Title:

Price vs. Revenue Protection: An Analysis of Government Subsidies in the Agriculture Industry

Abstract:

Abstract: The agriculture industry plays a critical role in the U.S. economy and various industry sectors depend on the output of farms. A salient challenge in farming is uncertainty in the farm yield, which depends on the weather conditions (and other unpredictable factors) during the growing season and impacts farmers' profit. To protect and raise farmers' income, the U.S. government offers two subsidy programs to farmers: the Price Loss Coverage (PLC) program which pays farmers a subsidy when the market price of a crop falls below a reference price, and the Agriculture Risk Coverage (ARC) program which pays a subsidy when farmers' revenue is below a guaranteed level. Given the unique features of PLC and ARC, in this paper we develop models to analyze the effects of these programs on consumers, farmers, and the government.

Our analysis generates several insights. First, while PLC always motivates farmers to plant more acres compared to the no-subsidy case, farmers may plant less acres under ARC, leading to a lower crop supply. Second, despite the prevailing intuition that PLC benefits farmers only if the crop price remains very low for several years, we show that both farmers and consumers can be better off with PLC for a large range of parameter values, even when the reference price represents the historical average market price. Third, we show that the two-sided structure of the ARC subsidy may induce farmers to utilize the subsidy in two different ways, depending on the crop and market characteristics. This is used to explore the implications of each subsidy regime on different stakeholders. Fourth, our analysis reveals that the government's cost of maximizing social welfare can be lower under PLC. Finally, we calibrate our model with USDA data and provide insights about the effects of crop characteristics and market characteristics on the relative performance of PLC and ARC. Our findings are corroborated by USDA's statistics for farmers' enrollment in the subsidy programs.

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