The Impacts of the Tax-Deferred Exchange Provision on Farm Real Estate Values

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ABSTRACT. *This study examines the effects of the Section 1031 tax-deferred exchange provision on agricultural land values. The provision allows taxpayers to defer taxation for relinquished productive assets if a like-kind asset is acquired within the allotted time of 180 days. The analysis examines a set of 3,580 farm real estate transaction from 55 agricultural counties in Indiana over the period 2003–2006. Hedonic price analysis suggests that properties acquired under a like-kind exchange are associated with a 1.32% price premium.* (JEL H23, Q15)

I. INTRODUCTION

Farmland is a critical resource in the agricultural sector. It accounts for over 80% of the total value of farm assets and is the primary collateral in farm loans. As a result, the value of farm real estate—and how these values are determined—has been a perennial concern of empirical economic research. Traditionally, it was assumed that the value of agricultural real estate was determined solely by its ability to generate returns from the production of farm goods and services. Modern empirical research, however, has shown that the value of agricultural real estate is influenced by a wide degree of factors, such as urban influence (Livanis et al. 2006), ethanol plants (Blomendahl, Perrin, and Johnson 2011), and agricultural policy (Goodwin, Mishra, and Ortalo-Magné 2003).

This study examines the effect of participation in the Federal Income Tax Code's Section 1031 "like-kind" exchange clause—a clause that allows participants to defer capital gains tax from the exchange of a like-kind property—on the value of agricultural real estate. The provision has been shown to raise real estate prices in other land markets. Given the importance of farm real estate within the agricultural sector, the influence of the like-kind exchange provision may carry important impacts for the agricultural sector. This study examines the per acre price premium for farm real estate acquired under 1031 exchange.

II. SECTION 1031 LIKE-KIND EXCHANGE

Section 1031 of the Federal Income Tax Code allows for the nonrecognition of gain or loss from exchanges solely in-kind. The tax provision allows taxpayers to defer taxation for relinquished productive assets if a like-kind asset is acquired. Essentially, in a tax-deferred exchange, the tax basis in the relinquished property, which is used to calculate capital gains, transfers to the new, or received, property. The policy was designed to promote administrative convenience and continuity of investment by alleviating the Internal Revenue Service (IRS) of the duty to monitor and enforce tax compliance in barter exchanges (Kornhauser 1987). Further, the provision prevents taxpayers from paying capital gains tax in instances where their gains are not liquid, and therefore they may not have the cash resources to pay a tax (Kornhauser 1987). The provision is not limited to agricultural lands.

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Eligible properties must be either investment property or land that will be put to productive use. This may include commercial, industrial, or agricultural properties. (Residences do not qualify for tax-deferred exchange.) For example, an apartment complex in New York City could be exchanged for an apple orchard in Washington State. It is important to note that the policy does not eliminate tax liability, but taxes are *deferred* until a later period. When the capital gains are realized in the future, they are subject to capital gains taxation.

Tax-deferred exchanges have been permitted by the IRS since 1921 (Colwell and Dehring 2001). However, the regulations concerning which properties qualify for tax-deferred status have relaxed considerably over time. The provision was later amended in response to the 1979 case *Starker v. United States* (Toth 1979). In *Starker,* the court ruled that Section 1031 applied even if real estate was exchanged for the option in real estate, so long as the option was intended to acquire like-kind property. Further, the *Starker* court held that an exchange agreement was valid under Section 1031 even though the exchange took place over a two-year period. Thus, exchanges were not required to be simultaneous to qualify for recognition. In 1984, Congress amended Section 1031 to control the like-kind exchange in the wake of the *Starker* decision. These amendments allowed property owners to engage in nonsimultaneous exchanges, meaning that they could relinquish a property without immediately exchanging it for another property. Further, the 1984 amendments established strict parameters for compliance in nonsimultaneous exchanges. Under the current provision, the owner must identify a property to acquire within 45 days of relinquishing the original property. Once the property has been identified, the owner must close on the exchange property within 180 days of relinquishing the original property. An independent (nonagent) third party may be involved in the exchange process as an intermediary. In these third-party arrangements, the landowner relinquishes a property to a qualified intermediary who then transfers the replacement property to the taxpayer. This has become the predominant form of Section 1031 exchanges involving agricultural land, at roughly 80% of like-kind transactions (Colwell and Dehring 2001).

