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The political economy of farmland ownership regulations and land prices

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Abstract

One of the most ubiquitous forms of agricultural regulation is a restriction on farmland ownership. One Canadian example of a farmland ownership restriction is The Saskatchewan Farm Security Act (FSA), passed in 1974. The purpose of this article is to explain, using a political economy framework, why the FSA was implemented and to estimate the effect of the FSA on Saskatchewan farmland values. A Present Value (PV) model is used to estimate the relationship between land values, rents, and the regulation. The Hausman endogeneity test reveals that the regulation variable is endogenous with the land price. The sign of the regulation variable is negative, which fits with the theory, i.e., the more stringent the regulation the lower the land value. We estimate that the regulation lowered Saskatchewan farmland prices by an average of 4 to 34 US$/acre, depending on whether ordinary least squares (OLS) or two-stage least squares (TSLS) is employed in the estimation, over the period of 1974–2001.

JEL classification: D72, Q15

Keywords: Agricultural policy; Regulation; Rent seeking; Farmland ownership

1. Introduction

One of the most ubiquitous forms of agricultural regulation is a restriction on farmland ownership. The motive for governments to create farmland ownership regulations can be explained using the theory of political economy. Governments may trade regulation or economic protection for political or financial support of special interest groups (Grossman and Helpman, 1994). Groups and individuals who lobby for the regulation are often the primary beneficiaries of the regulation (Stigler, 1975). If part of the government's objective function is to maximize electoral support, it will be subject to rent seeking by groups or individuals who desire some regulation which will enhance their economic well being (Tullock, 1989; Becker, 1983).

The central thesis of rent seeking is that individuals or groups spend resources to lobby governments for policies from which they are able to accrue economic rent. These policies may be as straightforward as a subsidy or tariff, or more complex, such as regulations that create barriers to entry into an industry (Stigler, 1975). In all cases, the objective of the policy is to make economic rents available to groups that otherwise do not receive them. One such policy is the creation of a barrier into the agricultural industry in the form of a restriction on farmland ownership.

Little empirical research has been done to demonstrate the linkage between farmland ownership restrictions and rent-seeking behavior. One paper that does demonstrate such a link between ownership regulation and rent-seeking behavior is Laband (1984). Laband argues that the legislative regulation in the United States against foreign ownership of farmland is a function of the relative political power of family farmers. Laband found that small increases in land values, which occur because of foreign demand for farmland, are not sufficient to offset the loss of human capital from exiting the industry. Thus small landholders (family farmers), who would be required to exit the industry because they cannot expand their operation in the presence of foreign bidders for farmland, lobby for restrictions on farmland ownership.

One Canadian example of a farmland ownership restriction is The Saskatchewan Farm Security Act (FSA), passed in 1974. The Saskatchewan government put in place a restriction on the amount of farmland nonprovincial residents and nonagricultural corporations could own in the province (Government of Saskatchewan, 1973). At the time these regulations were

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Table 1
Changes to the maximum ownership restrictions for Saskatchewan farmland, 1974–2002

Year	1974	1977	1980	1988	2002
Saskatchewan residents	Unrestricted	Unrestricted	Unrestricted	Unrestricted	Unrestricted
Canadian residents	15,000 US$ assessment	160 acres	10 acres	320 acres	Unrestricted
Non-Canadian residents	15,000 US$ assessment	160 acres	160 acres	10 acres	10 acres
Agricultural corporations	Unrestricted	Unrestricted	Unrestricted	Unrestricted	Unrestricted
Saskatchewan nonagricultural corporations	160 acres	160 acres	10 acres	320 acres	320 acres
Non-Saskatchewan nonagricultural corporations	160 acres	160 acres	10 acres	10 acres	10 acres

Note: Farm Land Security Board, 2002.

implemented, commodity prices were increasing (for example, wheat prices nearly doubled in one year) due to a large sale of wheat to the former Soviet Union. Grain farming became very profitable on the Canadian prairies and there was a considerable increase in the price of farmland (Schmitz et al., 2002). Both Saskatchewan farmers and nonfarmers began to see land as an asset with significant capital gains potential and attempted to acquire additional acreage.

