

**Effects of Agricultural Policy
on Farmland Values:
The Manitoba Case**

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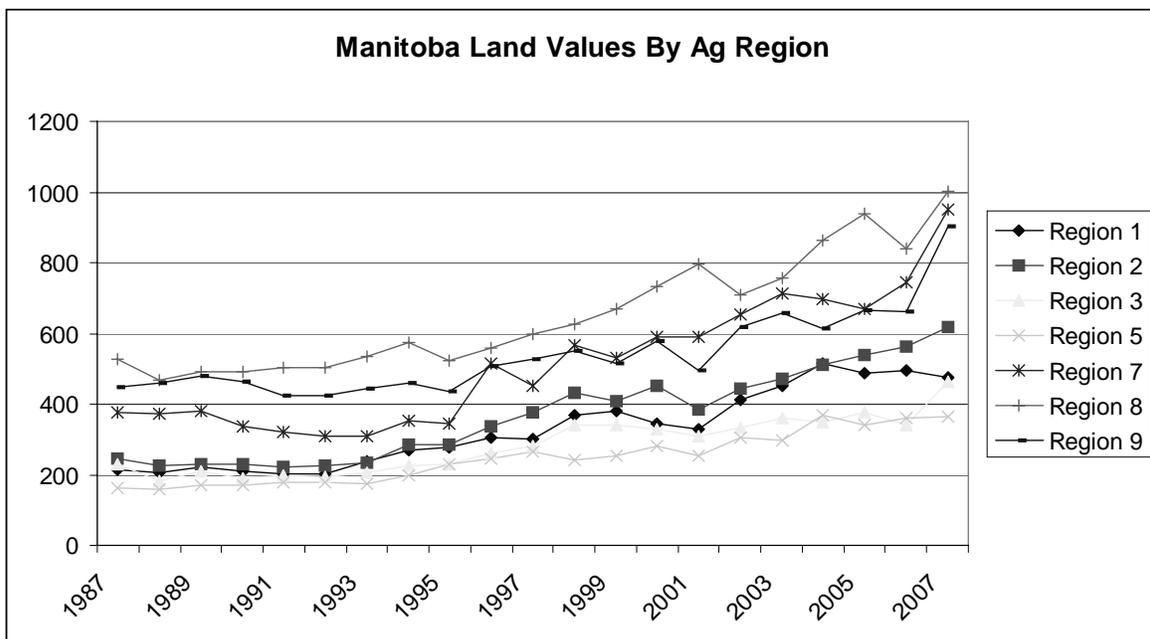
Introduction

- by affecting farm income, agricultural policy has the potential to influence farmland values
 - changing farm income means changing producers' ability to pay for land

- agricultural policy is an area of shared federal and provincial jurisdiction
 - for this paper, the effects of both federal policy and provincial policy are examined

Introduction

- in general, the last two decades have seen land prices in Manitoba increase steadily



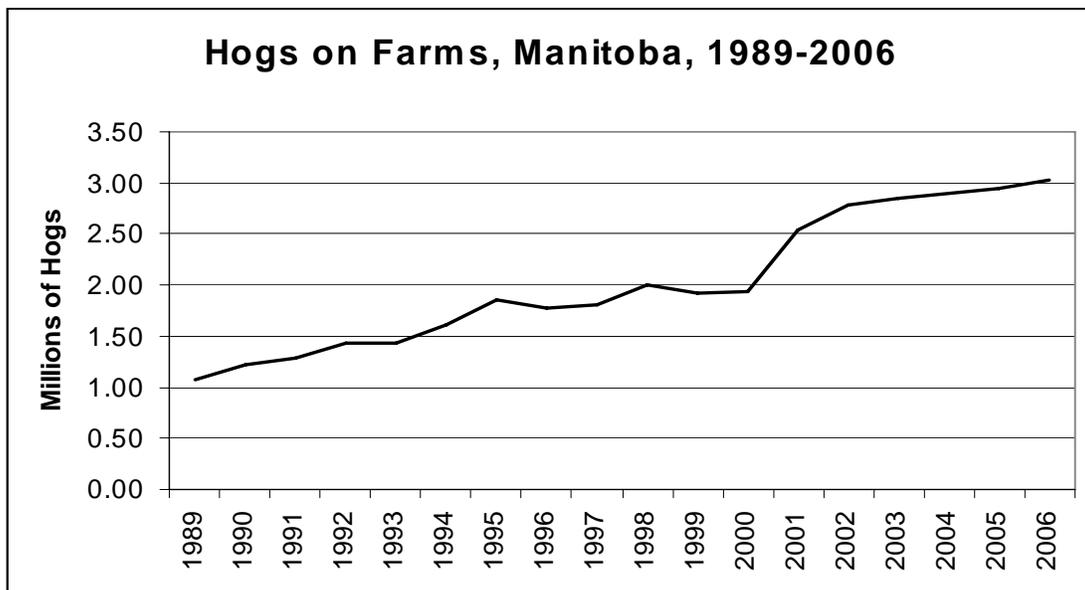
Provincial Agricultural Policy

- the Manitoba government has taken great pains to develop its hog industry (until recently!)
 - established MLMMI in 1998 to guide sustainable development of Manitoba's livestock industries
 - Board of Governors represents both public and private interests

- successfully attracted the McCain slaughter plant to Brandon in 1999
 - decision to built in Manitoba was made after a vigorous competition with other Prairie communities