Williamson, Brady, and Durst (2010) provides a number of important statistics for like-kind exchanges involving farmland over the period 1999–2003. Over this period, farmland was involved in roughly 2% of all like-kind exchanges. The fair market value of property acquired in exchanges involving farmland over this period totaled over $6.7 billion, with total deferred gains of $4.3 billion. The authors also show that in 2005, just 24% of landowners involved in farmland-for-farmland exchanges were farmers.

The 1031 exchange process may increase agricultural real estate values for properties acquired under the provision for at least five distinct reasons. First, participants have a narrow time window to identify replacement properties to ensure compliance (45 days to identify the property and 180 days to close). This increases the search costs for identifying replacement properties and, in turn, encourages participants to "bid up" the price of a replacement property as the constraint becomes binding (Colwell and Dehring 2001). Within the allotted time, landowners must identify a "like-kind" property, as well as obtain permits, conduct appraisals, receive loan approval, and acquire necessary licenses and inspections (Holmes and Slade 2001). Anecdotal evidence suggests that many property sellers wishing to execute a tax-deferred exchange have not identified an asset to replace their property at the closing date of their relinquished property (Holmes and Slade 2001). The timing may also reduce the bargaining power when acquiring replacement properties, so that participants are willing to purchase above the true market value of the property (Ling and Petrova 2008).

Second, if the value of the relinquished property exceeds that of the acquired property, the realized capital gains are subject to taxation as capital gains. As a result, there is an incentive to acquire properties valued *at least* equal to the original property (Ling and Petrova 2008). Third, the potential taxation or realized capital gains provides an incentive to underreport the value of the relinquished land (Colwell and Dehring 2001). Fourth, there is an incentive for investors to hold the replace-

ment asset longer because the replacement property is considered a long-term investment (Williamson, Brady, and Durst 2010). This occurs because the like-kind exchange does not avoid taxation but *defers* it to a later date. This in turn leads to increased competition and market thinness for agricultural real estate.

Finally, if the investment horizon for the acquired parcel (a legally defined long-term investment) is greater than the lifetime of the property owner, the *deferred* taxes become unrealized to the property holder. Alternatively, if the tax rates decrease between the time of the exchange and the final liquidation of the acquired parcel, the full tax value will not be realized. This reduction in cost is capitalized into the value of farmland parcel. Williamson, Brady, and Durst (2010) provide one real-world example. The Taxpayer Relief Act of 1997 reduced the 20% capital gains rate to 18% for assets held more than five years, beginning in 2001. An owner of farmland could exchange land in 1999 and hold the replacement property until 2006, when it could be sold and the gains taxed at 18%. The capitalization of program benefits has long been acknowledged within the agricultural land values literature (Goodwin, Mishra, and Ortalo-Magné 2003; Weersink et al. 1999; Duffy et al. 1994; Runge and Halbach 1990), and in effect, the tax-deferment benefits of Section 1031 may be similarly capitalized into the value of agricultural lands.

A small number of existing studies provide empirical estimates of the impacts of the 1031 exchange in other real estate markets. Ling and Petrova (2008) estimate price premiums for apartments and commercial real estate in 15 U.S. markets, and the estimated price premiums for like-kind exchanges range from 5% to 29% for apartments. For commercial properties, the estimated impacts range from 5% to 10%. A number of studies examine a detailed dataset for apartment and commercial properties in the Phoenix, Arizona, area. Lambson, McQueen, and Slade (2004) estimate a price premium for apartments under like-kind exchange at 4.06%, and Holmes and Slade (2001) find a 7.9% premium for apartments using the same data. Munneke and Slade (2001) study the market for office properties in Pheonix and find a much smaller premium at roughly 1%. Ling and Petrova (2008, 395) therefore characterize the 1031 exchange by stating that the "pursuit of tax avoidance comes at a steep price."

III. METHODOLOGY

Economic theory posits that the value of a productive asset is determined by its ability to generate returns. This suggests that the market value of a parcel of farmland is determined by the discounted stream of returns from agricultural production. This is formally expressed as the infinite-horizon capitalization formula:

$$V_t = \Sigma[E_t(R_{t+i})/(1+r)^i], \qquad [1]$$

where V_t is the value of the parcel at time t, E_t denotes the expectations operator based on current information with respect to returns R_{t+i} for future periods i, and r is a (constant) discount rate. The model therefore asserts that farmland values are determined by their ability to generate returns—typically measured by cash rents or farm income. However, a growing body of literature suggests that farmland values are determined by a number of additional factors beyond (expected) agricultural returns (see, e.g., Huang et al. 2006). The influence of additional factors is principally demonstrated through hedonic price analysis.

