher in rural areas. This commodity price/consumer price anomaly illustrates the folly of concluding that low farm prices necessarily benefit consumers.

Haiti: From Self-Sufficient to Malnourished In 1990, Haiti, another second-tier country, was nearly self-sufficient in providing its rice requirements. Today, after years of importing cheap rice from the US, Haiti's local production has collapsed. Its rice output is merely half of its 1990 volume. The other half has been taken over by cheap US imports. The rice-growing areas of Haiti now contain some of the poorest and most malnourished

populations on the island. A once proud, nearly self-sufficient rice producer is now dependent on food imports. Sadly, Haiti's economy cannot cover the cost in the long term, because it will not be able to maintain the required stores of foreign exchange. Beyond that, domestic production of other staple foods is also losing the battle against competition from cheap foreign imports. As one Haitian farmer said of her situation: "While rice is so cheap, we can never find a way out of our poverty. These imports make our lives impossible. I can no longer afford fertilizers, so I am producing less. My farm no longer grows enough even to feed this family. There is not enough money for health care and education (Oxfam International, 2002)."

Africa and SE Asia in Downward Spiral

Similar stories can be repeated in countries throughout the world. In 2001, the US sold its surplus wheat at 44 percent below the cost of production, corn at 33 percent below, rice at 22 percent below, and cotton at a whopping 57 percent below (Ritchie et al., 2003). This hit the countries in west and central Africa like a hurricane, virtually all of which are Least Developed Countries (LDCs). How can these countries possibly compete against a price 57 percent below production costs?

West and central Africa harvest nearly five percent of the world's cotton. Production in 2001/2002 was particularly good and would have been profitable if the international price had exceeded just 50 cents a pound (World Bank, 2002). Instead, because US cotton depressed world prices, these countries suffered a loss of some US$ 200 million. Should present US policies remain, these countries have no hope of reversing the downward spiral they face in the cotton sector. In Ghana, where local production costs for poultry run US$ 1.29 a kilo, imported poultry is flooding the market at US$ 0.65-1.00 a kilo. Then there is Vietnam. Its sugar industry, which offers a local price of US$ 278 a ton, must engage in the impossible task of competing with a world price of US$ 210-218 a ton.

As suggested earlier, when farmers need to make money, they tend to do what they are good at: plant crops they can sell. As small farmers increasingly focus on crops sold for cash, the amount of locally produced subsistence crops declines, making basic food more expensive and less secure. Poorer countries are then forced to import food they are otherwise well equipped to produce themselves. Indonesia is another example of this tragic twist. Until 1984, it was self-sufficient in rice production but is now one of the biggest importers of rice. This cycle of poverty will probably never turn around without a change of policy by America and the other first-tier countries.

Everywhere, overproduction and low prices predispose first-tier countries to dump their excess, forcing formerly productive second-tier small farmers into poverty. The effects are pernicious where the developing country's economy is already frail and the farmers are operating with limited resources.

US Prices Do Matter

These analyses and other studies clearly allow the conclusion that the US is a world price leader. US prices directly impact those of other countries across a wide spectrum of country-specific export/import situations. Thus there is no reason to doubt that domestic farm policies affecting prices move prices globally as well. While price is not the only thing that matters, it must be seriously dealt with where a change in American agricultural policy could make a vast difference in reducing poverty and increasing incomes worldwide.

The radical shift in US policy in the 1996 Farm Bill has contributed to worldwide poverty and food insecurity. To prevent dumping and raise farmer incomes, the problem of low prices in the US must be solved. Because the US price matters, it is crucial that policy

makers appreciate the depressing effects our policies have reaped.

It is not difficult to see that higher farm income and production that trails a rise in world prices would improve the livelihood of agricultural producers. If these conditions continued, they could introduce economy-wide improvements and higher incomes for the overall population. The higher income might more than make up for the likely increase in food prices.

Developing countries are normally unable to establish safety nets for displaced farmers or assist the urban poor in managing increases in food costs. A developing country, therefore, should manage the opportunities afforded by a rise in world prices. Its local marketing system should be designed to transfer price changes equitably among producers and consumers. Pursuing trade and agricultural policy changes without addressing adjustment costs, inefficiencies or unfair concentration of benefits could turn an economic opportunity into a severe setback.

In summary, higher world prices could increase the revenues of local farmers in developing countries. Whether or not the farmers benefit, though, is strongly influenced by the ability of the internal marketing system to transfer the gains to producers.

THE 2002 FARM BILL

The 2002 Farm Bill contains the policies governing American agriculture today. Scheduled to remain largely unchanged through 2007, the Bill continues and expands the programs introduced in the 1996 Farm Bill. The deliberate design is to allow prices to fall as low as market and weather conditions will permit. Three safety net mechanisms appear in the form of income support programs: (1) continuation of the direct payment program;[18] (2) a new counter-cyclical payment program;[19] and (3) continuation of the marketing loan program, which authorizes payment of loan deficiency payments and marketing loan gains.[20]

More of the Same

Like its 1996 sister Bill, the 2002 Farm Bill leaves no policy mechanisms in place to control production. Acreage set-asides are absent, although the long-term removal of environmentally sensitive lands through the Conservation Reserve Program is extended and expanded. Nor are there safeguards to prevent crop prices from falling even below their current levels, i.e., no price supports via non-recourse loans. On the flip side, there are no policy mechanisms in place to prevent crop prices from skyrocketing should a catastrophic event cause a severe shortage of stockpiles.

The 2002 Farm Bill authorizes a new Conservation Security Program, which makes direct payments to farmers for conservation practices on working farmland. Funding authorization for existing conservation programs is increased.[21] Emphasis is shifted away from retiring environmentally sensitive lands in favor of improving environmental performance on lands in cultivation. In addition to commodity policies continued from the 1996 Farm Bill, the 2002 Farm Bill in-

[18] Under the 1996 Farm Bill, producers of major commodities were eligible for fixed, declining payments for program crops. Producers received payments based on historical production (program base acreage). Payments were made regardless of the level of production, even if no crop was produced. These direct payments were often referred to as "transition payments," AMTA payments and Production Flexibility Contract payments. Under the 2002 Farm Bill, these payments are fixed and decoupled and are referred to as "Direct Payments."

[19] The counter-cyclical payments authorized in the 2002 Farm Bill are essentially a vehicle for "automatically" distributing the emergency/disaster/ad hoc payments that were made since 1998. Producers do not have to produce the commodity to be eligible for counter-cyclical payments; thus, they are partially decoupled. They are also partially coupled, since they are triggered when market prices fall below established, fixed target prices. The payment rate for counter-cyclical payments depends on the effective price for the commodity. The effective price is the direct payment rate plus the higher of the market price or national loan rate. Counter-cyclical payments are made on 85 percent of historical or updated base acreage for the crop using historical or updated program yields. Thus, as market prices decline, counter-cyclical payments increase.

[20] The marketing loan program allows farmers or processors to pledge a portion or all of the commodity as collateral and obtain a loan from the Commodity Credit Corporation (CCC), agreeing to repay the loan plus interest within a specified period. When market prices are below the loan rate, farmers are allowed to repay the loan at a lower loan repayment rate (based on local or world market prices). When a farmer repays the loan at a lower loan repayment rate, the difference between the loan rate and the loan repayment rate is the *marketing loan gain* and represents the farmer's program benefit. Alternatively, producers may choose to receive marketing loan benefits through direct *loan deficiency payments (LDP)* when market prices are lower than the loan rate. The LDP rate is the difference between the loan rate and the loan repayment rate. This option allows producers to receive the benefits of the marketing loan program without having to actually take out and repay commodity loans.

[21] While the legislation authorizes new and expanded conservation program funding, program implementation and budgetary allocations are separate matters. At this time, Congress has not yet fully funded the Conservation Security Program and implementation has been slower than anticipated.

cludes export credit guarantee programs, expanded food assistance and export promotion programs, and land conservation and environmental improvement incentives, among other diverse measures.

Absent any major unanticipated supply or demand shifts, like widespread drought, the 2002 Farm Bill essentially guarantees the continuation of low agricultural prices. Compensation will continue for American farmers for unsustainable prices and inadequate income through large direct government payments. The impact of low prices on agricultural markets or incomes in other countries is simply not a consideration in current US policy.

Implications for Farmers

Assuming that the policies mandated by the 2002 Farm Bill remain in place, how will US agriculture fare over the next decade? Based on the 2003 US Baseline for the agricultural sector provided by the Food and Agricultural Policy Research Institute (FAPRI), a simulation was estimated using the POLYSYS model (additional information about the POLYSYS model is available in Appendix C). This simulation projects the performance of the US agricultural sector under the continuation of the status quo in US farm policy.

Annual projections for US acreage planted to the eight major crops, prices for five major crops, net farm income, and government subsidy payments are presented in Box 4.

Under a continuation of the status quo, acreage planted to the eight major crops is projected to remain nearly constant, varying by only a half million acres (much less than one percent) from 2003 to 2011. The share of total acreage planted to each of the major crops is also projected to remain nearly constant. Soybeans show the largest acreage gain over the nine years, increasing about five percent.

Prices of corn, wheat, and soybeans are flat over the projection period. Cotton and rice prices increase about 25 percent between 2003 and 2011—driven by FAPRI-embedded assumptions of a higher volume of exports in the case of cotton, and growth in domestic consumption in the case of rice.

