



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Determinants of Farm Size and Structure

Proceedings of the program sponsored by the NC-181 Committee on Determinants of Farm Size and Structure in North Central Areas of the United States, held January 7, 8, 9, and 10, 1989, in Tucson, Arizona.

Rasmussen/Agricultural Structure and the Well Being of Society Revisited

Stanton/Changes in Farm Size and Structure in American Agriculture in the Twentieth Century

Hallam/Empirical Studies of Size and Structure in Agricultural

Helmers, El-Osta and Azzam/Economies of Size in Multi-Output Farms: A Mixed Integer Programming Approach

Sonka and Khoju/Empirical Studies of Firm Viability, Profitability, and Growth

Johnson/Firm Level Agricultural Data Collected and Managed by the Federal Government

Casler/Use of State Farm Record Data for Studying Determinants of Farm Size

Batte and Schnitkey/Emerging Technologies and Their Impact on American Agriculture: Information Technologies

Meyers and Westhoff/Commodity Program Reform and the Structure of U.S. Agriculture

Janssen and Johnson/Farmland Leasing and Land Tenure in South Dakota and Nebraska - Empirical Findings Emphasizing Current Situation and Changes between 1951-1986

Johnson and Grabanski/Technology Adoption and Farm Size

Casler/Managerial Factors that Affect New York Dairy Farm Profitability

Fox and Dickson/Farm Growth in the Ontario Dairy Industry: A Skeptical Look at Gibrat's Law

Robison/Distinctiveness in the Design and Choice of Durable Assets under Risk

Iowa State University
Ames, Iowa 50011
December 1989

COMMODITY PROGRAM REFORM AND THE STRUCTURE OF U.S. AGRICULTURE*

William H. Meyers and Patrick C. Westhoff**

Introduction

As a consequence of budget pressure at home and GATT multilateral trade negotiations abroad, there has been much debate in recent years about radical reform or elimination of commodity programs. This immediately raises the question of how current programs have influenced the structure of agriculture in the United States and, conversely, how their removal would alter this structure.

Since this policy reform debate has largely focused on commodity programs, this paper will not deal with the broader policy environment which includes tax, credit, research and other policies affecting agriculture. This paper begins by reviewing hypotheses on how commodity program functions are likely to affect the structure of agriculture. Then, prospects for the 1990s under the extension of current policies are reviewed based on recent FAPRI projections. Finally, comparisons of projection scenarios under two policy reform options are used to evaluate the potential impacts of policy reform on the structure of agriculture.

Program Functions That Affect Agriculture

Current commodity programs are a package of policy instruments that include income support, price stabilization, commodity credit, and supply management. Recently, environmental policy instruments have been included such as cross compliance and the conservation reserve programs; but these instruments are more likely than the others to be excluded from deliberations on reducing support levels in the context of either unilateral or multilateral policy reform. Export enhancement has also become a very significant part of government program costs, but it can be considered a targeted program on trade which has limited impact on the farm structure question.

It would be difficult if not impossible to empirically measure the separate effects of the different instruments in the package of commodity programs. A farmer participating in the wheat program, for example, receives a deficiency payment and becomes eligible for

*Paper presented at the NC-181 Regional Research Meeting on the Structure of Agriculture, Tucson, Arizona, January 7-12, 1989.

**Authors are professor of economics and research associate, the Center for Agricultural and Rural Development, Iowa State University, Ames.

loans and the farmer-owned reserve in exchange for setting aside a certain proportion of base acres. There is certainly some income support included in the payment, and some subsidies are imbedded in the loan programs. But program benefits are also, in part, payment for removing land from production. In terms of looking at structural impacts, however, it is useful to attempt to separate the differing impacts of these program functions or instruments on various factors involved in the structure of agriculture. Although this cannot be done quantitatively, it can be done qualitatively through the application of economic theory, available empirical evidence, and reasoned judgment. Given the subjectivity of these evaluations, analysts will differ in their conclusions about these impacts.

The degree of uncertainty about the direction of these impacts is indicated by the fact that six conference participants who indicated their own hypotheses about these effects often had widely differing views. The responses of these six participants were combined with those recorded by the author before the conference. The results (Table 1) indicate a fair degree of consensus on the impacts of income support and the net impacts of commodity programs but a lot of uncertainty about the impacts of price stabilization, commodity loans, and supply management programs. The weakness of this limited consensus, however, is indicated by the fact that more than half of the cases had only four of the seven respondents in agreement. Admittedly, some of the uncertainty was due to the vagueness of some of the categories defined by the author.

Insofar as consensus emerged, it supported the hypothesis that the current package of commodity programs has had the effect of increasing the number of farms, reducing farm size, and increasing specialization, the rate of adopting new technology, the barriers to exit and entry, the land ownership by operators and family income of farmers. The same pattern of expected effects emerges for the income support instruments in the commodity programs. Moreover, the degree of agreement about the income support effects was higher. Although the income support aspects of the programs seem to dominate the overall effects, where there was consensus about the impacts of other program instruments, it was usually in the same direction as the income support effect. The exception was the hypothesis that price stabilization programs--probably because of risk reducing effects--would have the effect of increasing the farm size.

Overall, these indicators are not very conclusive. It will be difficult to draw conclusions about the effects of policy reform on farm structure if we cannot resolve differences among analysts about the effects of current programs on the structural indicators.

Prospects for the 1990s Under Current Programs

Before evaluating the impacts of policy reform, it is useful to evaluate the prospects for agriculture if current programs are continued. This is the baseline to which policy changes can be compared.

The FAPRI projections for U.S. agriculture (FAPRI, March 1989) are based on moderate growth rates for real GDP in the U.S. and around the world, the continued depreciation of the U.S. dollar relative to most developed country currencies, and the continuation of current commodity programs with only slight modifications. In particular, it is assumed that the current programs will remain in effect until the Food Security Act of 1985 expires in 1990. The reduced acreage set aside rates for feed grains and wheat brought about by the 1988 drought are assumed to continue. The conservation reserve is assumed to reach the 40-million-acre minimum specified by the law.

For the years beyond the current legislation it is assumed that target prices will be held constant at the 1990 level and that loan rates and dairy support prices will continue to be adjusted based on formulas in the current legislation. Other countries are also assumed to continue current agricultural policies and no adjustment is made for policy changes that may occur as result of the current GATT negotiations.

