Counter-Cyclical Agricultural Program Payments: Is It Time to Look at Revenue?

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Briefing Paper 99-BP 28
December 2000
Revised

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Executive Summary

Demand is growing for counter-cyclical farm program payments. One proposal, Supplemental Income Payments for Producers (SIPP), would pay farmers when national farm revenue falls below a certain percentage of average national farm revenue for a crop within a year. The cost of this policy at the 95 percent payment trigger level would have averaged $1.47 billion per year had it been in place from 1977 to 1999. Corn farmers would have received 40 percent of payments, soybean farmers 20 percent, wheat farmers 23 percent, cotton farmers 7 percent, and rice farmers 3 percent.

One problem with a national revenue approach is that farmers in a particular state or region could suffer yield losses but still not receive a payment. An alternative policy that addresses this problem could base payments on county revenues or revenues at the crop reporting district level. A county-based program at the 95 percent trigger level would have cost an average of $2.65 billion per year from 1977 to 1999. Corn farmers would have received 35 percent of payments, soybean farmers 22 percent, wheat farmers 22 percent, cotton farmers 10 percent, and rice farmers 2 percent.

A revenue guarantee based on past revenue outcomes is likely to influence planting decisions when the market price for a crop falls significantly. Because a drop in market price before planting would greatly increase the likelihood that a farmer would receive a program payment, his or her planting decisions could be significantly influenced by the government program. If, on the other hand, the guarantee was based on the futures market, the farmers' market incentives and government program incentives for planting decisions would be better aligned.

Adoption of a SIPP policy at the county or crop reporting district level would greatly decrease the total amount of risk that farmers face, thus decreasing the usefulness of the crop insurance program as it now exists. A more privatized crop insurance program could emerge as insurance companies could offer insurance against losses that would not be covered by program payments.

COUNTER-CYCLICAL AGRICULTURAL PROGRAM PAYMENTS: IS IT TIME TO LOOK AT REVENUE?

Political support is clearly growing for some modification of farm policy. Lack of sustainability of the current program is best demonstrated by the disaster assistance packages during the last three years, which have allocated billions of dollars to farmers. There is pressure on the Agriculture Committees of the U.S. House and Senate to discuss possible changes to the farm bill.

One of the perceived weaknesses of the current policy (as originally designed) is that cash transition payments are paid to farmers even when market income is high, and the size of the payments does not increase when market income is low. Many are concluding that support for farmers should be counter-cyclical, in that payments should increase when market income goes down, and they should decrease when times are good.

Previous farm bills, with their deficiency payments, were counter-cyclical with regard to agricultural prices. When farm prices exceeded the government's set target price, no deficiency payments were made. However, when farm prices fell below the target price, deficiency payments were made and the payment was meant to counteract the low farm prices. Federally subsidized yield insurance still provides a counter-cyclical mechanism for crop yields. If yields fall below a given level, the producer receives an indemnity payment.

It is revenue that keeps a farm in business. Deficiency payments and yield insurance target components of revenue, but not revenue itself. Farmers could receive high prices and still be in financial difficulty if their yields are low; and low prices might not signal financial problems if yields are high. Very recent additions to the crop insurance mix (Crop Revenue Coverage, Revenue Assurance, Group Risk Income Protection, and Income Protection) demonstrate that programs based on revenue are feasible. Basing federal payments on some measure of farm revenue is an idea that is gaining advocates. One such program, titled Supplemental Income Payments for Producers (SIPP, House Resolution 2792), has been introduced by Representative Charles Stenholm (D-Texas).

In this briefing paper, we examine counter-cyclical revenue programs for U.S. agriculture. We outline several variations on the structure of the revenue program, discussing the advantages and disadvantages of each. We then look at the possible government outlays under three example programs by assuming they had been in place over the period 1977–99.

