

**U.S. COTTON SUBSIDIES UNDER FIRE:  
WOULD SUBSIDY ELIMINATION REALLY HELP FARMERS WORLDWIDE?**

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**Abstract**

Direct U.S. agricultural commodity payments are projected to remain near the \$20 billion per year level over the next five years. Domestic subsidies have been under intense scrutiny worldwide. In particular, U.S. cotton subsidies have been widely criticized, culminating in a 2003 formal challenge to U.S. cotton policy under the World Trade Organization. Critics claim that U.S. commodity payments have caused overproduction which has caused domestic prices to plummet. Given the United States' role as a price leader, farmers worldwide have been hurt by low world prices. Critics further claim that eliminating U.S. direct payments would cause planted acreage to decline and would result in rising U.S. and world prices. This paper addresses these claims. Results of a simulation using the POLYSYS model of the U.S. agriculture sector are presented showing that eliminating all U.S. agricultural subsidies results in minor changes in aggregate crop acreages and prices in the U.S. by 2011. There may be more significant acreage adjustments for individual crops, in particular cotton and rice, but a policy of subsidy elimination would not result in appreciable or timely production responses in the aggregate, which is the appropriate level for evaluating such policy alternatives. These results are supported by a simulation conducted by IFPRI using the IMPACT model to estimate the worldwide impacts of removing all direct subsidies and protectionist measures in all developed countries. Results indicate that crop price increases by 2020 would be less than three percent under the subsidy elimination scenario. Of particular importance in evaluating policy alternatives is an explicit recognition of the nature and behavior of agricultural markets and the consideration of aggregate policy impacts.

**Introduction**

“American cotton subsidies are destroying livelihoods in Africa and other developing regions. By encouraging overproduction and export dumping, these subsidies are driving down world prices – now at their lowest levels since the Great Depression. While America’s cotton barons get rich on government transfers, African farmers suffer the consequences.” Thus read a passage on the cover of “Cultivating Poverty: The Impact of U.S. Cotton Subsidies on Africa,” an Oxfam Briefing Paper released in 2002 as a part of their Make Trade Fair campaign. Among other things, the paper argues that, “agricultural subsidies in the United States are at the heart of a deep crisis in world cotton markets.” The assertion is that with the withdrawal of U.S. cotton subsidies cotton prices would increase by 11 cents a pound. While U.S. cotton support programs have been under extreme scrutiny worldwide, they are only part of a larger criticism of all U.S. agricultural policies.

There are plenty of examples of U.S. farm policy critics, in particular criticisms of the U.S. cotton policy. In a front page article in the June 26, 2002 issue of the Wall Street Journal titled “How a Cotton Glut Bred by U.S. Harms Poor Farmers Abroad” journalists Roger Throw and Scott Kilman write, “armed with roughly \$3.4 billion in subsidy checks, U.S. farmers last year harvested a record crop of 9.74 billion pounds of cotton, aggravating a U.S. glut and pushing prices far below the break-even price of most growers around the world.” A December 30, 2003 New York Times editorial challenging U.S. agricultural programs and the “so-called King Cotton lobby” proclaims, “the idea that our agricultural protectionism harms poor nations is hardly a fanciful one held by aggrieved third world farmers. Just about any multilateral economic or development agency you can think of has issued reports railing against rich nations’ farm subsidies. The World Bank estimates that an end to trade-distorting farm subsidies and tariffs could expand global wealth by as much as a half-trillion dollars and lift 150 million people out of poverty by 2015.” A month earlier a New York Times article by Elizabeth Becker detailed subsidies received by American companies to buy U.S. cotton.

Cotton has become a focal point for international critics of U.S. farm programs because unlike corn or soybeans, cotton is grown commercially in a large number of nations, particularly less developed countries. A drop in the price of cotton in these countries has a proportionately larger impact on population than it does in developed countries

such as the U.S. which can afford to make direct income support payments to their cotton farmers. For instance, with the low cotton prices of 2002, Burkina Faso lost one percent of its GDP and 12 percent of its export earnings. Mali, another West African country, lost 1.7 percent of its GDP and 8 percent of its export earnings. These losses are greater than the U.S. aid received by these countries.