Continuation of 2002 Farm Bill policies results in relatively constant net farm income, ranging between $46 billion and $52 billion. Increasing net farm income in the early simulation years is primarily due to rising prices and large government payments. Leveling prices and government payments coupled with rising production costs contribute to lower net farm income in later simulation years, averaging around $46 billion to $47 billion between 2007 and 2011.

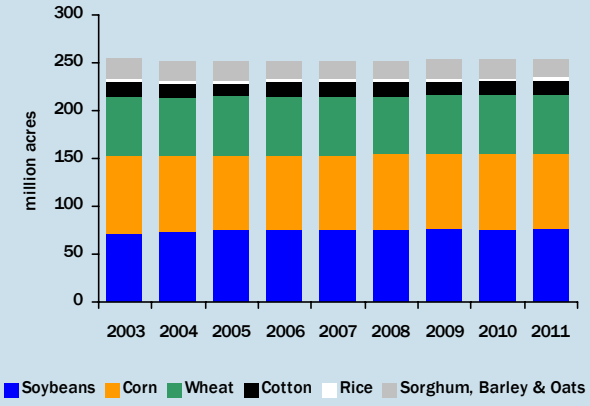
Since prices do not change dramatically throughout the period, government payments continue to be a significant component of net farm income. Through 2006, government payments are expected to average above $20 billion per year. As slight gains in prices occur in later years, total government payments level off around $18.5 billion annually. Annual direct (decoupled) payments remain level around $5 billion throughout the period. Loan deficiency payments (LDPs) decline from over $7 billion annually to under $5 billion as prices rise slightly and counter-cyclical payments also decline from about $5 billion to under $4 billion.

The FAPRI projections are not surprising. Absent any major unanticipated supply or demand shifts, aggregate crop acreage will remain nearly unchanged through 2011, although the crop mix adjusts at the margin. Crop prices remain generally flat and low, except for increases in cotton and rice prices. Therefore, a continuing burden on scarce budget dollars to compensate US farmers for low prices is assured, yet government subsidies will do little to relieve the economic stress in the US agricultural sector and in rural areas in general.

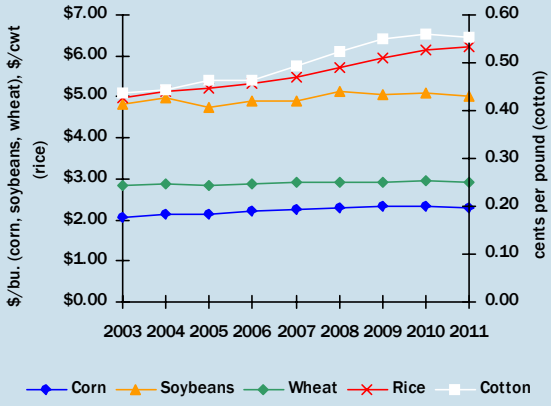
Box 4 — Continuation of the Status Quo

The following figures show 10-year projections for major agricultural sector variables assuming that the policies in the 2002 Farm Bill remain in place. Planted acreage is projected to remain nearly constant, declining one half million acres or two-tenths of a percent over the next decade. Prices of feed grains and soybeans are projected to remain relatively flat while cotton and rice prices are projected to increase substantially. Realized net farm income is at $46.5 billion in 2003 and rises to $52 billion in 2005 before declining and leveling off between $46 billion and $47 billion through 2011. Government commodity program payments are expected to remain around $21 billion per year for the next few years before peaking at $22.7 billion in 2005 then declining to around $18.5 billion per year through 2011. Simulations are based on the *2002 FAPRI Baseline Projections for the Agriculture Sector*.

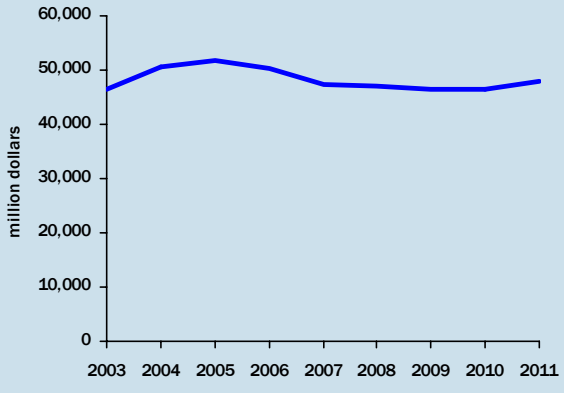
US Acreage Planted to the Eight Major Crops Under Current Farm Policy, 2003-2011



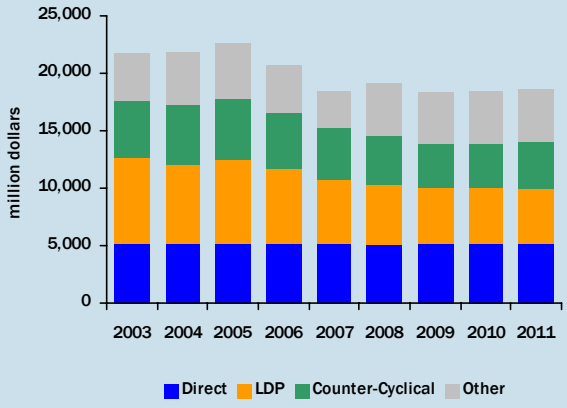
Projected Prices of Five Major Crops Under Current Farm Policy, 2003-2011



Projected Net Farm Income Under Current Farm Policy, 2003-2011



Projected Government Program Payments Under Current Farm Policy, 2003-2011



In summary, the 2002 Farm Bill will not cause a departure from the low commodity prices that have persisted since the mid-1990s. It continues the approach of making up losses in net farm income in the US with government subsidies. Its provisions offer little by way of improving the economic welfare of farmers in developing countries, whose production is either threatened by low-priced imports, or whose revenues are curtailed by the woefully inadequate prices for their exports. Market prices will languish below the cost of production, and American commodities will be dumped on world markets, further weakening the position of poor farmers around the globe.

CONFLICTING VIEWS:
HOW TO FIX BROKEN POLICY

Nearly everyone with a stake in agriculture agrees that persistent, low prices negatively affect American farm income and disproportionately affect income in some of the poorest regions of the world. But differing perspectives abound as to what causes the low prices and high subsidies and what could or should be done to restore prosperity to the farming sector in the US and elsewhere.

Brief summaries of the prevailing views of the agricultural crisis are included in Appendix C. Based on principles found in most every introductory economics textbook, these views focus on specific aspects of agricultural markets, or they make implicit (or explicit) assumptions about market responses that lead to explanations of the current low commodity price situation. And they propose ultimately unconvincing solutions to the palpable problems plaguing world agriculture.

The Free-Market Solution

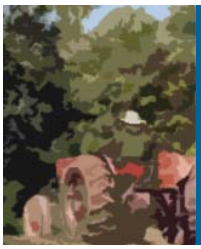
The most commonly held view among commentators is that high subsidies paid to farmers in developed countries are responsible for overproduction and low prices. As evidence, they point out that subsidies rose sharply at precisely the time prices plummeted. Hence subsidies cause low prices. Subsidies are believed by many economists to be "trade distorting" and an absolute negative. While subsidies are not necessarily prohibited by current trade liberalization frameworks such as the WTO, they are generally limited and, at best, frowned upon. It is argued that subsidies are proof that government intervention in the agricultural "free market" creates economic inefficiencies.

Proponents of this view hold that if agricultural markets are allowed to work freely, the agricultural sector will prosper. So that farmers, agribusinesses and consumers can make efficient decisions, it is necessary to eliminate any government actions that may interfere with market signals. The expectation is that all market forces—supply, demand, price, and structure—will respond to free market signals and adjust in a timely and efficient manner.

The Farmer-Oriented Solution

This view asserts that prices fell because the US eliminated policy mechanisms to manage productive capacity, and it recognizes the unique characteristics and nature of agricultural markets. Its advocates, noting that food production is central to human life, argue that governmental and business investments will increase agriculture's ability to produce more, better and safer food. They also recognize that neither agricultural supply nor demand, especially in the aggregate, is very responsive to changes in price. The expectation is that the agricultural sector will not respond to free market signals and adjust in a timely and efficient manner absent government intervention. This perspective comes down in favor of the need for government policy to manage productive capacity.

These two rival positions imply quite different policy prescriptions. The conventional, free-market view calls for eliminating market-distorting subsidies and government imposed protective measures. The farmer-oriented approach requires country-specific government policies that can manage—effectively and timely—the use of productive capacity.



WHAT IF WE GET RID OF SUBSIDIES?

While evidence points to low prices as the cause of high subsidies in the US, many experts around the world see just the opposite: that US subsidies are a major cause of low world prices. *If this is true, then eliminating subsidies should cause an appreciable increase in prices.* Those who seek to strengthen the "invisible hand" of unshackled market forces call for the immediate demise of all direct government payments, insisting that a non-subsidized American agricultural sector would work its way to a new equilibrium. They predict that US production would decline drastically, causing US prices and, consequently, world prices, to rise. This position is the one taken by the World Trade Organization (WTO). Their goal: to liberalize trade in agriculture and remove market-distorting subsidies. Given the strength of the trade liberalization movement, this approach is receiving considerable attention around the globe and has a number of supporters.

