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1990 Conservation Reserve Program self-employment taxes

In *Wuebker v. Comr.*, 110 T.C. No. 31 (6/23/98), the Tax Court held that annual payments received by the taxpayer under the 1990 Conservation Reserve Program (CRP) "were rentals from real estate and therefore not subject to self-employment tax under §§ 1401 and 1402, I.R.C."

In 1991, the taxpayer signed a Conservation Reserve Program contract. The taxpayer received cost-share payments for establishing the ground cover and "rental" payments for "use" of the land by the government for conservation purposes. The cost-share payments were included on Schedule F, for which self-employment tax was paid, and the "rental" payments were reported on Schedule E, for which no self-employment tax was paid. The IRS issued a notice of deficiency based upon its position that the "rental" payments were not in fact rent and actually constituted income from self-employment.

Many farmers enrolled in the 1990 Conservation Reserve Program to receive what was described in the contracts as "annual rental payments" from the government in exchange for giving up control of the use of the enrolled acreage to the government. At first glance, this sounds like rental income, which in general is specifically excluded from income for self-employment tax purposes. However, as often happens, the IRS does not adopt positions based on what you expect. Throughout the entire audit and appeals process, the IRS took the position that the payments were not rent; however, in its initial Tax Court brief, the IRS did not present a single argument as to why the payments were not rent even though the payments were defined by Congress to be rent and were described as rent in the CRP contract.

The IRS took the position that if the recipient of the CRP payments is engaged in the business of farming, the CRP payments are trade or business income includible for self-employment tax purposes. Not only did the IRS take this position, recently it received support for this position from the Tax Court in *Ray v. Commissioner*, T.C. Memo 1996-436. In that case, the Tax Court concluded the CRP payments were related closely enough to other business activities as a farmer to be considered part of the income from the business of farming. However, in the previous case, the Tax Court did not address the issue of whether the payments constituted rent.

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Canadian court dismisses transgenic animal patent

Suppose that you have cloned a new gene that can be used to produce a commercially valuable transgenic plant or animal. For example, you may wish to produce a new therapeutic protein in the milk of genetically engineered cows. Could you obtain a patent to these valuable transgenic cows in Canada? Yes, you can, according to a recent decision by the Federal Court in Canada, but you must show that the transgenic cows can be uniformly reproduced in aspects other than the fact that they carry the transgene. In practice, this means No.

The Federal Court in Canada elucidated this draconian standard in *President and Fellows of Harvard College v. Commissioner of Patents*, which was decided on April 21, 1998. In the decision, the court dismissed Harvard's appeal to reverse a prior decision by the Canadian Patent Office [CPO]. The CPO had rejected claims to transgenic non-human mammals in the "Oncomouse patent application" of Philip Leder and Timothy A. Stewart. Although earlier decisions established that single-celled organisms (including mammalian cell lines) and viruses are patentable subject matter under Canadian Patent Law, the CPW had decided that a higher life form is not sufficiently uniformly reproducible to be considered as a "composition of matter"

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The Tax Court distinguished this case from the *Ray* decision because it was clear from the statute, regulations, and contract that the payments were intended to be rent. Therefore, it is irrelevant whether the payments are related to the taxpayer's trade or business. Income Tax Regs. Section 1.1402(a)-4(d) provides, in part, that where someone is involved in a business that has income "which is classifiable in part as rentals from real estate, only that portion of such income which is not classifiable as rentals from real estate, and the expenses attributable to such portion, are included in determining net earnings from self-employment." The *Ray* case was based upon Rev. Rul. 60-32, 1960-1 C.B. 23, which the court said was not persuasive because the IRS did not address whether the payments constituted rentals.

The broad language used in the *Wuebker* case may well apply to Conservation Reserve Programs before 1990 to exclude CRP payments from income for self-employment tax purposes; however, the prior legislation may not use the term "rent" in the same manner as the 1990 legislation.