Supplemental Income Payments for Producers (SIPP)

Because SIPP has been introduced as a bill in Congress, we will use it as a base from which to compare alternative counter-cyclical revenue programs. SIPP makes payments to producers of a crop when the per-acre national gross revenue for that crop falls below a set percentage

of the five-year average of that crop's per acre national gross revenue. We refer to this revenue level as the payment trigger. Eligible crops are wheat, oilseeds, cotton, rice, and feed grains. Under SIPP, national gross revenue is the product of the total U.S. production of the crop for the year and the price established for the crop for the year. The crop price is set at the higher of the season average price received by producers or the loan rate for the crop. The total amount of payments to each crop under the program is equal to the number of harvested acres for the crop multiplied by the difference between the payment trigger and the current year's per acre national gross revenue.

Table 1 shows the hypothetical payments for the period 1977–99 under a national revenue program with a 95 percent revenue trigger, consistent with the SIPP proposal. On average, the program would have provided just under $1.5 billion in payments to producers each year. In 6 out of the 23 years examined there would have been no payments made under the program. For 1986, 1998, and 1999, payments would have exceeded $6 billion.

SIPP is designed to deliver payments when market revenue is lower than the average of the previous five years. As such, the program automatically responds to the conditions similar to those addressed by the last three disaster assistance programs. The program would be largely free of the moral hazard and adverse selection problems of the crop insurance program because payments depend on national triggers. Moral hazard refers to the possibility that producers will engage in "riskier" activities or change their behavior in order to increase their chances of receiving a payment. Adverse selection refers to the notion that the producers who seek insurance are those who are most likely to collect. Because the size of the payment depends on national price and production, farm-level activity can have no effect on the size or the likelihood of a payment. With SIPP, agricultural "disasters" are legislatively defined. This may lessen the political pressure for Congress to pass yearly ad hoc disaster programs that often result in payments that reflect the political realities of Congress rather than financial difficulties on the farm.

Potential Drawbacks of SIPP

Lack of Regional Counter-Cyclical Payments

SIPP payments can be triggered by either low prices or low national yields. As shown in Table 1, payments would have been triggered for corn producers in 1988 due to the midwestern drought. And in 1998 and 1999, payments would have been triggered by the steep drop in season-average price. It is much more likely, however, that SIPP payments will be triggered by low prices than low yields for the simple reason that when price is low in one region, it is low in all regions, which results in low national revenue. But when yields are low in one production region, they are unlikely to be low in all production regions because weather conditions are not perfectly correlated across the country. This implies that regional yield disasters can occur without triggering SIPP payments (i.e., production in other areas would make up for a regional shortfall).

To illustrate this point, Figure 1 shows actual and trend Iowa corn yields from 1977 to 2000. Iowa corn producers suffered four bad production years during this period but would have received SIPP payments only in two of those years (1977

and 1988). The 1993 production year was a disaster by any measure for Iowa corn producers, but production in other regions was high enough that national revenue was too high to trigger a payment. In contrast, 1988 was extremely bad also, but the 1988 drought hit enough regions so that a payment was triggered. Figure 2 illustrates a similar phenomenon for cotton. Texas cotton yields in 1980 were less than two- thirds of trend, yet producers would not have received a SIPP payment because production was high enough in other regions.

A program based on national revenue will not capture all regional disasters and, consequently, would fail to be counter-cyclical at the state or regional level. In addition, a program based on national revenue will also result in payments being made to producers in a region that has not suffered a loss. For example, in the 1988 drought year, most Nebraska farmers enjoyed both high yields, due to irrigation, and high prices, due to drought conditions in the rest of the Corn Belt. Yet like all corn farmers, Nebraska farmers would have received a SIPP payment.

Attributes of a County-Based Program

Basing SIPP payments on county revenue instead of national revenue would fix the problem of SIPP not being regionally counter-cyclical. A county-based program would have paid Iowa corn farmers more in 1993—$652 million—than in any other year. And Texas cotton producers would have been paid more in 1980—$276 million—than in any other year. In both cases, a nationally based SIPP program would not have paid. This starkly illustrates that the worse revenue years in a state—even in states that have the most acreage of a crop—may not result in a SIPP payment with a national trigger.