Hedonic price analysis posits that the value of a market good is determined by the value of its characteristics. The theory is derived from Lancaster's (1966) characteristics approach to consumer theory that suggests the utility of a good is a function of its attributes. The characteristics approach was later formalized by Rosen (1974). Hedonic price analysis through multiple regression methods has since been widely adopted in applied economic research, particularly in the study of the real estate sector. The empirical formulation of hedonic price model takes the form

$$\mathbf{y} = \mathbf{X}\boldsymbol{\beta} + \boldsymbol{\varepsilon}, \qquad [2]$$

where $\mathbf{y}$ is an $N \times 1$ vector of observed land prices or assessed values, $\mathbf{X}$ is a matrix of the K quantifiable characteristics of each parcel,

$\boldsymbol{\beta}$ is a set of unknown parameters, and $\boldsymbol{\varepsilon}$ is the regression error, typically assumed to follow a white noise process with mean zero and a constant variance. The characteristics in $\mathbf{X}$ typically include a set of structural (such as parcel size), locational (such as proximity to urban areas), and environmental attributes (such as surrounding land use).

Equation [2] has typically been estimated through ordinary least squares (OLS), yet in recent years studies have favored estimation through spatial process models. The estimation approach explicitly addresses the locational aspects of land values. The locational aspects may lead to biased and/or inefficient parameter estimates. The effects arise from three sources: (1) prices are affected by prices of neighboring properties, (2) spatially correlated variables have been omitted leading to nonspherical errors, and (3) the functional is misspecified or subject to measurement error (Wilhelmsson 2002). The most prevalent forms of spatial process models stem from two distinct motivations: observed interaction effects (price spillovers) and potential dependence in omitted variables or unobservable characteristics. Respectively, they are referred to as the *substantive* and *nuisance* motivations.

The spatial lag model (SLM) addresses the substantive motivation by including spatially weighted values of the dependent variable as a regressor in the hedonic price equation:

$$\mathbf{y} = \rho\mathbf{W}\mathbf{y} + \mathbf{X}\boldsymbol{\beta} + \boldsymbol{\varepsilon}, \qquad [3]$$

where $\mathbf{W}$ is an exogenous $N \times N$ matrix that defines the relevant "neighborhood" for each observation—called the spatial weights matrix—and ρ is a scalar spatial dependence parameter. The sign of parameter indicates the nature of the spatial dependence. For example, a positive ρ suggests that high-value parcels are located near similarly high-valued parcels. The spatial lag is endogenously determined, and as a result, the models are typically estimated through maximum likelihood or two-stage least squares (Anselin 2006).

The spatial error model (SEM) addresses the nuisance motivation. The model mitigates the effects of spatially related omitted or unobservable variables that are relegated to the regression error. The model takes the form

$$\mathbf{y} = \mathbf{X}\boldsymbol{\beta} + \mathbf{u}, \qquad [4a]$$

$$\mathbf{u} = \lambda\mathbf{W}\mathbf{u} + \boldsymbol{\varepsilon}, \qquad [4b]$$

where $\mathbf{u}$ is vector of error terms that are assumed to follow a spatial autoregressive process guided by the unknown spatial parameter λ and the exogenous spatial weights matrix $\mathbf{W}$. The error vector $\mathbf{u}$ is nonspherical, so the model is estimated through maximum likelihood or generalized moments (Anselin 1988).

One of the empirical challenges of the hedonic price method is that the model assumes that all of the right-hand-side variables are random. If the coefficient estimate for 1031 exchange participation is statistically significant and positive, it would imply that the provision is associated with a price premium. However, it may also be the case that exchanges are more likely for higher-valued parcels. This stems from the incentive to acquire properties valued *at least* equal to the original property (Ling and Petrova 2008). For example, if a large, commercial real estate parcel is relinquished in a 1031 exchange, the party evaluating farmland for acquisition may only target available farmland at or above the price of the relinquished commercial property. Thus, lower-valued properties will not be considered. In such a case, standard empirical estimation of the hedonic price model will inaccurately suggest a price premium as the result of 1031 exchange participation.

