



OXFORD JOURNALS
OXFORD UNIVERSITY PRESS

The Thunen Model and the New Economic Geography as a Paradigm for Rural Development Policy

Author(s): James Hite

Source: *Review of Agricultural Economics*, Autumn - Winter, 1997, Vol. 19, No. 2 (Autumn - Winter, 1997), pp. 230-240

Published by: Oxford University Press on behalf of Agricultural & Applied Economics Association

Stable URL: <https://www.jstor.org/stable/1349738>

REFERENCES

Linked references are available on JSTOR for this article:

https://www.jstor.org/stable/1349738?seq=1&cid=pdf-reference#references_tab_contents

You may need to log in to JSTOR to access the linked references.

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <https://about.jstor.org/terms>



and Oxford University Press are collaborating with JSTOR to digitize, preserve and extend access to *Review of Agricultural Economics*

JSTOR

The Thunen Model and the New Economic Geography as a Paradigm for Rural Development Policy

James Hite

The Thunen model and kindred recent work labeled “the new economic geography” supplies a plausible paradigm for a coherent rural development policy. The paradigm implies that being rural is being remote, that economies of agglomeration are strong, and that with remoteness comes serious inherent economic problems. In this paper, I sketch the paradigm and explore possibilities for using the paradigm to evaluate policy strategies for rural economic development.

Paradigms and Practice

Rural development practitioners often are not much concerned about paradigms for rural development (Goldstein and Luger). They may even deny such paradigms have any practical value. As one anonymous reviewer (a practitioner) commented on an earlier draft of this paper, “I do not think rural development is all that complicated...” All that is required, he added, “is some clear thinking about what needs to be done and whether an urban nation is politically willing to do it.”

Yet, on reflection, the clear thinking this practitioner identifies as being essential requires some conceptual base, some paradigm. How can we be clear about what needs to be done if we do not understand the way the rural economy works, and what, if any, the unique economic implications of being rural are? Consciously or not, practitioners and scholars alike have in their heads a paradigm of a generic rural economy. Even if we are only vaguely aware of the paradigm, that paradigm, however muddled or amorphous it may be, determines how we see the world, what we think is important, and what we think will work.

Many differences of opinion about what needs to be done in rural development stem from differences in either our paradigms or in our economic self-interests (Hite). Those differences may never disappear. Yet, stating our paradigms as explicitly as possible allows us to clarify rural development policy issues and move

■ *James Hite is alumni professor, Department of Agricultural and Applied Economics, Clemson University.*

toward consensus about what needs to be done, even if continuing disagreement over paradigms and the demands of self-interest prevent achieving full consensus.

In this paper, I argue that the Thunen model and kindred recent work labeled the “new economic geography” supplies a plausible paradigm for rural economic development policy. The next section deals with the problem of the missing paradigm. The second section contains a sketch of the basic Thunen model and discussion of some of its implications. In the third section, I give a cursory review of the new economic geography and consider how it provides increasingly sophisticated insights into economic activities at remote places on the Thunen plain. In the final section, I examine some implications for rural development policy that seem to flow from the proposed paradigm.

The Problem of the Missing Paradigm

Agricultural economists who study rural development are well aware of the problem of the missing paradigm. The matter has been addressed in the literature by some of the leading scholars working in the field (Nelson, Barkley, Deaton and Weber, Drabenstott and Henry, Knutson and Fisher, Deaton and Nelson, Gardner, Smith). The National Rural Studies Committee has focused on the central question: “What is rural?” Answering this question forces a search for a paradigm. Deaver’s paper attempting to answer that question takes a large step by suggesting the empirical facts a paradigm must explain. Lewis, a distinguished urban geographer, shows that the related question, “What is urban?” also needs an answer that fits modern urban geography. Indeed, Guttenberg shows that one question cannot be answered without answering the other.

Still, a paradigm has not been explicitly proposed for consideration and critical review. The lack of such a paradigm means that economic research in rural development is, like rural development policy, ad hoc. While technically often quite sophisticated, the research is plagued by a certain fuzziness and inconsistency in definitions, symptoms of a serious underlying epistemological deficiency. At best, we have a body of case study literature which is community- or place-specific, but from which it is almost impossible to generalize.