A county-level program also would reduce payments to producers who do not suffer a loss. Nebraska corn farmers would have received only $17 million in 1988 from a county-level program, whereas they would have received $216 million from a national-level program. North Carolina corn growers would have received only $300,000 from a county program in 1988 but $32 million from a national SIPP.

Basing SIPP on county yields could be easily accomplished. Payment triggers could be based on the five-year average per-acre gross revenue at the county level. The price employed in calculating revenues is still given at the national level, but production is measured at the county level. The National Agricultural Statistics Service (NASS) provides this level of crop production and price information. The trade-off between this variation and the national-level program is that the county-level program would respond better to regional disasters, but it would also require higher government outlays for a given trigger percentage. Other program variations on the same theme would use crop reporting district- or state-level production or state-level prices. As the level of aggregation decreases (from national, to state, to crop reporting district, to county), the government costs (and producer benefits) increase. All of the other advantages of the national-level program are maintained.

Table 2 shows the payments by crop, and in total, under the county revenue program with a 95 percent revenue trigger. The overall payments would have ranged from $91 million in 1979 to $9.78 billion in 1999. Average payments over the

period would have been $2.65 billion, which is nearly double the amount from the national trigger. The program would have been triggered in every year of the period. Estimates of the costs of revenue programs based on state or crop reporting district information and a 95 percent revenue trigger are shown in Figure 3.

The Durum Wheat Problem

In the fall of 1998, Crop Revenue Coverage (CRC) was expanded to include durum wheat. The price used to set the CRC spring revenue guarantee was the futures market price for spring wheat plus the average difference between durum wheat harvest prices and other spring wheat harvest prices during the previous five years. This difference amounted to $1.92/bu. But in the fall of 1998, the difference between futures prices of durum and other spring wheat was less than $0.50/bu. This meant that durum wheat farmers signing up for CRC would have a high likelihood of receiving a large insurance payment. Not surprisingly, planned durum wheat plantings in North Dakota, South Dakota, and Minnesota skyrocketed. In response, the futures price for durum wheat actually fell below the price of spring wheat on the Minneapolis Grain Exchange.

This illustrates the potential drawback of basing SIPP payments on *past* market prices and *current* planting decisions. When the market price outlook for a crop is currently much lower than prices received in the previous five years, the promise of a SIPP payment will tend to increase planted acreage, which will tend to decrease market prices. This tendency to base planting decisions on the government program would be especially large when the program is based on national revenue calculations because bumper crops at the regional level will not necessarily decrease the chances of a program payment.

SIPP Guarantees Based on Market Prices

Another alternative to the SIPP proposal would be to incorporate current market signals into the program by basing the payment trigger on current expectations of market prices as indicated by futures prices. The revenue insurance products now available work in this way. The government cost implications of this variation are not readily predictable over the long run. In any given year, if the futures price is greater than the five-year average price, then costs would be expected to be greater in that year. If the futures price is lower, then costs will be lower. One problem with this approach is that futures markets do not exist for all commodities. Revenue insurance products have accounted for a lack of futures markets by basing the price for non-futures commodities on the price from a futures commodity *and* the historical relationship between the prices of the two crops.

For the variation using the futures price as part of the revenue trigger, we examine only corn and soybean. For the futures prices, we use the February average settlement prices on the December corn and November soybean Chicago Board of Trade (CBOT) contracts to set the revenue guarantee. The harvest revenue is based on the average settlement price in October on the November soybean CBOT contract for soybeans and the average settlement price in November on the December corn CBOT contract for corn. This pattern follows the pricing structure employed in most revenue

insurance policies that are now available for corn and soybeans.

Tables 3 and 4 show corn and soybean payments under the national and county programs, respectively. Over the period studied, basing program guarantees on futures prices would have increased payments by 22 percent. However, the futures-based programs did not pay out more in every year. For the national program, the futures-based version paid out more in nine of the years; the season-average-based version paid out more in six years; and neither paid out in eight of the years. For the county program, the futures-based version provided greater benefits in 15 of the 23 years. The yearly pattern of payments also changed with the price structure. For example, for corn under the national revenue program, payments would have been triggered in 1977, 1986–88, and 1998–99 under the season-average price formulation; but under the futures price formulation, payments would have been made in 1977, 1981–83, 1986, 1989, 1991–92, 1996, and 1998–99.