In other words, the participation choice may be endogenous. The (potential) endogeneity of 1031 exchange participation can be addressed through a two-stage model. The first stage predicts the likelihood of exchange using an instrument that is correlated with the probability of participating in an exchange but not with farmland prices. In the second stage, the price premiums are estimated based on the predicted probability of participation.

IV. DATA

This study examines the effects of the 1031 exchange using a set of 3,580 farm real estate transactions recorded between January 2003

and December 2006 in Indiana. The data were collected in cooperation with Farm Credit Services of Mid-America. The majority of the data is obtained from the transaction record maintained by Farm Credit. In addition, a number of agents in selected counties gathered additional information related to participation in 1031 exchange. Farm Credit accounts for the majority of farmland transactions in the state, yet the data do not represent the universe of farmland sales. The transactions recorded by Farm Credit are assumed to be arm's-length, yet the potential for non-arm's-length transactions to impact the analysis were mitigated by removing transactions with unusually low per acre prices (less than $350).

Indiana is a major agricultural state. The state's primary agricultural base is dedicated to row-crop cultivation, specifically corn and soybean rotation, and it is considered representative of the Corn Belt region. According to the U.S. Economic Research Service (2011), in the years studied, farm real estate accounted for between 75% and 81% of the total value of farm assets in the state. The shaded counties depicted in Figure 1 represent the study area of 55 agricultural counties in northern and central Indiana. The counties are principally devoted to row-crop production yet are diverse in soil properties and population characteristics.

The transaction record contains a number of relevant property characteristics, including the parcel's total sale price, the presence of buildings and structures, size in acres, sale date, and a legal description of the location of the parcel. We eliminate all parcels with buildings and structures and limit our analysis to vacant cropland. To control for potential nonlinearities related to parcel size, the empirical model includes both total acreage and acres squared, and the sale date is used to create annual indicator variables.

The legal description provides the township, range, and section of the parcel. A section, as defined by the U.S. Geological Service, is one square mile of land, or approximately 640 acres. The legal information was used to geolocate each parcel as defined by the section centroid, which allows us to incorporate additional locational information

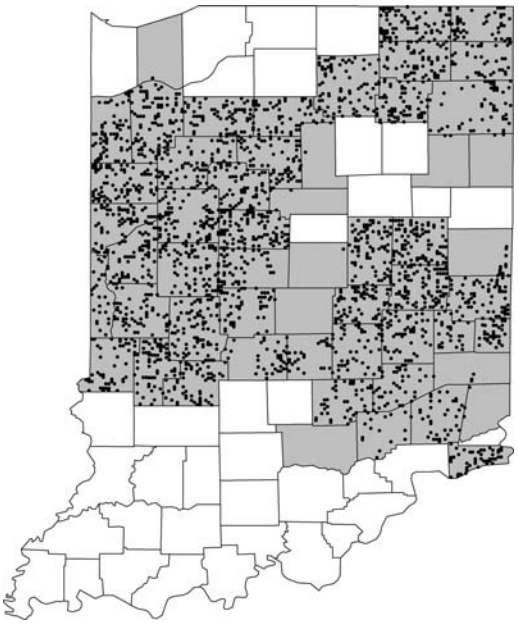

FIGURE 1
Study Area

through geographic information systems (GIS). The locational variables added through GIS include surrounding land cover, agricultural productivity, proximity of urban areas, population density, school quality, and transportation access. In addition, GIS was used to construct county-level indicator variables. The county-level fixed effects were included in the model to control for potential differences in policies administered at the county level, such as taxes and levies.

The surrounding land cover was calculated using data from the USDA National Agricultural Statistics Service Cropland Data Layer. The land cover variables were created to measure the percent of land in a one mile radius of each observation classified as cropland; pasture; forest; urban or residential; rivers, lakes, or streams; and wetlands. Agricultural productivity is measured by the estimated nonirrigated corn yields in bushels per acre obtained from the USDA National Resource Conservation Service State Soil Geographic Database.

Urban influence is measured as the radial distance in miles from neighboring urban ar-

eas as defined by the U.S. Census Bureau's Census Designated Metropolitan Areas. A similar study of the drivers of Illinois farmland values by Huang et al. (2006) demonstrated the differing impacts of large and small urban areas, and as a result, our empirical model includes two variables that capture the effects of neighboring towns (defined as at least 25,000 residents) and cities (defined as at least 100,000 residents). To limit potential edge effects, the measure also considers metropolitan areas in surrounding states (Michigan, Ohio, and Illinois). An additional measure of population influence is the population per square mile—or population density—by census block groups obtained from the U.S. Census Bureau.

