Urban/Regional Economics and Rural Development

By

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Abstract

To what extent should the study of rural economies in developed countries differ from urban/regional economics? We briefly review U.S. rural development research and indicators of rural distress. The market forces and market failures that explain rural distress and sometimes delimit the usefulness of existing rural/urban/regional theories regarding rural problems are discussed. A feast of uniquely rural issues require - and should inspire - theoretical innovations in urban, regional, and spatial economics.

Motivation

One fifth to one quarter of the populations in OECD countries today are residents of rural or non-metropolitan areas. But a far smaller proportion of the refereed research in economics and regional science concerns the challenges and prospects of low density, remote, and naturalresource dependent ("rural") communities.

This is surprising and unfortunate, because there are so many unresolved rural issues, and rural development research has many public good attributes. Rural communities are too small to survive mistakes and too small to support in-house the analytical capacity to avoid them. And, as Jane Jacobs (1984) emphasized, urban economies cannot achieve their full potential when the rural areas lack vitality.

Rural development research

By 'rural development research' we mean research about the processes that determine the uneven geographic distribution of population, industry, and returns to non-farm economic activities, given geographic variation in natural endowments. People, farms, and non-farm businesses consume space, spaces are separated by distance, and distances are costly to traverse. As such, rural development research should be spatial economics.

Instead, the vast majority of rural development research effort in the U.S. has been of the regional variety. Probably because local non-metro, metro, state, and federal governments demand them, rural development economists specialize in supplying predictions of area employment, income, and fiscal capacity. U.S. rural economists are best known for impact analyses or simulations of county or state economies. With some exceptions: Deller and Shields, 1998; and Shields, Stallmann, and Deller, 1999; in the past decade this staple work of rural development economists rarely appeared in refereed journals.¹

Civil engineers, public policy professionals, and many rural development economists in the U.S. perpetuate Walter Isard and Ben Steven's enthusiasm for regional input-output (I-O) models (e.g., Stevens & Treyz, 1986). I-O models are also sometimes needed to conduct the economic impact assessments that are required along with environmental impact assessments before new uses of land or water are allowed or new policies are enacted in the U.S. (Anderson and Kobrin, 2000). I-O models, however, abstract from all three of the "foundation stones" identified five decades ago by Hoover:

"an understanding of spatial and regional economic problems can be built on three facts of life: (1) natural-resource advantages, (2) economies of concentration, and (3) costs of transport and communication. In more technical language, these foundation stones can be identified as (1) imperfect factor mobility, (2) imperfect divisibility, and (3) imperfect mobility of goods and services." (as reprinted in Chapter 1 of Hoover and Giarratani 1999)

According to Hoover and many others, the best known tool in the rural development economist's kit is not suitable for most regional economic problems. Because there are no endogenous prices, wages, or rents to reflect changing relative factor abundance, value, or productivity, an input-output model reflects changes in a place's endowments, comparative

¹ Compendia of otherwise unpublished rural impact and simulation research can be found in the book edited by Johnson, Otto, and Deller, 2006; and in the reports listing the 'publications' by members of the USDA-CSREES Regional Project NE-1011 and its predecessors: NE-162, -130, and -80.

advantage, conservation, or congestion only by changing exogenous demand. Because marginal productivity is measured by average productivity-- consistent only with zero fixed cost activities--I-O analysis abstracts from economies of scale, critical mass, and spatial concentration issues. I-O treats both goods demand and factor supply as perfectly elastic, as if both goods and factors were costlessly mobile. A longer list of critiques is provided in the most widely used text about the technique, by Schaffer, 1999. In defense one might argue that in the very long run, price changes fade, capital is variable, and so are factor supplies. But I-O models are being used to estimate short run "impacts." Suffice it to say that anyone who supplies a better modeling tool that is as easy to parameterize and apply as a county-level I-O model will be welcomed as a hero.

The rural development research that *does* appear in refereed journals concerns rural labor supply, including commuting and migration; or demand, including establishment location; and income or growth differentials (Table 1). As Tom Johnson says, "the fundamental engine for economic growth, decline, and change at the local level is employment and the fundamental unit of the spatial economy is the labor market" (page 85 in Johnson, Otto, and Deller, 2006).