Taking a cue from Guttenberg, we may begin to piece together a coherent paradigm worthy of serious consideration. Being rural, first and essentially, deals with geography—the location of particular regions in space. The self-evident truth is that being rural is a geographic condition. A rural place is one that is not urban, and rural can have no meaning without reference to urban. We do not even need the word rural if there are no urban places. Rural can be defined by what it is not. What is rural is the residual space that is not urban (Guttenberg).

Saying that rural is simply the space that is not urban may be true, but it is hardly a paradigm. Yet, recognizing that truth is important because space must be a factor in any usable paradigm of a rural economy.

In the history of economic thought, only one tradition really incorporates geography and space as a central element: the tradition associated with the German theorist, J.H. von Thunen (Thunen). Thunen’s analysis (and, to some extent, all subsequent theories of an economy in space) begins with a simple model of one urban center and its rural hinterland (figure 1). Some label such a paradigm a center/periphery model (Prebisch). Certainly, Thunen’s model is a type of center/

Figure 1. Illustration of the basic Thunen model

Johann Heinrich von Thunen (1783–1850) provided the first systematic theory of economic location in the book *Der Isolierte Staat* (The Isolated City), first published in German in 1826.

Thunen first posits a perfectly homogeneous and isolated plain, at the center of which sits a single city that is the market for all the produce of the plain and all urban goods and services. Every point on the plain is exactly like every other point except with regard to its location relative to the city.

Economic distance is assumed to be a function solely of physical distance. Hence, a circle of a given radius around the city connects all points on the plain of equal economic distance from the urban market.

In such an imaginary world, Thunen asks, what would be produced at various locations on the plain? Because the plain is perfectly homogeneous, *in situ* production costs are the same everywhere on the plain. Landowners will want to produce that which maximizes the returns to land net of shipping costs. If we assume two commodities, such as strawberries and wheat, and also assume that shipping costs are a linear function of distance, we can show the simple Thunen model graphically as in figure 1a.

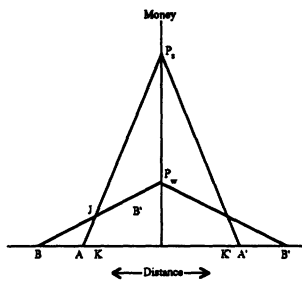


Figure 1a

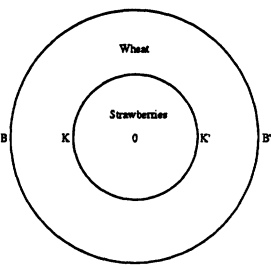


Figure 1b

The line segment OP_s in figure 1a is the market price of strawberries (measured in units of yield per land area) in the central city, and lines P_sA and P_sA' are the shipping point prices of strawberries at various points on the plain surrounding the city. Line segment OP_w is the similar price of wheat in the city market and lines P_wB and P_wB' are the shipping point prices of wheat at various points on the plain. Because the market price is per units of yield per land area, lines P_sA (P_sA') and P_wB (P_wB') are rent gradients. Hence, at all points immediately surrounding the city to a radius of OK (or OK'), rents are maximized producing strawberries, and at points between K and B (or K' and B'), rents are maximized producing wheat. Given these simplified assumptions, the resulting economic geography is a series of concentric circles around the city as figure 1b shows.

periphery model. Rural is an appropriate label for such places that are remote from the city on Thunen's isolated plain. Hence, a paradigm emerges in which rurality, in its most essential sense, is synonymous with Thunen remoteness, and remoteness is, at least potentially, measurable along some vector of economic distance.

If such a definition is accepted, some places must be more rural than others because some places are more remote than others. However measured, there are degrees of remoteness and degrees of rurality. Because economic distance refers to the costs of overcoming the friction of space, being rural means operating under the economic disadvantage of having to overcome some costs that are lower in other places that are less rural. And because the costs of overcoming

distance are not forever fixed, and, indeed, are radically altered by transportation and communication innovations, the degree of remoteness, that is, rurality, shifts through time in ways that affect the economic opportunities of places on the Thunen plain. A Thunen paradigm for rural development, therefore, has the potential not only of explaining (in a somewhat oversimplified way) the economic activities of various generic rural places at a particular time, but also ways in which innovations change rural economies through time.