The lower prices are attributed particularly to U.S. subsidies which allow for the sale of U.S. cotton into the world market at below the cost of production, one of several definitions of “dumping”. Using data from the U.S. Department of Agriculture (USDA) and the Organization for Economic Cooperation and Development (OECD), a recent report from the Institute for Agriculture and Trade Policy (IATP) finds that the U.S. is one of the world’s leading sources of dumped agricultural commodities (Ritchie, et al., 2003). According to estimates of the full cost of production, the 2001-2002 average market price for cotton covered about 60 percent of the average 2001-2002 cost of production. Corn market price contributed about 75 percent of the total cost of producing a bushel of corn (Ritchie, et al., 2003).

September 27, 2002, Brazil and Australia began the process of challenging U.S. cotton subsidies in the WTO Dispute Settlement Body (DSB). “Brazil contends that the subsidies granted by the government to its cotton farmers, such as marketing loans, export credits, commodity certificates and direct payments, are depressing world prices and are injurious to Brazilian cotton growers. Brazil claims that the cotton subsidies are exempted from the normal immunity granted under the so-called “peace clause” of the WTO’s Agreement on Agriculture (AoA), which protects countries using subsidies which comply with the agreement from being challenged under other WTO agreements. This immunity, however, only applies as long as the level of domestic support for a commodity program remains at or below 1992 levels. Brazil maintains that since 1992, the US has doubled the level of support to its farmers through subsidy programs (Bridges, 2002).” The DSB decided to first determine whether or not the U.S. subsidies were in violation of the “peace clause” and then if the U.S. is found not to have complied with the clause, the substance of the complaint will be adjudicated (Bridges, 2003). The “peace clause” is scheduled to lapse in 2004. A preliminary hearing on Brazil’s complaint is expected early in 2004.

The basic line of reasoning followed by most U.S. farm policy critics begins with the assertion that U.S. commodity payments have caused overproduction. Overproduction in the U.S. has caused domestic prices to plummet. Given the leadership role of U.S. prices in world commodity markets, U.S. price impacts have been transmitted worldwide, hurting farmers globally. It then follows from this line of reasoning that eliminating U.S. subsidies would cause planted acreage to decline. The result would be an increase in U.S. and world prices, improving price and income prospects for farmers worldwide.

The purpose of this paper is to examine these arguments. This leads to several questions about the assumptions implicit in the critics’ rationale that must first be addressed. First, are the current problems—overproduction, low prices, large government payments, dumping—policy-induced? If the answer is yes, then why did the policies not result in the anticipated outcomes? Given the policies in place, what would be the impacts on U.S. agriculture of eliminating all direct government payments? This paper addresses the first two questions generally and presents results of a simulation of a subsidy elimination scenario using the POLYSYS model of the U.S. agriculture sector.

### **The Role of U.S. Policy in Price and Income Problems**

The first question to address is the role that U.S. policy has played in the current price and income problems facing U.S. and world agriculture. To a large extent, the answer appears to be that yes, changes in U.S. agricultural policies contributed significantly to the low price problem. But the cause versus effect role of subsidies is the important relationship to determine. True, prices were low and subsidies were high. But it is important to recognize that the price declines occurred when U.S. subsidies were at very low levels. U.S. commodity prices generally peaked just before full implementation of the 1996 Farm Bill. By the first full year of the Freedom to Farm legislation, prices had already begun their descent. Low prices then triggered larger and larger government payments in the form of emergency or disaster or ad hoc payments which were eventually automated in the 2002 Farm Bill. High levels of U.S. direct government payments were a response to, not a cause of, low prices. The subsidy policy did not trigger the major price declines, but rather broader changes in agricultural policies allowed prices to decline without providing a mechanism to buoy prices.

Historically, U.S. farm/commodity policy has included two major aspects: (1) a policy of plenty, where ongoing public expenditures support expansion of agricultural productive capacity through research, extension, and other means and (2) a policy to manage the productive capacity, where various mechanisms have been used to manage productive capacity and to compensate farmers for consumers' accrued benefits of productivity gains. The current crisis in agriculture is the result of deliberate changes in U.S. agricultural policies. The U.S. has continued to maintain a policy of expanding productive capacity, but it has eliminated protective devices to manage the use of that capacity.

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. The shift in government policy has placed reliance on the free market to determine commodity prices and to make direct payments to support farmer incomes during periods of low market prices. To absorb excess supplies, U.S. 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 U.S. agricultural sector would quickly adjust to the greater export volume and farmers would reap the benefits of the export boom.