Although this decision is generally favorable for farmers, it is not known yet whether the IRS will appeal this decision. In addition, because this land is considered to be subject to a cash rental arrangement to a non-family member, additional thought needs to be given to the impact this might have on other planning decisions, such as being able to qualify for the new family business exclusion (which has

now turned into a deduction under Section 2057 of the Internal Revenue Code as a result of the recently passed Internal Revenue Service Restructuring and Reform Act of 1998).

—Russell Cunningham, Wright & Logan Co., L.P.A., Dublin, Ohio

Transgenic animal patent/continued from p. 1
or an "article of manufacture."

On appeal, Harvard argued that the CPO was requiring that all characteristics of the claimed invention must be under the inventor's control, including characteristics not relevant to the claimed invention. The important point, Harvard stressed, was that the transgenic animal carried the transgene.

The court explained that although it is not necessary that all characteristics be under the direct control of the inventor, an invention must be reproducible for the invention to be patentable. In the court's view, a transgenic mammal is not truly reproducible because too much is left to chance, including the chromosomal location of the transgene, the degree of transgene expression, and "everything else" about the mammal that is independent of the transgene.

In reaching this conclusion, the court noted that an earlier decision from the Federal Court of Appeal had held that a complex plant, such as a new soybean variety, could not be considered a "composition of matter" or an article of "manufac-

ture" under Canadian Patent Law. By analogy, the court contended that once a transgene has been injected into a fertilized egg, the inventor is engaged only in cross breeding. If cross-breeding of soybeans is outside the scope of the patent law, the court reasoned, then cross-breeding of mammals is not covered by the law. In short, the court concluded that a complex life form does not fit within the current parameters of the Canadian Patent Act.

Harvard had invited the court to follow the majority decision of the U.S. Supreme Court case that established that patentable subject matter included nonnaturally occurring life forms that were the product of human ingenuity. *Diamond v. Chakrabarty*, 206 USPQ 193 (1980).

—Phillip B.C. Jones, Ph.D., J.D.
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If you desire a copy of any article or further information, please contact the Law School Library nearest your office.

—Drew L. Kershen, Professor of Law,
The University of Oklahoma,
Norman, OK

Symposium info

The program for the AALA's 19th Annual Agricultural Law Symposium has been announced. The symposium will be held October 23-24, 1998, in Columbus, Ohio at the Hyatt on Capital Square. This year's program focuses on changes that are occurring in agricultural production following by a discussion of changes that the legal profession needs to make in response to the production changes, changes that are occurring on account of genetically modified organisms, cloning, consolidation of agricultural suppliers and processors, the concentration of wealth in older agricultural producers, world trading changes, environmental changes, and the electronic transfer of information require that lawyers revisit contract provisions, business organization structures, estate plans, and financing arrangements. All of these items will be covered in the

two days at Columbus.

A new feature this year for the AALA is the use of the Association's website as a source of information about the conference and allowing people to register by using the website. The website's address is <http://www.aglaw-assn.org>. Members are urged to contact this website to see the entire program of the Annual Symposium, and also to register. Brochures and registration material are also being mailed. This year's program will permit members to receive up-to-date information on what is occurring in agricultural production, processing, and marketing, and also advise on changes in contracts, litigation, business planning, financing, and estate planning. Columbus, Ohio is also an exciting city to visit, so members are urged to bring along a guest.

—Thomas A. Lawyer, President-elect,
AALA

Federal Register in brief

The following is a selection of items that were published in the *Federal Register* from June 22 to July 24, 1998.

1. Farm Credit Administration; Short and intermediate term credit; FCS and nonsystem lenders; final rule. 63 Fed. Reg. 36541.

2. Farm Credit Administration; Capital adequacy and related regulations; miscellaneous amendments; final rule. 63 Fed. Reg. 39219.