Worldwide Price Impacts

The International Food Policy Research Institute (IFPRI) recently conducted a study examining the effects of various trade liberalization scenarios on world commodity prices (IFPRI, 2003). Using the IMPACT agricultural sector model, IFPRI looked at the country-level and regional effects of trade policy scenarios on 16 commodities. One scenario required developed countries to remove protectionist measures and trade-distorting subsidies, or "price wedge" subsidies (producer and consumer subsidy equivalent price differences between domestic and international prices) by 2006 while developing countries maintain their existing policies. In removing all protectionist measures of every kind, this study sets an even stricter standard than simply eliminating US subsidy programs. The effects on world and regional prices are shown in table 2. *The bottom line: the much predicted price increases failed to appear appreciably or quickly.*

World corn prices experienced the largest gain among the cereals. Note that after 20 years, the extent of the price increase is less than 3 percent. The US experiences a price drop of 9.5 percent by 2020, while corn prices in identified developing countries increase between 2.4 and 2.6 percent. These mere traces of price movement after 20 years would be of little help in improving incomes of farmers in developing countries.

Other commodities are affected even less. Rice prices rose only 1.6 percent by 2020. The price of rice in the US declined 4.2 percent over the period while it increased between 1.1 and 1.6 percent in developing countries. The impact on wheat and other coarse grains is smaller still: a world price increase of 0.8 percent for wheat and 1.1 percent for other coarse grains by 2020.

The picture for meat and dairy commodities is entirely different. Baseline policies cause larger trade distortions for meat and milk compared to cereal. Thus, it is no surprise that starting from a high level of trade distortion, the complete removal of all protective policies results in significant price impacts. World dairy prices experienced the largest change, increasing 19.2 percent by 2020. World prices of beef, sheep and goats increased 5.2 percent by 2020. World poultry prices increased 3.8 percent and pork only 0.4 percent by 2020.

Table 2

Effects of Developed Country Trade Liberalization on World Prices and Regional Producer Prices, 2020 (*Source: IFPRI, 2003*)

	Baseline, 1997	Developed Country Subsidy Elimination, 2020			
	World / Producer Price [1]	World Price [1]	% Change from Baseline	Producer Price [1]	% Change from Baseline
Beef	1,748	1,839	5.2%		
Pork	2,245	2,254	0.4%		
Poultry	716	743	3.8%		
Sheep & Goats	2,841	2,989	5.2%		
Milk	292	348	19.2%		
Wheat	123	124	0.8%		
Other Coarse Grains	89	90	1.1%		
Rice	252	256	1.6%		
USA	214			205	-4.2%
Mexico	196			199	1.5%
Other Latin America	196			199	1.5%
Central & W. Sub-Saharan Africa	178			180	1.1%
Southern Sub-Saharan Africa	141			143	1.4%
Indonesia	192			195	1.6%
Thailand	194			197	1.5%
Philippines	224			227	1.3%
Vietnam	220			223	1.4%
Corn	104	107	2.9%		
USA	95			86	-9.5%
Mexico	80			82	2.5%
Other Latin America	77			79	2.6%
CW Africa	40			41	2.5%
Southern Africa	42			43	2.4%
Indonesia	76			78	2.6%
Thailand	80			82	2.5%
Philippines	117			120	2.6%
Vietnam	80			82	2.5%

(1) Prices are in US$ per metric ton.

US Price Impacts

Simulations were conducted using another model, POLYSYS (see appendix C), assuming the removal of US marketing loan payments (loan deficiency payments and marketing loan gains), counter-cyclical program payments, and direct payments by 2003. Other government payments, including environmental and conservation programs and subsidies on commodities not included in this study (e.g., dairy, sugar, wool and mohair, honey, minor oilseeds), remain and are paid at the levels set by the 2002 Farm Bill.

While it is not realistic that all government commodity program payments would be eliminated in one year, this simulation demonstrates that the removal of government supports will result in an unambiguous and dramatic reduction in net farm income. The modest changes in price cannot make up for the lack of government payments: farmer income would drop 25 to 30 percent under this scenario.

In the US, the most dramatic result of eliminating government payments—between $13 and $18 billion per year—is a loss of $11 to $15 billion in net farm income, fully

Table 3

POLYSYS Simulation Results Under the Subsidy Elimination Scenario and Percentage Changes from the Baseline Scenario for Planted Acreage, Price, Net Farm Income, and Government Payments, 2003-2011

	2003	2004	2005	2006	2007	2008	2009	2010	2011
Planted Acreage (mil. ac)									
Corn	81.2	79.2	78.7	78.2	78.4	79.5	78.8	79.9	78.8
% change from baseline	*1%*	*0%*	*0%*	*0%*	*1%*	*1%*	*1%*	*0%*	*0%*
Wheat	63.5	61.2	61.2	61.2	61.5	61.1	60.8	61.2	61.4
% change from baseline	*1%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Soybeans	72.7	74.1	74.9	75.4	75.9	75.1	76.6	75.6	77.4
% change from baseline	*0%*	*0%*	*1%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Cotton	13.0	13.8	13.8	13.8	13.4	13.6	13.7	13.7	13.6
% change from baseline	*-12%*	*-7%*	*-7%*	*-7%*	*-7%*	*-6%*	*-5%*	*-5%*	*-6%*
Rice	2.8	2.9	3.1	3.1	3.0	3.0	3.0	3.0	3.0
% change from baseline	*-14%*	*-9%*	*-5%*	*-7%*	*-7%*	*-6%*	*-6%*	*-5%*	*-5%*
Season Average Price									
Corn ($/bu)	$2.03	$2.12	$2.09	$2.19	$2.21	$2.24	$2.28	$2.25	$2.23
% change from baseline	*-2%*	*-2%*	*-1%*	*-2%*	*-2%*	*-2%*	*-3%*	*-3%*	*-3%*
Wheat ($/bu)	$2.80	$2.85	$2.80	$2.87	$2.89	$2.89	$2.94	$2.97	$2.94
% change from baseline	*-2%*	*-1%*	*-1%*	*0%*	*-1%*	*-1%*	*0%*	*0%*	*0%*
Soybeans ($/bu)	$4.80	$4.96	$4.71	$4.88	$4.89	$5.14	$5.07	$5.15	$5.04
% change from baseline	*0%*	*0%*	*0%*	*-1%*	*0%*	*0%*	*0%*	*1%*	*1%*
Cotton ($/lb)	$0.492	$0.498	$0.518	$0.511	$0.547	$0.576	$0.593	$0.600	$0.604
% change from baseline	*12%*	*12%*	*12%*	*10%*	*11%*	*10%*	*8%*	*7%*	*9%*
Rice ($/cwt)	$5.80	$6.12	$5.81	$5.90	$6.20	$6.41	$6.68	$6.74	$6.82
% change from baseline	*17%*	*19%*	*11%*	*11%*	*13%*	*12%*	*12%*	*10%*	*9%*
Net Farm Income (mil. $)	33,590	35,483	36,794	35,843	35,026	34,118	34,313	34,664	36,060
% change from baseline	*-28%*	*-30%*	*-29%*	*-29%*	*-26%*	*-27%*	*-26%*	*-25%*	*-25%*
Gov. Payments (mil. $)	8,344	4,191	4,615	3,733	3,908	3,916	3,974	4,112	4,238
% change from baseline	*-61%*	*-81%*	*-80%*	*-82%*	*-79%*	*-80%*	*-79%*	*-78%*	*-77%*

25 to 30 percent. Since only minor changes in price occur under this scenario, it is evident that most of the income loss results from the elimination of direct government payments. In summary, discontinuing government payments influences two groups of crops differently, but results in an unambiguous and dramatic reduction in net farm income. Acreage for rice and cotton declines. Consequently, their market prices rise. Corn, wheat, and soybeans experience some increase in plantings, and their prices decline, although slightly.

This result is not particularly surprising, given the nature of agricultural supply and demand. As we have seen, the total supply, or acreage, of major commodities taken together is not very responsive to changes in price, and the aggregate of the demands on major commodities, domestic and exported, does not increase significantly when prices are low.

Long run adjustments are likely to occur. If prices continue at very low levels without subsidies or other relief for farmers, production would eventually decline. Land prices would drop sharply. Capital resources would move out of agriculture and into other industries. Aggregate acreage would contract.

Disagreement arises as to how soon the acreage reduction would take place and how extensive it would be. Some argue that the shock of sudden and substantial declining

revenues would force large quantities of land out of production quickly. Severe adjustments would occur in rural communities, including wide-spread bank failures. But if farmers remain true to past behavior, they or their replacements would try to find ways to cover the variable costs of producing on most of the land currently under cultivation. After a number of years and several waves of land price reductions, more significant quantities of land would come out of production, especially in areas of lowest yield. But this marginal cropland would likely be abandoned after the analysis period considered in this simulation.

As to loss of acreage, remember that large agribusiness interests in the US have an incentive to maintain productive capacity. It is entirely possible that production would be maintained through farmer contract arrangements with large agribusiness enterprises, similar to those currently pervasive in the US poultry industry.

Supporting Evidence from Other Countries

Over the last few decades, several countries have moved toward policies of reducing government involvement in agricultural markets. Canada, Mexico and Australia have established track records of fewer government controls and freer markets.

Changes in commodity production in these countries are the result of a complex array of factors. However, evidence clearly indicates that removal of and reductions in subsidies have not led to significant drops in production. In fact, production increased in several cases. These observations support the IMPACT and POLYSYS models' results that eliminating subsidies will not significantly or quickly reduce production or increase prices.

The Canadian Experience

Huge increases in Canadian agricultural subsidies through the 1980s contributed to less than a three-percent rise in the number of acres cultivated. Then, fiscal deficits in the 1990s forced a 35 percent cutback in Canada's support programs over a three-year period. The most notable was the erasing of all subsidies for grain transportation in 1995. This and other significant reductions in government support levels between 1996 and 2001 resulted in less than a one-percent decline in farmland use.