Prices of grains and soybeans are expected to return quickly to pre-drought levels, assuming normal weather and no unexpected demand shocks in 1989 and 1990. Slight increases in nominal prices are projected in the subsequent years but not enough to keep real commodity prices from continuing their long term decline (Figure 1). Surplus capacity is expected to be a more serious problem for cotton and rice as these prices remain close to loan rates, and direct payment rates and program participation rates remain high.

A measure of the well-being of crop producers can be the net returns to participants and non-participants in commodity programs. In the case of wheat, the net returns to participants remain relatively stable in the \$75 to \$80 range for the next four years, then decline as costs continue to increase but target prices remain constant (Figure 2). The gap between participant and non-participant net returns, which was \$20 to \$30 per acre in the 1985 to 1987 period, returns to about \$20 per acre after the impacts of the drought wear off in 1990 but declines to about an average of \$10 per acre in the second half of the decade.

Corn net returns, after recovering from the drought impact, do not return to the pre-drought levels but gradually decline over the projection period (Figure 3). The gap between participant and non-participant returns, which averaged \$80 per acre from 1985 to 1987, remains in the \$40 to \$50 range over the projection period. For both wheat and corn, as with sorghum and barley, the participation rates decline as the gap narrows between participant and non-participant returns.

The total acreage planted to major program crops declined about 40 million acres as a result of acreage reduction programs over the past three years (Figure 4). As the acreage reduction program is cut back in response to the drought, planted acreage is expected to increase by more than 20 million acres in 1989 and to remain fairly stable at that level for the next few years. In the latter half of the decade, growth in area continues as export-led price increases bring more land into production.

Idle land, which reached nearly 80 million acres in 1988, is reduced by 24 million acres in 1989. It remains at about 60 million acres for the next few years. The significant change in idle acres is the shift from annual acreage reduction programs, which accounted for two-thirds of the idle acreage in 1988-89, to the long term conservation reserve, which accounts for two-thirds of the idle acreage from 1990 onward. The expectation that a larger share of land idled will be in the long term conservation program indicates that market prices could be more volatile in response to weather variability in the U.S. and around the world, given that carryover stocks are also substantially lower than they have been at any time since 1980.

The net farm income before inventory change is a relatively stable indicator of income, in that it avoids sometimes wide fluctuations in the values of inventories. By this measure, net farm income reached the record levels of \$46 to \$47 billion in 1987 and 1988 (Figure 5). The projections are for gradually declining net farm income levels, as increases in production expenses are expected to exceed the growth in cash receipts from market prices. The decline in government payments, from the peak of nearly \$17 billion in 1987 to less than \$9 billion in 1993, also contributes to this decline in income. This decline in payments is associated with falling target prices until 1990 and with lower rates of participation in commodity programs as market prices increase in the later years.

In general, the outlook is for a farm economy which is not as robust in terms of cash flow as it has been the last two years but it is certainly substantially more healthy than was the case during the early 1980s. Having been helped over the large surplus capacity period by large acreage reduction programs and a major drought, farmers are expected to receive more of their income from the market and less from the government, leading to government program costs in the range of \$10 billion or less rather than the \$20 billion or more that have been common in recent years (Figure 6).

Impact of Eliminating Commodity Programs

In a previous report (CARD, December 1988) FAPRI models were used to evaluate the impacts of unilateral elimination of U.S. commodity programs or the elimination of these programs in the context of a multilateral trade liberalization and policy reform among the major trading countries. The results provide insights into how current programs influence commodity prices, land use, farm income, and government costs. These results are briefly summarized here in order to provide insights into possible effects of such policy reform on farm structure.

The results that are reported are based on changes from a pre-drought scenario. The effects of the 1988 drought on these results would be expected to lead to smaller short run impacts on prices, planted acreage, farm income, and government costs. The long run effects should be very similar to those reported in this section. In both scenarios the current programs are phased out over the 1989 to 1991 period and the conservation reserve program is continued.

Unilateral elimination of U.S. commodity programs results in a rapid increase in acreage planted to program crops as acreage reduction programs are eliminated (Figure 7). This results in a drop in crop prices during the three-year phase-in period (Figure 9). The lower crop prices lead to an expansion in livestock production and lower livestock prices, which reach their low points two years later than that in the crop sector (Figure 10). The impacts are smaller in the later years, since the baseline idled acreage was smaller in the later years. The total area planted and idled declines as total land use falls in response to lower returns to crop production (Figure 8).

Net farm income, assuming no compensation payments, drops by ever larger amounts until the maximum drop of about \$15 billion in 1992 (Figure 11). Thereafter, the net farm income loss diminishes to about \$10 billion annually. Government costs also drop substantially, but the cost of continuing the conservation reserve program keeps it at slightly over \$2 billion annually. The cost savings reach a maximum of nearly \$8 billion in fiscal year 1993 (Figure 12) but average over \$5 billion annually for the 1992 to 1996 period. Thus, the cost savings under a unilateral approach would only be sufficient to compensate for approximately one-half of the loss in farm income.

The multilateral scenario for eliminating government support programs in the United States and abroad provides much different results. The larger reduction in prices to producers and consumers in such areas as the European Community and Japan result in substantial increases in demand for U.S. commodity exports. This more than offsets the increase in available crop acreage in the U.S. and leads to higher rather than lower prices for U.S. crops and livestock. The exception to this pattern is soybeans where prices decline since current policies abroad tend to be favorable toward the U.S. soybean industry.

The higher market prices lead to planted acreage levels which are higher than those of the unilateral scenario. The effects of higher prices and greater production lead to smaller short run declines in net farm income. In fact, near the end of the adjustment period, net farm income levels are approximately the same as those in the baseline. Costs decline even more rapidly under the multilateral scenario, since market prices are higher. This leads to a maximum cost savings of about \$9 billion in the fiscal year 1991 and an average of about \$6 billion annually for the period 1992 to 1996. Thus, in the multilateral case, there is more than ample savings generated by the elimination of programs to compensate producers for the loss of income during the transition period.