3. APHIS; International sanitary and phytosanitary standard-setting activities. 63 Fed. Reg. 38148.

—Linda Grim McCormick, Alvin, TX

Analysis of swine industry expansion in the U.S.: the effect of environmental regulation

By Yin Mo and Charles W. Abdalla

This paper summarizes a research project that investigated the relationship between the stringency of state environmental regulations and swine industry expansion over the 1988-1995 period.¹ The dynamics of the changing U.S. hog industry, environmental and other consequences of such change, and selected public policy issues are first described. A brief review of related previous research is presented. We conclude by highlighting the major research findings, identifying implications for policy, and providing suggestions for further study.²

Emerging issues in the U.S. hog industry

The hog industry is a major value-added sector in the agricultural economy. It is also a major contributor to the U.S. economy.³ Structural change and the industrialization process in the livestock industry have been noted and discussed since the early 1960s.⁴ Structural change in the swine industry was reflected by a decline in hog farm numbers and increase in the size of farms. In 1980, 670,000 farms produced hogs. Only 236,000 such farms remained in 1994.⁵ In the meantime, larger hog farms increased in their importance in hog production. As pork production is concentrating in the hands of fewer, larger producers and processors, hog farmers and pork processors are developing closer ties, forming a more integrated industry from the farm to the supermarket. Many researchers have attempted to identify the factors that brought these changes to the swine industry. These factors include new technologies (e.g., multiple-site rearing), the demand of more discriminating consumers, and improved information flow between consumers and producers via market structure change.⁶

Along with the technological and institutional change, the swine industry has become less tied to natural resources than in the past. Agriculture has been classified as a material-oriented industry in that it was believed to be bound to the location of the basic natural resources

upon which it depended, such as land or feed.

An industry can be classified as truly material-oriented only when its savings in transfer costs outweigh the possible cost advantages of other sites.⁷ This helps explain why animal rearing has been closely linked to feed crop production. Since the transportation cost of feed from a feed crop growing area was high, it limited the development of the livestock industry in those areas where cheap sources of feed were not available.

Technological and institutional innovation in the livestock industry have changed this view of agriculture as material-dependent. Improvements in genetics and better management practices have aided the hog industry in reducing feed conversion ratios and death losses. The decrease of feed conversion ratios reduced the feed cost of finishing per hog. In addition, declining transportation costs as well as improvements in transportation services have enabled the hog industry to move away from the vicinity of relatively cheap sources of feed. Thus, the importance of the transportation cost of feed in the total cost became less important.

The cost of transporting finished products to final markets increased in its role as a component of total costs. As an example, the proposed joint venture of Carroll's Foods and Smithfield Foods tried to develop a large fully-integrated hog facility in southern Utah even though virtually all the feed used at the complex would be shipped to that location from the midwest. "The decision as to where to locate new pork and poultry complexes in the future likely will be driven more by final market location and environmental issues than by location of available feed sources."⁸

Economies of scale obtained by technological and organizational innovation in the swine industry have contributed to the per-unit production cost reduction. Such achievements can offset the disadvantage of a location that lacks natural resources, and thus the swine industry has become less tied to natural resources than in the past. Changes in the hog-pork sector brought to the midwest a decline in its traditional comparative advantage in hog production. "The Midwest can no longer rely on its natural resource base...for industry location. Integrated firms are large enough now to provide all of their own support and can take their systems where they will be allowed to operate."⁹ As a result, new issues, such as where to expand or locate operations have become important to the future of the

modern swine industry.

The changes in the swine industry have brought about not only benefits to society, such as low-cost pork products, but also new conflicts and concerns. The hog industry has been marked by some critics as a "dirty" industry since large, confined hog facilities became the model for the industry in the 1990s. Citizens' concern over water quality and potential property value losses caused by odors from hog facilities comes from the production process associated with the modern hog industry. Since a large number of hogs are raised in confinement, large volumes of manure are generated, stored in lagoons, and spread on nearby farm fields. In the last several years, the over-application of manure and spills from storage lagoons have degraded surface and groundwater and resulted in loss of fish and other ecological resources in several regions of the country.

Environmental regulations have been enacted at the state and local level to reduce environmental damage from the rapid growth of livestock industries. Since there are differences in these regulatory programs, these differences may have influenced the growth of the hog industry across states, possibly leading over time to regional shifts in the location of the industry.