The majority of census farms (+90%) in Saskatchewan are owner-operated units. In 1972 over 75% of farmland in Saskatchewan was owned by the operator.[1] Nonresidents who entered the land market purchased land with the intent of relocating to Saskatchewan to become farm operators. Saskatchewan has never experienced the phenomena where large tracts of farmland are owned by absentee landlords.

The political process to create the regulation in Saskatchewan was the interaction between the provincial government, which has the constitutional jurisdiction over farmland ownership, and farm organizations. Organizations that participated in the lobbying effort included (among others) the Saskatchewan Wheat Pool, the Saskatchewan Association of Rural Municipalities, and the National Farmer's Union. The legislation was promoted to farmers and the general public as a method to reduce the exodus of farmers from the land, thus protecting the future of the family farm and preserving rural communities. The rent-seeking activities for ownership regulations included more groups than just farmers. For example, the Dean of the College of Agriculture at the University of Saskatchewan, Jake Brown, who was considered knowledgeable on Saskatchewan farmland values, publicly predicted land prices would rise to 3,500 US$/acre (Leader Post, 1972). Actual farmland prices never exceeded an average of 600 US$/acre. The Dean of Agriculture was a major political supporter of the FSA and was placed on the Government Board that enforced the new ownership regulations.

The formal proposal to limit farmland ownership in Saskatchewan first appeared in March 1973 with the "Final Report of the Special Committee on the Ownership of Agricultural Lands" (Government of Saskatchewan, 1973). The mandate of the committee was "to investigate the effects of the purchase and ownership of agricultural lands by nonresident, foreign and corporate persons" (p. 6). The committee made their conclusions based on several meetings with farmers conducted in towns across Saskatchewan. The committee made several recommendations in their report, some of which formed the basis of The Farm Ownership Act, 1974, which was amended several times and later called The Saskatchewan Farm Security Act (FSA). The Act restricted the ownership of farmland by Canadian residents, non-Canadian residents, and nonagricultural corporations. Table 1 depicts the changes that occurred to the *Act* over the years 1974–2002. In 2002 the Act was once more amended, and this time the restriction on Canadian residents was eliminated.[2] This was the most substantial decrease in the stringency of the regulation since its implementation.

The purpose of this article is to explain, using a political economy framework, why the FSA was implemented and to estimate the effect of the FSA and its subsequent incarnations on farmland values. Two hypotheses are tested: the first hypothesis, which comes out of the political economy framework, is that the ownership regulation is endogenously determined with the price of farmland. The second hypothesis is that the FSA significantly lowered the price of farmland in Saskatchewan. The Hausman endogeneity test reveals that the regulation variable is endogenous with the land price. The sign of the regulation variable is negative, which fits with the theory, i.e., the more stringent the regulation the lower the land value. The parameter on the farmland regulation variable is used to estimate the magnitude of the decrease in land values.

The article will proceed in the following manner. Section 2 provides the theoretical framework for the political rent seeking, which gives rise to the regulation. Section 3 provides the econometric model of farmland values in which the regulation is treated as an endogenous variable. Section 4 describes the results of the econometric model. Conclusions follow in Section 5.

2. Theoretical framework

The endogeneity of government policy and political support has its roots in the early work of Stigler (1975). He identifies the ability of the state to control the "entry by new rivals" (Stigler, 1975 pp. 116) as a resource, which is sought after by industry or

[1] The predominant form of farmland renting in Saskatchewan is a crop share arrangement.

[2] This amendment to the Act became law as of January 2003.

private groups. Grossman and Helpman (1994) extend Stigler's framework by using a general equilibrium model to incorporate the impact of lobbying expenditures on government policy choice. We use a partial equilibrium model of the land market and assume that the government responds to the farmers' lobby for ownership regulation.[3]