School corporation quality has been previously demonstrated to influence Indiana cropland values (Hendricks 2004), and we measure school quality as the percent of high school sophomores passing both Math and English Graduate Qualification Exam (GQE), obtained from the Indiana Department of Education.

Two measures of transportation are employed in the hedonic price model. First, the arc distance in miles to the nearest state or federal highway was calculated using data obtained from the Indiana Department of Transportation. Second, a similar distance measure was calculated for distance to the nearest interstate access point, or "on and off ramps."

A summary of per acre farmland prices and the explanatory variables included in the model is provided in Table 1. The average value per acre price is $3,834. This value is greater than those suggested by farmland surveys over the same period reported by the National Agricultural Statistics Service (an average of $2,893) and Purdue University Cooperative Extension (an average of $2,992). Observed price per acre ranged from $370 to $61,404. In addition, approximately 6% of farms were acquired under a like-kind exchange.

V. RESULTS

The hedonic price model is estimated in semilog form in which the dependent variable (per acre transaction price) is expressed as the natural log and the control variables remain in levels. The coefficients describe the percentage change in the sales price for a unit change in the characteristic—the approximate elasticity. The interpretation of dummy variable coefficients requires an additional adjustment outlined by Halvorsen and Palmquist (1980). The approximate elasticities for indicator variables are derived as $\xi_d = \exp(\beta_d) - 1$, where β_d is the coefficient estimate for the dummy variable d.

As previously mentioned, there is some concern of potential endogeneity for 1031 exchange participation. Specifically, it is plausible that exchanges are more likely for higher-value farmland, and as a result, traditional OLS estimation would incorrectly suggest a significant price premium. We explore the potential for endogeneity using an instrumental variable that is correlated with the probability of exchange but not with sales price. The data obtained from Farm Credit Services of Mid-America includes categorical variables for the intended use of the property, as stated by the party acquiring property through sale or exchange. We find that farmland acquired for part-time farming enterprises, in which the land owner's principal occupation is not farming but the intent is to farm for a share of his or her income, is an appropriate instrument. Pearson product-moment correlation coefficient test results suggest that the indicator is significantly correlated with the probability of exchange, but not transaction prices.

The model estimated under two-stage least squares (2SLS) suggests that 1031 exchange participation is, in fact, endogenous. The first stage involves regressing a dummy variable for 1031 exchange participation (1 = acquired under 1031 exchange) on the control variables and the instrumental variable (1 = acquired for part time farming operation) in a probit model. The results of the 2SLS estimation procedure are reported in the first column of Table 2. The second stage results generally adhere to expectations. They suggest a statistically significant price premium for parcels with higher shares of surrounding cropland, pastureland, and urban/residential land use activities, as well as higher-quality schools. Higher shares of surrounding wetlands are as-

TABLE 1
Data Summary

Variable	Mean	Std. Dev.	Min.	Max.
Price	3,834.000	3,018.464	370.000	61,404.000
1031 Exchange	0.059	0.236	0.000	1.000
Acreage	75.850	77.502	0.400	1,439.700
Yield	107.000	21.857	31.000	155.000
Population density	27.080	49.566	3.000	1,179.000
School quality	60.080	7.804	38.000	83.000
Land Cover Variables				
Cropland	0.573	0.231	0.000	0.971
Pastureland	0.276	0.123	0.028	0.795
Woodland	0.115	0.134	0.000	0.858
Urban/residential	0.021	0.046	0.000	0.489
Water	0.006	0.021	0.000	0.303
Wetland	0.001	0.004	0.000	0.096
Distance Variables				
Highway	1.349	1.055	0.001	6.292
Interstate	12.566	9.431	0.108	46.327
Town	22.870	11.825	0.000	63.490
City	33.620	15.267	0.100	71.600
Year				
2004	0.290	0.454	0.000	1.000
2005	0.266	0.442	0.000	1.000
2006	0.170	0.375	0.000	1.000

sociated with depressed per acre prices, and land values are adversely affected by distance to state highways, towns, and cities.

