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Contract Farming, Disease Outbreaks and Inclusive Growth in Rural China

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Background

- There is rich empirical literature evaluating the welfare impacts of contract farming. 1) Most of the studies adopt cross sectional data, which makes it difficult to assess the welfare effects in different risk contexts. 2) The distributional implications of contract farming are ambiguous, as the association between contract farming and farmer endowments is mixed. 3) Few studies have identified the endowment of farmers in evaluating the welfare impacts of contract farming.
- Do farmers who enter contracts benefit from such arrangements consistently even when a production or market shock, such as epidemic disease outbreaks, occurs? Is the effect of production risk on contracting farmers different by asset endowment?

Objectives

- Estimate the impact of contract participation for farmers with different asset endowments and the impact of contract participation on net broiler income and farm assets.

Methods

- Our study estimates the welfare effects of contract farming on the Chinese broiler industry and explicitly consider highly pathogenic avian influenza (HPAI) outbreaks, a common disease risk in the broiler industry.
- To assess the impact of contract participation for farmers with different asset endowments, we calculate an asset index and divide farmers into three categories based on this metric.

Data

- A ten-year, national-level panel dataset collected by the Chinese Ministry of Agriculture.
- The total sample consist of 32,621 households.

Model

- A two-stage estimation process is used to measure the effects of farm contracts on net income and asset. The interaction of contract adoption and HPAI is included.

$$Contract = \beta_0 + \beta_1 HPAI + \beta_2 Contract\ availability + \beta_3 Z + \varepsilon$$

$$Income / Asset = \beta_0 + \beta_1 Contract + \beta_2 HPAI + \beta_3 Contract \times HPAI + \beta_4 Z + \varepsilon$$

Econometric issues

- To address the potential endogeneity problem, we use the share of broiler farmers in a county that use a contract as an instrument variable for contract participation in our model.

Results

Variable	Net income	Δ Asset index
Contract	-55535.6***	-0.155**
HPAI	-46.887	-0.006*
HPAI*Contract	33253.1**	0.309*
Asset index _{t-1}	3305.721	-0.610***
Asset index _{t-1} ²	-9164.949**	0.053
Asset index _{t-1} ³	4536.308	-0.082**
Asset index _{t-1} ⁴	152.725	0.012
.....
Observations	32621	32621

Variable	Net broiler income			Δ Asset index		
	(1)	(2)	(3)	(1)	(2)	(3)
Contract	8511.804	17885.35*	-106999***	-0.284	-0.079	-0.098
HPAI	-209.421	-153.669	843.163	-0.019***	-0.001	0.014*
HPAI*Contract	9692.433	-15912.27	80248.26*	0.972*	0.175	0.101
Asset index _{t-1}	-702.055	-501830.2	160603.5	-0.451***	26.888	-1.504*
Asset index _{t-1} ²	-7766.025	1279301	-192953.4*	-0.677**	-68.040	0.739
Asset index _{t-1} ³	9034.628	-1421442	88100.63*	-0.813**	73.218	-0.297
Asset index _{t-1} ⁴	25718.32	580206.1	-12391.24	3.812***	-29.085	0.032
Observations	10874	10873	10874	10874	10873	10874

Conclusions

- For the largest asset endowment class, farmers receive higher income from contracts when HPAI outbreaks occur. However, contract farming has a negative effect on net broiler income and farm assets when there is no HPAI outbreak at provincial level.
- For the smallest asset class, contract participation has a positive effect on farm assets instead but not net broiler income, especially when there is an HPAI outbreak.
- Overall, contract farming results in beneficial outcomes for smaller farmers not only through a short-term change in income but also with effect on assets which affect the households' long-term profitability, even when there is an HPAI outbreak.