This other staple of rural development economists is classifiable as 'urban economics' (see Berliant and ten Raa, 1994) because when residential or workplace location choice is modeled, establishment locations are taken as exogenous. When establishment location choice is modeled, population distributions are taken as exogenous. Competition for land is generally not explicit; exceptions include Daniel and Kilkenny, 2002; and Wu and Gopinath, 2008.

There is substantial agreement in this literature that (1) firms choose the rural locations that are accessible to their input or output markets and offer the space and workforce they desire at competitive costs (Blackley, 1986; Johnson, 1991; Henderson, 1994). (2) There are different scales or critical mass, in terms of both population and business interdependencies, below which

different types of establishments are not sustainable (Shonkwiler and Harris, 1996; Barkley, et al, 2000); (3) People migrate <u>into</u> rural areas proximate to metro areas to enjoy rural amenities (Deller, et al, 2001; Chen and Rosenthal, 2008). (4) People migrate <u>out of</u> remote rural areas to capture higher returns on their human capital (Mills and Hazarika, 2001; Goetz and Rupasingha, 2004). Huang, Orazem and Wohlgemuth (2002) have shown that although higher rural human capital is associated with higher rural incomes, the effect is "swamped" by the rural brain-drain to urban areas. (5) Rural labor demand growth is met by reduced rural out-commuting rather than in-migration (Renkow, 2003), while excess rural labor supplies are resolved by reductions in the rural labor force. Khan, Orazem and Otto (2001) emphasize that commuting is an alternative to rural out-migration. But So, Orazem and Otto (2001) note that rural commuting costs can be prohibitively high.

Figure 1 shows the recent spatial gradient in net domestic migration rates in the U.S. Cities still attract in-migrants at the highest rates. Non-metro towns adjacent to metro areas also attract in-migrants. As summarized above, there is a net out-migration from remote rural communities. Especially in agricultural regions, towns are fewer, smaller, and farther apart than when the first issue of the *Journal of Regional Science* was published fifty years ago.

Is this *spatial rationalization* good for the country as a whole? Or do the local private and public costs of sustaining the people who remain in businesses and communities that have fallen below minimum efficient scale outweigh the nationwide benefits? This question begs to be answered for the developed country case in which all economic activities entail fixed costs, movement of both goods and people is costly, and prices, land rents, and wages are all endogenous. Interesting points of departure include Krichel and Levine (1999) or Bruekner and Kim (2001).



Figure 1. Annual Net Domestic Migration rates by County Population type and Urban Adjacency. The horizontal line at 0.1% indicates the nationwide average net in-migration rate.

Losers in a World of Returns-to-Scale

It has been argued elsewhere that rural development policies in advanced countries should enable adjustment to having fewer, larger, more prosperous rural communities (Brown, 1987; Kilkenny and Johnson, 2007). This contrasts with the slow and painful decline that has been occurring in remote rural counties under existing rural development policies.

Why is policy needed? The main reason is that the process of rural spatial rationalization imposes negative externalities on those left behind when individuals and businesses out-migrate in response to market forces. Policy is not needed to provide incentives for spatial rationalization. Policy is needed to coordinate the process to minimize the externalities, and to compensate the less mobile rural people who, through no fault of their own, may be made much worse off in the process. Given the fixed costs of doing business, firms serving a declining local population are also inadvertent losers.

Each family that moves out of a declining rural community leaves the schools and businesses another student or customer farther below minimum efficient scale. Each taxpayer who leaves increases the excess supply of housing, lowers the value of the tax base, and increases the fiscal burden of local public good provision on the remaining residents. The outmigration of relatively high rural human capital has a serious negative effect on origin communities. Piecemeal mobility of rural people and firms reduces rural efficiency and productivity, diminishes rural fiscal capacity, dampens rural economic opportunity, and exacerbates the dependence of rural communities on higher-level government support.

This kind of negative feedback in the process of spatial rationalization uniquely plagues remote rural communities. From rural areas, individual spatial mobility is not always a viable option. Rural fixed assets are not as easily liquidated as urban fixed assets. An out-migrating rural seller cannot hope to receive a price for their home or business that reflects their opportunity cost -the cost of a comparable urban home or business – from a rational buyer. And even if there were such buyers, simply replacing current rural residents or owners with new ones would not achieve spatial rationalization. Because it entails the ultimate abandonment of a subset of previously settled locations, there's no urban counterpart to this rural problem. Even decayed urban cores have urban redevelopment prospects. Remote rural communities do not.