The Canadian experience drives home yet again that cropland will remain in production, despite major subsidy cuts. But the mix of crops farmed did change significantly in direct response to government policy changes. Three crop groups historically account for just over half of Canada's total farmland: (1) wheat, (2) selected grains (oats, barley, and corn), and (3) selected oilseeds (principally canola but also including flaxseed, soybeans, sunflower, and mustard seed).

Figure 12 shows the Canadian acreage planted to each of these three crop groups since 1981. Between 1991 and 2001, acreage of Canada's leading crop, wheat, declined 23 percent. The elimination of subsidies for grain transportation in 1995 was a major contributor to this significant shift. Over the same period, oilseed production increased 143 percent. While the crop mix changed as relative prices and program payments changed, aggregate land in production changed little.

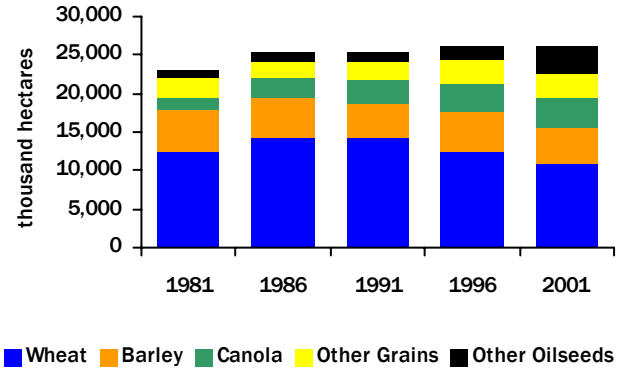
The Australian Experience

The Australian experience again demonstrates the tendency of farmers to continue to produce as much as they can, even when faced with declining government subsidies. Since 1991, despite continuing low world prices, planted areas of wheat, coarse grains, and oilseeds have increased more than 56 percent in Australia, as shown in Figure 13.

The Australian experience illustrates an interesting relationship between the crop and livestock components of Australia's agricul-

Figure 12

Canadian Farmland Planted to Major Crop Groups, 1981-2001

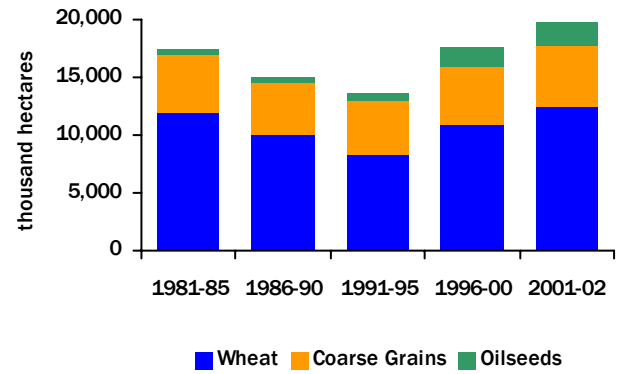


Between 1991 and 2001, Canadian wheat acreage declined 23 percent. Much of the lost wheat acreage was converted to oilseed production. Total oilseed acreage increased 143 percent between 1981 and 2001, now accounting for 8.5 percent of total Canadian farmland. Oilseed gains were primarily in canola and soybeans.

Source: Agriculture Canada

Figure 13

Total Planted Area by Crop Group, Australia, 1981-2002



Total planted area in Australia has more than doubled since the 1960s, increasing nearly 50 percent since the early 1990s. The increase since 1991 has been driven by the reduction in wool subsidies and declining sheep numbers. Sheep farmers have converted pastures to crop production.

Coarse grains includes barley, oats, sorghum, maize, and triticale.

Oilseeds includes canola, cottonseed, linola, linseed, peanuts, safflower, soybeans, and sunflower.

Source: Australian Commodity Statistics 2001, Australian Bureau of Ag and Resource Economics

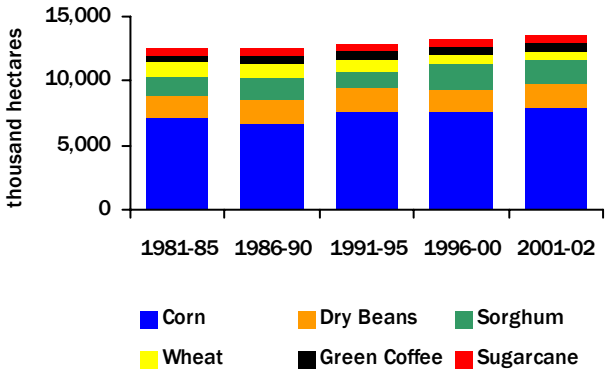
tural sector. Australia is the world's leading supplier of wool with sheep production representing a large share of agricultural receipts. The Australian government's support for wool production collapsed in 1991, contributing to a 31 percent decline in sheep inventories since 1991. Faced with declining government supports for wool, sheep farmers converted significant pasture acreage to crop production. This experience provides further evidence for the observation that farmers will remain in agriculture and continue to produce as much as they can—even in the face of declining prices and declining subsidies—as long as they can.

The Mexican Experience

Mexico's four major crops—corn, dry beans, grain sorghum, and wheat—account for about 80 percent of the total harvested area, with green coffee and sugarcane comprising an additional nine percent. Total har-

Figure 14

Mexico's Total Harvested Land by Crop, 1981-2001



Mexico's four major crops—corn, dry beans, grain sorghum, and wheat—account for about 80 percent o the total harvested area, with green coffee and sugarcane comprising an additional nine percent.

In the early 1990s, Mexico virtually eliminated price supports for major crops in transition to a more liberalized agricultural economy.

NAFTA was implemented in 1994, allowing importation of US corn.

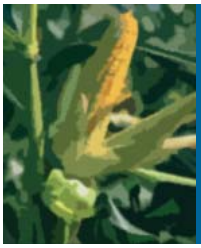
Source: SIACON; FAO

vested area and the share of the six major crops is shown in Figure 14.

Mexico's harvested acreage data reveal an upward trend since the 1980s. Notably, corn acreage has increased nearly 18 percent since 1986. This increase in acreage has occurred over a period of significant reductions in Mexican government supports for the agricultural sector and also a period of significant increases in foreign competition inside Mexico.

Beginning in the early 1990s, Mexico eliminated supports for some commodities, reducing the number of commodities eligible for price supports from twelve to three. Remaining price supports were converted from per-unit to per-acre to conform to trade liberalization pressures.

Additional and more significant program support reductions followed in the mid-1990s. Implementation of a new government program in 1994, PROCAMPO, moved supports in the direction of direct, decoupled income transfers. More importantly, implementation of the North American Free Trade Agreement (NAFTA) in 1994 called for phasing out import quotas for US commodities. The stated objective of NAFTA was to allow the Mexican agricultural sector to profit from liberalized trade. The observed result has been increased domestic production of basic crops, including corn, despite unprecedented access to cheaper foreign imports of major commodities. Confronted with sharply lower prices, declining government support, and new trade liberalization measures, acreage and production of traditional crops in Mexico has continued to increase.



A FARMER-ORIENTED POLICY BLUEPRINT

Although touted widely as "the" solution to the current agricultural crisis, eliminating subsidies in the US or even in all developed countries will not result in timely price increases of a magnitude that could help the world's large population of small farmers. Subsidy elimination would cause a shift in the mix of crops produced and, therefore, some relative changes in prices, meaning that some farmers and countries will be helped and others harmed. But the overall impacts are negligible. Getting rid of subsidies will certainly not result in the levels of agricultural prosperity claimed by its advocates.

Well, if phasing out subsidies will not solve the problem, what will raise prices and improve the lives of farmers? One compelling option is to explore the use of price-enhancing and stabilizing mechanisms from the rich history of American agricultural policy in addressing today's failures. The changes of the late 20th century were driven by the belief that the upswing in exports resulting from lower prices would usher in a booming agriculture sector. The lower prices have, indeed, occurred, but a boom is nowhere to be seen.

One saving course of action is to redirect the goal away from low market prices and high subsidies and toward managing productive capacity. Managing the excess is an explicit recognition that the farming community is not capable of a timely response to changes in supply and demand. Carefully crafted and implemented policies can provide a reasonable and sustainable level of farm prices and income, a higher level of stability, increased dependence on market revenues and less reliance on government payments. An appropriate cluster of policies could improve the position of American farmers and provide relief to farmers around the world.

A Policy Blueprint

The idea is to increase market prices to a reasonable and sustainable band and then manage the excess. Several combinations of policy tools show promise as paths to achieving this objective. This study identifies and analyzes one such combination. It includes: (1) acreage diversion through short-term acreage set-asides and longer-term acreage reserves; (2) a farmer-owned food security reserve; and (3) price supports through government commodity purchases.

No single policy instrument is powerful enough to address the complicated issues presented by the current crisis. The policy blueprint illustrated here consists of several instruments working together. This blueprint is not meant to exclude other policy mechanisms that may be able to achieve the goals of higher and stable prices. Rather, it serves as a starting point for evaluating the potential for alternative policy directions to bring about positive changes.

Diversion of Acreage

The diverted-acreage component includes a short-term annual set-aside program and a long-term land retirement program. Acreage retirement would reduce excess production and improve environmental performance. Farmers would be encouraged to retire environmentally sensitive cropland for ten or more years and institute conservation or restoration practices on the retired land. This policy is currently in operation as the Conservation Reserve Program (CRP).

