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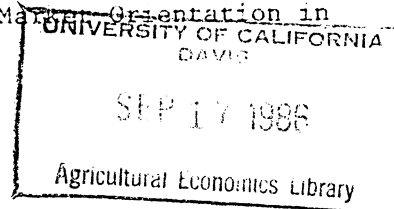
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Income Subsidies Provided by Crop Provisions of the 1973, 1977 and 1981
Agricultural Acts: A Counter-factual Analysis of Market Orientation in
Commodity Policy

by
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Introduction



Agricultural commodity programs have been used to support the income of producers of specific commodities since 1933. For the most part, this income support has been through the use of nonrecourse commodity loans which allow producers to forfeit commodities to the government in payment of the loan if prices are not sufficiently above the loan rate to make redemption of the loan profitable. In effect, this puts a floor on the price of the commodity, if program participation is high enough, and results in a distortion in the market as stocks are accumulated in Commodity Credit Corporation (CCC) storage. The price distortion from the fixed loan rate results in a misleading signal relative to the quantity needed by the market and producers supply more than the market will clear at that price. Over time producers have come to expect that the income from the commodity program would be available in the future and have incorporated the expected program income stream into their asset pricing formulas, i.e., program benefits have been capitalized into land values. The distortion resulting from the programs makes it difficult to determine the level to which prices would fall if programs were removed. Where the long run price equilibrium would likely occur and the path to such an equilibrium are major questions which confound policy development. If the sector can achieve long run equilibrium quickly and painlessly the movement to a free market can be accomplished at little cost to the sector. However if the market suffers

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from a large and chronic disequilibrium the adjustment of the sector will be long and difficult.

The objectives of this paper are to: (1) trace out the adjustment path of the sector under approximately free market conditions, (2) determine the level of subsidy provided by historical programs and (3) determine if possible whether the adjustment to a free market will be short term with a quick recovery or long term with no recovery. To accomplish these objectives, the Economic Research Service's (ERS's) Food and Agricultural Policy Simulator (FAPSIM) was used for a counter-factual analysis for the period -- 1975 to 1983.

Analysis

The FAPSIM model explicitly incorporates policy variables as control levers in order to evaluate the effects of policies on specific commodities and on the sector in general. Model parameters were estimated with the policies of the 1973, 1977 and 1981 Agricultural Acts in place.

To evaluate how the sector might have behaved under an alternative set of policies, which would have allowed prices to move toward the long run equilibrium level, the major crop policy levers: fixed loan rates, the farmer owned reserve (FOR), the CCC storage program, target prices and deficiency payment, set-aside and land diversion programs were turned off for the period from 1975 to 1983.

Historical Condition

For the period from 1973 to 1976 the provisions of the 1973 Act were largely ineffective because prices in the market were above the specified loan rates and target prices and no acreage reduction programs were in effect, thus the

market and the model provide nearly identical solutions. Actual government stocks were nonexistent and the CCC loans that were made were largely redeemed. For 1975, total price support and related program outlays were \$744 million, the smallest outlay from 1952 to 1985. The period from 1974 to 1976 was, perhaps, the only period since the beginning of programs in the 1930's when it would have been possible to move toward a market orientation without facing the immediate problem of policy induced excess capacity.

During the 1977 to 1981 period the wheat loan rate essentially set the floor price and in 1977/78 stocks began to accumulate in the Farmer Owned Reserve. By 1982/83 FOR stocks of wheat exceed 1 billion bushel. Corn stocks in the FOR reached 636 million bushel in 1979, dropped to zero in 1980 and were over 1.5 billion bushels in 1982. The corn loan rate essentially set the price floor in 1977 and 1982. In 1983, the largest annual acreage reduction program in the history of farm programs was undertaken to reduce the stock carry over and prevent further stock accumulation. Thus, the historical period encompasses free market conditions initially and strict supply controls at the end.