The farmer's objective function can be written as

$$\text{Max} E(\Pi^t) = E(P_0^t)Q^t - w_1^t x_1^t - w_2^t(r^t)x_2^t$$
$$\text{s.t. } Q^t = f\left(x_1^t, x_2^t\right), \tag{1}$$

where $E(P_0^t)$ is the expected wheat price, Q^t is the production of wheat with the properties $f'_{x_1} > 0$, $f'_{x_2} > 0$, $f''_{x_1x_2} > 0$, $f''_{x_2x_1} > 0$, $f''_{x_1x_1} < 0$, $f''_{x_2x_2} < 0$, w_1^t is the price of a variable input (for example fertilizer), x_1^t is the quantity of the input used, $w_2^t(r^t)$ is the observed price of land services, which is a function of the government regulation r^t, and x_2^t is the amount of land service used, all in period t. Wheat, canola, and cattle, which represent over 65% of gross farm income during the period of this study (SAFRR, 2002), are used as a proxy for all farm commodities. In this model the regulatory influence of the government action has an impact on the price of farmland services, not the availability of farmland services (i.e., the number of acres of farmland that are available for farmers to produce wheat does not change with or without the regulation).

The first-order conditions for this problem can be written as

$$\frac{w_1^t}{E\left(P_0^t\right)} = f_{x^1}^t, \tag{2}$$

$$\frac{w_2^t(r^t)}{E\left(P_2^t\right)} = f_{x^2}^t. \tag{3}$$

We assume that

$$w_2^t = \lambda^t + \psi r^t, \tag{4}$$

where λ^t is the price of land services in a free market and r^t is the stringency of the regulation at time t. The effect of the ownership regulation on the observed land price is represented by ψ, which may be positive or negative depending on the sign of ψ, shown in Eq. (5)

$$\frac{\partial w_2^t(r^t)}{\partial r} = \psi. \tag{5}$$

We hypothesize that ψ is negative, i.e., that an increase in the stringency of the farmland ownership regulation reduces the price of land services and therefore the farmland price.

One of the results, which can be obtained from Eqs. (2) and (3), is the derived aggregate input demand function D_2^t for land services, $x_2^t = x_2(w_1^t, w_2^t(r^t), E(P_0^t))$. The demand curve for land services is shown in Fig. 1. The aggregate input demand function is a horizontal summation of residents' and nonresidents' demand curves.

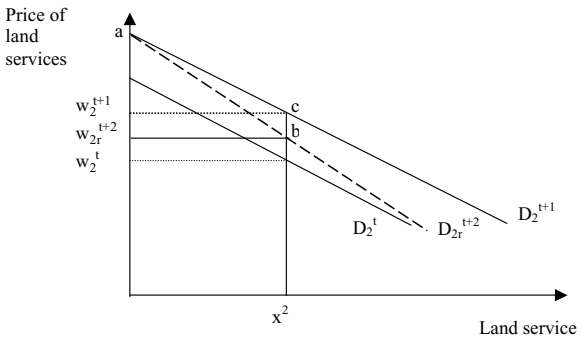

Fig. 1. Demand for land services in the presence of government regulation.

When the expected price of wheat increases, the derived demand for land services shifts from $D_2^t(E(P_0^t), w_1^t)$ to $D_2^{t+1}(E(P_0^{t+1}), w_1^{t+1})$ since $E(P_0^{t+1}) > E(P_0^t)$, as shown in Fig. 1. As a result of the shift in the derived demand the equilibrium price of land services changes from w_2^t to w_2^{t+1}. Now suppose the government introduces a farmland ownership regulation r, which restricts all nonresidents from owning land. The nonresidents' demand curve is removed from the horizontal summation, which pivots the derived demand curve for land downwards, from D_2^{t+1} to D_{2r}^{t+2} and lowers the price of land services from w_2^{t+1} to w_{2r}^{t+2}.

The demand curve for land services pivots downward because of the reduced number of eligible bidders that result from the imposition of the ownership regulation. The decrease in the price of land services occurs for at least two reasons. First, one group of potential bidders for land services has been removed from the market. It is well known that the lower the number of bidders, the lower the winning bid in an auction, regardless of the type of auction (Brannman et al., 1987; McAfee and McMillan, 1987). Any regulation that restricts the number of bidders can therefore be expected to lower the amount of the winning bid, *ceteris paribus*. Second, if bidders who place a higher value on the parcel of farmland are excluded by regulation, bids will be lowered still further because bids are functions of participants' valuations of the item for sale (McAfee and McMillan, 1987). Lapping and Lecko (1983) note that tax advantages, for instance, could be a reason that nonresidents place a higher valuation on farmland than residents.