Short-term set-asides would avoid the occurrence of very low prices by inducing farmers to idle a portion of their working cropland. As the average market price falls below a threshold, a set-aside rate is triggered. The set-aside rate is the portion of a producer's cropland that must be idled for that crop year. Participation of farmers in the set-aside program would be a prerequisite to their receipt of farm program benefits. It is expected farmers would idle some of their less productive cropland, thereby reducing the effectiveness of the set-aside program.

Food Stock Management

The second element of the blueprint is a food stock or inventory management reserve program. Stock reserves would reduce the frequency and size of price spikes for the major commodities. Historically, large price spikes pull idle or new cropland into production. As seen earlier, newly introduced acreage will tend to remain in production even as prices fall.

When prices are below the defined threshold level, producers would enroll a share of their production in an on-farm storage program. The farmer holds the commodity on reserve, isolating it from the market, in exchange for a storage payment from the government. The farmer maintains full ownership. When the price increases beyond a threshold price—called the "release price"—producers are given strong incentives to sell reserves until the price drops. Handled in this manner, the reserve becomes a genuine price support mechanism, effective according to its size. Because the size of most reserves would be limited, the reserve operates as a temporary weapon against depressed prices. The expected short duration of specific reserves works to limit the government's storage payments.

Price Supports

The third element—a price support mechanism—would trigger government purchases of commodities from the market when the price falls below the threshold. The price support comes into play only when set-asides "miss" a low price event. Since the purchased stocks would be owned by the government, they would be the first to return to the market when the price increases beyond the release price. The purchased stocks provide an added margin against price spikes.

While a non-recourse loan is technically operational in the current farm policy legislation, it does not function as a price floor because of the availability of the loan deficiency payment (LDP) and marketing loan gain (MLG) options. By eliminating the LDP and MLG options, this policy blueprint restores the function of the non-recourse loan rate as a price floor.

Previous Experience

These are not new policy tools. Each has played a role in US farm policy history, and none has an unspotted record. However, assessment and perception of their past performance has had more to do with implementation than anything else. The contention is that the illustrative combination of the above three instruments would provide a workable set of controls leading to higher prices and higher market returns for producers.

Results of Implementing the Blueprint

A simulation of the blueprint of policy instruments—acreage set-asides, stock/inventory management and price supports—was conducted using the POLYSYS model. The purpose was to estimate performance over the period from 2003 to 2011. Details of the assumptions incorporated in the illustrative simulation model are provided in Box 5. Obviously, the particular size, rates, prices and triggers associated with this approach (i.e., the selected assumptions according to Box 5) will directly affect the outcome. Thus, the results serve as a starting point for discus-

Box 5 — Details of the Policy Blueprint Simulated

Elimination of Government Payments

- No counter-cyclical payments (CCP)
- No direct payments (DP)
- No loan deficiency payments (LDP) or marketing loan gains (MLG)

Stock Management

- Storage payments: $0.30/bushel for corn, wheat, soybeans; $0.30/hundred-weight for rice
- Maximum stock size:
  - Corn: 3,000 million bushels; approximately 30% of total use
  - Wheat: 700 million bushels; approximately 30% of total use
  - Soybeans: 700 million bushels; approximately 25% of total use
  - Rice: 40 million hundred-weight; approximately 20% of total use
- On-farm storage
- Entry level price/loan rate:
  - Corn: $2.44/bushel
  - Wheat: $3.44/bushel
  - Soybeans: $5.50/bushel
  - Rice: $7.15/hundred-weight
- Release price:
  - Corn: $3.90/bushel
  - Wheat: $4.80/bushel
  - Soybeans: $8.00/bushel
  - Rice: $10.40/hundred-weight

Set-Aside / Short-Term Land Retirement Program

- Cropland set-aside, *not crop-specific* set-aside
- Set-aside trigger: for every crop with a previous year price below the established price threshold, a 5% set-aside is triggered. The set-aside is additive across crops. A set-aside is triggered by rice for not meeting the established threshold only if it is the only crop not meeting the threshold price.
- Hence, the maximum set-aside rate is 15%
  - Corn: $2.90/bushel
  - Wheat: $4.10/bushel
  - Soybeans: $6.60/bushel
  - Rice: $8.50/hundred-weight
- The corresponding slippage rates are:
  - 5% set-aside: 0.67
  - 10% set-aside: 0.585
  - 15% set-aside: 0.50

Price Support Mechanism

- A price support program, through government commodity purchases, is implemented only after the maximum level of the stock reserve has been achieved
- Prices are supported at the entry price for the stock reserve program, which is in fact a price floor:
  - Corn: $2.44/bushel
  - Wheat: $3.44/bushel
  - Soybeans: $5.50/bushel
  - Rice: $7.15/hundred-weight
- Government stocks are released before the reserve stocks are released and at price levels similar to those for exiting reserve stocks:
  - Corn: $3.90/bushel
  - Wheat: $4.80/bushel
  - Soybeans: $8.00/bushel
  - Rice: $10.40/hundred-weight

Table 4

POLYSYS Simulation Results Under the Farmer-Oriented Policy Blueprint and Percentage Changes from the Baseline Scenario for Planted Acreage, Price, Net Farm Income, and Government Payments, 2003-2011

	2003	2004	2005	2006	2007	2008	2009	2010	2011
Planted Acreage (mil. ac)									
Corn	76.2	76.3	77.6	77.2	78.3	79.2	80.2	81.1	82.0
% change from baseline	*-5%*	*-4%*	*-1%*	*-1%*	*0%*	*0%*	*2%*	*2%*	*5%*
Wheat	59.5	61.2	61.9	62.0	62.6	62.6	63.1	63.3	60.8
% change from baseline	*-5%*	*0%*	*1%*	*1%*	*2%*	*2%*	*3%*	*4%*	*-1%*
Soybeans	69.0	69.9	70.6	70.9	71.4	71.3	71.7	71.8	72.7
% change from baseline	*-5%*	*-5%*	*-5%*	*-6%*	*-6%*	*-5%*	*-6%*	*-5%*	*-6%*
Cotton	12.6	12.9	13.1	13.0	12.7	12.9	13.0	13.2	13.1
% change from baseline	*-14%*	*-13%*	*-12%*	*-12%*	*-12%*	*-11%*	*-10%*	*-9%*	*-9%*
Rice	2.9	3.0	3.1	3.1	3.1	3.0	3.0	3.0	3.0
% change from baseline	*-9%*	*-8%*	*-5%*	*-4%*	*-4%*	*-6%*	*-6%*	*-6%*	*-6%*
Season Average Price									
Corn ($/bu)	$2.59	$3.03	$2.94	$3.07	$3.03	$3.04	$3.07	$3.12	$3.13
% change from baseline	*25%*	*40%*	*39%*	*38%*	*35%*	*32%*	*31%*	*34%*	*37%*
Wheat ($/bu)	$3.63	$3.72	$3.70	$3.72	$3.70	$3.71	$3.73	$3.72	$3.93
% change from baseline	*28%*	*29%*	*31%*	*29%*	*27%*	*28%*	*28%*	*25%*	*34%*
Soybeans ($/bu)	$5.71	$6.14	$5.99	$6.19	$6.14	$6.31	$6.36	$6.41	$6.23
% change from baseline	*18%*	*23%*	*27%*	*26%*	*25%*	*23%*	*26%*	*25%*	*24%*
Cotton ($/lb)	$0.508	$0.542	$0.561	$0.550	$0.591	$0.616	$0.640	$0.640	$0.644
% change from baseline	*16%*	*22%*	*21%*	*19%*	*20%*	*17%*	*17%*	*14%*	*16%*
Rice ($/cwt)	$7.18	$7.20	$7.21	$7.22	$7.26	$7.33	$7.57	$7.60	$7.72
% change from baseline	*45%*	*41%*	*38%*	*35%*	*32%*	*28%*	*27%*	*24%*	*24%*
Net Farm Income (mil. $)	38,958	46,114	49,867	49,643	48,656	47,421	47,439	48,327	50,365
% change from baseline	*-16%*	*-9%*	*-4%*	*-1%*	*3%*	*1%*	*2%*	*4%*	*5%*
Gov. Payments (mil. $)	13,936	6,300	7,801	6,351	6,811	6,874	7,410	7,418	7,932
% change from baseline	*-35%*	*-71%*	*-66%*	*-70%*	*-64%*	*-64%*	*-61%*	*-58%*	*-57%*

sion. Table 4 presents the simulation results for crop acreage, prices, net farm income and government payments.

Total cropland planted to the eight major crops declines by six percent in the first year. The total planted acreage drops by an average of 14 million acres at the beginning of the period, and is 4.5 million acres lower than the baseline by 2011. The initial dramatic drop can be explained by the relatively large initial acreage set-aside established to raise prices. When prices increase, the acreage set-aside is reduced, as discussed above. The aggregate acreage set-aside ranges from 19 to 35 million acres over the period.[22]

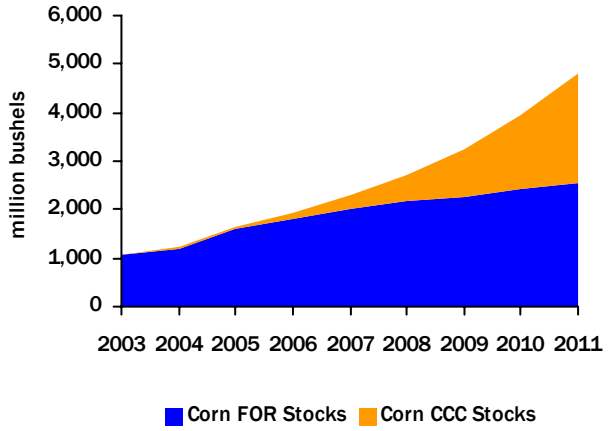
As expected, the largest relative acreage losses came from cotton and rice. Initially, cotton acreage was reduced by 2.1 million acres, or 14 percent. Thereafter, acreage slowly increased to a level nine percent below the baseline by 2010. Rice acreage initially declined by nine percent, settling in at six percent below the baseline by 2008. Corn and wheat acreage initially declined because of the large beginning set-asides, yet this acreage returned to levels above the baseline as relative prices caused some cotton and rice acreage to shift to corn and wheat.