For the following analysis, 1975 was used as the point of departure from historical program conditions. This permits an evaluation of the market beginning in a period of market directed change under largely uncontrolled conditions. Moving to a low and flexible level of support under these conditions avoids the problem of counteracting the program induced disequilibrium of the early 1980's because the support program is made flexible before expectations of higher income are captured in the model.

Alternative Scenarios

For the first alternative it was assumed that nonrecourse loan rates for

wheat, corn, sorghum, barley, oats, soybeans, and cotton were set at 85 percent of the 5 year historical average price minus the high and the low. Commodity Credit Corporation (CCC) release prices were set at 115 percent of the same price. In concept, protection is provided in the form of price support only in years of large crop yields or slack demand. In other years, the market is free to allocate supplies among foreign and domestic markets. The hypothetical program, as structured, would act to protect commodity producers from excessive variability but would not induce expansion of capacity if the market was not strong enough to induce the expansion. The second simulation assumes that, in addition to providing protection from excess production or slack demand in a particular year as in the first alternative, there is a specific policy to protect incomes of producers when prices are below the historical average. This is accomplished by establishing a target price set at 100 percent of the 5 year historical average price minus the high and the low. The model results thus include three outcomes; (1) the actual historical program as it is replicated by the model, (2) a set of simulations with flexible loan rates, and (3) a flexible market oriented loan rate with a target price with all producers eligible for the deficiency payment (income support) if market prices fall below the historical average.

Tables 1 and 2 summarize results for wheat and corn for three scenarios. An important caveat is that, while exports do adjust to changing prices, it is not possible to fully reflect the difference in export volume that would have occurred if free market conditions had prevailed during the historical period. One might expect that with lower prices competitors would not have found it as profitable to expand and our share of the market might have remained larger. The model therefore may produce lower exports on a

counter-factual basis than would have existed if supports had not been in place in the historical period. Nevertheless the direction and approximate magnitude of the differences among scenarios appear to be empirically and theoretically correct.

Under the free market option wheat prices are lower and more variable than under the historical conditions, wheat production falls below historical levels, export volume increases, and commercial stocks rise to the 650 million to 800 million range (table 1). Corn follows a pattern similar to wheat but because of the greater variability in corn yields prices are more variable. Commercial stocks rise to nearly 1.0 billion bushels in 1982 and then because of the poor yields in 1983 fall to less than 100 million bushels (table 2).