The Effect of Varying the Revenue Trigger

Figure 4 shows how average program payments change as the revenue trigger percentage changes for both the county program and the national program. Varying the trigger percentage changes the total outlays from $552 million at the 75 percent level to $3.57 billion at the 100 percent level for the county program. The county program costs nearly 10 times more than the national program at the 75 percent trigger, but less than twice as much at the 100 percent trigger.

SIPP Based on Combined Crop Revenues

Press reports indicate that the Commission on 21st Century Production Agriculture may recommend a variation of SIPP based on combined revenues from barley, corn, cotton, oats, rice, sorghum, soybeans, and wheat. To examine how this variation may work, we have calculated the payments for a SIPP program where the per-acre revenue trigger is based on the ratio of the previous five-year sum of values of production and the previous five-year sum of harvested acres for the eight crops. Actual per-acre revenues are given by the current year's sum of values of production and harvested acres for the eight crops. We refer to this program as a combined crop SIPP.

At a 95 percent revenue trigger, the crop-specific versions of SIPP would have provided roughly $500 million more in payments than the combined crop SIPP. The reduction in payments is due to revenue shortfalls in one crop being offset by revenue gains in another. The number of payments also differs between the crop-specific and combined crop SIPP programs. Table 5 shows this difference in payment streams. At the national level, the crop-specific SIPP program would have paid out in 17 of the 23 years, but the combined crop SIPP program would have paid out only in three years (1986, 1998, and 1999). In those years, the combined crop SIPP program at the national level paid out over $6 billion a year. This indicates that the outlays of a combined crop SIPP program with a national-level trigger will vary significantly, with no payments being made in most years and

billions of dollars in payments being made in a few years. Note that the pattern of payments under the combined crop SIPP program closely follows the pattern of aid packages that Congress has recently put together. Large supplemental farm payments were allocated in 1998 and 1999, and a record amount of farm payments were made for the 1986 crop. This reinforces the finding of this report that national-level counter-cyclical payments would be triggered by low prices rather than by low yields.

The Effect of SIPP on Crop Insurance

Adoption of a county-level SIPP program would essentially remove nearly all systemic (non-poolable) sources of risk from farm-level revenue. The remaining risk would be price basis risk and farm-level yield losses caused by local flooding, pest problems, hail, and wind damage. The proportion of systemic risk that exists with total risk varies by region; however, evidence suggests that provision of a county-based SIPP program would greatly reduce farm-level risk, and this potentially would have profound consequences on the crop insurance industry.

Under the current crop insurance program, the government provides premium subsidies as an incentive for farmers to purchase crop insurance from private companies. The crop insurance companies must offer insurance to every farmer at rates that are set by the government. In return for following these restrictions, the companies receive reimbursement from the government for selling the policies and adjusting the losses. The government also offers subsidized reinsurance, which is important because a large proportion of crop insurance claims are caused by events that affect a significant portion of policyholders, such as widespread droughts or price declines. For example, the price decline in 1998 meant that nearly all Revenue Assurance policyholders in Iowa qualified for an indemnity payment.

Systemic sources of losses are not the sort of losses that insurance companies prefer to insure. Rather, they prefer to insure poolable risks because the losses to the few would be paid by the premiums of the many. Thus, there is a sort of bargain struck between the crop insurance companies and the federal government. The companies will administer the program for the government, and, in return, the companies can transfer a large portion of the systemic risk to the government.

It is important to note that under a county-level SIPP program, the government would accept the transfer of risk directly from farmers, and would therefore have little justification to underwrite the private-sector crop insurance companies. The SIPP payments would cover a large portion of the total revenue risk on the farm, and the demand for crop insurance surely would decrease substantially in most locations.

