

Evolution of Supply Management Programs Toward Planting Flexibility

U.S. agricultural commodity policy has undergone important changes over the last 10 to 15 years, particularly regarding supply management programs. Policy changes since the mid-1980's have significantly changed agriculture from the highly managed sector of the early- and mid-1980's to a more market-oriented sector today (Nelson and Schertz; Young and Shields).

Supply Management Policy Evolution to Market Orientation

Under the 1985 Act, supply management programs significantly limited producers' planting decisions with both institutional barriers and economic barriers to acreage shifting among crops. Requirements to plant the program crop (or to certify acreage as "considered planted") to protect the farmer's acreage base for that crop were a strong institutional barrier to planting flexibility. Large deficiency payment rates, although a benefit of program participation, also represented an economic barrier to planting flexibility. As a result, program participation rates were high, supply response was significantly constrained, and the programs encouraged the planting of the same program crops over time.

Farm legislation in 1990 provided farmers some planting flexibility. Flexibility to plant other crops on 25 percent of program-crop base acres was permitted with base protection for any acreage switched, thus breaking the institutional barrier to flexibility. On 15 percent of the acreage base (normal flex acres), there were no deficiency payments regardless of the planting choice, effectively eliminating the economic barrier to use of planting flexibility. For the remaining 10 percent of the acreage base where planting flexibility applied (optional flex acres), deficiency payments were paid if the program crop was planted, but were foregone for each acre that was flexed to an alternative crop. On optional flex acres, therefore, the economic barrier to use of flexibility remained. The combination of these program changes partly opened supply response to market forces. There was considerable use of flexibility on normal flex acres, where both the institutional and the economic barriers were removed, but there was only limited switching on optional flex acres, where economic barriers (in particular, the potential loss of deficiency payments) remained.

The 1996 Act introduced nearly full planting flexibility. With only a few limitations, planting alternative crops is now permitted on a farmer's entire acreage base, thus fully eliminating institutional barriers to flexibility. Under the 1996 Act, farmers who participated in the wheat, feed grain, cotton, and rice programs in any one of the years 1991-95 could enter into 7-year production flexibility contracts and receive payments for the years 1996-2002.⁴ These contract payments are not linked to production choices—farmers receive the full contract payment so long as the land is kept in an agricultural use. Thus, economic barriers to flexibility are also removed under the 1996 Act, making supply response more open to market forces.

A Closer Look at 1990 Farm Legislation

Because most of the U.S. experience with planting flexibility was during 1991-95 under provisions of 1990 farm legislation, features of that legislation and the economic planting incentives during those years are discussed in this section. This also sets the stage for the supply response estimation that follows, based mostly on analysis of normal flex acreage.

To facilitate the analysis of the economics of various planting decisions, we used a net returns framework (Westcott, 1991; Westcott and Glauber). Comparisons of net returns for different planting options form the basis for the cropping choices that farmers make to maximize profits. Of particular interest is how program payments affected producers' decisions.

Program Participation Decision (Whole Base)

Program payments under 1990 farm legislation affected producers' decisions to enroll in the annual commodity programs by influencing expected net returns. Equations 1a, 1b, and 1c indicate alternative average per-acre net returns to, respectively, (a) enrolling in the program for a program crop (and planting the program crop to the extent permitted); (b) not enrolling in the program but planting the program crop; and (c) planting an alternative competing crop.

(1a) Market returns plus Government payments for program crop; program participant:

$$NR_p = (1 - ARP) (P * Y - VC) + (1 - ARP - 0.15) D$$

⁴Contract acreage includes (1) land considered planted to program crops for any of the crop years 1991-95, (2) land enrolled in acreage reduction programs (ARP's) for any of the crop years 1991-95, and (3) land leaving the Conservation Reserve Program (CRP) that had an acreage base.