Table 1 Historical and Simulated Outcomes for Wheat 1976-83

WHEAT	units	Scen.	1976	1977	1978	1979	1980	1981	1982	1983
PRODUCTION	mil. bu.	Hist.	2149	2045	1775	2134	2381	2785	2765	2972
PRODUCTION	mil. bu.	Free	2149	2045	1952	2073	2306	2645	2745	2693
PRODUCTION	mil. bu.	Trg't	2149	2091	1915	2141	2306	2666	2737	2732
TOT. DOM. USE	mil. bu.	Hist.	754	858	836	783	781	846	907	1111
TOT. DOM. USE	mil. bu.	Free	754	798	815	812	872	788	940	1187
TOT. DOM. USE	mil. bu.	Trg't	754	801	818	806	884	814	941	1209
EXPORTS	mil. bu.	Hist.	949	1124	1194	1375	1513	1770	1508	1428
EXPORTS	mil. bu.	Free	949	1063	1208	1464	1711	1898	1772	1393
EXPORTS	mil. bu.	Trg't	949	1063	1208	1463	1711	1939	1773	1486
TOTAL USE	mil. bu.	Hist.	1703	1982	2030	2158	2294	2616	2415	2539
TOTAL USE	mil. bu.	Free	1703	1861	2024	2276	2584	2686	2712	2580
TOTAL USE	mil. bu.	Trg't	1703	1864	2026	2269	2595	2753	2714	2695
TOTAL STOCKS	mil. bu.	Hist.	1113	1179	925	902	989	1159	1515	1399
TOTAL STOCKS	mil. bu.	Free	1113	1300	1130	929	654	616	657	770
TOTAL STOCKS	mil. bu.	Trg't	1113	1341	1232	1100	814	730	760	797
RESERVE	mil. bu.	Hist.	0	342	403	236	359	560	1060	611
RESERVE	mil. bu.	Free	--	--	--	--	--	--	--	--
RESERVE	mil. bu.	Trg't	--	--	--	--	--	--	--	--
COM. STOCKS	mil. bu.	Hist.	1113	788	470	523	430	409	262	599
COM. STOCKS	mil. bu.	Free	1113	856	597	635	613	616	655	770
COM. STOCKS	mil. bu.	Trg't	1113	856	597	635	613	630	656	797
GOV'T (CCC)	mil. bu.	Hist.	0	48	52	142	200	190	192	188
GOV'T (CCC)	mil. bu.	Free		444	533	294	41		2	
GOV'T (CCC)	mil. bu.	Trg't	0	485	635	465	200	100	14	0
HARVESTED AC.	mil. ac.	Hist.	71	67	57	63	71	81	78	61
HARVESTED AC.	mil. bu.	Free	71	67	62	62	69	76	80	74
HARVESTED AC.	mil. bu.	Trg't	71	68	64	65	69	77	79	75
FARM PRICE	dol./bu.	Hist.	2.73	2.33	2.97	3.78	3.91	3.65	3.55	3.54
FARM PRICE	dol./bu.	Free	2.73	2.62	2.90	3.33	2.99	3.10	2.45	3.69
FARM PRICE	dol./bu.	Trg't	2.73	2.62	2.90	3.33	2.99	2.92	2.44	3.29
TARGET	dol./bu.	Hist.	2.29	2.90	4.00	4.00	3.60	2.90	3.40	3.40
TARGET	dol./bu.	Free	--	--	--	--	--	--	--	--
TARGET	dol./bu.	Trg't	2.35	3.08	3.40	3.40	3.06	2.99	2.87	2.94
LOAN RATE	dol./bu.	Hist.	2.25	2.25	2.35	2.50	3.00	3.20	3.55	3.54
LOAN RATE	dol./bu.	Free	2.00	2.62	2.90	2.90	2.60	2.54	2.44	2.55
LOAN RATE	dol./bu.	Trg't	2.00	2.62	2.90	2.90	2.60	2.54	2.44	2.50