The three-tiered combination of policy mechanisms—the set-asides, stock reserves

[22] The lack of a one-to-one correspondence between active cropland reductions and acreage set-asides is attributable to slippage and the setting aside of lands that would periodically remain idle anyway.

Figure 15

Corn Reserve (FOR) Stock and Government (CCC) Stock Levels, 2003-2011



By design, the farmer-owned stock reserve fills first. By the third year, the government stock purchase (CCC purchases from the market) program begins to accumulate stocks.

The farmer-owned stock reserve averages below the three billion bushel maximum. In actual implementation, measures (such as stock adjustments or caps) would be put in place to prevent excessive stock accumulations.

and price supports—resulted in average prices well above the low baseline levels. The price of corn increased on average by $0.70 to $0.80 per bushel, a 30 percent increase. The price of rice increased from 24 to 45 percent. Initial rice prices were about 45 percent higher than baseline levels and only about 24 percent higher than baseline prices by the end of the simulation period. Wheat prices were 25 to 31 percent higher; soybean, about 23 percent higher.

The general increase in prices leads to net farm income close to and above the baseline. After 2006, net farm income exceeds the baseline. The gap during the first years is largely the result of adjustments in the livestock sector to higher feed costs. In fact, the gap in the returns to crops is only $1.7 billion lower in 2003, and future estimates are consistently above the baseline level.

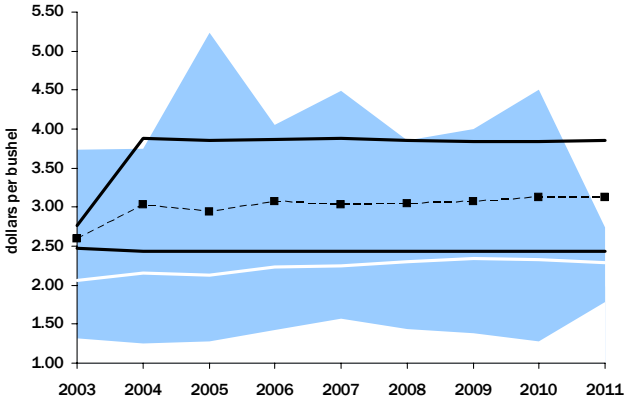
As expected, government payments were significantly below the baseline situation. The figure in table 4 shows the total cost of direct payments to farmers and the expenses associated with the reserve and price support programs. Total government outlays start just under $14 billion in 2003, when most of the reserves need to be filled, and then fluctuate between $6.3 and $7.9 billion, consistently lower than the estimated subsidies and other expenses under the 2002 Farm Bill. On average, the blueprint simulated results in huge government savings: $10 to $12 billion per year.

The results for corn stock reserves and government stock programs are shown in Figure 15. Notice that the average reserve level is less than the maximum three billion bushels. This is a strong indicator that the reserve keeps the price of corn from soaring to levels beyond the release price. In actual implementation, measures would be put in place to prevent excessive stock accumulations. Such measures could include adjustments in set-aside rates or caps on stock levels.

Figures 16 and 17 illustrate the impact of the blueprint on price and income variability. Under the baseline policies of the 2002 Farm Bill, the shaded area in Figure 16 outlines the points at which the price of corn will fall with 90 percent probability. The white line indicates the average price for the baseline scenario. The area between the black lines indicates, with the same 90 percent probability, the price of corn under the blueprint. The black broken line within the black price band represents the average annual price. It is clear

Figure 16

Corn Season Average Price Probabilities, Baseline Scenario Versus the Farmer-Oriented Policy Blueprint Scenario, 2003-2011



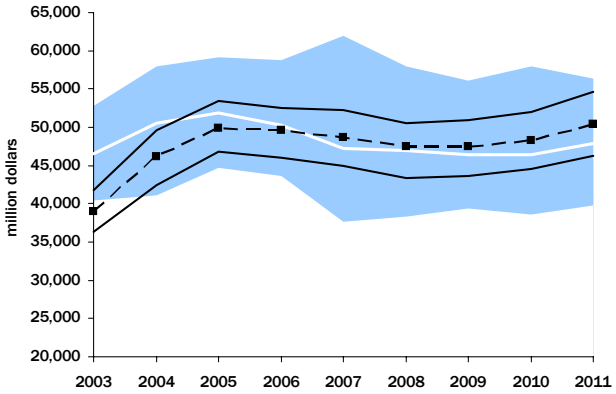
The shaded area indicates the baseline area in which the price of corn will fall with a 90 percent probability, and the baseline average corn price is the white line.

The solid black bands indicate the policy blueprint scenario area in which the price of corn will fall with a 90 percent probability, and the policy blueprint scenario average corn price is the dotted black line with squares.

From this graph, it is evident that the policy blueprint scenario truncates both the upper and lower tails of the price distribution compared to the baseline.

Figure 17

Net Farm Income Probabilities, Baseline Scenario Versus the Farmer-Oriented Policy Blueprint Scenario, 2003-2011



Again, the shaded area indicates the baseline area in which net farm income will fall with a 90 percent probability, and the baseline average is the white line.

The solid black bands indicate the policy blueprint scenario area in which net farm income will fall with a 90 percent probability, and the average under the policy blueprint scenario is the dotted black line with squares.

It is evident that the policy blueprint scenario requires farmers to give up the possibility of achieving very high income levels in exchange for eliminating the possibility of very low income levels.

that the blueprint works effectively at both ends: the upper and lower tails of the price distribution are flattened. The upper tail is truncated by the stock reserve programs; the lower tail, by the set-aside and price support programs.

Figure 17 applies the same type of analysis to net farm income. This blueprint demonstrates that the upper and lower tails of the distribution of net farm income have been truncated. Farmers will give up the possibility of achieving very high income levels in exchange for eliminating the possibility of very low income levels.

Table 5

POLYSYS Simulation Results Under the Farmer-Oriented Policy Blueprint Replacing Annual Acreage Set-Asides with Intermediate-Term Bioenergy-Dedicated Crops and Percentage Changes from the Baseline Scenario for Planted Acreage, Price, Net Farm Income, and Government Payments, 2003-2011

	2003	2004	2005	2006	2007	2008	2009	2010	2011
Planted Acreage (mil. ac)									
Corn	79.6	80.2	78.5	78.6	78.9	79.4	79.6	79.5	78.6
% change from baseline	*-1%*	*1%*	*0%*	*1%*	*1%*	*0%*	*2%*	*0%*	*0%*
Wheat	59.0	58.9	58.9	58.8	59.2	58.8	58.6	58.6	58.3
% change from baseline	*-6%*	*-4%*	*-4%*	*-4%*	*-3%*	*-4%*	*-4%*	*-4%*	*-5%*
Soybeans	70.1	68.9	71.0	70.9	71.1	70.6	71.0	70.8	72.6
% change from baseline	*-3%*	*-7%*	*-5%*	*-6%*	*-6%*	*-6%*	*-7%*	*-7%*	*-6%*
Cotton	13.0	13.1	12.8	12.7	12.2	12.4	12.4	12.6	12.2
% change from baseline	*-12%*	*-12%*	*-14%*	*-14%*	*-16%*	*-14%*	*-14%*	*-13%*	*-15%*
Rice	3.0	3.0	3.0	2.9	2.9	2.8	2.8	2.8	2.9
% change from baseline	*-7%*	*-8%*	*-8%*	*-11%*	*-11%*	*-13%*	*-12%*	*-12%*	*-8%*
Switchgrass	6.0	6.7	7.3	8.0	8.5	9.2	9.7	10.1	10.6
Season Average Price									
Corn ($/bu)	$2.52	$2.83	$2.85	$2.96	$3.00	$3.02	$3.08	$3.15	$3.14
% change from baseline	*22%*	*31%*	*34%*	*32%*	*33%*	*32%*	*31%*	*36%*	*37%*
Wheat ($/bu)	$3.63	$3.84	$3.86	$3.88	$3.88	$3.96	$4.05	$4.05	$4.17
% change from baseline	*28%*	*33%*	*36%*	*35%*	*33%*	*36%*	*38%*	*36%*	*42%*
Soybeans ($/bu)	$5.69	$6.15	$5.93	$6.13	$6.16	$6.43	$6.48	$6.54	$6.36
% change from baseline	*18%*	*24%*	*25%*	*25%*	*26%*	*25%*	*28%*	*28%*	*27%*
Cotton ($/lb)	$0.500	$0.530	$0.570	$0.580	$0.630	$0.650	$0.700	$0.700	$0.730
% change from baseline	*14%*	*19%*	*23%*	*25%*	*28%*	*24%*	*28%*	*25%*	*32%*
Rice ($/cwt)	$7.18	$7.19	$7.29	$7.39	$7.51	$7.84	$8.04	$8.30	$8.37
% change from baseline	*45%*	*40%*	*40%*	*39%*	*37%*	*37%*	*35%*	*35%*	*34%*
Net Farm Income (mil. $)	37,079	45,691	50,714	50,189	49,031	48,879	49,108	50,559	52,650
% change from baseline	*-20%*	*-10%*	*-2%*	*0%*	*4%*	*4%*	*6%*	*9%*	*10%*
Gov. Payments (mil. $)	14,238	7,172	8,153	6,566	6,670	6,464	6,214	6,107	5,750
% change from baseline	*-34%*	*-67%*	*-64%*	*-69%*	*-65%*	*-67%*	*-67%*	*-67%*	*-69%*

Bioenergy Crops to Manage Production

As previously mentioned, other policy devices might serve as substitutes for any one of the three instruments in the blueprint. For example, an intermediate-term program to divert acreage away from traditional tradable crops toward a non-food, non-tradable crop might serve to replace the set-aside device. Switchgrass immediately comes to mind. This is a perennial grass with high cellulose content, native to the United States. Relatively clean burning, it can be co-fired with coal to reduce the level of pollutants released into the atmosphere or it can be processed into ethanol for the production of fuels with consequent environmental benefits.

