The Effect of Crop Insurance on Agricultural Loan Delinquencies

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  - Given that our unique longitudinal data set separates out these two types of loans—production and real estate loans, we offer novel empirical insights as to whether the impact of crop insurance on loan delinquency differs depending on the type of loan taken by the farmer.

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- **Weather variables, unemployment rate, and farm net income.**

Empirical Strategy

- We estimate the effect of crop insurance participation on agricultural loan delinquencies at the county-level based on the following specification:

$$Delinq_{it} = \beta_1 Ins_{it} + \beta_2 W_{it} + \beta_3 X_{it} + \lambda t + \gamma_i + \epsilon_{it}$$

where:

- $Delinq_{it}$: agricultural loan delinquency rates (%) in county i in year t
- Ins_{it}: liability-based crop insurance participation rate (%) for county i in year t
- W_{it}: weather variables (GDD, HDD, precipitation, precipitation squared)
- X_{it}: unemployment rate and farm net income
- t: a linear time trend
- γ_i: county fixed effects
- ε_{it} is the error term

- **Estimation Strategies:**
  - Linear panel FE
  - IV-FE: using total insurance premium subsidy rate as an instrument variable

Empirical Results

Table: Effects of Crop Insurance Participation on Agricultural Loan Delinquency

	Production Loan		Real Estate Loan		Overall Ag Loan	
	FE	IV-FE	FE	IV-FE	FE	IV-FE
	(1)	(2)	(3)	(4)	(5)	(6)
Ins	-0.0030***	-0.0298***	-0.0048***	-0.0182**	-0.0045***	-0.0274***
	(0.0011)	(0.0056)	(0.0015)	(0.0074)	(0.0011)	(0.0088)
Unemployment Rate	11.6859***	12.1088***	16.7637***	16.9756***	14.3228***	14.6867***
	(0.7324)	(1.3518)	(0.9512)	(1.5128)	(0.6971)	(2.0078)
Income	-1.0836**	-0.8465	-2.3101***	-2.1919***	-2.1455***	-1.9426
	(0.5460)	(0.6167)	(0.7093)	(0.7459)	(0.5198)	(1.2781)
GDD	0.2706**	0.4252***	0.3318**	0.4090***	0.2279**	0.3604*
	(0.1196)	(0.1093)	(0.1554)	(0.1380)	(0.1139)	(0.1921)
HDD	-0.9242	-0.5349	-0.5276	-0.3324	-0.5908	-0.2557
	(0.8807)	(0.6894)	(1.1438)	(0.9610)	(0.8382)	(1.3116)
Precipitation	0.1601	0.0499	1.6845***	1.6296***	0.8602*	0.7659
	(0.4839)	(0.5021)	(0.6286)	(0.5837)	(0.4607)	(0.5921)
Precipitation squared	0.0565	0.0153	-1.0416**	-1.0624**	-0.4835	-0.5191
	(0.3694)	(0.3701)	(0.4798)	(0.4321)	(0.3516)	(0.4764)
Time Trend	-0.0574***	0.0128	-0.0241***	0.0110	-0.0328***	0.0274
	(0.0037)	(0.0146)	(0.0048)	(0.0213)	(0.0035)	(0.0286)
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19813	19813	19815	19815	19815	19815
F-statistic		513.70***		513.56***		36.34***
Kleibergen-Paap rk LM statistic		341.09***		341.03***		10.76***

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- We find a negative and statistically significant impact of crop insurance on county-level agricultural loan delinquency rates.
- Results are robust when using alternative crop insurance participation measures and different estimation strategies (i.e., alternative IVs and "external-IV-free" Kinky regression approach).

Conclusions

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  - Second, the geographic scope of the current study is mainly focused on the US Midwest and we specifically conduce the empirics largely for corn operations.

Questions or Comments?
Thank you!!