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PRICE SUPPORTS VERSUS AN EQUILIBRIUM EXCHANGE RATE: A COMPARISON OF INCOME DISTRIBUTION CONSEQUENCES*

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U.S. domestic farm prices were set above market clearing levels during much of the 1950's and 1960's. Initially, market prices were sustained by the government acquiring the difference between the quantity supplied and the quantity demanded at the prevailing prices and adding it to public stocks - stocks which provided a relatively high degree of stability to U.S. and world markets in this period. Later (starting in 1956), supply was brought into balance with demand at the prevailing price ratios by removing land from production. Stocks in government hands, which reached a peak of $6.4 billion in 1959, were worked down to slightly over $1 billion in 1967 and 1968, and again in 1971...

The conventional view has been that these policies constituted a subsidy to U.S. agriculture and induced a greater commitment of labor and nonland capital to the sector than would otherwise have been the case. Moreover, it has been assumed that land-owners benefitted from the policy compared to labor, and that consumers suffered losses because of the higher prices that they had to pay for food and other agricultural products. The presumption has been that large farmers also benefitted from the program relative to small farmers.

A recent reinterpretation (Schuh) of this period of our history, however, has argued that an important countervailing factor had been neglected, i.e., that agriculture suffered discrimination as a result of the chronic over-valuation of the dollar in this period. The over-valuation caused U.S. agricultural exports to be less competitive in world markets than they might otherwise have been, which in turn caused domestic agricultural prices to be less than they would have been at an equilibrium exchange rate.

On this view the price support program did little more than cushion a decline in relative farm prices that was being imposed by a chronic disequilibrium in the foreign exchange market. As real support levels for major commodities were permitted to drift down in order to reduce the continued accumulation of stocks in government hands, consumers ended up being the major beneficiaries of both the trade policy and the considerable technical progress in agriculture. Land owners and farm operators, in turn, were compensated for the decline in real prices by acreage diversion and diversion payments for withdrawing land from production.

This paper represents a modest attempt to further out knowledge in reinterpreting the consequences of policies used in this period. It draws on a previous study to make a tentative reinterpretation of the income distribution consequences of the policies pursued. Although interesting in their own right, the results are by no means definitive, and perhaps serve as much to suggest the need for additional research as anything else.

At one level it could be argued that the price support program offset the consequences of the over-valuation, with the result that the net effect was neutral. However, the interpretation presented below suggests

that this was not the case, and that the effect of the policies on both the functional and personal distribution of income was quite different than is generally assumed. The analysis also suggests why a land retirement program evolved rather than some other form of "support" for the agricultural sector.

Conventional View of Income Distribution Consequences

Floyd has made perhaps the most rigorous and systematic analysis of the income distribution consequences of the price "support" program. He specified a six-equation model consisting of an aggregate production function, the marginal productivity conditions for the two factors (land and labor), supply relations for the factors, and a demand relation for farm output. The labor input is an aggregation of labor and capital.

To show the effects of price supports on the factor markets under conditions where output is not controlled, the full system was solved and elasticities of the equilibrium factor prices and quantities with respect to the price of farm output were calculated. To show the effects of price supports and acreage controls combined, land is treated as a parameter and the model is reduced to a system of three equations in three variables. The rise in price of the product is viewed as the result of the acreage reduction.

Although Floyd also presented results for a system of marketing controls, we present in Table 1 only his results for a 10 percent government-induced rise in product prices for the case of no output controls and acreage controls, since they are most pertinent for our analysis. A range of structural parameters was consider by Floyd in order to establish upper and lower limits to the estimated effects. The parameters assumed for the analysis were -0.25 and 0.50 for the price elasticity of output demand, 0.5 and 1.5 for the elasticity of substitution, 1.0 and 3.0 for the supply elasticity of labor and capital, zero for the supply elasticity of land, and 0.2 and 0.8 as the relative shares of land and labor-capital, respectively, with labor and capital aggregated into one input.

