Do Agricultural Contracts Impact Grain Prices? Evidence from Mexico

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Motivation

1. Agricultural contracts are the main channel through which main grains (corn, wheat, sorghum and soybeans) are sold in Mexico.
2. Contracts are operated by the government and little is known about their effect on prices.
3. Since the financial crisis, concerns on the large public costs of operating contracts have emerged in the public debate.

Objectives

1. Estimate the effects of agricultural contracts on grain prices in Mexico from 2008-2010.
2. Analytically derive the impacts of contract prices and production on cash market prices.
3. Obtain separate estimates of the two channels by which contracts can affect cash market prices: 1) direct, working as a benchmark for cash market prices and 2) indirect, by decreasing the amount of supply available for the cash market, inducing higher prices.
4. Compare the effects of quantities sold via contracts and the cash market on cash market prices.

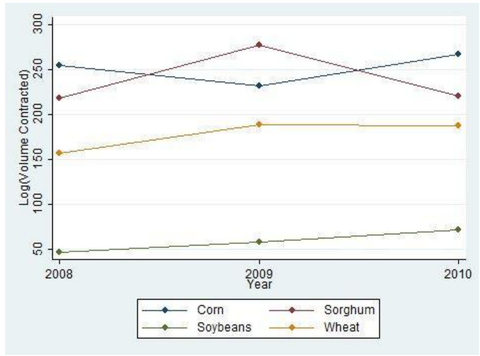
Theoretical Model

1. Monopolistic competition model with risk-averse producers (Ireland, 1985).
2. Production and contract prices are assumed exogenous.
3. Producer's maximization problem is to decide how much production to allocate into contractual agriculture and how much into the cash market.

Empirical Methods

1. Use a panel data at the cycle-grain-state level with cash market prices, contract prices, climatic variables and economic variables from 2008-2010.
2. Exploit state level variation in contracts over time to estimate impacts of contracts on cash market prices (see Figure).
3. Jointly estimate cash market prices as a function of production sold in the cash market and production sold via contracts, using 3SLS and controlling for fixed effects.

Figure. Volume of grains contracted per state 2008-2010



Results

1. The model predicts that higher contract prices and more production induce more contracts.
2. Contracts are estimated to influence cash market prices via the direct channel: they work as a benchmark for cash market prices.
3. Grain supply sold via contracts is a more important determinant of prices than supply sold in the cash market.
4. A 10% increase of volume sold via contracts is estimated to reduce the cash market price by 2.3% (see Table).

Table. Estimates of Grain Prices, Quantity Not Contracted and Quantity Contracted

Variable	2SLS			3SLS		
	Cash Market Price	Quantity Not Contracted	Quantity Contracted	Cash Market Price	Quantity Not Contracted	Quantity Contracted
Quantity Not Contracted[a]	-0.0816***			-0.0807**		
	(0.0307)			(0.0327)		
Quantity Contracted[a]	-0.2332**	-0.2326		-0.2394**	-0.2446	
	(0.0773)	(1.0545)		(0.1105)	(0.5817)	
Manufacturing GDP	0.0420			0.0630		
	(0.1981)			(0.1531)		
Unemployment	0.1169			0.1026		
	(0.1962)			(0.1285)		
Wage	2.2908***			3.5436***		
	(1.0600)			(0.9820)		
Precipitation		0.3721**			0.3643***	
		(0.1535)			(0.1034)	
Lagged Contract Price			0.8511*			-0.0926
			(0.4774)			(0.0743)
Fertilizer Price			-0.1682**			1.1088***
			(0.0840)			(0.2920)
Constant	-1.8972	12.4493	4.2861	-9.0079	12.6045**	2.0945
	(6.5176)	(11.5488)	(3.7650)	(6.7606)	(6.2543)	(2.2526)
Observations	120	120	120		120	
R^2	0.3635	0.1098	0.0890			

Hetersokedasticity-robust standard errors clustered at the cycle-gran-state level in parentheses:
* significant at 10%, ** significant at 5%, *** significant at 1%.
[a] Instrumented in 2SLS models

Conclusions

1. Contracts are the main determinant of grain prices in Mexico.
2. They lower grain prices.
3. Policies that aim at eliminating contracts should weight the costs of operating contracts (subsidizing options in the international market) against their benefits (lower prices, less price volatility).

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Bibliography

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