Implications for Farm Structure

Under the unilateral commodity program phase out, there would be severe price declines and even more severe declines in net returns since deficiency payments would also be lost. More price risk would also be expected, given the lower level of commodity stocks and the lack of a loan program or price floor. Land prices and asset values in general would be expected to decline substantially in consort with the decline in the expected net returns. The estimated impacts also suggest that even in the long run, the government cost savings are smaller than the loss in net farm income.

Based on the weak consensus reported in Table 1 of this paper, program elimination without compensation would lead to fewer and larger farms, greater diversification, slower adoption of new technology, reduced barriers to entry, reduced land ownership by operators, and, of course, lower income. Another way to look at the potential impacts of the income losses is to ask which farms are most heavily dependent upon government payments.

The 1987 data on the distribution of government payments by value of sales class (Table 2) indicate that the farms most heavily dependent on government payments relative to farm income and total income are those in the \$40,000 to \$99,999 and \$100,000 to \$499,999 value of sales classes. The largest farms (by value of sales) either are not producing commodities that are affected by the government programs or have reached the payment limitation constraint. The very small farms earn most of their income off the farm and depend on government payments for only eight percent of their total income. Of course, these averages obscure some very large cotton and rice farmers who are highly dependent on payments for their income and some very small, poor farmers who do not have a large off-farm income. Still, the evidence suggests that the effect of removing commodity programs without compensation would be most severe on the \$40,000 to \$99,999 sales class.

In the context of a multilateral phase out of government support programs in the U.S. and abroad, there would be more than ample government cost savings to institute compensation payments to offset the loss of incomes from the programs. Under the current U.S. GATT proposal such payments would have to be designed to be "decoupled" (neutral with respect to production, consumption, and trade). Such compensation would not need to be distributed in the same way that current program benefits are distributed. Targeting could be employed to achieve particular structural or rural development targets, provided that Congress would be able to find a targeting scheme that would be sufficiently broad based to achieve majority support. Even the general idea of decoupled programs has not yet been broadly accepted in Congress.

In an environment without commodity program bases and supply management constraints, the possibilities for increased diversification could offset somewhat the increased risk associated with the removal of commodity programs. Asset value declines, while creating wealth losses and financial problems for current producers, would, of course, reduce barriers to entry for new farmers. These are among the reasons why it is difficult for analysts to reach a consensus about the effect of current programs on farm structure. Unless the research community can assemble more consistent and conclusive results on these effects, it is difficult to draw strong conclusions about the effect of existing programs or their elimination on the structure of agriculture.

Table 1. Hypotheses on the Effect of Commodity Programs on Farm Structure¹

Effect On / Of:	Program Function				
	Income Support	Price Stabilization	Commodity Loans	Supply Mgt.	Net
Number of Farms	+	+	?	?	+
Farm Size	-	+	?	-	-
Specialization	+	+	+	?	+
Adoption of New Technology	+	+	+	?	+
Barriers to Entry & Exit	+	?	?	+	+
Land Ownership by Operator	+	?	?	?	+
Family Income	+	?	+	+	+

¹Where 4 or more of the seven respondents agree, a "+" or "-" is indicated, otherwise "?" is indicated.

+ means higher or more
 - means lower or less
 ? means uncertain

Table 2. Distribution of farms, direct government payments, cash sales, net farm income, and off-income by value of sales class, 1987

Sales Class	\$500,000 and over	\$100,000 to 499,999	\$40,000 to 99,000	Less than \$40,000	All Farms
Number of Farms	29,000	272,000	286,000	1,589,000	2,176,000
Percent of Farms (%)	1.3	12.5	13.2	73.0	100.0
Percent of Government Payments (%)	7.9	47.6	25.5	19.0	100.0
Percent of Cash Receipts (%)	37.5	39.9	13.1	9.4	100.0
- - - - - dollars per agricultural operation - - - - -					
Payment per Farm (\$)	46,100	29,300	14,900	2,000	7,700
Cash Sales per Farm (\$)	1,787,700	202,800	63,400	8,200	63,500
Payment/Sales (%)	2.6	14.4	23.5	24.4	12.1
Net Farm Income (\$)	738,100	71,700	18,700	516	21,500
Payment/Net Farm Income (%)	6.0	41.0	80.0	^a	36.0
Off-farm Income (\$)	29,400	14,800	14,600	23,700	21,500
Payment/Total Income (%)	2.5	33.9	44.7	8.3	17.9
- - - - - billion dollars - - - - -					
Total Payments	1.3	8.0	4.3	3.2	16.7

Source: Economic Indicators of the Farm Sector, USDA, ERS, National Financial Summary, pp 39-51, Oct. 1988.

^a Net farm income is negative without government payments.