(1b) Market returns; non-participant:

$$NR_n = P * Y - VC$$

(1c) Market returns for alternative competing crop:

$$NR' = P' * Y' - VC'$$

NR_p , NR_n , and NR' are alternative expected net returns; P , Y , and VC are price, yield, and variable production costs for the program crop; P' , Y' , and VC' are price, yield, and variable production costs for an alternative competing crop; ARP is the annual Acreage Reduction Program land-idling requirement; and D is the deficiency payment rate on a per-acre basis.

Net returns for program participation reflect both the benefits of expected deficiency payments as well as the costs of idling land. Provisions of the 1990 farm legislation that reduced payment acres lowered the acreage eligible for deficiency payments by 15 percent of the acreage base, as indicated in equation 1a. Net returns for the program crop as a nonparticipant or for an alternative competing crop are based on the marketplace, equaling expected market receipts minus variable production costs.

The decision to participate in the program was a whole-base decision prior to the 1996 Act, meaning that farmers either enrolled their entire base acreage in the program or grew the program crop or an alternative competing crop outside of the program. Deficiency payments affected the participation decision, as indicated by the inclusion of payments in equation 1a. A choice to not participate or to plant an alternative crop would be based on the net returns associated with those decisions, compared with the net returns and program payments associated with the participation option.

Other factors that could affect the program participation decision included a lack of base protection if a producer planted an alternative crop or idled land as a nonparticipant. Flexibility provisions that allowed some shifting to other crops while protecting the program crop acreage base only applied to program participants. Thus, farmers wanting to shift to other crops without a loss of base acreage would need to enroll in the program. On the other hand, however, a program participant could not plant the program crop beyond the size of the acreage base. If a farmer wanted to overplant the acreage base and enlarge the base for future years, this could be done only as a nonparticipant for the year of overplantings.

Planting Decisions for Subcomponents of Enrolled Acreage Base

As a whole-base decision, program payments affected the decision to participate. However, once in the program, how did program payments affect marginal planting choices for different parts of the enrolled acreage base? Again, these planting decisions can be examined by analyzing net returns associated with each of the subcomponents of the enrolled base. These subcomponents include normal flex acreage, optional flex acreage, and nonflex acreage divided into two parts related to the 0/85 program. For each acreage base subcomponent, average per-acre net returns for alternative planting choices are presented. For illustration purposes, a farm with a 100-acre base is used in the discussion. Also, to simplify the arithmetic, the examples presented assume a 0-percent Acreage Reduction Program (ARP), as was implemented in 1994 for corn. Acreage designations and corresponding program payment acres for two planting alternatives, the regular program and the 0/85 program, are also illustrated in figure 1.

Normal flex acreage. Normal flex acreage (NFA) covered 15 acres of the 100-acre base. On these acres, no deficiency payments were made regardless of whether or not the farmer planted the program crop. Planting flexibility provisions allowed the planting of alternative crops on these acres without penalty. Net returns for planting the original program crop were therefore based on market returns, as shown in equation 2a, while plantings of a permitted alternative crop also were based on its market returns, as in equation 2b. Because there are no deficiency payments in equation 2a, Government payments did not affect the planting decision on these acres, and the producer's planting decision was based on expected market returns among competing crops.

(2a) NFA, market returns for program crop:

$$NR = P * Y - VC$$

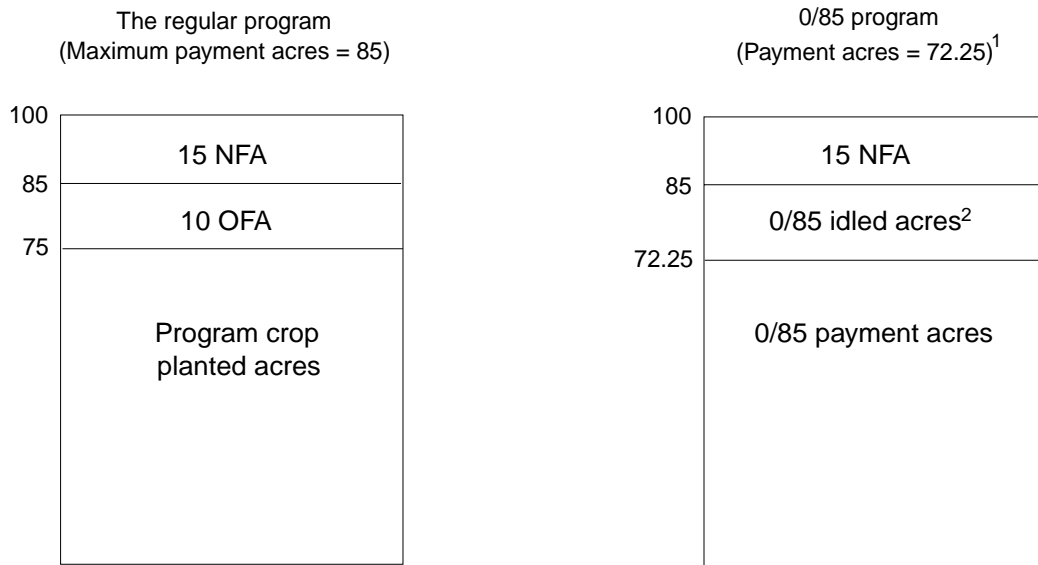
(2b) NFA, market returns for alternative competing crop:

$$NR' = P' * Y' - VC'$$

Optional flex acreage. Optional flex acreage (OFA) covered 10 acres of the 100-acre base. On these acres, deficiency payments were made if the farmer planted

Figure 1

Acreage designations and payment acres on a 100-acre base farm for different program planting alternatives



¹72.25 payment acres under the 0/85 program in this example equal 85 percent of the maximum payment acres under the regular program.

²Equals 12.75 acres, 15 percent of the regular program's maximum payment acres of 85.

the program crop. Planting flexibility provisions applied to these acres, but deficiency payments were forgone for each acre that was switched to an alternative crop. Net returns for planting the original program crop equaled market returns minus variable costs plus deficiency payments as shown in equation 3a, while net returns for planting an alternative crop were based on market returns for the alternative as in equation 3b. Thus, net returns to the alternative crop competed with net returns to the program crop plus program payments. On these 10 acres, program payments mattered because they affected the planting decision.

(3a) OFA, market returns plus Government payments for program crop:

$$NR = P * Y - VC + D$$

(3b) OFA, market returns for alternative competing crop:

$$NR' = P' * Y' - VC'$$

Nonflex Acres. For the remaining 75 nonflex acres of the assumed 100-acre base, a program participant's planting choices generally were to plant the program crop on this entire nonflex acreage, or to idle the land or plant a designated minor oilseed or industrial crop

under 0/85 provisions (fig. 1). If the entire nonflex acreage was planted to the program crop, producers received deficiency payments. In contrast, 0/85 provisions allowed a producer to devote a part of, or all, the permitted program crop acreage to conservation uses and to receive deficiency payments on 85 percent of the maximum payment acreage.

2.75 of the Remaining 75 Nonflex Acres. For analytical purposes, the 75 nonflex acres are divided into two parts, 2.75 acres and 72.25 acres, reflecting features of the 0/85 program.⁵

For 2.75 acres of the 75 nonflex acres, deficiency payments were paid if the farmer planted the program crop.⁶ Net returns equaled market net returns plus

⁵The 0/85 program replaced the 0/92 program in 1994. The breakout of enrolled acreage into subcomponents and the combinations of planting choices in a comparison of the 0/92 program and the 0/85 program differ somewhat.

⁶The 2.75 acres are the difference between the 75 nonflex acres and the 72.25 payment acres under the 0/85 option, which permitted producers to receive payments on 85 percent of the 85 maximum payment acres (MPA) under the regular program. The 85-acre MPA is calculated by subtracting ARP and NFA from base acreage, that is, 85 acres in this 0-percent ARP, 100-acre base farm example. Figure 1 illustrates the differences in receiving Government payments for these subcomponents for a 100-acre wheat farm under the regular program, where the entire nonflex acreage is planted to wheat, and the 0/85 program.