Prototypical Thunen Economy

What would a Thunen model, considered logically and without any resort to empirical data, tell us to expect about the characteristic of a rural economy? Let us first consider the static situation, assuming a constant technology and some positive cost to overcoming the friction of distance. With the help of neo-classical economics and German location theories, we can deduce the first two of three characteristics, which Deaver suggests define what is empirically rural, as characteristics of remote economies on the Thunen plain:

1. Extensive instead of intensive land use with low population densities.
2. High economic specialization.

Consider first the matter of extensive land use and low population densities. In the Thunen model, the realized price (shipping point or net back) of products declines with remoteness from the city market because of shipping costs. Thus, the marginal output value is lower in remote than nonremote areas. Conversely, to the extent that inputs must be bought into the central city and carried to the worksite, marginal input costs are higher in remote than nonremote sites.

If marginal revenue is lower and marginal costs higher in remote than less-remote areas, output per unit of land area will be lower in the remote areas (Chisholm). It also follows that remote areas can support population densities equal to nonremote areas only if the permanent residents of remote areas are willing to accept lower real per capita incomes. Only if the population densities of remote areas are below those of less-remote areas can some approximation of parity in real per capita incomes be realized.

Thus, the first empirically observed characteristic of rural places is directly deducible from the Thunen model.

The second empirically observed characteristic of rural places, specialization, is more complicated. Scale economies must be introduced into the Thunen plain. Scale problems inherent in remoteness are what gives rise to cities. Cities can be seen as a social innovation for realizing more economies of scale (internal and external). Thunen's central city is assumed. However, if there are positive transport costs and scale economies in some industries, those industries that do not realize minimum long-run average costs at output levels that can be absorbed purely by local demand have strong incentives to seek, from the smallest population required to absorb such output levels, a site that minimizes remoteness. And to the extent that external scale economies exist, they will have incentives to agglomerate in a single area, such as Thunen's central city where transport costs to the whole plain are minimized. Thus, after scale economies are added to Thunen's system, Thunen's central city emerges endogenously.

Other areas lack many of the possibilities for internal and external scale economies that the central city has, and the more remote the area on the Thunen plain, the greater the lack. Economic sectors with few economies of scale can find a niche in Thunen's central city or in remote areas, but sectors with large economies of scale can withstand intense cost competition only by locating in the central city. Thus, because of scale economy problems and positive transport costs, remote areas with sparse populations cannot support an economy of many sectors and will be more specialized than economies of less remote and urban areas.

If we complicate the Thunen model a bit more to include two periods and then introduce the Johnson and Quance asset fixity model, we can deduce a third characteristic of rural areas, which has been noted from empirical observation: Remote areas on the Thunen plain will most likely have capital shortages.

Consider the following logic: The collateral value of an asset to a lender depends on its salvage value, which, in turn, depends on its use value in its highest alternative use, less those transaction costs associated with transferring the asset from its current use to the alternative use. If remote areas are areas with highly specialized economies, the salvage market for an asset in remote areas most likely will be thin. Redeploying it to an alternative use involves relatively higher transaction costs than those in less remote sites. Hence an asset, particularly a relatively immobile asset, installed at a remote site is, other things being constant, worth less as collateral against a loan than an asset in a less remote site. This makes it difficult for industries in remote areas to secure financing for new capital. Thus, remote economies are sluggish in adjusting to changing market signals and are economically conservative.

A host of empirical studies verify that rural economies tend to be capital poor and face difficulties in obtaining financing for new assets (Barkley and Helander; Markley; Rogers, Schaffer, and Pulver). As long as the principle economic activity of remote and rural places was agriculture, the Johnson asset fixity hypothesis (Johnson and Quance, Johnson, Edwards) sufficed to explain the capital/finance problem as being inherent in the agricultural sector.

Remote areas are not unique in being high-risk sites for investment. High-crime areas of cities, eroding beaches, and earthquake-prone areas along large geologic faults are high-risk sites. But the Thunen paradigm helps us see a new logic that shows that risk is affected by remoteness. This new logic suggests that the capital and financing problems of remote rural areas are not so much inherent in the economic sectors in which they specialize, but in their geography. On the Thunen plain, remote areas are more prone to asset fixity than less remote areas (Ward and Hite, Webb *et al.*).