Figure 1: Real U.S. Gulf Port Prices

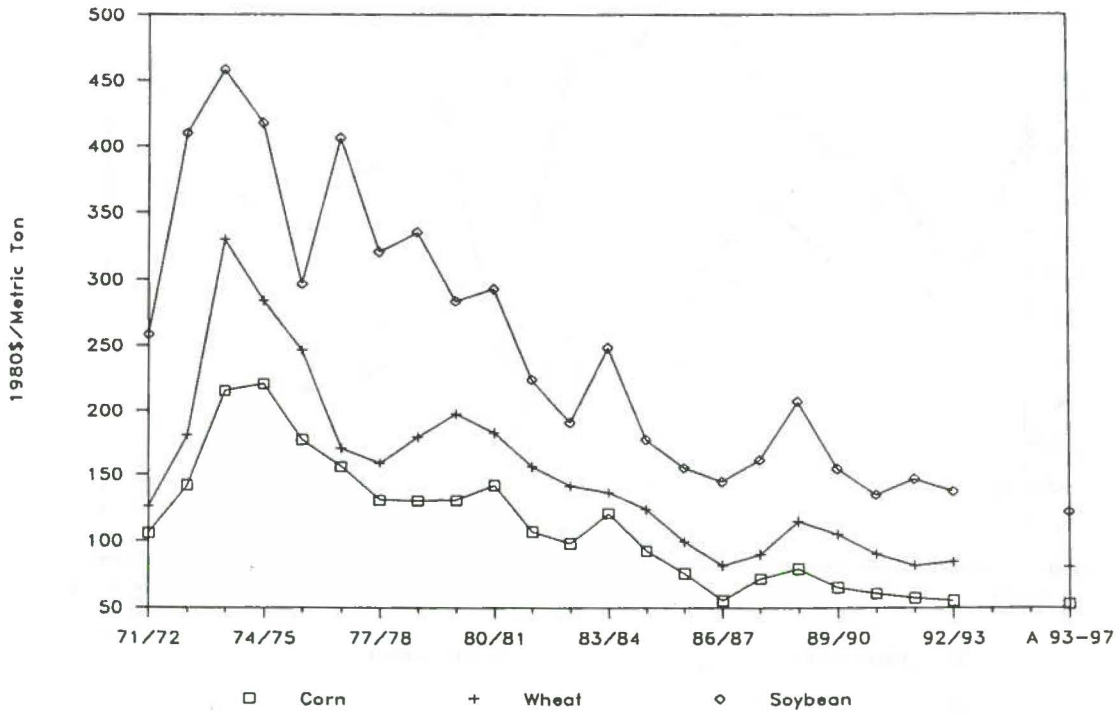


Figure 2: U.S. Wheat Net Returns

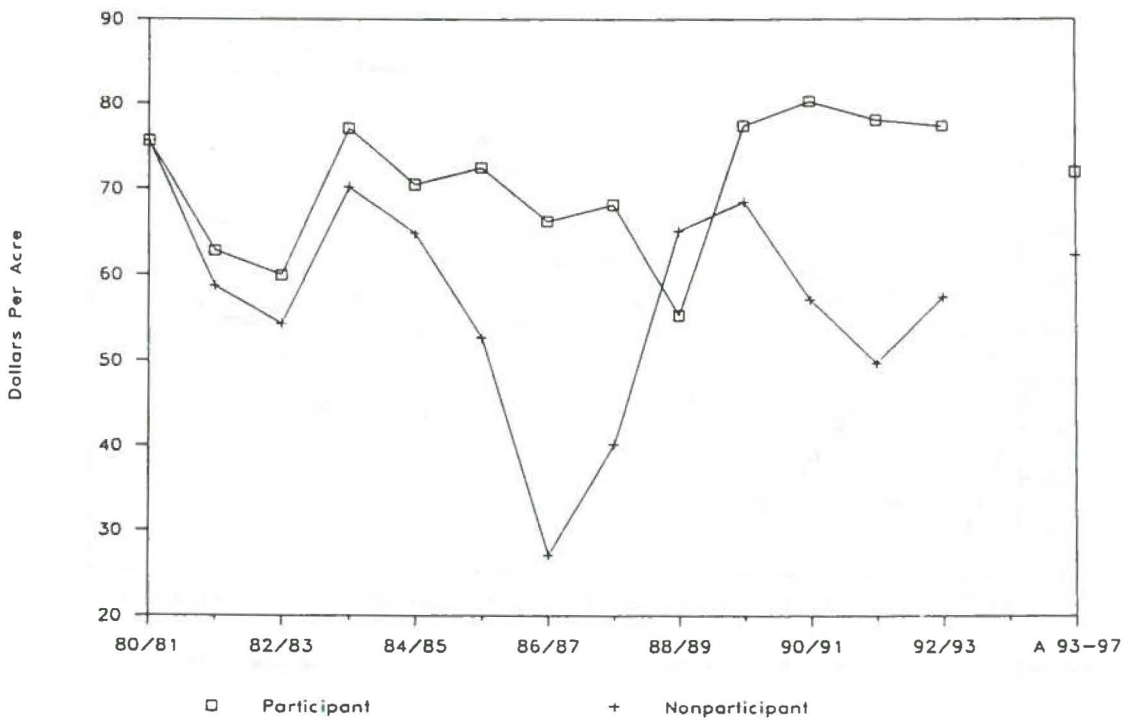


Figure 3: U.S. Corn Net Returns

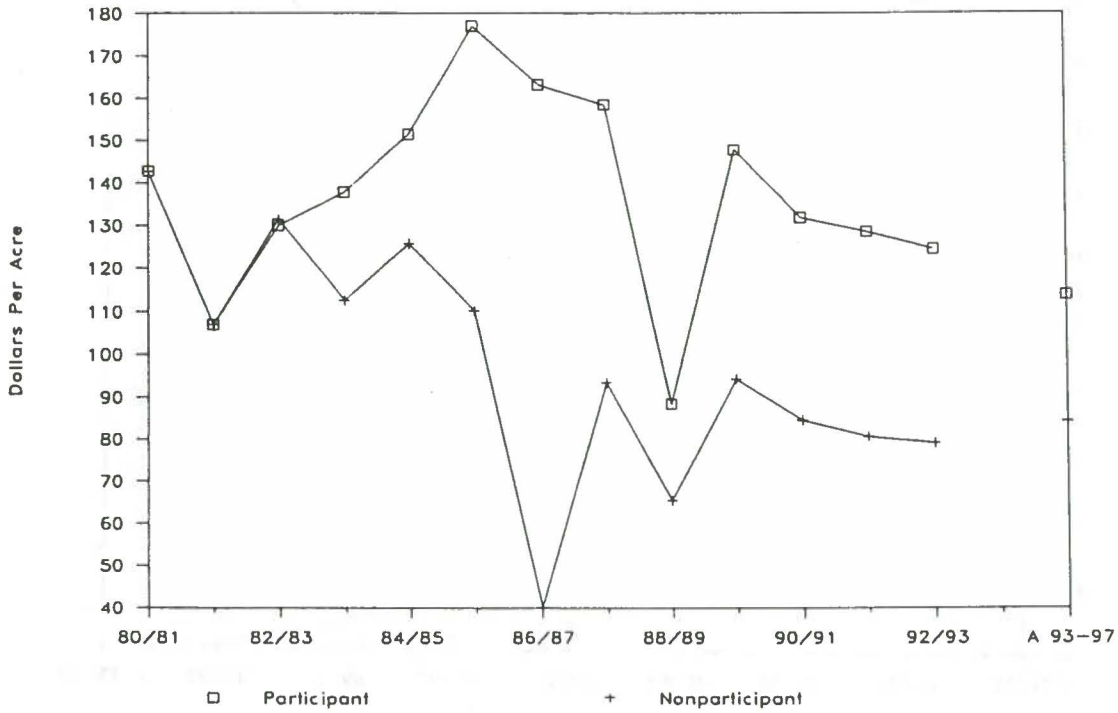


Figure 4: U.S. Total Crop Acres