Industrial location issues are quite complicated. No factor can uniquely determine where hog farms locate. In addition to regulatory factors (e.g., environmental policies), other factors may also be important in explaining where the hog industry is located. These can be categorized as natural endowment, economic, and business climate factors. The natural endowment factors attempt to capture states' differences in natural conditions that affect their suitability for hog production. Economic factors, such as feed price and slaughtering capacity, influence the profitability of doing business in a state. Business climate, which reflects whether the hog industry is welcomed by local communities, can affect hog farms' operating costs and strategy for expansion.

Although many factors may have influenced hog industry location, the major focus of this study was the impact of regulatory factors, especially environmental regulations, on the location of the hog industry. There is anecdotal evidence supporting the hypothesis that the stringency of state environmental regulations influences firm location choices. The evidence does indicate, at a minimum, that some large livestock producers or integrators have taken into account environmental

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regulations when making expansion or location decisions. For example, Bacon explicitly cited the difference in environmental regulations in Virginia and North Carolina as the reason for the decision by Carroll's Foods, a southern-Virginia-based hog-raising company, to build its newer farms in North Carolina.¹⁰

Some academic researchers have concluded that differences in local and state institutions and policies for water quality and other relevant laws and local ordinances are exerting influence on the location of swine production. For instance, Hurt and Zering listed environmental regulatory factors as one of the key factors explaining the boom in North Carolina's swine industry.¹¹ However, the lack of systematic analysis has made it difficult to draw definitive conclusions about this relationship. The goal of this study was to fill this knowledge gap.

Policy design issue: who should have jurisdiction over animal waste?

This study's relevance lies not only in its potential to explain the role of environmental regulations on hog production growth patterns, but also in its possible implications for environmental policy design and implementation. There has been a long-standing debate in the U.S. over the question of whether federalism is an efficient way to achieve pollution abatement goals. The question of the appropriate division of responsibilities between national and local authorities has been a policy issue since the federal government placed much more emphasis upon pollution control in the early 1970's.

Agricultural pollution is regulated on two levels. Part of agriculture, such as large feedlots whose pollution is defined as point source pollution, is primarily regulated by the federal government. Most other agricultural operations are still within the scope of nonpoint sources, and thus their pollution is primarily under the control of the states.¹² Even for the first type of regulation, states generally have the authority to implement federal standards. The actual administration of water quality standards for point sources has been left to the states, who are in turn free to impose stricter point source controls than those promulgated by the U.S. Environmental Protection Agency (EPA).

State governments have taken advantage of this flexibility and have much discretion in implementing federal environmental rules. Since only general guidelines exist on the federal level, each state interprets and implements these guidelines differently. In particular, it is not uncommon to find that state responses to federal regulatory guidelines are not dictated solely by environmental concerns.¹³

Economists and policy-makers who support a decentralized approach believe that such an approach could bring economic efficiency. They argue that decision-makers at lower levels are more likely to make policy choices consistent with the collective preferences of the affected group.¹⁴ Therefore, decentralized policy making can allow local costs and benefits to be reflected in the decision process more accurately.

However, since policy makers at lower government levels have to take into account the collective preferences, it is not uncommon that environmental laws made at such levels serve purposes other than protecting the environment efficiently. For example, in the evaluation of the current decentralized approach of regulating livestock industry, Smith and Kuch argued that only when the variation among states' implementation of federal guidelines are solely attributable to the unique environmental problems or needs of individual states can the interstate patterns of livestock industry relate efficiently to environmental protection goals.¹⁵ Given that many factors other than the states' environmental problems or needs affect how states currently translate federal guidelines and enforce the regulations, Smith and Kuch concluded that current patterns of interstate concentration in animal agriculture do not suggest economic efficiency in environmental protection.