Remote, low density rural areas are also disadvantaged by the lack of agglomeration externalities such as the static and dynamic economies (or the positive feedback) arising from establishment co-location (Shonkwiler and Harris, 1996), division of labor, labor pooling, learning-by-doing, knowledge spillovers, or innovation (Duranton, 1998; Barkley, Henry, and Kim, 1999; Duranton and Puga, 2001; Partridge and Rickman, 2008).

Scale issues and localized imperfect competition are arguably even more important for the analysis of rural communities than in any other context. Where population and population density is low, the size of the market is insufficient to support more than one establishment in a sector, given sunk and/or fixed costs (Berry, 1967). Adding insult to injury, the costliness of

transportation and communication across space can impart monopoly power to sole vendors of goods and services in remote rural areas (Holmes and Stevens, 2004; Richards, *et al* 2008), or monopsony power to sole buyers of rural inputs or rural labor (Shonkwiler and Taylor, 1988; Sexton, 2000).

In addition to the negative feedback associated with piecemeal rural outmigration, the lack of agglomeration economies, and the likelihood of imperfect competition; there are numerous other market failures justifying rural development policy; challenging economists to find more effective ways to support spatial rationalization. Outward signs of inefficiencies and missing markets include lower property vales, higher rural vacancy rates, and lower rural incomes: figures 2, 3, and 4.

The effects of space and the costs of distance underlie many of the market failures specific to rural areas. Transport costs can add so much to the delivered price of a rural place's comparative advantage goods that a remote rural place's businesses simply cannot compete (Mutti, 1981; Gersovitz, 1989; Venables and Limao, 2002).

According to Glaeser and Kolhase (2004) overland transport costs have fallen 90% over the past century. And just since the 1950s, water-borne transport rates for bulk products have decreased up to 70% (Lundgren, 1996). Krantz (2000) argues that transportation remains a major determinant of location because relative spending on transport, which is 6-8% of GDP across OECD countries, has been relatively constant during industrialization and modernization. While Glaeser and Kolhase argue that transport costs for goods have fallen enough to be negligible; the fact is that although overland transport cost rates have fallen, our use of transport services has increased, and the mix of modes has changed. The U.S. relies increasingly on high cost truck transport, currently about 25¢ per ton-mile, and less on low-cost rail transport (3¢ per

ton-mile) than before. In any case, isn't it because transport costs are <u>not</u> negligible that remote locations are unattractive to firms and residents, and remote land rents so low (Stahl, 1986)?

Another fact that has not yet informed how we stylize rural economies is that rural delivered prices of final goods from rural raw materials are higher than urban delivered prices (even abstracting from the lack of economies of scale in rural retailing). In developed economies, raw rural products are either centrally warehoused before redistribution, or they are centrally processed before being shipped in final form. Either way, transport costs on paid by rural consumers of goods made of local raw products can be twice the transport costs paid by urban consumers of the same goods. Von Thünen might conclude that this would result in even lower nominal rural property values than a simple monocentric model with one-way transportation costs would suggest. Roback (1982) might predict that it would also be reflected in even lower rural wages. Instead, many urban economists refer to agglomeration economies of scale to explain away the facts (Figures 2 and 3) that urban rents and wages may be even higher than excess demand plus savings on transport costs may justify.



Figure 2 . Median Home Value, by County Population Size and Proximity to Urban Areas. \$81,352 was the nationwide median home value in 2000.



Figure 3 . Median Household Income, by County Population size and Proximity to Urban Areas. \$35,370 was the nationwide median household income in 2000

Figure 2 shows that the median value of a remote rural home (\$58,000) is less than half the median city home value (\$125,000). Figure 3 shows that in rural counties that are not adjacent to metro areas, median household incomes (\$30,000/year) are two-thirds the median income in city households (\$48,000). Why not migrate for a higher income? The difference between the sale value of a remote rural home and the purchase price of an urban one may be a hurdle immobilizing rural individuals who would otherwise relocate. Adding injury to insult, a rural home may not sell at all. As shown in figure 4, rural vacancy rates in remote counties in 2000 (37%) were more than twice city vacancy rates of 16%.