There still would be some demand for insurance, however, because nonsystemic risks are not the only sources of risk that are important to farmers. A private crop insurance industry could emerge to cover nonsystemic losses, much like the crop-hail insurance industry now does. A policy could be a "residual risk" policy that would compensate for farm-level losses in excess of losses covered by SIPP payments, or that would compensate for losses in years in which SIPP payments were zero.

TABLE 1. SIPP program payments with 95 percent revenue trigger ($ million)

	Barley	Corn	Cotton	Oats	Rice	Sorghum	Soybean	Wheat	Total
1977	78	610	0	0	0	19	0	1381	2088
1978	0	0	0	1	167	0	0	84	252
1979	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	155	0	176	0	332
1983	0	0	0	0	66	121	0	0	187
1984	0	0	0	0	88	209	1331	0	1627
1985	192	0	0	37	0	0	323	142	694
1986	412	2532	161	121	0	197	729	2463	6615
1987	123	1539	0	0	0	130	0	1049	2841
1988	0	1908	0	0	30	0	0	0	1938
1989	0	0	0	12	0	156	0	0	168
1990	0	0	0	64	50	0	0	129	244
1991	0	0	0	74	0	0	0	0	74
1992	0	0	16	0	25	0	0	0	40
1993	0	0	128	8	0	0	0	0	136
1994	0	0	0	3	0	0	0	0	3
1995	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0
1998	77	3222	453	47	0	245	1652	1164	6860
1999	52	3813	1463	38	401	201	2512	1194	9674
Average	41	592	97	18	43	56	292	331	1468

TABLE 2. County revenue program payments with 95 percent revenue trigger ($ million)

	Barley	Corn	Cotton	Oats	Rice	Sorghum	Soybean	Wheat	Total
1977	110	1600	72	39	24	137	86	1388	3458
1978	46	184	310	41	183	109	82	344	1299
1979	7	6	13	5	0	4	28	29	91
1980	12	247	374	7	0	69	560	126	1395
1981	4	89	129	1	6	197	671	196	1294
1982	7	18	116	13	154	177	626	138	1248
1983	16	1040	85	16	64	239	541	86	2088
1984	101	423	115	8	89	457	1808	382	3383
1985	240	160	77	50	14	312	1008	802	2662
1986	349	2565	327	114	8	237	1181	2318	7099
1987	117	1620	24	12	7	163	121	1029	3093
1988	147	2688	318	34	46	33	442	620	4329
1989	20	336	116	54	2	216	332	377	1453
1990	8	174	89	73	60	69	212	602	1287
1991	13	617	283	76	0	70	427	482	1968
1992	42	445	342	13	41	44	268	195	1391
1993	34	1520	513	34	1	63	655	285	3105
1994	46	64	23	16	7	27	38	186	406
1995	0	9	321	1	0	12	141	73	558
1996	7	160	59	1	0	91	29	209	555
1997	35	264	99	7	0	41	76	729	1251
1998	106	3249	729	47	32	250	1835	1394	7642
1999	77	3849	1417	36	389	194	2511	1308	9781
Average	67	927	259	30	49	140	595	578	2645

TABLE 3. National revenue program payments with 95 percent revenue triggers ($ million)

	Using Season-Average Prices			Using Futures Prices		
	Corn	**Soybean**	**Total**	**Corn**	**Soybean**	**Total**
1977	610	0	610	1647	903	2550
1978	0	0	0	0	0	0
1979	0	0	0	0	0	0
1980	0	0	0	0	0	0
1981	0	0	0	3157	2039	5196
1982	0	176	176	1603	1599	3202
1983	0	0	0	188	0	188
1984	0	1331	1331	0	1685	1685
1985	0	323	323	0	0	0
1986	2532	729	3261	824	0	824
1987	1539	0	1539	0	0	0
1988	1908	0	1908	0	0	0
1989	0	0	0	472	1981	2453
1990	0	0	0	0	0	0
1991	0	0	0	857	0	857
1992	0	0	0	252	0	252
1993	0	0	0	0	0	0
1994	0	0	0	0	0	0
1995	0	0	0	0	0	0
1996	0	0	0	622	0	622
1997	0	0	0	0	0	0
1998	3220	1652	4872	2536	1586	4122
1999	3813	2512	6325	2147	645	2792
Average	592	292	884	622	454	1076