Another important argument against a decentralized approach is the possibility of interjurisdictional competition through different environmental standards. The fear is that local officials would set less stringent environmental standards than necessary to attract business and jobs. For example, Cumberland argued that national minimum standards for environmental quality are needed to avert "destructive interregional competition," since state or local authorities are likely to compete with one another in terms of reducing standards for environmental quality so as to reduce the costs for prospective business enterprises.¹⁶ The underlying argument is that decentralized jurisdictions, if left to their own, will fail to select the optimal standards.¹⁷

However, interjurisdictional competition may result in the goal of efficiency in environmental protection not being met. If firms react to differences in environmental laws in such a way that firms shift to areas where less stringent rules exist rather than modifying their operations within the jurisdiction, even greater net environmental damages may result from the change. This may happen since the locations where firms move in may have less appropriate physical conditions or greater nutrient surpluses than locations where firms move out.¹⁸ Given the mobil-

ity of current livestock facilities, the decentralized approach may cause a regional shift resulting in an increase in net environmental damage.

It is not sufficient to evaluate the decentralized regulatory process and its alternatives only through casual observation or theoretical deduction. Systematic empirical studies are needed. If researchers and policy analysts better understood the relation between the location of animal agriculture and the stringency of environmental regulations, they could more definitively assess the performance of the current decentralized regulatory system and determine if changes in the current institutional arrangements are needed.

Previous research

Many studies have explored whether the stringency of environmental regulations affects firms' location decisions. However, almost all research has limited its focus to the manufacturing sector. None of the existing studies that focus on environmental regulations address the agricultural production sector. Relatively little previous research has been conducted on this topic for agribusinesses or animal agriculture.

Empirical results from manufacturing studies do not suggest strong negative effects of environmental regulation on industry growth and local economic development. These studies take two basic forms: surveys of manufacturing executives regarding the type of factors they consider in plant location¹⁹ and statistical analyses of state characteristics presumed to affect firm location.²⁰ Despite the theoretical intuition and the "conventional wisdom" supporting a linkage between state environmental policies and firm location decisions, most empirical studies to date, including both survey and analysis of secondary data, have found only weak and insignificant effects for manufacturing as a whole.²¹ In some studies, significant results were found in certain high-pollution industries, but the magnitude of this relationship was small.²² Only one study found a strong significant effect of the stringency of environmental regulation.²³ Definitive conclusions about the effects of environmental regulations in the manufacturing sector await the completion of further research.

Research on the potential effect of environmental policies upon growth and location of farming and related businesses has been limited. Lopez and Henderson (1989) used telephone interviews with food processing executives in five north-east states to identify factors affecting locational choices for their plants.²⁴ Vesecky and Lins surveyed Illinois agribusiness decision-makers about fac-

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SWINE INDUSTRY/*Cont. from page 5*
tors affecting expansion and contraction.²⁵ Findings from both studies suggest that state environmental policies and their enforcement appear to influence decisions of agribusiness to grow or contract and to locate their operations.

In a survey of U.S. large hog producers, it was found that forty-four percent of the large hog producers in the U.S. considered environmental conflicts and local opposition as the limitations on their expansion. The concerns were found to differ by region. However, whether this difference was related to the stringency of environmental regulation was not analyzed.

Survey results and most empirical analyses of secondary data in manufacturing do not indicate a strong negative effect of environmental regulation on industry growth and local economic development. However, the empirical studies conducted thus far are too dissimilar to provide for a consensus among researchers about this relationship. It also has to be kept in mind that survey results may not be reliable since what people say can be different from what they actually do.²⁶ In addition, since a few recent studies did find the presumed effect of environmental regulation, it encourages further study of this relationship. Also, since little empirical work has been conducted thus far to investigate the effect of environmental regulation in agriculture, additional analysis of the agricultural production sector is warranted.