We may deduce other characteristics of a remote or rural economy from the Thunen model. But all these characteristics are evident empirically to varying degrees in remote and rural economies. For now, we note that much of what we observe empirically in rural economies can be explained with a simple version of the Thunen model. Rural economies are

1. either low density in population or relatively poor,
2. specialized,
3. economically conservative.

Only if an area is so remote as to be beyond the Thunen city's commercial production zone are we likely to find any exceptions to these characteristics, and then only in less specialization to meet the needs of a subsistence existence. Generally, if we allow for differences in resource endowments and a multicentered system of urban areas, the characteristics of remote areas deduced from the Thunen model accurately describe salient empirical characteristics of rural economies.

Thunen and the New Economic Geography

In recent years, Paul Krugman's work has given rise to a body of literature, "The New Economic Geography" (NEG). The question thus arises: Does the NEG supersede the Thunen model and undercut the conclusions one would draw from it?

The general answer to that question is no. Although the NEG is formulated within the framework of general equilibrium theory, it, too, assumes a homogeneous plain and can be seen as simply a modernization and refinement of Thunen's analysis. A central city is not assumed initially, but Fujita and Krugman show how such a city emerges endogenously in a two-sector model if transport costs are low, economies of scale are substantial, and the inputs for at least one sector are perfectly mobile. Krugman also shows that a system of different size cities, resembling Losch's and Christaller's central area structures, emerges when we introduce multiple sectors into the model. In the broad sense, the NEG verifies Thunen and the "German Geometry" familiar to students of location theory.

Yet, the NEG provides important new insights that are not immediately obvious from Thunen and the old location theory. Not the least of these insights is the interaction between scale economies and transport costs in producing spatial agglomerations of economic activities. At the extreme, if transport costs for all sectors are zero and scale economies infinite, all economic activity using mobile factor inputs eventually concentrate in a single city. In less extreme cases, multiple, smaller spatial agglomerations of firms occur in sectors facing moderate transport costs and moderate economies of scale, even if factor inputs are perfectly mobile. Hence, falling transportation costs and increasing economies of scale for firms using relative mobile inputs generate pressures for spatial centralization away from remote rural areas and toward fewer and larger urban centers. Moreover, this tendency exists even in the absence of external urban economies, such as labor pooling.

Such a conclusion is not reassuring to those concerned with the economic well-being of the hinterland. Kilkenny has recast the Krugman formulation to generalize the analysis further, and she produces results that offer a glimmer of economic hope for remote areas.

In Kilkenny's model, firm and household location decisions are linked to make location decisions for firms affected by spatial distribution of population, and vice versa. The model contains an agricultural sector, which uses immobile assets, such as land, to produce food for urban residents, and the larger the city, the greater the hinterland required to supply it with food. Hence, because of positive food transport costs, urban cost-of-living rises (or urban real wages fall) as city size increases. In the Kilkenny model, firm location decisions affect relative costs, prices, and real local wages. Moreover, as activities concentrate spatially, land prices increase in the cities, and, although land costs are not explicitly incorporated into Kilkenny's model, higher land prices also tend to break agglomeration tendencies.

Hence, even with falling transport costs and increasing economies of scale, the trend toward spatial centralization has limits. But decreasing transport costs for agricultural products along with generally declining transport costs and growing economies of scale in nonagricultural sectors fuel a population and economic activity shift from the country to the city. Whether economies of scale have been increasing generally might be debatable, but transport costs have generally been declining for at least twenty years. Moreover, the NEG shows that falling transport costs help to explain the changing economic fortunes of rural and remote areas.

Another important insight emerging from the NEG is that the way a *laissez faire* economy organizes itself in space is path dependent. Intuitively, we might expect that history is important, but the work of Krugman and his associates rigorously demonstrates its importance. After a critical mass is achieved at some point on the Thunen plain, further agglomeration brings increasing returns. Congestion diseconomies might ultimately overwhelm these increasing agglomeration returns, but they do not negate them.

Such a result is broadly consistent with empirical findings. Henry and Drabenstott show that the employment growth that has occurred in rural (non-standard metropolitan area) areas in the period 1981–92 is associated with industry clusters of the sort that emerge endogenously in the Krugman model. While finding evidence that urban spillover, local input markets, and quality of life factors also play a role in explaining recent employment growth in rural areas, Henry and Drabenstott conclude that "...the rural areas that grew in the 1980s tended to be those with a head start in a vital industry" (p. 67).