Figure 4. Housing Vacancy Rate, by County Population Size and Proximity to Urban Areas Note: the line at 24% indicates the nationwide average housing vacancy rate in 2000.

According to the federal definition, poverty has always been higher in non-metropolitan than in metropolitan U.S. As figures 2 and 3 indicate, although nominal rural wages are low, nominal rural housing costs are even lower. Jolliffe (2006) has shown that adjusting for cost-of-living differences, metro poverty is more severe than non-metro poverty. Nevertheless, interesting empirical work that also controls for local costs of living, by Fisher (2007), suggests that rural residence choice may be endogenous to poverty status. Individuals with low human capital appear to sort into nonmetro areas.

A yet uninvestigated issue is the possibility that the illiquidity of rural housing interferes with the mobility of rural homeowners. Mills (2000) concluded that non-metropolitan unemployment spells were only slightly longer because of the characteristics of the individuals and the local job markets; abstracting from housing issues. The low cost of rural housing might effectively undermine the incentives of the rural unemployed to move in order to become employed. This is a rural version of a hypothesis first posed by Hughes and McCormick (1981), who showed that unemployed Britons preferred to stay unemployed and in subsidized housing rather than to accept employment that would require them to move. Subsequent research concerning metropolitan U.K., Europe, and the U.S. has shown that homeownership in itself does not prolong unemployment spells (Goss and Phillips, 1997;..., Munch et. al., 2006).

Empirical work by urban economists has, however, found economically large negative effects on household mobility arising from either negative housing equity or higher mortgage costs (Quigley, 1987; Stein, 1995; Genesove and Meyer, 1997; and Ferreira, Gyourko, and Tracy, 2008). These analyses have looked at variations in real estate costs over time. Wouldn't it be interesting to investigate the effects on labor mobility of variations in real estate costs over space, between rural and urban areas?

Spatial Heterogeneity

As shown in figures 2-4 and as argued by Jane Jacobs (1984), stagflation is a *spatial* phenomenon: rural prices are just as high -or higher- than urban prices for tradable goods, while rural incomes are much lower, and rural factors of production are under- or unemployed. These inefficiencies should be addressed. Place-tailored policies may be necessary. Because of spatial heterogeneity, spatially-uniform/ economy-wide/ or 'pan-territorial' policies do not usually have spatially-neutral effects (Henderson, 1988; Hurter and Martinich, 1989; Kilkenny and Huffman,

2003; Blank, 2005; Partridge, et al, 2008). Current U.S. rural housing and mortgage interest rate tax deduction policies are the same as U.S. urban policies. But local property tax and zoning policies differ. As shown by Gyorko and Voith (2002) about metro areas, the interaction of all three (four) may exacerbate the relative illiquidity of rural housing and interfere with spatial rationalization. Further research into the possible differential spatial effects and policy interactions between U.S. rural housing policies, nationwide tax policies, and rural versus urban property taxes and zoning regulations, would be very valuable.

Another example of the unintended consequences of pan-territorial policies is the rural brain drain. It is widely agreed that because of the public good attributes and because economic growth depends on growth in human capital, investing in human capital is good public policy. The economy-wide efficiency gains from greater factor mobility are undeniable. And investing in human capital in rural areas can benefit the rural individuals whose earnings rise (when they relocate). But it is odd as a rural development tactic because such programs have no affect on the differential rates of return to human capital that inspires rural out-migration. The treatment (raising rural human capital) can aggravate the symptom (rural out-migration) and generates negative feedback effects. This example also indicates the limited applicability of an approach that treats business location as exogenous to people location choice.

Rural development policy cannot ignore the (unintended?) negative feedback effects caused by policies, such as the rural 'brain drain' associated with public investment in rural schools. Models of rural economies should not ignore negative feedback either. Models that treat individual establishment location or migration effects as inframarginal are not well-suited for analyzing rural development. There are three issues: one is the costliness of being below minimum efficient scale; the second is local market structure, and the third is competing with firms in places that provide agglomeration economies.