Per acre prices and total parcel size share a U-shaped relationship, as indicated by the acreage and acreage squared coefficients, with a minimum at 543.32 acres. Previous studies suggest that land prices increase at a decreasing rate with increases in parcel size. This price effect stems from the potential value of subdivision, called plattage value (Colwell and Sirmans 1978). As a result, per acre prices would be expected to decrease at a decreasing rate with increases in parcel size. The U-shaped relationship indicated by our model appears to somewhat conflict the prior results. However, only 13 of the 3,580 transactions (or roughly 0.36%) have a size of greater than 543.32 acres.

The coefficient estimate for 1031 exchange participation suggests a positive relationship between the provision and per acre transaction price. Using the Halvorsen and Palmquist (1980) adjustment ($\xi_d = \exp(\beta_d) - 1$), the results suggest that participation in 1031 exchange is associated with a 1.73% price premium.

The OLS estimates are tested for potential problems related to spatial dependence using a set of specialized Lagrange multiplier tests and their robust equivalents (Anselin et al. 1996). The results, as reported in Table 3, suggest that spatial econometric methods are preferred. Both the spatial lag and spatial error tests are statistically significant, yet in robust form, only the spatial lag is statistically significant. We therefore estimate the spatial lag specification via spatial 2SLS as reported in the second column of Table 2 (Kelejian and Prucha 1998).

The SLM estimates generally adhere to the 2SLS findings. There are no observed sign changes for the statistically significant variables, yet a number of variables that were statistically significant for the 2SLS model are no longer—including cropland, pastureland, wetland, and the distance to towns and cities. The statistically significant spatial lag coefficient ρ of 0.758 suggests the presence of spatial spillovers in farmland transaction values.

TABLE 2
Regression Results

	2SLS		SLM	
Variable	Coef.	Std. Err.	Coef.	Std. Err.
Constant	8.122	0.342***	1.764	0.454***
Exchange	1.004	0.104***	0.749	0.096***
Acreage	−0.003	0.000***	−0.002	0.000***
Acreage squared	0.000	0.000***	0.000	0.000***
Yield	0.000	0.000	0.000	0.000
Population density	0.000	0.000	0.000	0.000
School quality	0.003	0.001***	0.002	0.001***
Land Cover Variables				
Cropland	0.333	0.183*	0.182	0.170
Pastureland	0.437	0.198*	0.242	0.183
Woodland	0.010	0.193	−0.080	0.178
Urban/residential	1.849	0.254***	0.938	0.239***
Water	−0.024	0.377	0.161	0.348
Wetland	−4.801	1.821***	−0.852	1.693
Distance Variables				
Highway	−0.013	0.006**	−0.011	0.006*
Interstate	0.000	0.001	−0.001	0.001
Town	−0.012	0.001***	−0.002	0.001
City	−0.003	0.001***	0.000	0.001
Year				
2004	0.121	0.017***	0.112	0.016***
2005	0.153	0.018***	0.159	0.017***
2006	0.250	0.020***	0.252	0.019***
ρ			0.758	0.039***
County-level fixed effects	Yes		Yes	
Pseudo-R^2	0.417		0.503	

Note: 2SLS, two-stage least squares; SLM, spatial lag model.
* $\alpha \leq 0.10$; ** $\alpha \leq 0.05$; *** $\alpha \leq 0.01$.

TABLE 3
Spatial Test Statistics

Test Statistic	Value
LM lag	672.48***
Robust LM lag	146.02***
LM error	527.21***
Robust LM error	0.75

Note: LM, Lagrange multiplier.
*** $\alpha \leq 0.01$.

The interpretation of the coefficients from the spatial lag specification is not as straightforward as that of traditional linear regression. The complication arises as a result of the so-called spatial multiplier effect (Anselin 2003). The spatial multiplier effect can be observed when taking the derivative of [3] with respect to attribute x_k, which yields $\beta_k(I - \lambda \mathbf{W})^{-1}$.

As a result, a change in the value of an explanatory variable at one location will affect the outcome variable at that location (direct impact) and potentially affect all of the other locations indirectly (indirect impact) (LeSage and Pace 2009). The total impact of a change at one location is therefore much larger and complex than implied by least squares (for a recent example, see Kuethe and Keeney 2012).