We are left then with a tautology: Remote rural economies are disadvantaged because they are thin and unable to offer opportunities for achieving economies of scale because they lack a critical mass; and because they lack that critical mass, they are thin and lack opportunities for realizing economies of scale. The lower the transport costs, other things being constant, the more remote rural economies will be and the greater the disadvantages under which they must operate. Only in an environment where economies of scale are relatively unimportant do the disadvantages of remoteness diminish as transport costs fall.

Policy Implications

The Thunen/NEG paradigm suggests that a rural region experiencing an economic decline has two broad options for reversing its fortunes via public policy:

1. It can seek to reduce its population.
2. It can subsidize new investment.

The first option is one usually adopted by traditional societies. Facing growing economic problems, usually in the form of starvation, traditional tribes split, some members migrating in search of a new home. As long as the United States had a frontier beckoning, this traditional option worked well. When the western frontier closed, the labor needs of the Industrial Revolution drew rural migrants to an urban frontier. Rapid increases in productivity in the traditional primary industries of hinterland economies relative to the economy as a whole moderated the forces driving rural residents to migrate. So, too, did falling birth rates

in rural places. Even so, the stream of rural-to-urban migrants in the United States in the twentieth century has been greater than urban areas have been able to assimilate easily, and a persistent urban poverty with rural roots reaching back three or four generations has become a serious social problem.

The first option may not be socially desirable. Even if it were, it is politically unrealistic in a democratic society if there is evidence of asset fixity anywhere in the economy. The holders of immobile and highly specialized assets seek out political interventions in the form of subsidies for place-specific investments that raise (or at least conserve) the value of those fixed assets. In the United States (and many other countries), it is evidence of the political shrewdness of rural asset holders that there has been an array of income transfers, such as agricultural price supports, grants and below-market interest loans for infrastructure, *inter alia*, that subsidize populations in remote areas. These subsidies are financed, at the margin, by urban economic activities (Kilkenny and Failde).

Leaders in some parts of the rural hinterland have also seen that it can make sense to subsidize new investment and finance those subsidies from the local economy. Consider the following:

- If labor is relatively immobile, some industries might be attracted to remote rural places where they can act as a monopsonist in a local labor market; hence, the prospect of cheap labor might, at the margin, logically attract employers in industries in which economies of scale are modest. The workforce that values the social and natural environment of the hinterland might consider lower wages, which allow them to remain in rural areas and small towns, to be a better deal than any other realistic alternative available.
- If there are increasing returns in the form of pecuniary externalities flowing from such industrial investment, the beneficiaries of labor immobility in remote areas attracting employers seeking cheap labor will include landowners and the local business community, some part of which also holds relatively immobile capital assets. Hence, the business community and landowners in the hinterland might maximize the present value of their net worth by assuming some extra tax burden to finance incentives for new industries.
- Incentives in the form of tax breaks or other subsidies to new investors need not be in perpetuity if a critical mass of some industry is attracted to a location, and remoteness is consequently reduced. One way for remote areas to overcome the disadvantage of remoteness is to invest in building the minimum critical mass. After that critical mass is achieved, no further incentives are required to achieve the self-sustaining engine of increasing returns.

After considering the Thunen/NEG paradigm, we should not be surprised to see states and local governments offer incentives for new industry and business financed by the local tax base. If labor is immobile and some significant assets are fixed, packages of self-financed local or regional incentives exist that are economically sensible in that they represent Pareto-better movements. If there are increasing returns to scale, such incentive packages make ever better sense for many remote rural areas. Potentially, they can help provide the seed needed to generate the critical mass Henry and Drabenstott saw as important, and when that critical mass is reached, the incentives can be phased out as no longer needed.

To extend the policy implications of the Thunen/NEG paradigm further, we would need to reach out to public choice theory and consider the political economy of subsidies and local incentives. That would take this paper further afield than is appropriate here. Suffice it to say that ample reason exists to expect that subsidies and incentives policies, in application, will not lead to true Pareto-better outcomes, and, in practice, the whole effort will turn into a feeding frenzy of rent-seekers.