The path of the agriculture sector observed in the wake of major shifts in policy directions has not been consistent with the expectations. The export boom that was expected as U.S. prices were allowed to fall has not materialized. As seen in figure 1, U.S. exports of major commodities have been flat for the last quarter century, despite deliberate policy shifts to allow prices to fall. U.S. cotton exports are more price responsive than other major commodities, but even they did not “boom” as price support levels were reduced. In fact, contrary to what is generally perceived, growth in domestic use has far exceeded export growth. Growth in domestic use has even exceeded population growth, primarily due to increases in industrial and other non-food demands. When export growth failed to materialize, proponents of freer markets argued that remaining vestiges of government intervention in agricultural markets were to blame. They argued that government price support and supply control programs still in place were hampering export market growth. The rationale behind this argument was that production in modern agriculture is much more responsive to price changes than it had been at the time that the government programs were instituted. It followed from this line of reasoning that removing government interventions in markets would allow producers to freely respond to market signals and make necessary production adjustments. This culminated in the 1996 Farm Bill which removed the set-aside mechanism to control supply and eliminated the price support mechanism of the non-recourse loan program.

Termination of the set-aside program freed up acreage that had previously been withheld from the market. The response in the first year after removal of set-asides was a six percent (over 15 million acres) increase in cropland planted to major crops. Inventory adjustments and yield pressures staved off massive price declines for a period then prices began to plummet in 1998. As prices declined and farm income was pressured, government subsidies increased to compensate. An important observation from this experience is to note the price responsiveness of producer acreage decisions. Figure 2 shows indexed planted acreage for the eight major crops (corn, wheat, soybeans, cotton, barley, oats, grain sorghum, and rice) and the indexed market price as well as the indexed market price adjusted for all direct government payments (e.g., AMTA payments, LDPs, emergency payments, direct payments, and counter-cyclical payments). In the figure, prices and acreage are indexed to their 1996 level. Compared to the 1996 level, market prices declined by about 30 percent between 1996 and 1998 and remained about 36 percent lower through 2001. Even when all government payment benefits are added to the market price, the “adjusted” price was still nearly 20 percent lower between 1998 and 2001. Prices then began to recover in 2002 and 2003. But through 2002 (the last year for which government payment data are available for the calculations), crop prices still remain about 20 percent below the 1996 level. Despite large (36 percent unadjusted or 20 percent adjusted) price declines, aggregate acreage changed very little over the period, generally around five percent. Even as market prices have increased nearly 20 percentage points between 2001 and 2003, planted acreage responded by less than one percent.

This provides evidence of the lack of responsiveness in agricultural markets on both the supply side and the demand side. Despite dramatic and sustained price declines, producers responded very little in aggregate planted acreage. Further, price recovery also failed to induce a significant acreage response. On the demand side, the large price declines failed to generate additional export demand. And increases in domestic demand were more attributable to

population growth and new demands in the industrial sector than attributable to additional consumption induced by low prices. The fundamental price and income problems in agriculture are the result of a lack of self-correction in agricultural markets. Regardless of the cause of declining revenue, total crop output declines very little in response. Regardless of the trigger for declining prices, aggregate demands fail to respond proportionately.

### **Impacts of Eliminating U.S. Subsidies**

Differing perspectives abound as to what has caused low prices and high subsidies and what could or should be done to restore prosperity to the farming sector in the U.S. and elsewhere. As previously discussed, many critics of U.S. agricultural subsidies hold the view 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 caused low prices. It follows from this cause-effect assumption that eliminating domestic subsidies would cause acreage to decline and prices to rise. If subsidies *cause* low prices, then eliminating subsidies should increase prices.

Simulations were conducted using the POLYSYS model to estimate the agriculture sector impacts of eliminating U.S. agricultural direct subsidies (Ray, et al., 2003). The POLYSYS simulations are anchored to a baseline of projections for agriculture sector variables, in this case, the 2003 U.S. Baseline for the agricultural sector provided by the Food and Agricultural Policy Research Institute (FAPRI, 2003). Thus, the baseline for the analysis is a continuation of policies set in place in the 2002 Farm Bill. Simulation estimates represent changes from the baseline, or status quo, level of projections. The scenario simulated assumes the removal of U.S. 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 other than major crops (e.g., dairy, sugar, wool and mohair, honey, minor oilseeds) remain and are paid at the levels set by the 2002 Farm Bill.