Table 4 reports the estimated approximate elasticities for each of the statistically significant variables of the SLM. The first column reports the average price change at each observation implied by a one-unit change in the explanatory variable—the direct impact. When the direct impact is positive, per acre values go up, thereby raising the value of surrounding properties through spatial spill-

TABLE 4
Approximate Elasticities of Spatial Lag Model

Variable	Direct	Indirect	Total
Exchange	1.316	8.641	9.957
Acreage	− 0.003	− 0.007	− 0.010
Acreage squared	0.000	0.000	0.000
School quality	0.003	0.007	0.010
Urban/residential	1.051	2.837	3.888
Highway	− 0.012	− 0.032	− 0.044

overs. This, in turn, raises the value of the property experiencing a change in the explanatory variable. When aggregated, these feedback loops form the indirect impact reported in Column 2.

As previously stated, the semilog specification requires an additional adjustment to the coefficient estimates for dummy variables in order to obtain the approximate elasticities (Halvorsen and Palmquist 1980). The interpretation is further complicated by the spatial lag component of the SLM, and as a result, we follow the adjustment outlined by Steimetz (2010) and Cohen and Coughlin (2010). The results suggest that 1031 exchange participation is associated with a 1.32% direct impact price premium. That is the price per acre for farmland acquired under 1031 exchange for the parcel exchanged. This is similar in magnitude to the price premium implied by 2SLS (1.73%). The impact on all other parcels through the spatial spillover is much greater at 8.64%. This yields a total price premium as the result of 1031 exchange at 9.96%. The direct and total impacts are similar to those of nonagricultural properties, including apartments and commercial properties, provided by the existing literature (including Ling and Petrova 2008; Lambson, McQueen, and Slade 2004; Holmes and Slade 2001; and Munneke and Slade 2001).

VI. CONCLUSION

Farmland is a critical resource in the agricultural sector. It accounts for over 80% of the total value of farm assets and is the primary collateral in farm loans. As a result, the value of farm real estate—and how these values are determined—has been a perennial concern of empirical economic research. The existing literature shows that the value of agricultural real estate is determined by a number of factors beyond its ability to generate returns from agricultural production. This study examines the impacts of Section 1031 exchanges as part of the Federal Income Tax Code. This analysis employs a set of 3,580 farm real estate transactions from 55 agricultural counties in northern and central Indiana over the period 2003–2006. A hedonic price model is estimated using a spatial lag model that controls for the endogeneity of 1031 exchange participation. The results suggest that farmland parcels acquired under Section 1031 like-kind exchange are associated with a 1.32% direct impact premium and, when considering price spillovers, a total price premium of 9.96%.

Section 1031 exchange provision was introduced to encourage the continuity of investment in productive assets by alleviating taxpayers from the burden of capital gains tax in instances where their gains are not liquid, and in such cases, taxpayers may not have the cash resources to pay a tax (Kornhauser 1987). The provision also provides an advantage to the IRS, which is alleviated of the duty of monitoring and enforcing tax compliance in barter exchanges (Kornhauser 1987). In order to ensure the efficiency and efficacy of the provision, a number of requirements were later added. Compliance requires that a replacement property must be identified within 45 days of the sale of the relinquished property, and the purchase of the acquired property must be completed within 180 days. These timing requirements alter the incentives of parties wishing to execute an exchange. This leads to decreased bargaining power of participating landowners, which in turn leads to higher transaction prices for properties acquired under 1031 exchange.

Changes in tax rates may also alter the impacts of the exchange participation. As demonstrated by Williamson, Brady, and Durst (2010), a reduction of the capital gains rate following the Tax Relief Act of 1997 allowed some participating landowners to lower the realized tax burden. The monetary advantages may be capitalized into land values in a fashion similar to the capitalization of traditional farm program payments, which is well documented in the existing literature (Goodwin,

Mishra, and Ortalo-Magné 2003; Weersink et al. 1999; Duffy et al 1994; Runge and Halbach 1990).

In sum, the requirements and potential tax reduction of 1031 exchange participation may greatly alter transaction prices in farm real estate markets. The provision, however, is not limited to farmland, and farmland is involved in relatively few 1031 exchanges. Williamson, Brady, and Durst (2010) show that farmland was acquired, relinquished, or both in only 2% of all 1031 exchanges over the period 1999–2003. As such, the provision may also increase transaction values for other types of real estate. These effects have been documented in previous studies of apartments (Lambson, McQueen, and Slade 2004; Holmes and Slade 2001) and office properties (Munneke and Slade 2001).

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