Table 1. Effects (Percent Change) of a 10-percent Government-Induced Rise in Product Prices, Given Alternative Assumptions About Output Control.

Output Control Accompanying Price Supports	Output	Farm Wage Rate	Quantity of Labor	MVP of Land	Quantity of Land Used
No output controls:					
Maximum	+17.0	+8.8	+13.5	+31.8	0
Minimum	+ 5.7	+4.5	8.8	+14.7	0
Acreage controls:					
Maximum	- 5.0	+ 5.0	+ 5.0	+10.0	-52.0
Minimum	- 2.5	0.0	0.0	+ 6.0	-12.0

Source: Floyd

Floyd's results indicate that a 10-percent government-induced rise in product prices with no controls on output would result in an increase in the farm wage rate of between 5 and 9 percent and an increase in the employment of labor of between 9 and 14 percent. The use of acreage controls, on the other hand, reduces the demand for labor, other things being equal. The results indicate that where acreage is controlled the maximum plausible increase in the wage rate would be 5 percent. Floyd notes that it is also plausible that no increase in the returns to labor would occur in this case. Hence, he concludes that, except where output is not controlled, there does not appear to be much chance of a significant rise in the return to labor in agriculture as a result of these policies.

The value of land increases in both cases -- whether output is not controlled or whether land is taken out of production according to an acreage-allotment program and compensated by the government. Where output is not controlled, a rise of 15-30 percent might be expected. And if the government applies acreage controls and compensates land removed from production according to its marginal return at the new level of putput, land rental values rise less - probably by not more than 10 percent. In either case, however, the presumption is that land benefits relative to labor from the policies, although both land and labor are assumed to benefit and labor employment is assumed to increase.

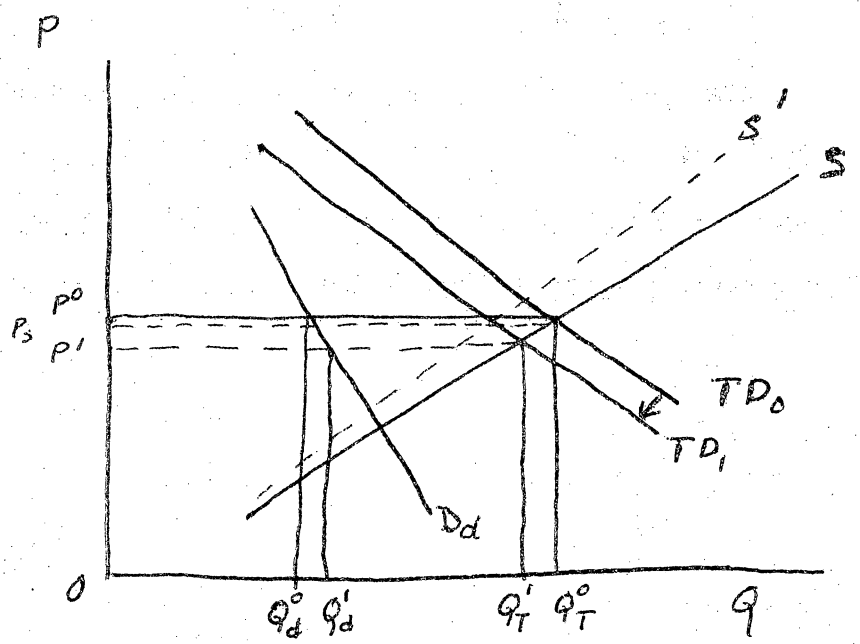
A Reinterpretation

Floyd's analysis, of course, treats U.S. agriculture as if it were part of a closed economy and ignores the consequences of exchange rate and trade policy. Moreover, his analysis assumes that the price support-land retirement programs raised farm prices relative to what they would have been in the absence of the programs.