The theoretical framework assumes that the price of land services after the regulation is imposed remains higher than it was before the increase in the price of wheat (i.e., $w_{2r}^{t+2} > w_2^t$); this higher price of land services will be capitalized into land values. Following the introduction of the regulation, farmers who use farmland services in the production of wheat experience an increase in economic surplus. In other words, the regulation increases the welfare of the local consumers of farmland services. Farmers who sell farmland lose producer surplus

[3] Canadian farmers do not have to report lobbying expenditures. There is no legislated requirement that lobbying expenditures or activities be made public. Thus lobbying data do not exist and so it is impossible to model and estimate the political decision-making process.

due to the regulation. Because of the inelastic supply curve for land services, all of the market adjustment due to the introduction of the regulation occurs in the price of land services. In addition, as shown in Fig. 1, there is an efficiency loss equal to area *abc* due to the regulation. The regulation creates winners and losers in the land market, but in aggregate there is a loss in total economic surplus.

One question that needs some explanation is why farmers who own land would support this type of ownership regulation. In the early 1970s the profitability of wheat production in Saskatchewan was high and many people wanted to own farmland. There were more buyers than sellers and any regulation that reduced the number of buyers found political support. By 2002, the profitability of wheat production had been low for at least 10 years (i.e., 1992–2002) and there were more sellers than buyers of farmland. Thus it is predictable that by 2002 the majority of farmers favor the removal of the ownership regulation.

We now need to convert the annual price of land services into a land price. The method most commonly used to link land rents to land value is the Present Value (PV) model. Melichar (1979) initially suggested that the PV model would be an appropriate method of valuing farmland. Since then, numerous authors either confirm (Alston, 1986; Pongtanakorn and Tweeten, 1986) or reject (Falk, 1991; Featherstone and Baker, 1987) the PV model's usefulness in valuing farmland. In an attempt to bring some resolution to the question, Falk and Lee (1998) broke down the time series of U.S. farmland price into three uncorrelated components, and found that deviations of farmland price from predictions of the PV model are not important in the long run. Given this result, and given that the PV model is the most often used for similar Canadian studies (e.g., Baker et al., 1991), it is adopted here as the benchmark model for the competitive case of Saskatchewan land price valuation.

It is assumed that if investors (including farmers) see land as an asset they will bid for land according to the PV model

$$P_L^t(r) = \sum_{t=1}^{n} \frac{NR_L^t(r^t)}{(1+i)^t}, \tag{6}$$

where $P_L^t\ (r)$ is the price of land, $NR_L^t\ (r^t)$ is the net return to land, and i is the discount rate all in period t. The net returns to farmland are a function of the prices of commodities, the cost of production, and r, which is the stringency of the regulation.

3. An econometric model of farmland values

In the PV model, the role of expectations must be explicitly considered, as it is the expected rents that are used in the valuation process by bidders. When modeling Canadian land prices, Veeman et al. (1993) recognize that due to the uncertain nature of commodity prices and government subsidies, rational expectations cannot be assumed for bidders, and instead employ adaptive expectations. We construct our land price model in a way similar to Veeman et al. (1993).

In an adaptive expectation model, the dependent variable is determined by the expected rather than current value of the independent variables (Kennedy, 1998; Greene, 2000). In our case we write

$$P_L^t = \beta_0 + \beta_1 NR^{t*} + \varepsilon^t, \tag{7}$$

where NR^{t*} is the expected value of land rent in time period t, with expectations formed in time period $(t-1)$, and ε^t is the error term. Because future land rents are not known, a simple rule can be used to base expectations upon past forecast errors. Specifically, expectations on the independent variable are formed by adding to the previous period's expected value a constant proportion (θ) of the previous period's forecast error. This yields

$$NR^{t*} = NR^{t-1*} + \theta(NR^{t-1} - NR^{t-1*}) + \mu^t, \tag{8}$$

where μ is an error term. Equation (7) can be rearranged to $NR^{t*} = (P_L^t - \beta_0 - \varepsilon^t)/\beta_1$, and for period $t-1$, $NR^{t-1*} = (P_L^{t-1} - \beta_0 - \varepsilon^{t-1})/\beta_1$. We then solve for the lagged land price effect by using Eq. (8) and substituting back so that

$$P_L^t = \theta\beta_0 + (1-\theta)P_L^{t-1} + \theta\beta_1 NR^{t-1} + \left[\varepsilon^t - (1-\theta)\varepsilon^{t-1} + \beta_1\mu^t\right]. \tag{9}$$

Therefore, past values for land rents depend on past values of land, which in turn depend on the past values of land rent, because forecasts are made in time period $(t-1)$, and so on.