The subsidy elimination scenario analyzed shows differing impacts on two groups of crops. Acreage for rice and cotton declines (figure 3). Cotton acreage declines significantly in the first simulation year (-12%) but gains acreage as the crop mix begins to stabilize. Averaged over the simulation period, 2003 to 2011, cotton acreage averages less than one million acres below the baseline acreage level. Rice acreage declines also, but to a lesser extent than cotton. Rice acres fall significantly in the first simulation year, but average rice acreage over the 2003 to 2011 period is below the baseline level by less than 233,000 acres. Consequently, market prices for cotton and rice rise (figure 4). Compared to the baseline scenario, cotton prices average \$0.05 per pound higher in the subsidy elimination scenario than they are projected in the baseline. The average price increase for rice over the period is \$0.70 per hundredweight, or about 12 percent higher than in the baseline.

Another group of crops—corn, wheat, and soybeans—are affected very differently. Acreage of these major crops actually increases slightly as they are planted to the 1.2 million acres of lost cotton and rice (figure 5). Aggregate acreage of major crops changes very little despite a reduction of \$13 to \$18 billion per year in government payments. Acreage of corn, wheat, and soybeans all change by less than one percent compared to the baseline level. Corn prices averages less than \$0.05 per bushel below the baseline level (figure 6). Wheat prices are less than \$0.02 below the baseline level while soybean prices remain virtually unchanged.

While it is not politically feasible that all government payments would be eliminated in one year, the simulation demonstrates that the removal of government supports will result in an unambiguous and dramatic reduction in net farm income. The design of the scenario calls for reductions in government payments between \$13 billion and \$18 billion annually over the 2003 to 2011 period. The modest price and acreage changes, assuming trend yields, are far from sufficient to offset the reductions in government support. The result is that net farm income falls between \$11 and \$15 billion over the period, a reduction of between 25 and 30 percent.

Results of the U.S. simulation are further supported by an analysis conducted by the International Food Policy Research Institute (IFPRI). IFPRI used the international IMPACT model to examine the effects of various trade liberalization scenarios on world commodity prices (IFPRI, 2003). IFPRI looked at the country-level and regional effects of trade policy scenarios on 16 commodities. One scenario required all 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 U.S. subsidy programs. The price impacts (measured as percentage changes from the baseline level) by the year 2020 are presented in figure 7. Among cereals, world corn prices experienced the largest gain, increasing less than three percent by 2020. While world corn prices increase less than three percent, the U.S. corn price actually declines by 9.5 percent by 2020. The world price for rice and wheat and other coarse grains is smaller still. World rice prices increased by 1.6 percent by 2020 while the U.S. rice price declined by 4.2 percent compared to the baseline. World wheat price increased by 0.8 percent by 2020 while the price of other coarse grains increased by 1.1 percent.

### **Summary and Discussion**

U.S. agricultural subsidy policies, especially cotton subsidies, have been contentious in global trade discussions. But are agricultural subsidies the problem? This paper argues that the causal relationship between subsidies and low prices has been misrepresented by many claiming that an end to U.S. (and developed country) subsidies will bring about renewed prosperity for farmers worldwide, especially Southern hemisphere farmers in developing countries. Changes in U.S. agricultural policy did allow market prices to free-fall, but the relevant policy change was the elimination of policy mechanisms to moderate supply and support prices. Higher and higher government direct payments to farmers were then triggered by sustained low prices, not the reverse. The U.S. agriculture sector responds little to changes in price, both on the supply side and the demand side. It follows, then, that eliminating U.S. agricultural subsidies would not result in a significant production or price response. This hypothesis is confirmed in a simulation of a scenario in which all U.S. direct government payments to major crops are eliminated. The POLYSYS simulation estimates that elimination of U.S. subsidies results in minor changes in aggregate acreages of major crops and, therefore, prices. Changes in prices are not sufficient to offset the reduction in government payments resulting in a 25 percent decline in net farm income. The subsidy elimination scenario results in acreage allocation adjustments among crops, most notably, a reduction in cotton and rice acreage and shifting to corn, soybean and wheat production in those regions. In the simulation, subsidy elimination results in cotton prices that are \$0.05 per pound higher than the baseline level and rice prices about \$0.70 per hundredweight higher than the baseline level. Corn and wheat prices are slightly lower than baseline levels while soybean prices remain virtually unchanged.