Schuh's reinterpretation of the post-World War II period casts the situation in a substantially different light. He argues that most observers ignored the role of the over-valuation of the dollar, an over-valuation which began according to Houthakker in 1949 but which was masked for a few years due to the effects of the Korean War. As the effect of the over-valuation began to be reflected in declining foreign demand and lower domestic prices for agricultural products, the government stepped in first by purchasing from the market and adding to stocks. This policy could not be sustained, however, since the large build-up of stocks in government hands and the large budget costs were politically unacceptable. Consequently, support prices were gradually flexed downward in real terms, contributing

to the persistent decline in relative farm prices. As a corollary measure, land was withdrawn from production and income losses that would have occurred in the market place were compensated (perhaps only in part) by land diversion payments. The artificial scarcity of land created by this program sustained the price of land.

A graphic interpretation of what was happening is presented in Figure 1. Total demand (TD) for U.S. agricultural output is made up of a domestic demand (D_d) and a foreign demand, with the latter shown as the difference between TD and D_d. TD_o represents total demand in the presence of an equilibrium exchange rate and TD, represents total demand with an over-valued exchange rate.



The consequence of the over-valuation is to lower the domestic price from P^o to P'. Land retirement, on the other hand, shifts the aggregate supply to the left, other things being equal, causing price to rise to some point above P'. The extent of the price rise would depend on how much land was removed from production.

The key question, of course, is what in fact happened to the price of the product. Clearly the government attempted to sustain prices for some period. The large stocks accumulated in government hands were testimony to that. But the real value of support levels for all major commodities drifted downward almost continuously from the early 1950's through the early 1970's (Schuh). The real support price of corn declined by 45 percent from 1950-52 through 1970-72, the real support price of cotton and peanuts by 25 percent, the real support price of wheat by 39 percent, and the real support price of tobacco by 9 percent. The parity ratio, of course, declined from an index of 100 in 1952 to an index of 70 in 1971.

Schuh argued that by the end of the 1960's the agricultural sector was about as close to being in adjustment at prevailing domestic price ratios as it had been for 20 years. Support levels had been worked down to near-equilibrium levels with a couple of important exceptions. Stocks in government hands had been worked down, with acreage diversion fluctuating from year to year but not trending upward. And the labor market was approaching equilibrium, with the gap between farm and non-farm income having been reduced substantially. In effect, the agricultural sector had been adjusted to the lower set of domestic product prices as reflected by the over-valued dollar. Exchange rate policy was taken as a datum and resources in the agricultural sector were adjusted to the price ratios established by it and other market conditions. The effect of the price support program was to cushion the adjustment.

Schuh also argued that the persistent downward pressure on farm prices in this period probably stimulated a more rapid rate of technical change than would otherwise have been the case. If this were the case, then the supply curve of agricultural output would have shifted back to the right, offsetting part or all of the effect of the land retirement program.

Our primary interest here is the income distribution consequences of this revised interpretation. Rather than to make an estimate of how much discrimination agriculture in fact suffered, we can do as Floyd and others have done and analyze the consequences of a 10 percent decline in relative farm prices. Our interest is in the relative effect of the policies, and not the absolute effects.

Floyd's results that were presented in Table 1 can be used for the analysis. As a first approximation, all that has to be done is to change the signs on the numbers in the "no control" rows. The consequence of a 10 percent reduction in real farm prices as a result of the over-valuation of the dollar would be to reduce the level of farm employment by from 9-14 percent, and to lower the farm wage rate by from 5-9 percent. These results indicate the extent to which an already serious labor adjustment problem was made more serious, and explain in part why outmigration from agriculture was so great in the 1950's and 1960's. They are also just the opposite of Floyd's results and to the usual interpretation of the impact of public policy on the farm sector.

What is equally interesting is the extent to which land owners would have suffered capital losses in the absence of an acreage control or land retirement program. The analysis suggests that without such programs, land values would have declined between 15 and 32 percent, relative changes that are substantially larger than the decline in wage rates suffered by labor. Moreover, land has few alternatives outside of agriculture, a factor reflected in the zero supply elasticity assumed by Floyd.