TABLE 4. County revenue program payments with 95 percent revenue triggers ($ million)

	Using Season-Average Prices			Using Futures Prices		
	Corn	**Soybean**	**Total**	**Corn**	**Soybean**	**Total**
1977	1600	86	1686	2429	1074	3503
1978	184	82	266	74	55	130
1979	6	28	34	8	62	70
1980	247	560	807	638	884	1522
1981	89	671	760	3258	2170	5428
1982	18	626	644	2044	1743	3787
1983	1040	541	1581	1396	335	1731
1984	423	1808	2231	581	2107	2688
1985	160	1008	1168	270	522	792
1986	2565	1181	3746	1044	331	1375
1987	1620	121	1741	68	40	108
1988	2688	442	3130	1555	611	2166
1989	336	332	668	1345	2168	3512
1990	174	212	386	612	190	802
1991	617	427	1044	1701	627	2328
1992	445	268	714	1452	383	1835
1993	1520	655	2176	1360	715	2074
1994	64	38	101	780	262	1041
1995	9	141	150	51	218	268
1996	160	29	189	1338	475	1812
1997	264	76	339	391	173	564
1998	3249	1835	5084	2770	1793	4564
1999	3849	2511	6360	2353	1018	3371
Average	927	595	1522	1196	781	1977

TABLE 5. National program payments with 95 percent revenue triggers ($ million)

	Crop-Specific SIPP	Combined-Crop SIPP
	Total	Total
1977	2088	0
1978	252	0
1979	0	0
1980	0	0
1981	0	0
1982	332	0
1983	187	0
1984	1627	0
1985	694	0
1986	6615	6247
1987	2841	0
1988	1938	0
1989	168	0
1990	244	0
1991	74	0
1992	40	0
1993	136	0
1994	3	0
1995	0	0
1996	0	0
1997	0	0
1998	6860	6551
1999	9674	8496
Average	1468	926