The simple PV formula is a misspecification because it ignores the influence of the farmland ownership regulation. First, following our theoretical model, the regulation reduces the number of bidders, which lowers the value of farmland. Moreover, our conceptual framework illustrates that the regulation is endogenously determined with the price of farmland. In order to test this hypothesis a two-stage least squares (TSLS) model is used and the Hausman test is applied. The variable r_p^t is the predicted value of r^t, which is estimated using instrumental variables.

The final form of our land price model consists of only known values

$$P_L^t = f\left(P_L^{t-1}, P_L^{t-2}, \ldots, P_L^{t-i}; NR^{t-1}, NR^{t-2}, \ldots, NR^{t-j}, r_p^t\right), \tag{10}$$

where i and j are the lag lengths on land values and rents. The actual model estimated is[4]

$$P_L^t = \beta_0 + \beta_1 NR^t + \beta_2 P_L^{t-1} + \beta_3 r_p^t + \eta^t. \tag{11}$$

[4] We follow the model of Carlberg (2002) in determining the appropriate number of lagged price variables. This is a complicated econometric issue and is not central to this article.

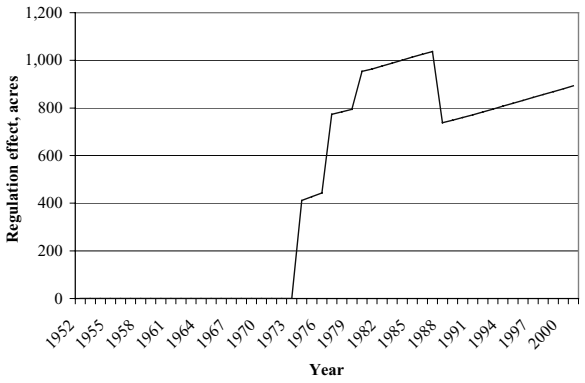

Fig. 2. Restrictiveness of farm size regulation: 1974–2001, acres.

In Eq. (6) we included a parameter, ψ, the sign of which indicates the direction land prices move from the free market value as a result of the ownership regulation. The magnitude of the impact of the regulation on land prices is determined by the size of the estimated parameter. This is estimated in Eq. (11) as parameter β_3.

The data are a time series from 1953 to 2002. Farmland value per acre is approximated as the "value of land and buildings" reported by Statistics Canada (2002). Data on cash rents in Saskatchewan are not available, so "cash receipts from farm products" is used as an approximation for the period 1950 to 1970, and "total cash receipts" is used for the period 1971 to 2002. The CPI (1992 = 100) is used to convert all prices to real terms.

The stringency of the ownership regulation cannot be measured directly. The maximum ownership restriction on Canadian residents and the average farm size in Saskatchewan are used to determine the effect of the regulation. The regulation variable is constructed as the difference between the restriction on Canadian residents (i.e., the number of acres a non-Saskatchewan resident could own) and the average farm size in Saskatchewan in each year (see Fig. 2). The regulation variable assumes that the average farm size in Saskatchewan is what the average nonresident would choose in a free market. The regulation thus becomes more punitive as the difference between the average farm size and the maximum allowable ownership increases. Descriptive statistics for the variables are presented in Table 2. The set of instruments used to explain the regulation variable includes all the variables in eq. (11) plus the price of wheat, canola, and cattle. The results of the instrumental variable model are not presented but are available from the authors upon request.[5]

[5] One may argue that the use of wheat prices as one of the instruments for the regulation is not appropriate, because there is an a priori belief that the exogenous instrument is likely correlated to some degree with the dependent variable, farmland prices. While we do not reject the notion that this instrument may be correlated with farmland prices in the long run, it is only the contemporaneous correlation that is of empirical concern. Tests of correlation between the TSLS instrument and the dependent variable illustrate that almost no contemporaneous correlation exists. We conclude that the TSLS instrument, including wheat, canola, and cattle prices, is a good instrument for the regulation variable.