Urban economists have long treated rents and wages as endogenous with respect to market size. Prices of tradables were exogenous until Abdel-Rahman (1988) introduced Dixit-Stiglitz monopolistic competition into a model of urban systems. The new economic geography ("NEG") urban core-rural periphery models have suggested that the reductions in transport costs that allow establishments to benefit from pecuniary scale economies should have encouraged spatial concentration of non-farm population and industry at the expense of rural development (Fujita, Krugman, and Venables, 1999). In fact, over the past two centuries the non-farm rural shares of developed country populations (in France, England, and the United States, for example) have not continuously declined, but have remained remarkably stable at 20-25% (Kilkenny, 2004). Calmette and le Pottier (1995) showed that hinterland locations will be chosen by industry under certain extremely low transport cost conditions; and Kilkenny (1998) showed conditions under which population and industry can be asymmetrically distributed (see also Nakajima, 1995; and Lanaspa and Sanz, 2001).

Also in contrast with canonical NEG model assumptions, competition is clearly local for the majority of businesses in rural communities. An alternative market structure suggested by Holmes and Stevens (2004) has promise. Holmes and Stevens' formalize all three modes of feedback mentioned above: minimum efficient scale, local monopoly power, and competition with respect to export markets. Their model accounts for the observed positive correlations between city size and service sector establishment size, among other relevant stylized facts. This is the direction that future new economic geography work must take to make useful contributions.

Summary

As any urban/regional economist would predict, there are significant spatial gradients in the returns to labor and property. Nominal incomes and rents decline dramatically with distance from urban centers. Are rural incomes *inefficiently* low? The chronic out-migration from remote rural counties suggests that people think so. And piecemeal outmigration may be the most costly way to achieve spatial rationalization. This review emphasized the need to do more than identify rural labor market signals and trends. We need to know how to distinguish market forces from market failures, and how to manage the negative feedback that makes spatial rationalization even more painful and costly than it already is.

Rural communities are too small to sustain mistakes or to do the research to avoid them. Academia should rise to the challenge. But the "theory of rural development" tool kit is full of holes; some beliefs don't hold water. Meanwhile the U.S. government spends \$40 billion annually on non-farm rural economic development programs (Kilkenny & Johnson, 2007). Hundreds of billions more are spent by state and local governments attempting to provide every rural citizen with potable water, sanitation, education, public safety, and judicial services.

Rural development policy should be based on sound theory, but it is not even coherent. Some rural programs (e.g. subsidized housing) may be perpetuating a financial 'lock in,' immobilizing rural people in poor rural areas. Other rural public investments (e.g., workforce training) may be fueling rural outmigration rather than stemming it. Yet others may be encouraging moral hazard (e.g. outrights grants for water and sanitation to places that satisfy small size and low fiscal effort eligibility criteria). And maybe we are spreading our public resources too thin. Would rural Americans be better off if there were fewer, larger, rural communities? What are the spatial density and scale attributes of socially optimal rural community infrastructures?

This review has outlined a feast of questions yet to be addressed by economists interested in issues of critical mass, minimum efficient scale, spatial rationalization, endogenous fiscal capacity and fiscal effort, moral hazard, endogenous sorting, spatial monopoly and monopsony, spatial gradients, compensating differentials, financial 'lock in,' stagflation as a spatial phenomenon, policy interaction, and spatial heterogeneity. And when we answer those questions, can we package it all into user-friendly community-level applied general equilibrium model software, so that any small community anywhere can get theoretically sound answers to their "What if? questions on a moment's notice? That's the rural challenge for urban and regional economists.