But all is not gloom and doom. Real world rural places, however disadvantaged by remoteness, might find economic prosperity in Ricardian rents arising from special resource endowments, be they endowments of the more traditional sort, such as soils or minerals, or endowments of the sort that will attract tourists, retirees, or electronic commuters seeking to escape urban congestion (Beyers and Lindahl). A serious limitation of the Thunen paradigm is the simplifying assumption of undifferentiated space. Policy that facilitates local discovery and exploitation of Ricardian possibilities is consistent with the thrust of many rural development extension efforts to enhance leadership skills in rural communities, nourish entrepreneurial ventures, and foster protection of quality-of-life amenities.

Summary and Conclusions

Even if practitioners working in the front lines of rural development do not consider the lack of a rural economy paradigm to be a significant problem, the lack of such a paradigm prevents the framing of any coherent rural development policy. The result is that research and policy is usually ad hoc, and policy is sometimes counterproductive. As is the case relative to the adverse effects on rural areas of falling transport costs, we may propose policies that have the opposite intended effect on rural economies. It also poses a serious limitation for rural development scholarship.

In this paper, I suggest that the Thunen model is a useful starting place for constructing the needed paradigm. As the core of a paradigm for a rural economy, the Thunen model has the great advantage of specifically incorporating geography, and it is geography that provides the essential definition of a rural place. The Thunen model also lends itself easily to analysis, using neoclassical economic theory, particularly marginal analysis. I demonstrate, even if in an abbreviated way, how some of the most common features that empirically characterize a rural economy are deducible by pure logic with regard to remote places on Thunen's imaginary plain. I also show how the Thunen model is being refined and modernized as part of the new economic geography.

Yet, the Thunen model, even as refined and modernized in the new economic geography, is only a starting place. It can help us face up squarely to the problems inherent in being remote and come to terms with the limitations of public policy in overcoming those problems. It may mean that remote rural areas seeking development will need to offer tax breaks or other subsidies to investors in the form of development incentives. To go on from there with a positive strategy for rural development, we must look beyond Thunen to the possibilities for Ricardian rents inherent in differentiated space.

Not all rural places will be fortunate in their resource endowments. However, some may well have possibilities for Ricardian rents that are not immediately obvious and are discoverable only through the energy of local action and local entrepreneurship. This suggests that a requirement of rural development policy

is to create and maintain conditions in which every rural area is given a fighting chance to find its own economic future. If rural areas can protect and market attractive quality-of-life amenities, maintain a relatively low cost of living, and offer serviceable links to global telecommunications infrastructures, many of them can survive as local economies, and some might even thrive. An inventive, sustained extension outreach effort in rural development, which focuses on nourishing local action at the grassroots level, would complement such a policy strategy.

Acknowledgments

The author gratefully acknowledges helpful comments from David Barkley, Maureen Kilkenny, William Ward, and three anonymous referees for this journal.