CO, WH, SB, BA, SG, OA, RI, CT

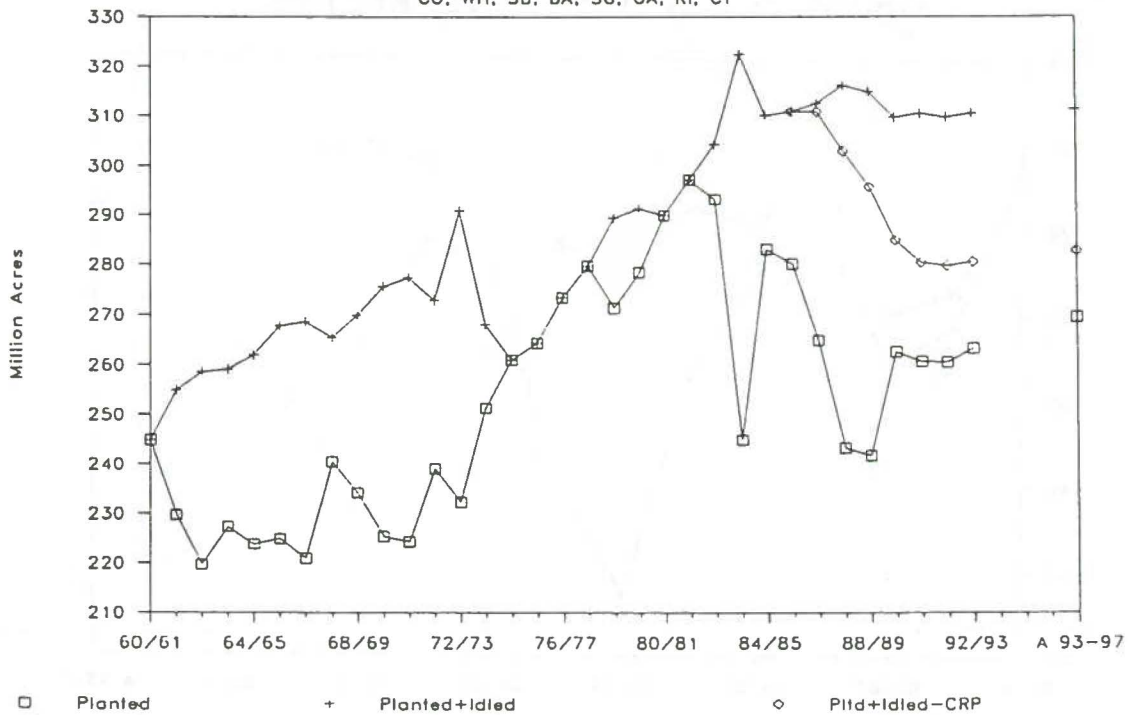


Figure 5: NFI and Government Payments

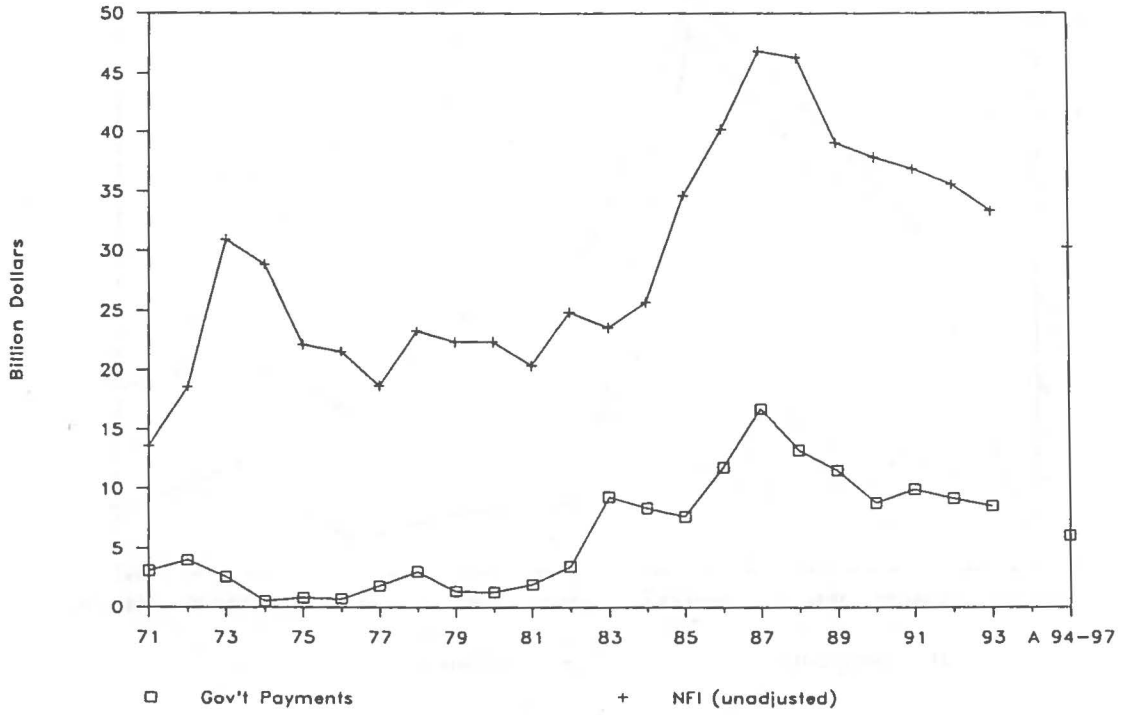


Figure 6: Net CCC Outlays

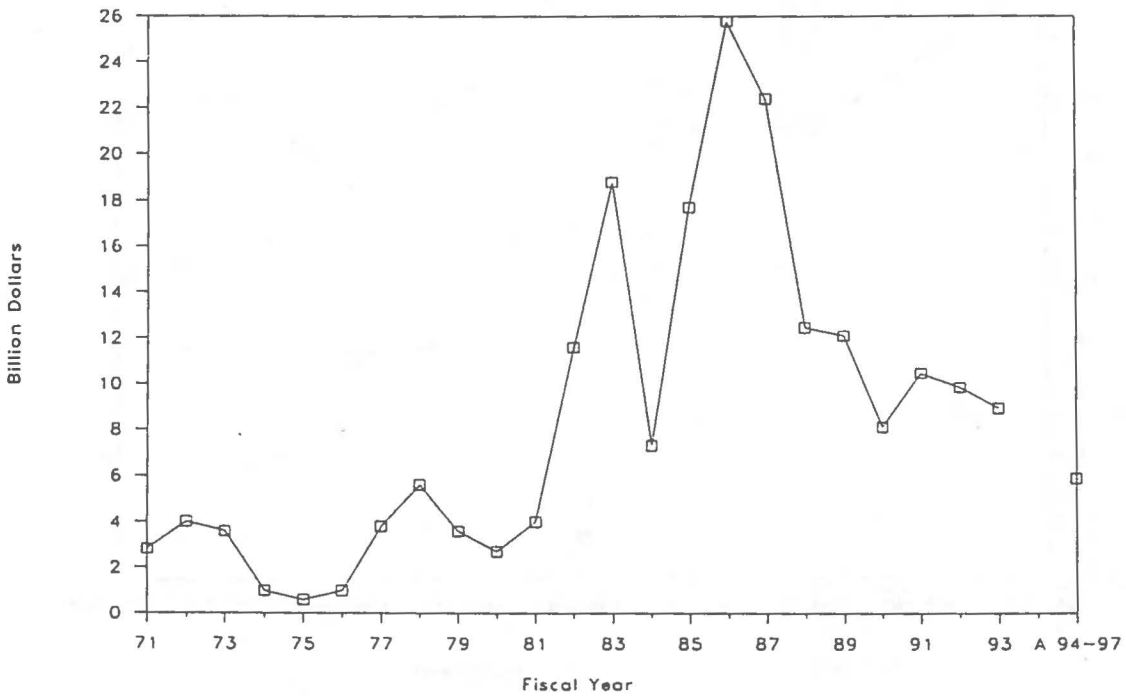


Figure 7: Area Planted in 8 Major Crops