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title	journal	year	authors
What Causes Spatial Variations in Economic Development in the US?	AJAE	2008	Wu & Gopinath
The Geographic Diversity of U.S. Nonmetropolitan Growth Dynamics: A Geographically Weighted Regression Approach	Land	2008	Partridge, Rickman, Ali & Olfert
Distance from Urban Agglomeration Economies and Rural Poverty	JRS	2008	Partridge & Rickman
Local Amenities and Life-Cycle Migration: Do People Move for Jobs or Fun?	JUE	2008	Chen & Rosenthal
Measuring the Impact of Meat Packing and Processing Facilities in Nonmetropolitan Counties: A Difference-in-Differences Approach	AJAE	2007	Artz, Orazem & Otto
Why Is U.S. Poverty Higher in Nonmetropolitan than in Metropolitan Areas?	G&C	2007	Fisher
Proprietorship Formations and U.S. Job Growth	RRS	2007	Shrestha, Goetz & Rupasingha
Regional Innovation Systems: Implications for Nonmetropolitan Areas and Workers in the South	G&C	2006	Barkley, Henry, & Nair
Employment Growth and the Allocation of New Jobs: Evidence from the South	RRS	2006	Renkow
Food Industry Investment Flows: Implications for Rural Development	RRS	2006	Lambert, McNamara, & Garrett
A Time Series Analysis of U.S. Metropolitan and Non-metropolitan Income Divergence	ARS	2006	Hammond
Industry Agglomeration and Investment in Rural Businesses	RAgEc	2005	Gabe
The Returns to Education in Rural Areas	RRS	2004	Goetz & Rupasingha
Education and Nonmetropolitan Income Growth in the South	RRS	2004	Henry, Barkley, & Li
Employment Risk in U.S. Metro & Nonmetro Regions: The Influence of Industrial Specialization and Population Characteristics	JRS	2004	Hammond&Thompson
Agriculture and Rural Economic Growth	JAAE	2003	Deller, Gould & Jones
Employment Growth, Worker Mobility, & Rural Economic Development	AJAE	2003	Renkow
Rural/Urban Welfare Program and Labor Force Participation	AJAE	2003	Kilkenny & Huffman
Does Public Lands Policy Affect Local Wage Growth?	G&C	2003	Lewis, Hunt&Plantinga
Rural Population Growth, 1950-1990: The Roles of Human Capital, Industry Structure, and Government Policy	AJAE	2002	Huang,Orazem &Wohlgemuth
The Effects of Housing Prices, Wages, and Commuting Time on Joint Residential and Job Location Choices	AJAE	2001	So, Orazem & Otto
Deriving Empirical Definitions of Spatial Labor Markets: The Roles of Competing versus Complementary Growth	JRS	2001	Kahn, Orazem & Otto
The Role of Amenities and Quality of Life in Rural Economic Growth	AJAE	2001	Deller, Tsai, Marcouiller & English
The Migration of Young Adults from Non-metropolitan Counties	AJAE	2001	Mills & Hazarika
The Long-Term Development of Local Retail and Services Sectors in Rural Southern Counties	RRS	2001	Hammond&Thompson
Industry Characteristics Linked to Establishment Concentrations in Nonmetropolitan Area		2000	Kim, Barkley & Henry
Are Spells of Unemployment Longer in Nonmetropolitan Areas? Nonparametric and Semiparametric Evidence	JRS	2000	Mills, B
Social Capital and Economic Growth: A County-Level Analysis	JAAE	2000	Rupasingha, Goetz, & Freshwater
Industry Agglomerations and Employment Change in Non-metropolitan Areas	RURD	1999	Barkley, Henry, & Kim
Metro-Nonmetro Distinctions in the Determinants of Family Income Inequality	RRS	1998	Levernier, Partridge, & Rickman
Economic Effect of Endangered Species Preservation in the Non-metropolitan West	G&C	1997	Duffy-Deno

Table 1. Referenced research about rural labor suppry, demand, and meeting determination	Table 1.	Refereed re	esearch about r	ural labor s	supply.	demand.	and income	determinat	tion
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Income Non-convergence and Rural-Urban Earnings Differentials: Evidence from North Carolina	So Ec J	1996	Renkow
Identifying "Spread" versus "Backwash" Effects in Regional Economic Areas: A Density Functions Approach	Land	1996	Barkley, Henry, & Bao
Supply and Demand for Married Female Labor: Rural and Urban Differences in the Southern US	SoJAE	1992	Alwang & Stallmann
The Locational Determinants of Western Nonmetro High Tech Manufacturers: An Econometric Analysis	WJAE	1991	Barkley & Keith
An Empirical Update on the Product-Cycle Explanation and Branch-Plant Location in the Nonmetropolitan U.S. South.	E&P-A	1991	Johnson, M.
The Product Cycle and High Technology Industry in Nonmetropolitan Areas, 1976-1980	RRS	1989	Miller
Commercial Bank Loans and Non-metropolitan Economic Activity: A Question of Causality	RRS	1985	Barkley & Helander