There are several key considerations that must be acknowledged when analyzing policy alternatives. First, any analysis of agricultural sector policies must account for the unique characteristics and behaviors in agricultural markets, recognizing that market responses in agriculture—for good reasons—are different from market responses in most other product markets. It is also important to consider aggregate policy impacts. Isolating individual crops and extrapolating responses across the agriculture sector does not adequately account for the high degree of cropland substitution in agriculture and the tendency for cropland to remain in production. The U.S. has a long history of comprehensive farm policies that address major crops simultaneously and policy analysis must also consider comprehensive policy change impacts. If changes in U.S. policy have brought about a situation in which prices are free to fall or rise without limits and no mechanisms are in place to temper price changes and large government payments are required to offset unsustainable market incomes and the payments—in and of themselves—are neither the cause nor is removal the solution, then perhaps alternative policy directions should be explored for U.S. agricultural policy.

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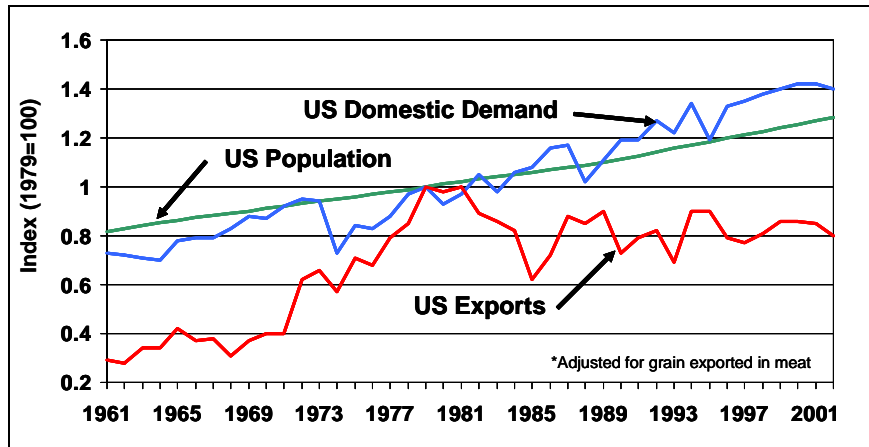


Figure 1. Indexed U.S. Population, U.S. Demand for 8 Major Crops, and U.S. Exports of 8 Major Crops (1979=100).

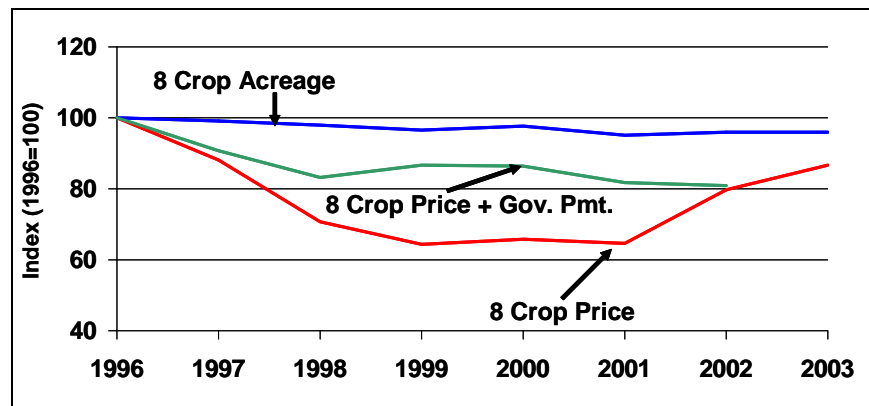


Figure 2. Indexed U.S. Acreage Planted to the 8 Major Crops, 8-Crop Market Price, and 8-Crop Market Price Adjusted for Direct Government Payments (1996=100).