Practices associated with the production of switchgrass are no different from those used to produce alfalfa hay. In contrast to a land retirement program the cultivation of switchgrass is a farming activity.

Switchgrass is enjoying a great deal of attention these days. The US Department of Energy is currently conducting numerous pilot projects testing the application of switchgrass to a variety of uses. Studies by the US Departments of Agriculture and En-

ergy, the University of Tennessee, and the Oak Ridge National Laboratory conclude that a framework could be developed to encourage the conversion of acreage to the production of switchgrass for use by utilities and fuel manufacturers (De La Torre Ugarte and Walsh, 2003). This would give an obvious boost to farm income and would reduce reliance on subsidies. Incentives would be needed to encourage utilities to incorporate switchgrass into their energy generation, but the use of switchgrass would work to reduce reliance on undesirable fossil fuels.

According to the simulation, the annual set-aside component of the blueprint can be replaced realistically with a bioenergy production program using switchgrass for energy. An incentive would provide up to $25 per dry ton to be shared by pre-arrangement among agricultural producers, utilities, and ethanol producers. According to De La Torre Ugarte and Walsh, this monetary incentive would be sufficient for both producers and end users to develop a long-term sustainable bioenergy industry (De La Torre Ugarte and Walsh, 2002).

Table 5 shows that the overall levels of price increase from a switchgrass application are comparable to those generated by the set-aside program. To compensate for the loss of income in the first few years, some of the significant savings generated under the blueprint could be used. By the end of the period of analysis, the effect promises to be stunning: net farm income could experience growth of ten percent above the baseline situation, and government payments, including the $25 incentive, could be reduced by a remarkable 69 percent.

Thus the illustrative blueprint is not rigid in the assumption that annual set-asides are a necessary component. Similar levels of price and acreage impacts can be achieved with land retirement, and even better results with the cultivation of acreage in a way that does not pressure traditional crop acreage and prices. This approach is even more appealing when the alternative land use is in a non-food, non-traditional category. Diverted land can be brought back to major crops if unexpected weather jeopardizes the supply of food or if other conditions warrant. One other possibility is the dedication of traditional crops exclusively to energy production.

CRP Expansion Could Achieve Similar Impacts

The acreage planted to switchgrass in Table 5 is an approximation of the lower limit for an expansion of CRP acreage that could achieve similar price and income results. This is because acreage enrolled in the CRP is more likely to be environmentally sensitive than the switchgrass acreage, thus average productivity of CRP acreage would likely be lower. Further expansion of CRP acreage may provide additional environmental benefits.

Summary

In summary, the preliminary estimation of impacts associated with the blueprint suggests that this approach has potential for sizable benefits to producers. It would increase US prices substantially—by about one third, on average—without significantly reducing farm income, and at less than half the cost of current failing policies. From a purely humanitarian and societal view, its impact on US market prices would go a long way in sustaining the livelihoods of small, poor farmers worldwide.

CONCLUSIONS

It is time to recognize that low-price farm policies benefit agribusinesses, integrated livestock producers, and import customers but are disastrous for market incomes of crop farmers in the US and around the world.

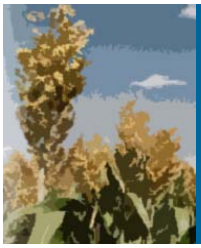
Higher prices alone will not guarantee sustainable livelihoods for the world's poorest farmers. A range of national and international policies affecting credit, land ownership, technology, transportation, tariff protection and access to markets is essential if agricultural production is to deliver a better future for farmers. However, as this study has shown, the US is exporting poverty with its products by its continuous pursuit of measures that depress prices throughout the world. At the same time, it is jeopardizing its own diversified family-farm base.

Policies that assure rock-bottom world prices for staple foods are guarantors of continued economic distress affecting billions of people. Since our policies determine the fate of farmers well beyond our borders, the welfare and future of those farmers must be part of America's goal in crafting new approaches.

Changing US policy alone cannot solve the global crisis in agriculture. Most, if not all, major exporting countries will have to recognize that they, too, bear a heavy responsibility to cooperate with the US in a concerted effort to improve farmer livelihoods. If other nations do not recognize this responsibility, it is doubtful that the necessary changes will ever be enacted.

The emphasis on WTO-style trade liberalization has discouraged the use of some of the policy mechanisms described in this study. That doors have been shut, however, is not a reason to continue moving blindly in the wrong direction. Those who write the rules governing domestic and international agriculture and trade policy must be put on notice that an end to today's agricultural world crisis is their most urgent mandate. The way out lies in a careful and balanced application of policy measures discarded in our headlong rush to an imagined "free market" in agriculture.

A future that brings prosperity to farmers in the US and in the developing world is not only possible, it is achievable. It can be ours at less cost and within a shorter time span than the hoped-for benefits of liberalized agricultural trade promised by the wealthy nations of the world to their developing country counterparts. The choice is ours to make: whose future will be protected, and what kind of global food system will be the outcome of US agricultural policy?



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APPENDIX A

Types of Farm Programs & Policy Instruments	Objective / Purpose	Program Examples	Description / How It Works
Income Support Programs			
Direct Payment Programs	Decoupled income support payments. Designed as a "transition" away from commodity payment programs.	Production Flexibility Contract (PFC or AMTA) Payments; Direct Payments	Lump-sum, decoupled payments to participants in previous farm programs; payments calculated on yield history and program-crop acreage.
Disaster / Emergency / Ad Hoc Payment Programs	Unscheduled assistance in response to weather or market or other unanticipated negative conditions.	Market Loss Assistance Payments; Crop Loss Assistance Payments; Livestock Disaster Payments	
Marketing Assistance Loans & LDPs	To provide producers with interim financing on their eligible production and prevent government acquisition of stocks.	Loan deficiency payments (LDPs); marketing loan gains	Producers receive a nonrecourse commodity loan which they may repay at less than principal plus interest when market prices are below the loan rate or they may choose to receive an LDP in lieu of securing a loan.
Deficiency / Target Price / Counter Cyclical Payment Programs	Crop-specific or decoupled income support payments paid when crop prices are below a target price; decline or disappear as market prices increase.	Deficiency payment program (also called target price program); counter cyclical payment program	Payments made based on the difference between an established target price and the higher of the commodity loan rate or the national average market price.
Price Support & Stabilization Programs			
Nonrecourse Loan Program	To provide a price floor at the loan rate, strengthen prices by withdrawal of commodities from the market, and even out marketings throughout the year.	Nonrecourse loan program	Provides commodity-secured loans to producers for a specified period of time, after which the producer may either repay the loan and accrued interest or transfer ownership of the commodity pledged as collateral to the CCC as full settlement of the loan.
Farmer-Owned Reserve (FOR) Program	To reduce price volatility and assure ample stocks in times of short supply through subsidized long-term storage of grain.	Farmer-Owned Reserve	Producers entered into a 3-year agreement receiving a nonrecourse commodity loan with the possibility of deferred interest and storage cost reimbursement in exchange for some restriction on the timing of grain removal from the reserve.
Marketing Orders	Specify minimum prices processors must pay for products within a specified area.	Federal milk marketing orders	
Production Management Programs			
Annual Acreage Reduction Programs	Raise crop prices by reducing production through annual land retirement.	Acreage reduction programs (ARPs); set-aside programs; paid land-diversion programs	Participating farmers idled a crop-specific, nationally set portion of their crop acreage base to be eligible for CCC loans and deficiency payments.
Multi-Year Acreage Reduction Programs	Long-term (10-15 year) retirement of environmentally sensitive cropland.	Conservation Reserve Program (CRP); Wetlands Reserve Program (WRP)	Landowner receives an annual rental payment to convert environmentally sensitive land to approved conserving uses for 10-15 years.
Marketing Quota or Allotment Programs	Raises crop prices by restricting supply below the market-clearing quantity.	Peanut marketing quota program; federal tobacco marketing quotas; sugar allotment program	Provide each processor or producer of a specified commodity a specific annual limit on sales, above which penalties would apply.
Demand Enhancement Programs			
Export Programs	Help US exporters meet competitors' prices in subsidized markets.	Export Credit Guarantee Program; Export Enhancement Program; P.L.480 (food aid)	Exporters receive subsidies based on the volume of exports to specifically targeted countries.
Domestic Programs	Subsidize or promote domestic purchase/use of commodities to increase domestic utilization and achieve social objectives.	Food Stamps; commodity distribution programs; commodity promotion programs	Distributes surplus government commodity stocks or subsidizes the purchase of qualifying commodities.
Import Restriction Programs			
Tariff & Quota Programs	Raise domestic crop prices by reducing the amount of lower priced imports allowed to enter the domestic market.	Non-tariff barriers; tariff-rate quotas (TRQ); fixed tariffs; bound tariffs; import quotas	Tariffs are surcharges applied to import commodities; quotas are import quantity restrictions; TRQs allow a predetermined quantity of imports to enter after payment of a relatively low tariff.
Conservation Programs			
Working Lands Programs	Improve the environmental performance of the agricultural sector.	Environmental Quality Incentives Program (EQIP); Conservation Security Program	Participating farmers receive cost-share or direct payments to address onsite and offsite problems with soil erosion, animal waste, and water quality.
Non-Working Lands Programs	Preserve and restore agricultural and environmental resources.	Farmland Protection Program; Conservation Reserve Program; Wetlands Reserve Program	Participating farmers receive cost-share or direct payments to remove environmentally sensitive lands from production or restore/preserve desirable habitats.
Other Government Programs			
Subsidized Federal Crop Insurance	Provides farmers with a means to manage the risk of crop losses resulting from natural disasters.	Catastrophic (CAT) insurance coverage; multi-peril crop insurance (MPCI); revenue insurance	Federal government subsidizes producer insurance premiums.
Government Sponsored Research	Increases agricultural productivity through technological developments or reduced costs.	Agricultural Research Service; Cooperative State Research, Education, and Extension Service (CSREES)	

