

Summary and Discussion

For the past several decades, crop production in the United States has shifted to larger operations. The shares of cropland and farmland operated by large-scale farms have steadily increased, while the shares operated by medium-sized farms have declined. Many factors, including changes in technology and factor prices, likely contributed to the increased concentration of production. To what extent have commodity program payments contributed to this phenomenon?

This report uses data from five censuses to explore a series of empirical relationships between program payments and changes in farm structure. In general, the findings indicate a positive association between program payments and subsequent increases in measures of farm concentration, survival, and growth. This association was maintained under different model specifications. Across ZIP Code areas, cropland concentration grew faster where beginning-period payments per acre were higher. Concentration growth increased consistently as payment levels increased, and this pattern was similar in different time periods. This pattern persisted after controlling for ZIP Code location, initial concentration, sales per cropland acre, and the ratio of cropland to other land uses.

The ZIP Code analysis was supplemented by analyses of farm business survival and growth. These analyses compared the survival rates over time of farms with high and low levels of payments as a share of sales, and estimated the relationship between payments and farm business survival rate while controlling for farm operator and operation characteristics. Findings indicate a significant positive association between past commodity program payments and farm survival rates, with and without controlling for other factors. Also, conditional on survival, payments are positively associated with growth in farm size.

Have Payments Made Farms Larger?

The findings of this report are consistent with the hypothesis that farm commodity program payments influence structural change in agriculture. However, it is not possible to rule out other explanations for the observed associations between payments and farm structure, despite efforts to control for factors that might cause spurious associations between program payments and structural change. It is impossible to know whether factors remain that have not been accounted for. This is a standard caveat to non-experimental studies that employ data observed in the natural world as opposed to data from a carefully controlled experiment (see footnote 4). Payment levels depend, to some extent, on farmers' decisions to participate in government programs and on their production decisions. Hence, unobserved factors might affect both payment levels and farm structure, and bias estimates of the effect of payments.

For example, if variation in land quality is not adequately accounted for by the controls, then this could be an alternative explanation for the findings in the ZIP Code and farm-level analyses. Much of the local variation in payments may be due to local variation in base acres and program yields. Areas with more base acres and higher program yields may also have superior land quality. Technological change might be more scale-enhancing in areas with better land quality—for example, larger harvesters might be more feasible in flatter and more productive regions. However, technological change would also have to favor higher valued field crops relative to lower valued crops (e.g., cotton over corn over wheat) to explain the payment-farm size relationship at a broader level. A technological effect of this kind would seem coincidental, particularly because it would need to be associated with payment levels in a consistent and gradual way in order to explain the similar and steadily higher rates of concentration growth across the five payment quintiles.

Another possible noncausal explanation for the findings is that variation in commodity program payments per acre reflects differences in farmers' managerial abilities. That is, "better" farm managers are able to obtain higher commodity program payments per acre due to their superior practices and yields. But it seems unlikely that farming ability would significantly influence variation in per-acre payments across farms, especially after controlling for grower and operation characteristics (crop type, farm size, region, farmer age, farm organization, etc.). Because it is not possible to measure farmers' ability to farm or obtain commodity program payments, it is not possible to measure the role of ability in the observed correlation between payments and farm size growth.

Reconciling the possible causal and noncausal explanations for the empirical findings of this study will require more research. For example, if payments facilitate growth in farm size by enhancing liquidity and lowering borrowing costs, then it should be possible to observe whether farmers who receive higher payments also receive better terms of credit from their lenders. Or, if technological advances drove farm growth in areas with both higher land quality and higher payments, researchers should be able to identify a set of technologies and show how they facilitated the whole range of greater farm sizes in different parts of the country. While technology has clearly played a role in the concentration of production, less clear is how these technologies might have acted to increase concentration in a pattern aligned so closely with payment rates. Identifying a series of facts that are broadly consistent with each other and with the observed pattern of farm size growth will provide a better understanding of the pattern, and then, perhaps, draw out some deeper implications of farm policies.