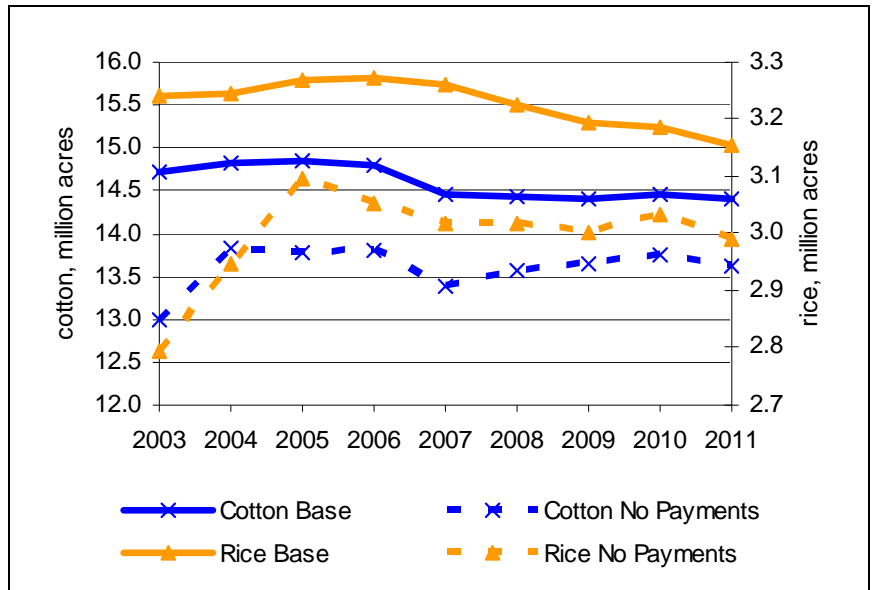


Figure 3. Simulated Cotton and Rice Planted Acreage Under the Baseline and Subsidy Elimination Scenarios, 2003-2011.

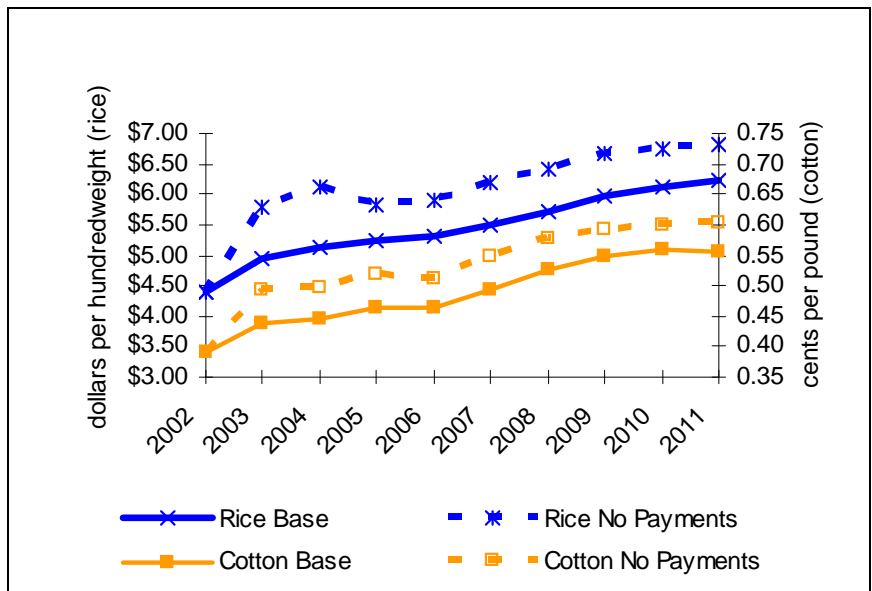


Figure 4. Simulated Cotton and Rice Prices Under the Baseline and Subsidy Elimination Scenarios, 2003-2011.