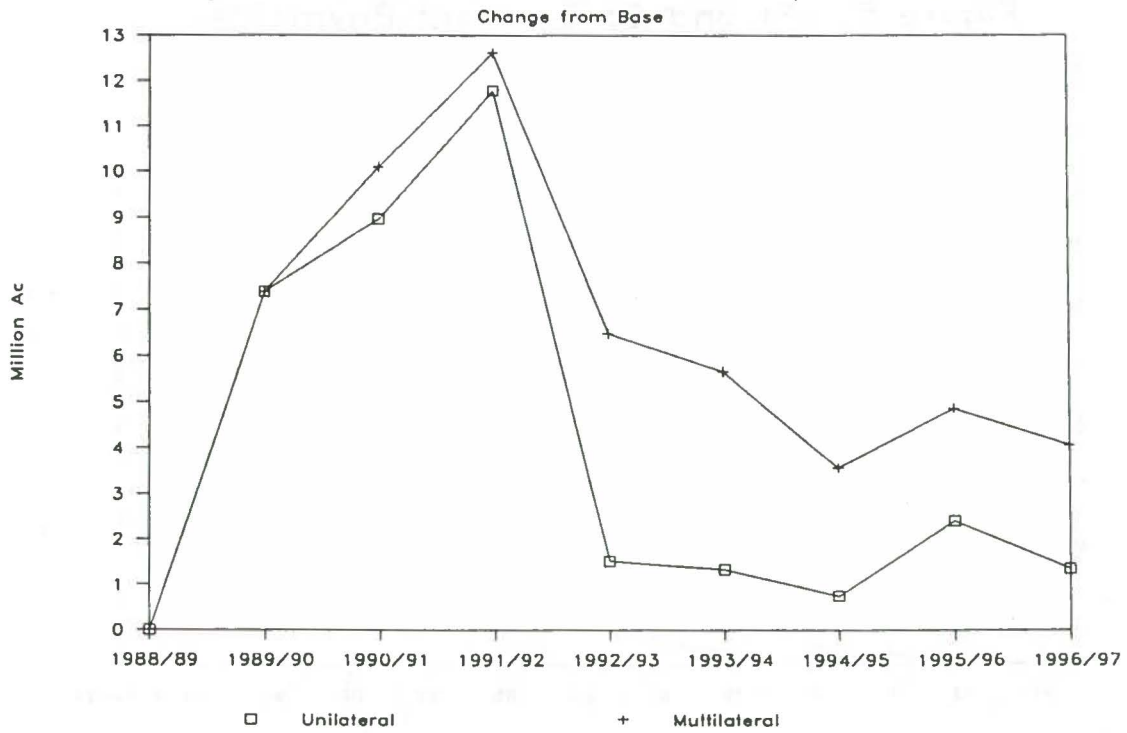


Figure 8: Total Area Planted and Idled

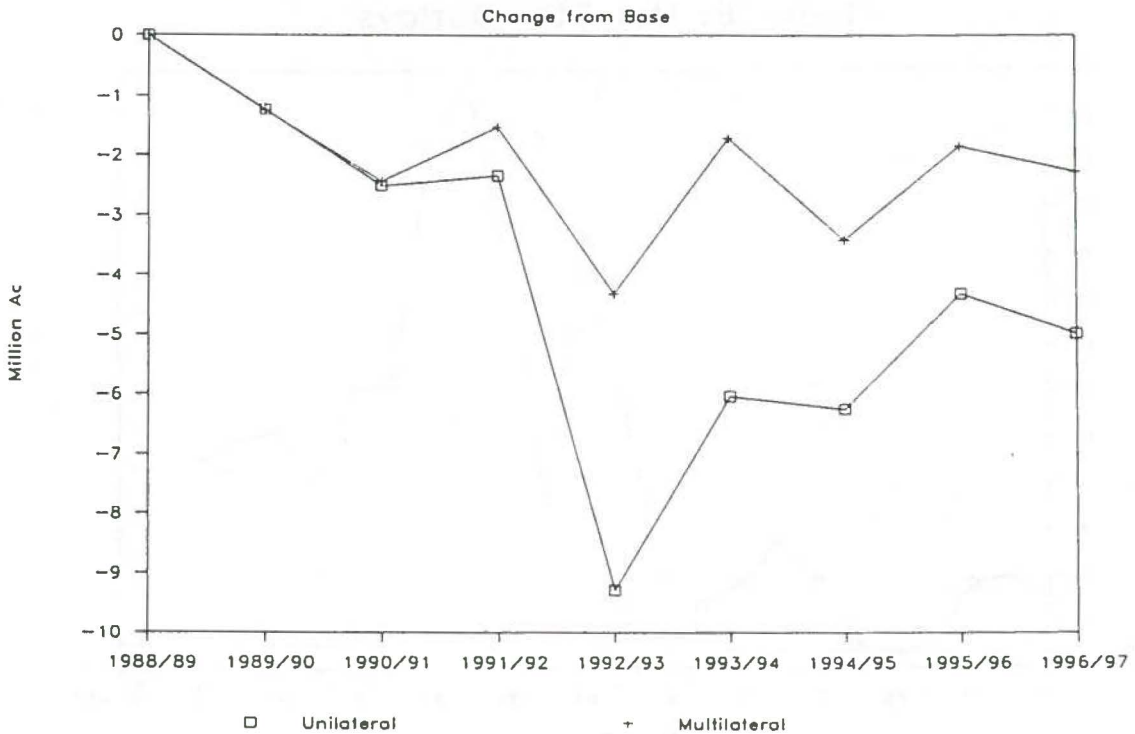


Figure 9: Price Index for 8 Major Crops

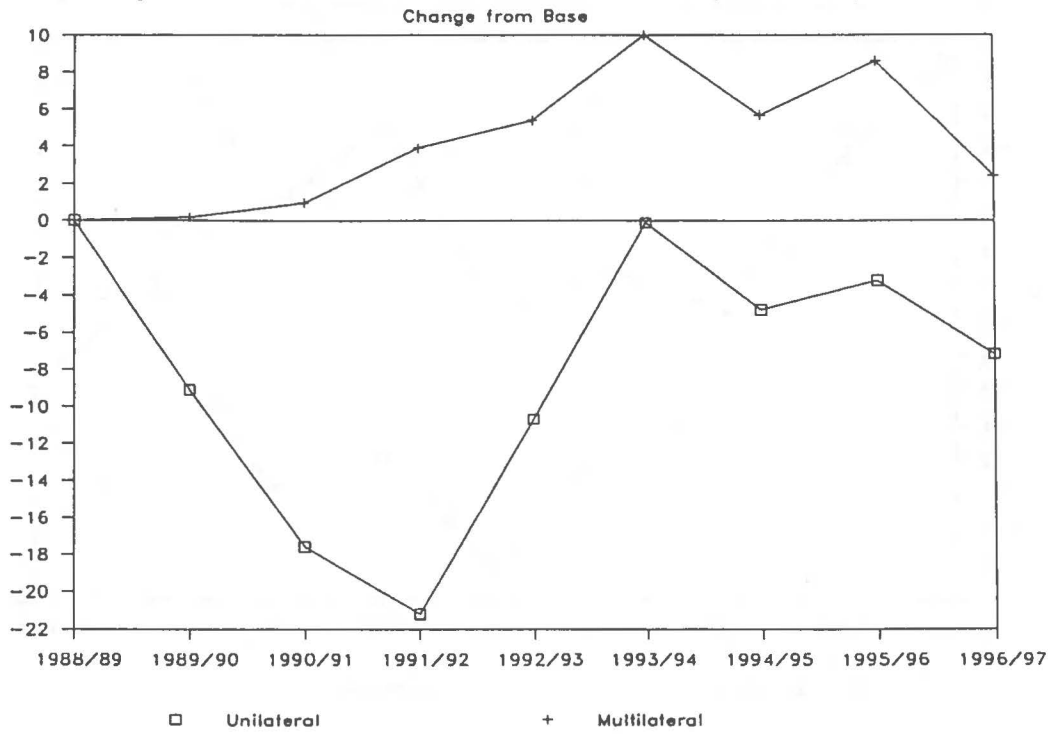


Figure 10: Price Index for 5 Livestock Products

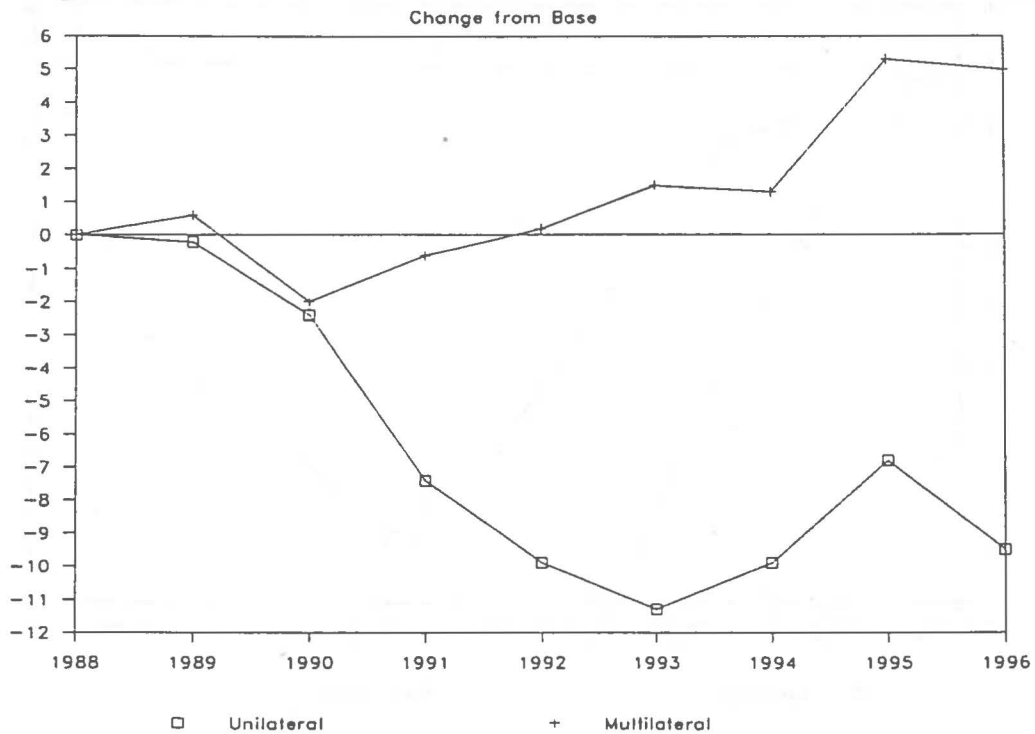