Data collection and analysis

To investigate the relationship between the stringency of states' environmental regulations and swine industry location decisions, an aggregate analysis was conducted. Aggregate analyses are those that investigate general economic activity such as employment growth to detect the effects of stringency of environmental regulations. Specifically, the dependent variable was a state's hog inventory growth rate over the 1988/89-1994/95 period. A total of sixteen independent variables were included in the analysis. Most were obtained from secondary data sources. A mail survey was used to obtain the data concerning the stringency of state environmental regulations. A variance component regression model was used to investigate the hypothesized relationship. The hypothesis that environmental regulations affect hog producers' expansion and location decisions was tested at the aggregate level. To be more specific, the null hypothesis was that the stringency of state environmental regulations does not influence the growth rate of hog inventory across states. Accordingly, the alternative hypothesis is that the stringency of state environmental regulations influences the growth rate of hog inventory

across states. If the null hypothesis can be rejected and the alternative hypothesis can be accepted, it is expected that the more stringent the state environmental regulations are, the lower will be the rate of growth in a state's hog inventory. The analysis covers the period 1988-1994 and 13 major hog producing states.²⁷

Research conclusions

From an overall standpoint, the results did not strongly support the hypothesis that the stringency of environmental regulations had an impact on hog inventory growth over the study period. Five variables were used to test this hypothesis. Two of the independent variables used to test the hypothesis are established general environmental regulation indices that were not specific to the livestock industry and did not vary over time. The remaining three variables were obtained through surveys. These variables attempted to measure the stringency of states' animal waste management programs and their enforcement in thirteen states. Among these three variables, one measured the stringency of environmental laws regulating the livestock industry "on paper" while two variables measured states' enforcement efforts.

A general environmental index variable and a variable measuring the states' penalties on facilities violating animal waste management laws had statistically significant coefficients with the expected signs. The other general environmental index variable was statistically significant with an unexpected sign. A variable that was a more appropriate measurement of the laws regulating livestock industry was insignificant, though the sign was as expected. The variable measuring states' enforcement capabilities was significant but had an unexpected sign.

One explanation for the insignificance of the states' environmental laws regulating livestock industry is that the states' laws on "paper" did not differ significantly in an earlier part of the study period.²⁸ More differences in states' regulatory programs can be found in their enforcement efforts, which possibly had an impact on the growth rate of the swine industry across states. One of the two variables measuring states' enforcement efforts—amount of fines per violation—was significant and had the expected negative sign. This suggests that swine producers were sensitive to the penalties imposed on facilities violating the law. However, the number of staff devoted to animal waste management had an unexpected positive sign.

One way to interpret the above finding is that state environmental agencies may have gone through a learning process as they attempted to regulate the swine industry during the study period. The strong positive relationship between the num-

ber of staff devoted to animal waste management programs and hog inventory growth suggests the following: as environmental concerns became more serious with expansion of the industry in the early 1990's, greater efforts were devoted to the regulatory program in an attempt to reduce environmental damage. The argument was supported by a survey of industry experts. The results of the survey indicated that the regulatory programs of most states had greater impact later in the study period. Further research is needed to fully understand the relationship between the stringency of environmental regulatory programs and hog industry expansion.

Another interesting finding relates to local institutions and public policies. The existence of the capability of local governments to regulate the swine industry through local zoning ordinances appeared to have had an impact on the growth of the hog industry. This result supported the argument that states with local governments that had legal authority to regulate the hog industry have made the regulatory environments less uniform and perhaps unstable. Such states may discourage operators' investment in the hog business. Recent support for the importance of this variable is also provided by a heated debate among state lawmakers over local control issues in North Carolina and Iowa.²⁹ However, since this public policy influence was measured through a dummy variable, it is not possible to make a conclusion about the magnitude of the impact of this policy factor.

The analysis also provides insight into other factors influencing the recent growth of hog production in the U.S. The models explored in this study indicated that natural endowment factor (precipitation), economic factors (hog/corn price ratio and the percentage of large farms), and business climate (percentage of rural population) consistently performed well in explaining the variation in a state's hog production over the 1988-94 period. Growth in swine production was found to be associated with lower precipitation, possibly resulting from decreased costs caused by manure management in drier environments.