APPENDIX B

Sources of the Current Agricultural Crisis: Views and Policy Prescriptions

Conventional Academic Economists

This group includes such writers as Bruce Gardner, David Orden, Kym Anderson, Vincent Smith and Joseph Glauber. They currently represent the most prevalent viewpoints in global policymaking arenas. They argue that agricultural support and protection programs are fatally defective. In a world without government policies that interfere with the mechanisms of the marketplace, the free market will attract resources to the most productive activities, and this will deliver net benefits to society. This group believes governments can best support "non-market" objectives through non-distorting methods like the decoupling of payments from the dynamics of the marketplace. They hold that US agricultural policy is moving in the right direction.

Free Marketers

This is the position taken by conservative "think-tanks" such as the Heritage Foundation and the Cato Institute. The group includes such writers as John Frydenlund, Brian Riedl, and Chris Edwards. John Frydenlund, in the Heritage Plan for Rural Prosperity, argued that competition in the free market would greatly benefit US farmers. “Re-established as a reliable supplier of low-cost products, the US would regain its preeminence in world agricultural exports. Farmers would be freed to do what they do best—out-produce the rest of the world—and this expansion of productive output would mean growth in farm income, even though some prices might fall temporarily" (Frydenlund, 1995). The free marketers believe that the only weaknesses in the marketplace today are caused by policy makers who cave in to special interests during a time of naturally depressed prices. "Farms that cannot adjust should exit the industry" (Edwards, 2001).

New Economy Theorists

This group observes that “consolidation and supply chains are changing the nature of farming,” where “supply chains arise through vertical integration, in which a single company owns each link of the supply chain" (Lamb, 2002). They argue that “keeping inefficient producers afloat leads to excess supplies, low prices, instability and future farm crises" (Lamb, 2002). Additionally, the "New Farm Economy" will supply safer food because “supply chains have greater incentives to enhance food safety" (Lamb, 2002).

The new economy theorists cite two problems that would arise if government subsidies were discontinued: a failure of financial banking throughout rural America, and too much political "rent seeking" power in the hands of farmers. They propose a rolling buyout procedure to cull from the market those farmers who rely too heavily on government assistance. “During periods of low farm income or low farm prices, farmers would have on option to enter a buyout agreement with the government or to remain in agriculture without government subsidies" (Lamb, 2002). The rolling buyout plan, they predict, will usher in vertical integration and consolidation in such magnitude that producers could gain market control, and overproduction would cease to be a problem. Lamb states that “the key to finally ending government interventions is to create a farm system in which the remaining farmers see greater returns from market transactions than from government farm programs" (Lamb, 2002).

Demise Theorists

The most extreme free-market prediction was made by Steven Blank, a University of California agricultural economist. He argues that since US farmers cannot compete in the production of bulk commodities with farmers in other parts of the world, who enjoy significantly lower land and labor costs, America will soon be out of the farming business altogether.

The rationale for this theory is that “advances in production technology created the need for global markets.” Because food has an “absolute limit to the volume that can be consumed over time,” demand is very inelastic and prices can decline drastically. This combination of expanded supply through technology and limited consumption created the current situation of falling prices and “commodities being produced in greater quantities than the global market can absorb” (Blank, 1998).

Tariff Abolitionists

This group argues that although price supports and direct subsidies do skew commodity prices downward, tariffs are the real price depressants. The perspective of many domestic crop production organizations is mirrored in the stance of the US House Agriculture Committee: “With foreign tariffs on agricultural goods more than five times higher than US tariffs, US farm policy helps level the playing field" (House Ag. Committee, 2002). The abolitionists view the tariffs of other nations as unfair competition; therefore, the US needs to support its farmers until such tariffs are eliminated. Because high tariffs are more damaging on less-developed nations than other forms of government interference, this group maintains that if you want to address low prices, tariffs should be the first issue to tackle (Tokarick, 2002).

Agrarians

Ironically, the Agrarians, the least represented group in global trade arenas, represent the viewpoint of the majority of small farmers throughout the world. They reject outright the idea that a global unrestricted marketplace will lead to net gains for the majority of the population. They favor a system of local economic self-determinism, where independent regions would negotiate a level at which they would partake in trade. This group encompasses such 20th century writers as J. Russell Smith, Liberty Hyde Bailey, Albert Howard, Wendell Berry, Wes Jackson, John Todd and Jane Jacobs.

Agrarians view the current low prices as the result of long-term development of technology, economies of scale and, most importantly, the steady eroding of economic boundaries at the local level. Although they may not be against measures on the larger economic scales that would increase the per-unit price of commodities, they believe the long-term solution will entail the emergence of community level self-imposed economic boundaries. Their solution involves a kind of secession: “not a secession of armed violence but a quiet secession by which people find the practical means and the strength of spirit to remove themselves from an economy that is exploiting them and destroying their homeland" (Berry, 2002).

Rent Seeking Theorists

Many economists have come to see political institutions as markets in themselves. They “recognize the non-separability of political and economic markets" (Rausser, 1982). From this perspective, agricultural policy can be seen as the interplay between demand (special interests groups such as the Farm Bureau, county agricultural agents and the USDA) and supply (elected officials). Elected officials “pursue policies until the marginal expected gain in votes equals the

marginal expected loss in votes." The result: political economic seeking transfers (PESTS) are created by "powerful interest groups seeking to benefit their own welfare to the detriment of society as a whole" (Rausser, 1982).

Although rent seeking theorists believe there may be market failures in agriculture which need to be addressed by intervention, they see the current situation as a failure of government to adequately correct market failures. Low prices and overproduction are the result of inherent systematic processes by which certain farmers and corporations are receiving unjust income transfers. The solution can be achieved through "institutional innovations in the same fashion that biological and physical scientists produce technological innovations" (Rausser, 1982).

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APPENDIX C

The POLYSYS Modeling Framework

The Policy Analysis System (POLYSYS) is an agricultural sector modeling system designed to simulate the effects of changes in government policies and other exogenous variables. POLYSYS is used to evaluate the impacts of those changes on key variables of the agricultural sector including: supply, domestic demand and exports, stocks, market prices, government expenditures, net farm income, and other performance variables. Each POLYSYS analysis is anchored to a baseline situation, from which changes are introduced and simulated. In this analysis, POLYSYS is anchored to a ten-year baseline of key agriculture sector variables according to the July 2002 FAPRI baseline projections (FAPRI, 2002).

The POLYSYS model includes eight major crops—corn, grain sorghum, oats, barley, wheat, soybeans, cotton, and rice—and six major livestock categories—beef, hogs, sheep, broilers, turkeys, and eggs. POLYSYS models agricultural supply using Agricultural Statistics Districts (ASD), as defined by the National Agricultural Statistics Service, as the basic unit of analysis. There are 305 ASDs in the continental US thus, the crop supply side of the modeling system is the result of aggregating impacts in 305 ASD regions. Crop demand is modeled nationally and includes demands for feed, food and industrial domestic uses, as well as demand for exports. The livestock sector is included mainly to provide feedback for changes occurring in the crop sector, such as feed prices, and to provide impacts on changes in feed demand and farm income.

The planting or production decision is modeled at the ASD level (305 regions in the US) and assumes that producers allocate their acreage to a crop mix that maximizes their expected net returns. The national crop supply, then, is the summation of regional production resulting from the optimal allocation of acreage as described above. The demand for agricultural commodities includes domestic (feed, food, industrial) and export demand. The demand for each crop and use is driven by a set of short and long term price elasticities, and solves simultaneously with the supply module to estimate the equilibrium supply, demand (domestic, export) and prices for all crops. An inventory identity equation ensures that supply and demand are balanced. Finally, changes in crop and livestock markets interact with equations representing income and government program relationships to estimate the changes in farm income and government program variables.

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