Figure 11: Net Farm Income

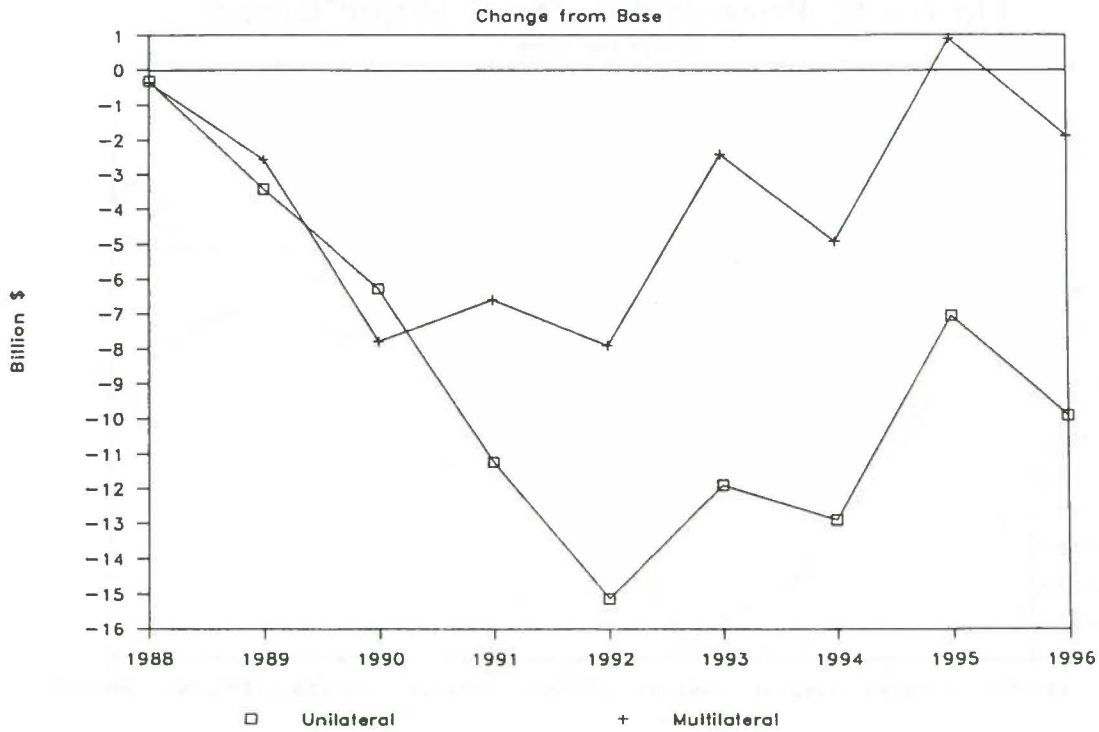
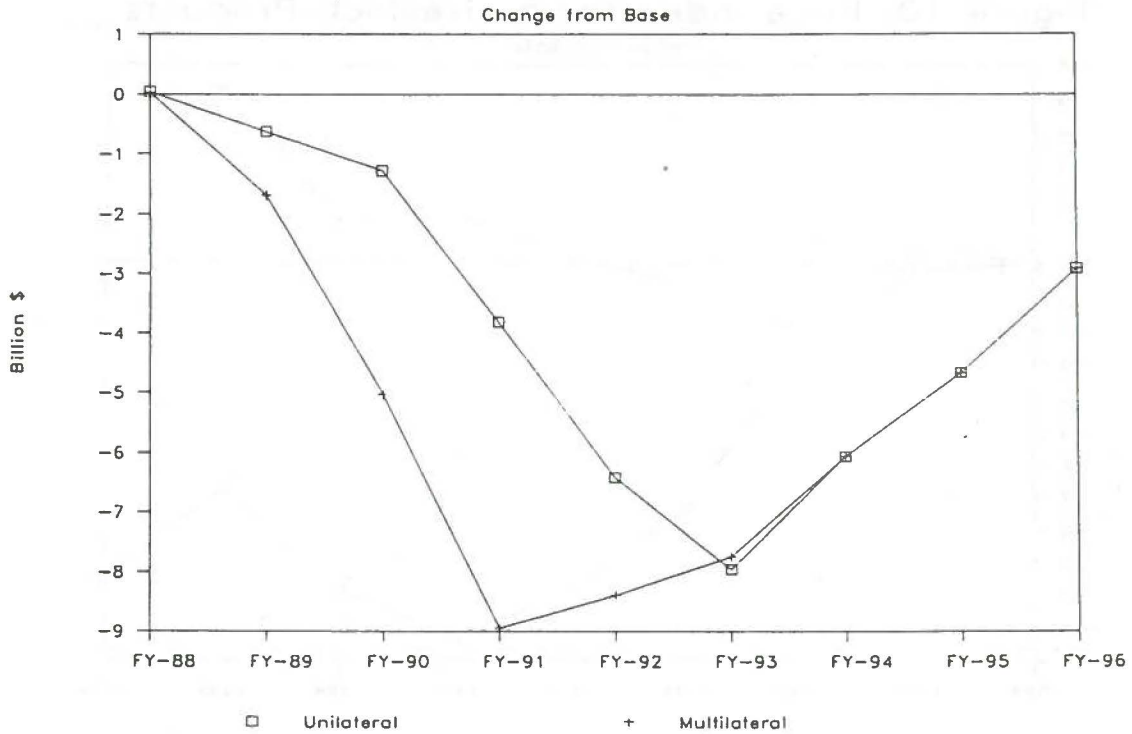


Figure 12: Government Cost



References

- "Policy Scenarios with the FAPRI Commodity Models." Working Paper #88-WP41 (December 1988). Center for Agricultural and Rural Development, Iowa State University, Ames.
- "FAPRI U.S. and World Agricultural Outlook, Summary and Tables." FAPRI Staff Report #1-89 (March 1989). Food and Agricultural Policy Research Institute, University of Missouri, Columbia, and Iowa State University, Ames.