With these results, one has a somewhat different perspective on why the political process channeled support to agriculture in such a way as to provide partial protection to land values. The extent to which only partial support was provided can be seen from the data under "acreage controls" in Table 1. Acreage restrictions are seen to raise land values between 6 and 10

percent, depending on the assumptions about the parameters and the amount of land removed from production. Hence, the net effect of a combined overvaluation of the dollar which lowered farm prices by 10 percent and a land set aside of the amounts indicated in the table would be to lower land values between 9 and 22 percent compared to what they would have been.

Under the assumptions which give a minimum or lower limit effect of acreage controls, Floyd's results indicate that such policies had no effect on farm wage rates or employment. This suggests that the acreage control programs did little to cushion the labor adjustment problem. What they did in essence was to limit somewhat the rather large losses that land owners would have suffered in the absence of such programs.

A final point is of interest. Those who have viewed agriculture through the prism of a closed-economy model have argued that restricting output and raising agricultural prices was a means of increasing aggregate farm income by means of taking advantage of the inelastic domestic demand curve for agricultural products. The failure to sustain these prices is interpreted as a reflection of the decline in political power of the farm block.

Viewing agriculture in the context of an open economy also puts this interpretation in a somewhat different light. Total demand for agricultural output becomes more elastic when viewed in the context of an open economy, and the farmers can be viewed as acquiescing in the decline in product price because it would lead to a larger gross farm income in the aggregate, other things being equal.

Tweeten has made one of the few estimates of the price elasticity of foreign demand for U.S. agricultural output. His conservative estimate, which he obtains by assuming that important trading partners such as the

European Community are totally unresponsive to price, puts this at -5.6 in the intermediate run. If one weights the foreign and domestic demand (assumed to be-0.25) at a ratio of 1 to 3 (.25 and .75), the estimate of the aggregate price elasticity of demand for U.S. agricultural output would be -1.6. Although only a tentative approximation, this estimate does suggest that farm income in the aggregate would be larger with lower farm prices.

Some Concluding Comments

U.S. farm policy has often been viewed as being highly regressive in its income distribution consequences. It has been assumed that consumers were forced to pay higher prices than they otherwise would have had to pay, and low income groups suffer larger relative income losses as a result of higher food prices than do upper income groups. The programs were assumed to benefit land owners relative to labor, and to especially benefit the larger land owners.

The reinterpretation taking the over-valued dollar into account leads to quite different results. Food and agriculture prices are seen to be lower than they otherwise would have been, with the result that there was a progressive redistribution of income in favor of the poor. Land owners are seen to suffer capital losses in a relative sense, with acreage controls offsetting only part of these losses.

Labor clearly had to bear the bulk of the adjustment costs. But that was not a result of the farm programs per se. Rather it was due in large part to the over-valuation of the dollar. The acreage control program obviously did not help this group, except marginally, but neither did it appear to exacerbate the problem.

The policies did benefit land owners relative to labor, but only in the sense of keeping the losses that would have occurred from the over-valuation

of the dollar smaller than they otherwise would have been. Viewed in this light, farmers who protest from having their export markets taken away from them by export controls can be viewed somewhat more sympathetically. After suffering a generation of discrimination, they might rightly complain at having their new-found markets taken away from them again.

As a final point, we would note that our results represent only a first approximation to the further reinterpretation of the U.S. agricultural development experience, and are offered primarily to point to the need for additional research. Floyd's model is a simple one and the parameters need to be updated. Our acceptance of his demand elasticities, for example, are appropriate only in the short run, and on the assumption that the policy intervention was such as to make domestic demand the most important determinant of farm income.

The analysis is also static. The dynamics of the adjustment problem may well have caused more severe income problems for labor than the static results would suggest, especially in light of the tight monetary policies (and the unemployment it caused) that were pursued in the 1950's, for example, to stem the outflow of gold. And perhaps most importantly, the model needs to be cast in the context of an open economy, with more attention given to general equilibruim effects. Until that is done, our reinterpretation of Floyd's results can be viewed only as a first crude approximation to the relative income distribution consequences of the policy mix that prevailed through the 1950's and 1960's.

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