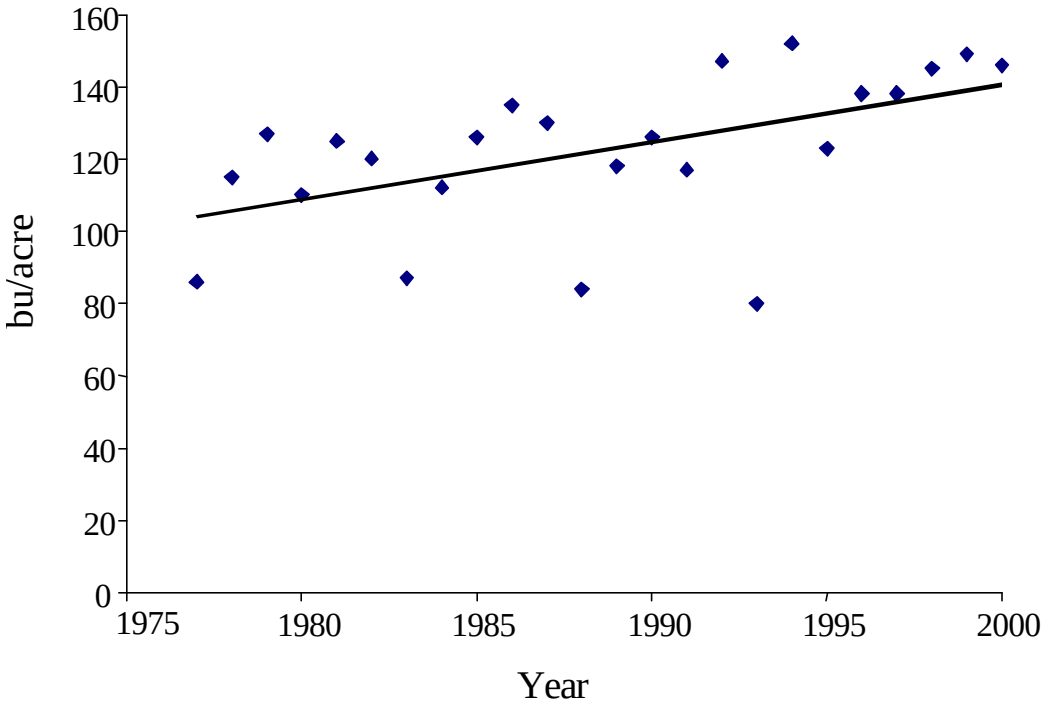

FIGURE 1. Iowa corn yields: 1977–2000

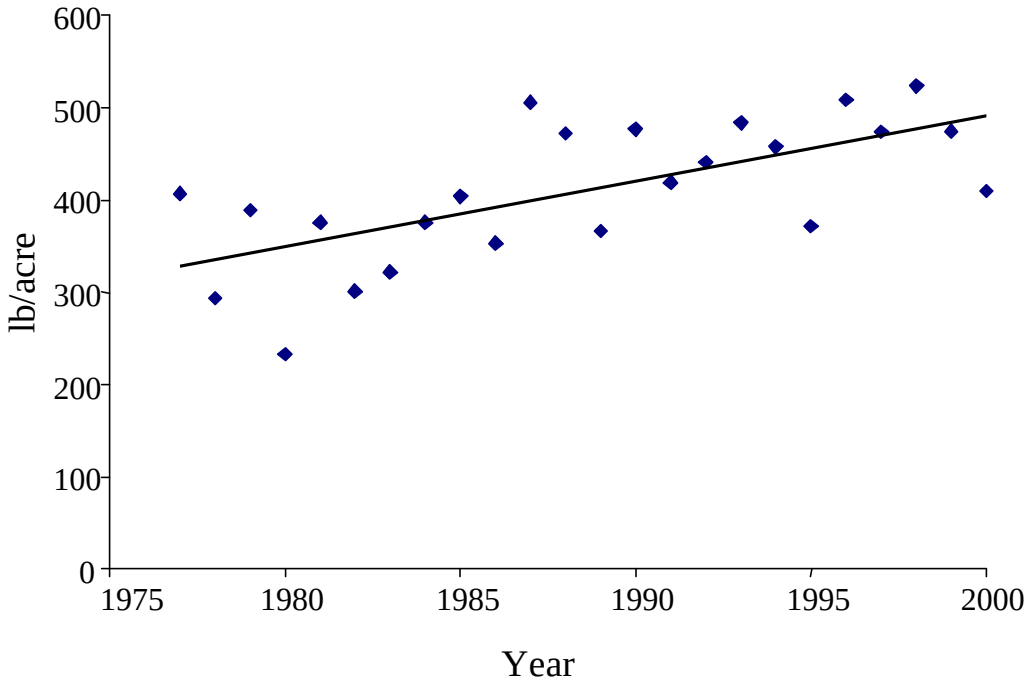

FIGURE 2. Texas cotton yields: 1977–2000