Table 2 Historical and Simulated Outcomes for Corn 1976-83

YEAR	Unit	Scen.	1976	1977	1978	1979	1980	1981	1982	1983
PRODUCTION	mil. bu.	Hist.	6289	6504	7268	7927	6640	8118	8235	5931
PRODUCTION	mil. bu.	Free	6289	6507	7392	7897	6586	8377	8335	5160
PRODUCTION	mil. bu.	Trg't	6289	6453	7411	7913	6529	8420	8408	5087
TOT. DOM. USE	mil. bu.	Hist.	4121	4334	4944	5183	4868	5013	5420	4709
TOT. DOM. USE	mil. bu.	Free	4120	4432	5096	5300	4809	5407	5997	4322
TOT. DOM. USE	mil. bu.	Trg't	4120	4435	5134	5324	4740	5407	6012	4372
EXPORTS	mil. bu.	Hist.	1684	1948	2133	2432	2355	1967	1870	1865
EXPORTS	mil. bu.	Free	1684	1988	2191	2479	2332	2187	2159	1618
EXPORTS	mil. bu.	Trg't	1684	1988	2191	2479	2292	2186	2160	1636
TOTAL USE	mil. bu.	Hist.	5805	6281	7077	7615	7223	6979	7290	6573
TOTAL USE	mil. bu.	Free	5805	6420	7287	7780	7142	7593	8171	5940
TOTAL USE	mil. bu.	Trg't	5805	6423	7322	7803	7032	7594	8171	6008
TOTAL STOCKS	mil. bu.	Hist.	886	1111	1303	1616	1034	2174	3120	723
TOTAL STOCKS	mil. bu.	Free	886	975	1081	1199	643	1428	1607	77
TOTAL STOCKS	mil. bu.	Trg't	886	918	1008	1119	617	1444	1682	86
RESERVE	mil. bu.	Hist.	0	315	539	728	186	1386	1550	426
RESERVE	mil. bu.	Free	--	--	--	--	--	--	--	--
RESERVE	mil. bu.	Trg't	--	--	--	--	--	--	--	--
COM.STOCKS	mil. bu.	Hist.	886	783	666	632	611	486	419	96
COM.STOCKS	mil. bu.	Free	886	900	854	854	643	964	970	77
COM.STOCKS	mil. bu.	Trg't	886	900	854	854	617	964	970	86
GOV'T (CCC)	mil. bu.	Hist.	0	13	99	256	237	302	1149	201
GOV'T (CCC)	mil. bu.	Free	0	75	227	344	0	464	637	0
GOV'T (CCC)	mil. bu.	Trg't	0	18	154	264	0	480	711	0
HARVESTED AC.	mil. bu.	Hist.	83.5	83.2	80.6	80.4	82.9	83.2	81.1	60.2
HARVESTED AC.	mil. bu.	Free	83.5	83.2	84.5	81.8	82.5	85.7	84.8	83.3
HARVESTED AC.	mil. bu.	Trg't	83.5	82.6	84.7	81.9	81.8	86.0	85.6	83.3
FARM PRICE	dol./bu.	Hist.	2.15	2.02	2.25	2.52	3.11	2.50	2.68	3.25
FARM PRICE	dol./bu.	Free	2.15	1.89	2.05	2.36	3.18	1.86	1.86	3.94
FARM PRICE	dol./bu.	Trg't	2.15	1.89	2.05	2.36	3.31	1.86	1.86	3.90
TARGET	dol./bu.	Hist.	1.57	2.00	2.10	2.20	2.35	2.40	2.55	2.65
TARGET	dol./bu.	Free	--	--	--	--	--	--	--	--
TARGET	dol./bu.	Trg't	1.84	2.22	2.40	2.41	2.24	2.18	2.18	2.09
LOAN RATE	dol./bu.	Hist.	1.50	2.00	2.00	2.10	2.25	2.40	2.55	2.65
LOAN RATE	dol./bu.	Free	1.54	1.88	2.05	2.05	1.91	1.85	1.85	1.78
LOAN RATE	dol./bu.	Trg't	1.54	1.88	2.05	2.05	1.91	1.85	1.85	1.78

When all crop and livestock changes are accounted for by the model the bottom line is that net income falls by \$2.2 billion in 1978 and by 1983 net income is below the historical level by \$8.4 billion under the free market scenario. Without price supports, farm income would have been more variable and would have followed a downward trend from 1976 to 1983. Under such conditions investments in the sector would have been sharply curtailed, the increase in debt would have been smaller and the effects of rising real interest rates on the sector would have been reduced.

Table 3 Net Farm Income

Scenario	1976	1977	1978	1979	1980	1981	1982	1983
	-----million dollars-----							
Historical	23980	18277	31951	26426	29812	22405	19045	27905
Free market	23975	18486	29700	22949	26100	20278	12357	19554
Flexible Target	24020	18574	32692	27133	28179	20474	15210	22409

Table 4 shows an estimate of the indirect subsidy to producers of grains and cotton during the 1976 to 1983 period as a result of the price support program, which results in a transfer from consumers. The estimated subsidy is the change in producer revenues as a result of the program. By 1982 this subsidy reached \$6.7 billion dollars. No estimate of the indirect subsidy to dairy or livestock producers is included in this analysis.

Table 4 Estimated Indirect Subsidy From Price and Quantity Changes

Year	Wheat	Corn	Sorghum	Oats	Barley	Cotton	Total
	-----MILLION DOLLARS-----						
1976	0	0	0	0	0	0	0
1977	0	100	47	26	13	265	451
1978	0	603	114	24	16	114	871
1979	954	805	159	6	3	152	2079
1980	2102	711	38	46	0	98	2995
1981	1832	365	117	143	10	34	2501
1982	2733	3325	389	181	45	0	6673
1983	752	3816	285	176	0	0	5029

Tables 5 and 6 report the direct subsidy from deficiency payments and storage payments in the historical program. The value of the 1983 Payment-in-kind program is not included, however, this would swell the 1983 subsidy enormously. The major point is that the subsidies were growing sharply.