The importance of the hog/corn price ratio in explaining the industry growth verified the economic theory of firm behavior. The number of larger farms was found to be a significant factor influencing growth in all models, providing additional evidence of the role of economies of scale in hog facility expansion. Also, land values were positively related to increases in hog industry growth in most models, suggesting that such measures reflect a benefit, such as in securing capital, needed for expansion, rather than acting as a cost factor. A state's business climate had an important bearing upon growth in hog production. Hog facilities were found

to be more likely to expand in a state with more rural people.

Policy implications

The study results have implications for policy makers and others who are interested in understanding the emerging locational patterns of the U.S. swine industry. There are at least two major policy issues associated with this research. The first issue concerns where hog facilities locate and expand and thus has implications for state or local policies. A second policy issue concerns the relationship between swine industry expansion and the stringency of environmental laws.

The research provides the following insights into where swine facilities are likely to locate and expand.

- Based on the spatial patterns observed in the 1988-85 period, drier states are likely to see growth in their swine sectors. If other conditions are the same, drier states, which are expected to have a less vulnerable environment for hog production, are likely to increase their hog inventories. Given that expansion in swine production continues to occur in drier states, states and local governments in these states should take steps to prepare for this growth.

- States with existing larger swine facilities are likely to grow. Larger swine facilities that benefit from economies of scale can have lower cost per unit than smaller swine farms and thus are more competitive. These facilities may have advantages in terms of manure management and ability to meet state environmental rules as well. Consequently, states with a higher proportion of these highly competitive facilities are likely to see more growth in the future.

- States with more rural people are more likely to see growth in swine production. This prediction is based on the belief (supported in this analysis) that such states are more likely than more urban states to have a positive business climate for hog production. In such states, the transactions cost of dealing with concerned or irate neighbors or community groups will be avoided or reduced when swine facility operators locate or expand their facilities.

- States in which local governments have less authority in regulating livestock operations are more likely to see growth in their swine sectors. In particular, the states that exempt agriculture from local zoning ordinances may encourage investment in the hog business. Currently, there are active policy debates in the leading hog industry states, including North Carolina and Iowa, about local preemption issues. The outcome of these debates, which are being determined in both legislative and judicial bodies, will have important consequences for where future industry growth will occur and appears likely to play a key role in state-to-state or

regional shifts.

- States that are more lenient to violators of environmental laws are more likely to see a growth in swine production. The finding suggests that the size of the penalties in a state on violators has an impact on the rate of swine industry growth in that state. It appears that the larger the penalties applied, the slower the industry growth is in that jurisdiction. State policy-makers interested in influencing hog production growth should pay greater attention to the penalties associated with violating environmental laws.

In terms of the relationship between swine industry growth and the stringency of environmental laws, it is difficult at this time to draw a definitive overall conclusion and policy implication. It is worth mentioning that states' enforcement of environmental laws appears to be important to swine industry expansion. Given that more personnel have been devoted to the animal waste management programs in some states (e.g., Minnesota and Pennsylvania), the impact of enforcement on swine production and expansion can be expected to be greater in these states.

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² Because of the constraints of space, those portions of the research paper that discuss previous research, data collection and analysis methods, and the results of the research are omitted. Interested persons may contact the editor of 281-388-0155 to request a faxed copy of those pages, or fax the request to 281-388-1291.

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⁶ *Id.*

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⁹ Hurt, *supra* note 5, at 12.

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¹¹ C. Hurt & K. Zering, *Hog Production Booms in North Carolina: Why There? Why Now?*, Purdue Agric. Econ. Rpt. 11-14 (Aug. 1993).

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¹⁵ Smith and Kuch, *supra* note 13.

¹⁶ J. Cumberland, *Efficiency and Equity in Interregional Environmental Management*, 48 Review of Reg. Studies 1-9 (1971).

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¹⁹ R. Schmenner, *Making Business Location Decisions*. Englewood Cliffs, NJ: Prentice-Hall, 1982; Epping, G.M., *Tradition in Transition: The Emergence of New Categories in Plant Location*, 19 Ark. Bus. & Econ. Rev. 16-25 (1986); Stafford, H.A., *Environmental Protection and Industrial Location*, 75 Annals of the Assoc. of Am. Geographers 227-240 (1985).

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