Provincial Agricultural Policy

- as a result of efforts to expand the industry, hog numbers have risen steadily



Federal Agricultural Policy

- transportation of prairie grain was regulated by the federal government starting in 1897
 - the Crows Nest Pass Agreement fixed grain freight rates in exchange for a massive subsidy to CP
- the program was tinkered with intermittently until 1983, when the WGTA was introduced
 - the Western Grain Transportation Act fixed subsidies to railways & increased freight rates

Federal Agricultural Policy

- the WGTA was repealed in 1995, resulting in increased freight costs to farmers

Town	1994/1995	1997/1998
	CWRS Basis	CWRS Basis
	<u>Per Tonne</u>	<u>Per Tonne</u>
Souris, MB	\$22.68	\$46.07
Swan River, MB	\$24.02	\$50.05
Morden, MB	\$22.23	\$43.87
Stonewall, MB	\$21.56	\$42.82

Source: Freight Rate Manager v 2.1

Objective

- determine whether government policies affected the value of farmland in Manitoba
- land is the largest asset on the farm balance sheet
 - so policies that alter the value of land can have significant implications for farmer wealth

Theory

- the income capitalization model suggests land price is a function of expected future net rents
- this can be written formally as:

$$P_t^L = \delta^s \sum_{s=1}^S R_{t+s}$$

- where P_t^L is the price of land in period t
 - R_t is the net rent accruing to land s periods into the future from period t
 - δ is the discount rate

Theory

- it is hypothesized that expanding the hog industry led to higher land prices, *ceteris paribus*
 - activities associated with hog production are often higher-valued than traditional grain production
 - the hog operations themselves are capital intensive, and land surrounding ILOs is needed for manure
 - the net returns from these activities would thus be higher, leading to upward pressure on land prices

Theory

- it is hypothesized repealing the WGTA led to lower land prices, *ceteris paribus*
 - transportation costs for grain increased dramatically when the Act was repealed
 - this meant farmers' costs of production increased, and accordingly net returns decreased
 - as a result, land as an asset became less valuable, and so bid prices should be reduced

Procedure

- two models are estimated: one for each policy
 - provincial policy: “hog model”
 - federal policy: “WGTA model”

- panel data techniques employed
 - have observations on 12 agricultural regions in Manitoba over a 20 year period

- an adaptive expectations framework is used
 - includes lags on net rents as well as land values

Procedure

- data are converted to natural logs for estimation purposes
- Feasible Generalized Least Squares (FGLS) is used for estimation
 - corrections for autocorrelation & heteroskedasticity are made
- model is estimated using Stata

Procedure: Hog Model

- the equation estimated to capture the effects of the provincial policy is as follows:

$$P_t^L = \beta_0 + \beta_1 \times P_{t-1}^L + \beta_2 \times P_t^W + \beta_3 \times P_{t-1}^W + \beta_4 \times H_t + \beta_5 \times INT_t + e_t$$

- where P_t is the price of wheat in period t
 H_t is the number of hogs on farms in period t
 INT_t is the real interest rate in period t

Procedure: WGTA Model

- the equation estimated to capture the effects of the federal policy is as follows:

$$P_t^L = \gamma_0 + \gamma_1 \times P_{t-1}^L + \gamma_2 \times P_t^W + \gamma_3 \times P_{t-1}^W + \gamma_4 \times WGTA_t + \gamma_5 \times INT_t + e_t$$

- where variables are as previously defined, but WGTA is a binary variable
 - WGTA = 0 for 1987-1995
 - WGTA = 1 for 1996-2006

Data

- transaction-level data were used to calculate a average land price for each of MB's 12 ag regions
 - data includes years 1987-2006
- wheat price was used as a proxy for net rents
 - FRP from CWB for #1 CWRS 12.5% protein
- prices deflated using MB FPPI (grains) for WGTA model and MB FPPI (all) for hog model

Data

- hog numbers were taken from the Manitoba Agriculture Yearbook
- real interest rate was calculated as t-bill rate less moving average of CPI deflator

Results: Hog Model

<u>Variable</u>	<u>Coefficient (std err)</u>
constant	-2.751 (1.227)**
lagged land values	0.511 (0.071)**
wheat price	0.869 (0.230)**
lagged wheat price	0.017 (0.240)
hogs	0.067 (0.039)*
real interest rate	0.039 (0.020)*

N = 228

$R^2 = 0.848$

Results: WGTA Model

<u>Variable</u>	<u>Coefficient (std err)</u>
constant	-3.671 (1.143)**
lagged land values	0.379 (0.068)**
wheat price	0.954 (0.213)**
lagged wheat price	0.408 (0.217)*
WGTA binary variable	0.202 (0.033)**
real interest rate	0.016 (0.020)

N = 228

$R^2 = 0.750$

Conclusions

- as predicted by theory, expansion of the hog industry has caused land prices to increase
 - the operations themselves can pay more for land, and additional land is needed to absorb manure

- however it was not found that the repeal of the WGTA had a deleterious effect on land prices
 - probably the case that the effect was too small to measure and was overwhelmed by increasing prices

Conclusions

- skyrocketing commodity prices have pushed land prices even higher the last few years
 - driven in part by government biofuels mandates

- government policy has changed radically toward hogs in Manitoba
 - moratorium on new barns will soon be permanent

- clear that various types of government policies have the potential to affect farmland values