Table 5 Deficiency Payments

Year	Wheat	Corn	Sorghum	Oats	Barley	Cotton	Total
million dollars							
1976	0	0	0	0	0	0	0
1977	1463	0	409	0	249	0	2121
1978	743	0	149	0	64	0	956
1979	0	0	30	0	38	0	68
1980	0	0	0	0	0	0	0
1981	428	0	19	0	95	270	812
1982	110	194	0	0	66	660	1030
1983	656	450	0	0	46	623	1775

Table 6 Storage Payments

Year	Wheat	Corn	Sorghum	Oats	Barley	Total
million dollars						
1976	0	0	0	0	0	0
1977	68	63	10	4	5	150
1978	101	135	12	7	10	265
1979	59	182	3	6	5	255
1980	95	49	0	0	3	147
1981	148	367	61	0	6	582
1982	281	410	58	1	26	776
1983	162	113	48	7	25	355

The summary in table 7 shows that wheat producers, in the aggregate, have been the largest beneficiaries of the programs followed by corn and cotton producers.

Table 7 Total Direct and Indirect Subsidy

Year	Wheat	Corn	Sorghum	Oats	Barley	Cotton	Total
----- million dollars -----							
1976							
1977	1531	163	466	30	267	265	2722
1978	844	738	275	31	90	114	2092
1979	1013	987	192	12	46	152	2402
1980	2197	760	38	46	3	98	3142
1981	2408	732	197	143	111	304	3895
1982	3124	3929	447	182	137	660	8479
1983	1570	4379	333	183	71	623	7159

Under the third scenario, which provides income support to producers with a target price at the level of average historical prices, the income subsidy rises to \$4.0 billion in 1978, drops to near zero in 1980 and climbs to \$4.0 billion in 1982. Thus, the subsidy program varies largely in a counteractive way with yield and demand shocks to the system. Net income is held above the free market level but at a relatively high cost to the treasury as compared to the high cost to consumers.

Conclusions

The analysis shows that the 1977 and 1981 programs supported the incomes of producers above the market clearing level. In the 1976 to 1983 period the cumulative nominal income enhancement amounted to about \$29.9 billion, nearly 75 percent of this through indirect payments from consumers through higher prices. The average subsidy per year for the 1977 through 1983 period was about \$4.3 billion. At normalized current return-to-asset ratios (.03) for the sector the average subsidy would have supported about \$143 billion in asset values. However, the subsidy was growing and by 1982 amounted to \$8.4 billion or enough to support \$280 billion in asset values under historic relationships. ERS estimated the value of real estate at about \$823 billion in 1982, thus, about 34 percent of the value could have been supported by the expectation of a continued subsidy of that magnitude. For 1983 the

subsidy dropped to \$7.5 billion with the expectation of a further decline and by February 1984 the total value of real estate had declined to \$782 billion.

The above data suggest that capital and real estate values in agriculture are in line with past income subsidy programs and were greatly out of line with the free market. The excess capacity problem created by past programs was and is large. Too many resources are employed in the sector and movement to a free market will be costly in terms of the loss of income and wealth of farm people and rural communities.

Providing transitional income support through direct payments to commodity producers will reduce their immediate problems, however, the need for support is unlikely to be lessened by the action of the free market. The income support programs will retain resources in the sector and contribute to downward pressure on prices and income from the market and thus result in a continuing large transfer program.

The FAPSIM model results do not provide support for the hypothesis that the agricultural sector will have a quick turn-around if allowed to operate under free market conditions. The behavior of the model under free market conditions suggest a chronic disequilibrium and a prolonged downward trend in income.