Government payments as in equation 4a. If instead, the farmer chose to idle this land, there would be no market receipts, deficiency payments for these acres were forgone, and there would be a cost associated with idling the land in a conserving use (equation 4b). Planting a designated minor oilseed or industrial crop was not an option on the 2.75 acres (see below). Thus, Government payments mattered for the planting decision on this land, since the choice to idle competed with program payments and the planting of the base crop.

(4a) Market returns plus Government payments; program crop:

$$NR = P * Y - VC + D$$

(4b) Cost of cover crop, if idled:

$$NR' = - VCC$$

72.25 of the 75 Nonflex Acres (0/85 Program).

Because of 0/85 provisions, different net returns affected the planting decision on 72.25 acres of the 75 nonflex acres (based on the assumed 100-acre base).

Under the 0/85 program, if a farmer idled at least 15 percent of the maximum payment acres (or planted an approved crop), deficiency payments would still be paid on 85 percent of the maximum payment acreage. For the 0-percent ARP assumed in these examples, the maximum payment acreage would be 85 acres of the 100-acre base, so 85 percent of the 85 maximum payment acres would be 72.25 acres. Planting flexibility under the 0/85 program applied to these 72.25 acres, which could be planted to the original program crop, switched to minor oilseeds and designated industrial and other crops, or idled, with deficiency payments still paid.⁷

If these acres were planted to the program crop, net returns equaled market receipts plus deficiency payments minus variable costs of production as shown in equation 5a. If the acreage was switched to a permitted alternative crop, net returns equaled market receipts minus production costs for that crop, plus deficiency payments of the program crop, as in equation 5b, with subscripts “a” for the alternative crop. If the farmer chose to idle this land, deficiency payments

would still be paid, so net returns equaled those payments minus the costs associated with idling the land in a conserving use, as in equation 5c. Because the producer received deficiency payments for each option, whether the acreage was planted to the program crop, planted to a permitted alternative crop, or not planted, the planting decision was based only on market returns.

(5a) Market returns plus Government payments for program crop, if planted to program crop:

$$NR = P * Y - VC + D$$

(5b) Market returns for alternative crop plus Government payments for program crop:

$$NR_a = P_a * Y_a - VC_a + D$$

(5c) Government payments minus the cost of cover crop, if idled:

$$NR' = - VCC + D$$

Implications for Supply Response Estimation

Net returns analysis of the program participation decision and of planting choices for various planting options under 1990 farm legislation have a number of implications, particularly for the role of Government payments. As indicated by the analysis, different net returns are important for different producer decisions. Government payments mattered for the whole base decision to participate in the annual farm programs. However, once the participation decision was made, Government payments were largely irrelevant for the cropping choices for program participants. The potential forgoing of payments based on planting decisions mattered on only 12.75 acres of a 100-acre base once the participation decision had been made —10 optional flex acres and 2.75 nonflex acres that were not covered by the 0/85 program. Cropping and idling choices on the rest of the acreage base were determined largely by market returns.

This result has important implications for estimating supply response under the 1990 Act. Producers make their acreage allocation decisions by equilibrating net

⁷For producers enrolled under the 0/85-92 underplanting provision, their base was protected even if they devoted all the permitted acreage for a commodity to conservation uses. In return, they received projected deficiency payments on 85-92 percent of MPA. However, for nonparticipants, idling cropland lost base protection.

returns at the margin. Unless a producer is making this decision at the margin in the 72.25- to 85-acre portion of the 100- acre base assumed in these examples, market returns were the producer incentive at the margin. Most producers participating in the program made their acreage allocation decisions for program

crops at the margin in the range of normal flex acreage during 1991-95 (in response to price signals).⁸ This provides the rationale for measuring producers' supply response (and deriving elasticities) in this report by focusing on NFA data.

⁸Based on individual farm records for 1992 maintained by the Farm Service Agency, nearly 80 percent of corn producers enrolled in the corn program planted either a portion or all of their corn NFA to corn (Tice).