4. Results

The existence of a unit root in the dependent variable, farmland prices, is an empirical concern. The augmented Dickey–Fuller (ADF) test revealed the need to first difference the farmland price series and the land rent price series to obtain a stationary time series. The results of the ADF tests are provided in Table 3.

Equation (11) is estimated by regressing the first-differenced average farmland value at time (t) on the first-differenced average farmland value at time ($t-1$), the first-differenced cash rent value at time (t), and the regulation variable, r, at time (t). The Newey–West technique is used to correct for heteroscedasticity in all regressions.

The sign on the estimated parameters shown in Eqs. (11a)–(11c) of Table 4 are consistent with the theoretical model. First, the farmland regulation variable has the expected negative sign. Thus, as the stringency of the farmland ownership regulation increases, the price of farmland declines. Second, net returns have a positive influence on the price of farmland. Third, the lagged price of farmland is positive, consistent with the adaptive expectations model.

Equation (11a) in Table 4 reports the outcome of the Hausman endogeneity test. The residuals from the equation that predicts r_p are represented in Eq. (11a) as *Resid*. The *Resid* variable is significant at the 1% level, thus rejecting the null hypothesis of no endogeneity. This is strong empirical evidence for endogeneity revealed through the errors-in-variables test, giving us both theoretical and empirical grounds to estimate the parameter β_3 treating r as an endogenous variable in Eq. (11c). A Durbin test of serial correlation without strictly exogenous regressors (Wooldridge, 2003) reveals that first-order autocorrelation exists in Eq. (11a). This problem is remedied by incorporating an AR(1) error structure into the model; additional testing shows no further correction is required.

Equation (11b) in Table 4 is estimated using ordinary least squares (OLS) and does not incorporate the *Resid* variable. In this equation we treat r as an exogenous variable. A Durbin test of serial correlation without strictly exogenous regressors (Wooldridge, 2003) reveals that first-order autocorrelation does not exist in Eq. (11b). All coefficients have the expected sign and are significant at the 5% level, except for the regulation coefficient. This regression was estimated to provide one estimate of the elasticity on the regulation variable despite the strong evidence in favor of the TSLS specification.

Equation (11c) in Table 4 includes the regulation variable as an endogenous variable, which most closely matches our theoretical model. Equation (11c) is estimated using TSLS that instruments r^p in response to our first hypothesis of endogeneity between the price of farmland and the farm ownership regulation. A Durbin test of AR(1) serial correlation after TSLS (Wooldridge, 2003) reveals that first-order autocorrelation does not exist in Eq. (11c). All of the coefficients, including the regulation variable, have the expected sign. The rent variable and

Table 2
Descriptive statistics

Variable name	Variable description	Measurement	Mean	Standard deviation
P_L	Farmland price	$/acre	299.12	141.71
NR_L^t	Cash receipts from farm products	Thousands US$	4,718,024	1,206,496
r^t	Regulation: Difference between average farm size and maximum farmland ownership for Canadian nonresidents	Acres	821 (1974–2001)	429.98

Note: Author's calculations.

Table 3
Nonstationarity results using augmented Dickey–Fuller (ADF) tests

Variable	ADF test statistics	
	Level	First difference
$P_L{}^{(t)-(t-1)}$	−2.15	−2.49*
$NR_L{}^t$	−2.09	−5.74*

*Indicates rejection of the null hypothesis of nonstationarity at 5% significance level.

the regulation variable are weakly significant, with P-values of 0.20 and 0.16, respectively.

The second null hypothesis of the article is that the ownership regulation did not significantly reduce the price of farmland. Given the weak statistical significance of the regulation variable in Eq. (11c) ($P = 0.20$), the null hypothesis cannot be strongly rejected. However, the coefficient on the ownership regulation becomes much larger and more significant when it is specified as an endogenous variable, which suggests the OLS estimates may be inefficient and inconsistent.