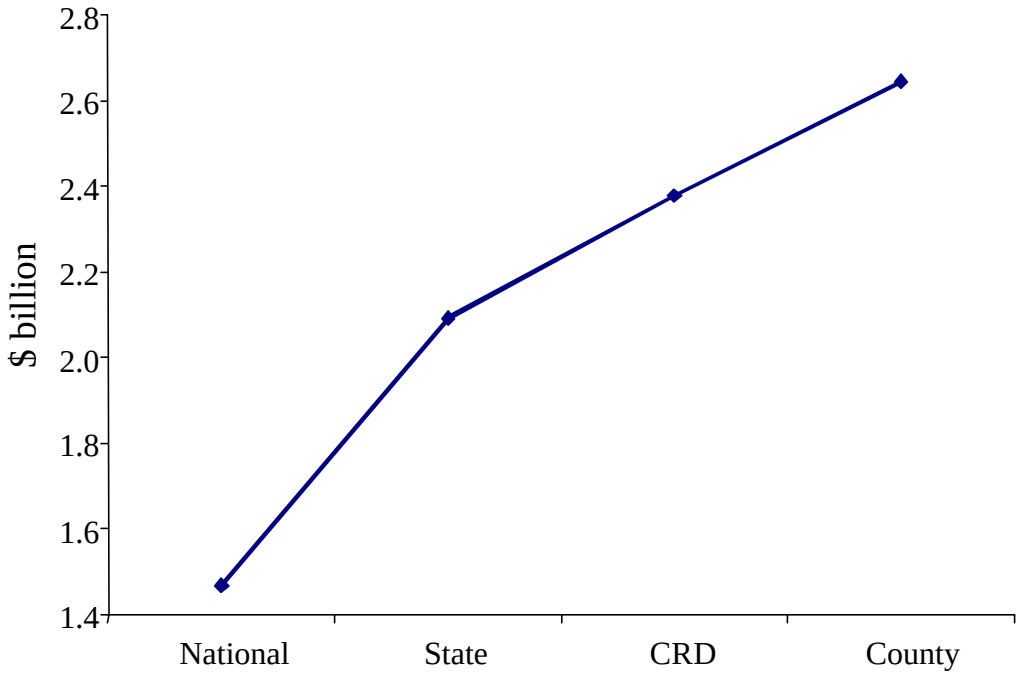

FIGURE 3. SIPP average costs: 1977–1999

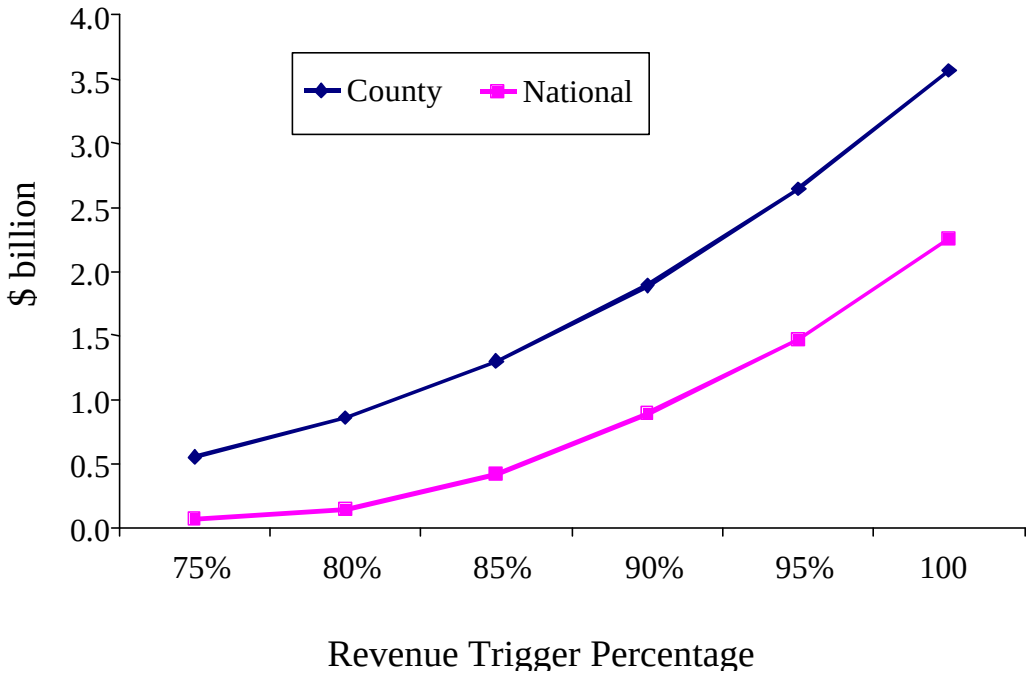

FIGURE 4. Percentage payment trade-off