References

- Barkley, D.L., and P.E. Helander. "Commercial Bank Loans and Non-Metropolitan Economic Activity: A Question of Causality." *Rev. Reg. Stud.* 15(Winter):26–32.
- Barkley, P.W. "Toward a Development Policy for Rural America." *N.E. J. Agr. and Resour. Econ.* 17(2):85–92.
- Beyers, W.B., and D.P. Lindahl. "Lone Eagles and High Fliers in Rural Producer Services." *Rural Develop. Perspect.* 11(1996):2–10.
- Chisholm, M. *Rural Settlement and Land Use*. 3rd. ed. London: Hutchinson of London, 1979.
- Christaller, W. *Central Places in Southern Germany*. Translated by C.W. Baskin. Englewood Cliffs NJ: Prentice-Hall, 1966.
- Deaton, B.J., and G.L. Nelson. "Conceptual Underpinnings of Policy Analysis for Rural Development." *S. J. Agr. Econ.* 24(1992):87–89.
- Deaton, B.J., and B.A. Weber. "The Economics of Rural Areas." *Agriculture and Rural Areas Approaching the Twenty-First Century*. R.J. Hildreth, K.L. Lipton, K.C. Clayton, and C.C. O'Connor, eds. Ames IA: Iowa State Univ. Press, 1988.
- Deaver, K. "What is Rural?" *Policy Stud. J.* 20(2):184–89.
- Drabenstott, M., and M. Henry. "Rural America in the 1990s." *Rural America in Transition*. M. Drabenstott and L. Gibson, eds., pp. 85–91. Kansas City: Federal Reserve Bank of Kansas City, 1988.
- Edwards, C. "Resource Fixity and Farm Organization." *J. Farm Econ.* 41(1959):747–59.
- Fujita, M., and P.R. Krugman. "When is the Economy Monocentric? Von Thunen and Chamberlin Unified." *Reg. Sci. and Urban Econ.* 25(4):505–28.
- Gardner, B.L. "Changing Economic Perspectives on the Farm Problem." *J. Econ. Lit.* 30(1):62–101.
- Goldstein, H.A., and M.I. Luger. "Theory and Practice in High-Tech Economic Development." *Theories of Local Economic Development*. R.D. Bingham and Robert Mier, eds., pp. 147–71. Newbury Park CA: Sage Publications, 1993.
- Guttenberg, A.Z. "Regionalization as a Symbolic Process." Paper presented at S. Regional Sci. Assn. annual meeting, Morgantown WV, April 1988.
- Henry, M., and M. Drabenstott. "A New Micro View of the U.S. Rural Economy." *Fed. Reserve Bank of Kansas City Econ. Rev.* 81(2):53–70.
- Hite, J.C. "Rural Development, Privatization, and Public Choice: Substance Depends Upon Process." *J. Agr. and Appl. Econ.* 25(1):89–98.
- Johnson, G.L. "Supply Functions — Some Facts and Notions." *Agricultural Adjustment Problems in a Growing Economy*. E.O. Heady, H.G. Diesslin, H.R. Jensen, and G.L. Johnson, eds. Ames IA: Iowa State College Press, 1958.
- Johnson, G.L., and C.L. Quance, eds. *The Overproduction Trap in U.S. Agriculture*. Baltimore MD: The Johns Hopkins Press, 1972.
- Kilkenny, M. "Transport Costs and Rural Development." *J. Reg. Sci.*, in press.
- Kilkenny, M., and A. Failde. "Fiscal SAMs and Fiscal Federalism." Paper presented at S. Reg. Sci. Assn. annual meeting, Memphis TN, April 1997.
- Knutson, R.D., and D.U. Fisher. "Rural Development Policy: Fragmentation, Moving Toward Consensus." *Choices*, 2nd Quarter 1989, pp. 8–11.
- Krugman, P. *Development, Geography and Economic Theory*. Cambridge MA: MIT Press, 1995.
- Lewis, P. "The Urban Invasion of the Rural Northeast." *Proc. Natl. Rural Studies Committee*. Corvallis

OR: Western Rural Development Center, 1991.

Losch, A. *The Economics of Location*. New Haven CT: Yale Univ. Press, 1954.

Markley, D.M. "Impacts of Banking Deregulation on Rural Capital Markets: Evidence from Virginia and Tennessee." *Rev. Reg. Stud.* 17(Fall):14-22.

Nelson, G. "Elements of a Paradigm for Rural Development." *Amer. J. Agr. Econ.* 66(1984):694-700.

Prebisch, R. "A New Strategy for Development." *J. Econ. Stud.* 3(1):3-14.

Rogers, G., R. Shaffer, and G. Pulver. "The Adequacy of Capital Markets for Rural Nonfarm Businesses." *Rev. Reg. Stud.* 20(Fall):23-32.

Smith, S.M. "The Theoretical Foundation of Rural Economic Development Policy." Staff Paper 301, Dept. Agric. Econ. & Rur. Soc., Penn State Univ., 1996.

von Thunen, J.H. *von Thunen's Isolated State*. Translated by Peter Hall. London: Pergamon (First German ed. 1826), 1966.

Ward, W.A., and J.C. Hite. "Asset Fixity, Asset Specificity and Regional Economic Change: Hypothesis and Implications." Working paper 012996, Clemson Univ. Dept. Agric. and Applied Econ., 1996.

Webb, D.M., M.L. Warner, J.C. Hite, and W.A. Ward. "Asset Fixity, Space and Rural Development: An Empirical Test and Implications." Paper presented at AAEA annual meeting, Indianapolis IN, 1995.