Because the farmland regulation variable is endogenous, it is interesting to investigate how the TSLS regulation coefficient differs from the OLS regulation coefficient. Elasticities were thus calculated for the regulation variable from both the OLS (11b) and TSLS (11c) models. The elasticity of the regulation variable is −0.32 when estimated by OLS in Eq. (11b). When the TSLS model is estimated, i.e., Eq. (11c), the elasticity on the regulation variable increases to −2.87, which is much more elastic than the OLS estimate. Thus 1% increase in the stringency of the ownership regulation reduced Saskatchewan farmland values by 2.87%. Two conclusions may be drawn based on this result. First, the government regulation on ownership has an elastic effect on farmland prices. Second, if there is endogeneity between land prices and the government regulation, ignoring this effect results in a considerable underestimation of the regulation's significance and impact on land prices.

Multiplying the coefficient of r in Eq. (11b) and the coefficient of r_p in Eq. (11c) by the average effect of the FSA over its duration provides an estimate of the magnitude of the effect of the FSA on farmland values. We estimate that the regulation lowered Saskatchewan farmland prices by an average of 4 to 34 US$/acre, depending on whether OLS or TSLS is employed in the estimation, over the period 1974–2001. In the TSLS case the evidence suggests that the FSA had a very large effect on Saskatchewan farmland values. The predicted annual negative effect of the regulation on Saskatchewan farmland values using TSLS is illustrated in Fig. 3.

The regulation was changed in 2003 when it became perceived as keeping land prices artificially low by limiting the

Table 4
Regression results on Saskatchewan farmland values (1953–2001)

Variable	Equation number		
	11a	11b	11c
		Coefficient (standard error)	
C	−87.51 ** (22.91)	3.01* (2.84)	20.89* (17.88)
r^t	−0.081 ** (0.022)	−0.0047 (0.0083)	
$r_p{}^t$			−0.042 (0.032)
$NR^{t-(t-1)}$	2.75×10^{-5}** (6.61×10^{-6})	1.15×10^{-5}** (3.21×10^{-6})	8.84×10^{-6} (6.12×10^{-6})
$P_L{}^{(t-1)-(t-2)}$	1.04×10^{-8} (1.11×10^{-8})	0.68 ** (0.14)	0.65 ** (0.13)
Resid^t	0.072 ** (0.026)		
AR(1)	0.55 ** (0.17)		
F-statistic	11.54	17.11	12.64
Adjusted R^2	0.59	0.54	0.27
Number of included observations	47	48	48

**$P < 0.05$; *$P < 0.10$.
Note: Authors calculations.

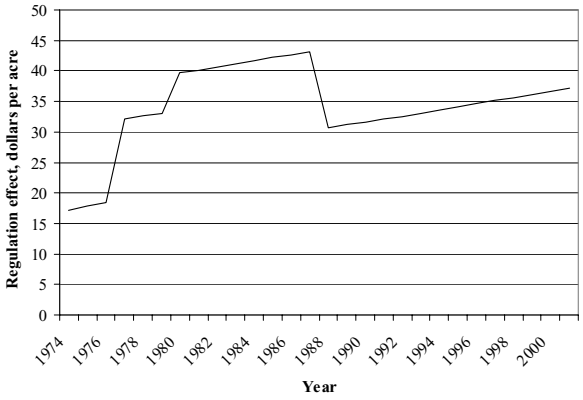

Fig. 3. Annual negative effect of regulation on land prices, TSLS estimate.

number of potential bidders. Lobbying occurred because of the low commodity prices, which farmers have experienced since the early 1990s.

5. Conclusion

Two main conclusions can be drawn from this research. First, Stigler's model of endogenous policy theory is a useful framework to understand why ownership regulations are so ubiquitous. Second, it provides evidence that regulations that restrict farmland ownership can affect farmland prices. This result is consistent with Stigler's hypothesis.

Several potentially fruitful extensions of this model exist. The theoretical framework outlined lays out a general equilibrium approach to determining the regulation, but stops short of providing an actual general equilibrium model. Such a model would enhance the theory in this area of study. There is also potential to test the significance of other Saskatchewan land policies—and indeed, the land-use-related policies in other jurisdictions—on farmland prices using an econometric approach similar to the one employed here. It would also be interesting to apply the endogenous regulation variable to different types of models that explain farmland prices, for purposes of demonstrating the robustness of the empirical results. Furthermore, sensitivity analysis could be employed as another method of demonstrating the robustness of the econometric model.

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