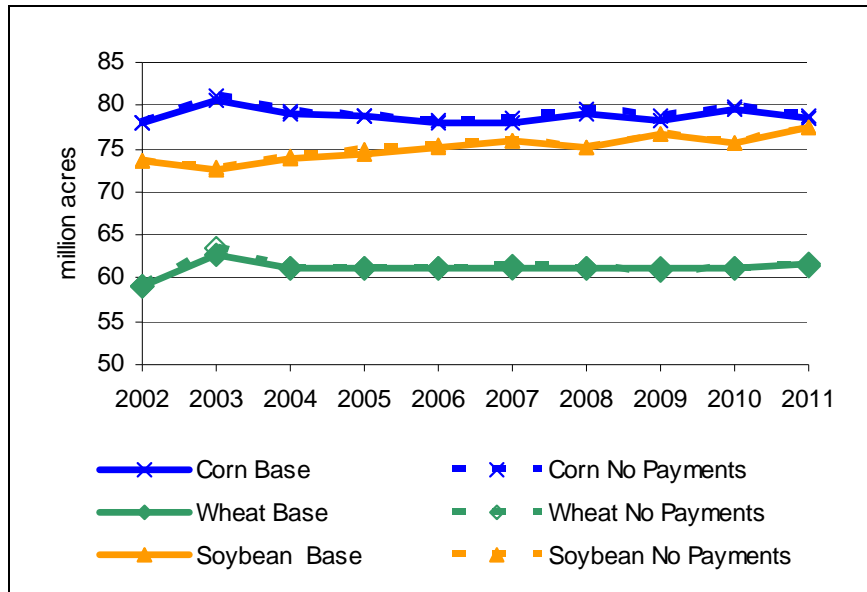


Figure 5. Simulated Corn, Soybean, and Wheat Planted Acreage Under the Baseline and Subsidy Elimination Scenarios, 2003-2011.

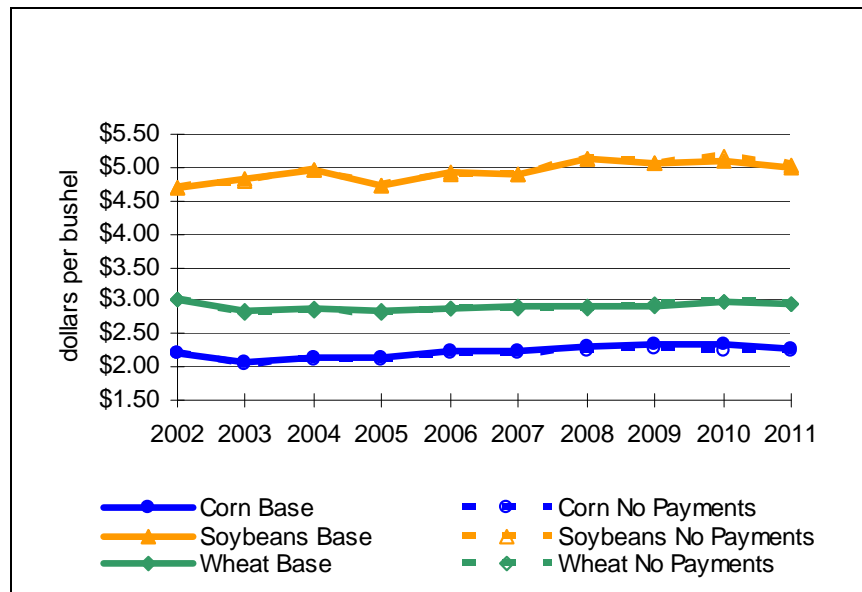


Figure 6. Simulated Corn, Soybean, and Wheat Prices Under the Baseline and Subsidy Elimination Scenarios, 2003-2011.

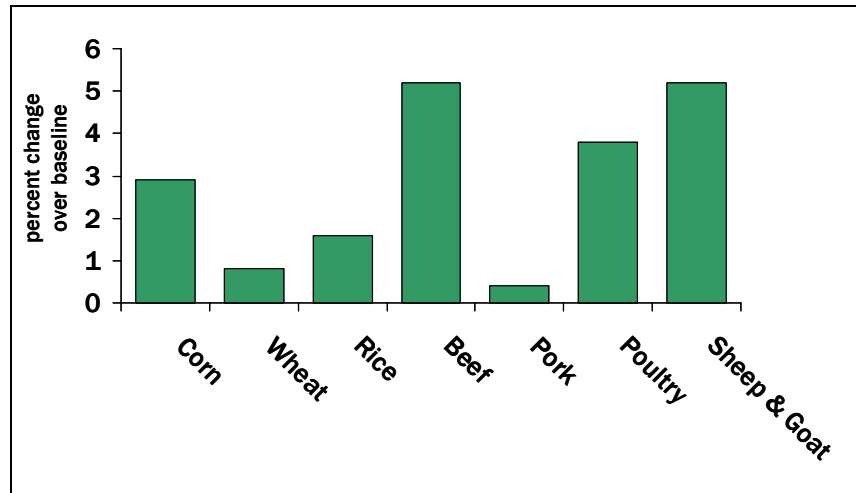


Figure 7. IFPRI Estimates of Percentage Price Changes from the Baseline Under the Trade Liberalization Scenario, 2020.