



## Rural electric cooperatives and economic development

Dusan Paredes<sup>a</sup>, Scott Loveridge<sup>b,\*</sup>

<sup>a</sup> Departamento Economía, Universidad Católica del Norte, Antofagasta, Chile

<sup>b</sup> Department of Agricultural, Food, and Resource Economics, Michigan State University, Justin S. Morrill Hall of Agriculture, Room 4, 446 West Circle Dr. East Lansing, MI 48824, USA



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### ABSTRACT

Using electric cooperative service area data at the zip code level, we estimate the county-level share of electricity produced by locally owned electric cooperatives. We then estimate the impact of this share on county level 2010–14 growth while controlling for rurality and other factors. We find that electric cooperative share is positively related to county level wage growth in rural areas. The estimated parameter is small but positive and statistically significant. The results imply that rural electric cooperatives deliver benefits beyond service provision.

### 1. Introduction

In addition to providing essential services, utilities provide a source of local jobs and income. A longstanding strategy offered by many who wish to stimulate job or income growth in a regional economy is localism—plugging cash leakages by studying what is purchased from outside the region and encouraging “import” substitution (Hustedde et al., 1984; Deller, 2009). While this type of thinking is most often aimed at other types of goods and services, it may also be considered for electricity production. Advocates for import substitution can sometimes make common cause with the social movements for sustainable consumption (Seyfang, 2005), for example in focusing on locally grown food, but the two concepts are different. If local production processes are extremely inefficient, locally produced goods may not be more sustainable than those produced in more distant areas, even if they substitute for imports. It is thus important to understand the overall impacts of various import substitution strategies. In this article, we investigate local economic impacts of the organizational form of electric utilities, irrespective of the physical processes used to generate their electricity. In the case we explore here, the “local good” is essentially the ownership and management of the utility, not a physical good.

An argument related to import substitution is the infant industry idea that a local sector must be protected in the early stages until it is mature enough to compete (Bardhan, 1971), and one can envision a situation in which management expertise gained through participating in electric utility governance translates into capacity to engage in other types of business. This is not unlike the argument of downtown development districts, which often promote “locally owned” or “non-chain” shops as providing higher employment benefits as well as contributing

more to the local civic society and leadership capacity than chain stores, thereby creating more of what some call “care and connection” (Seyfang, 2005). Retaining profits so that they can be re-spent in the area is also offered as an argument in support of import substitution, with some places, such as Vermont, attempting to discourage large corporate retail operations (DeWeese-Boyd, 2006). Another import substitution strategy involves requiring public agencies to favor local providers in contracting, or to require employees to work in the jurisdiction, as a way of recapturing part of the public expenses in the form of tax payments or increased local demand for goods and services (Sandro, 1995). There is also an emerging movement to encourage local investments through social media crowdfunding techniques with businesses that play to local cultural values (Mollick, 2014). Locally controlled cooperatives are also starting to be seen as potential catalysts for innovation in achieving socially desired outcomes (Seyfang and Smith, 2007).

Widely used economic models predicting the impact of a shock to the local economy implicitly support import substitution strategies. For example, commercial regional economic impact models (such as IMPLAN and REMI) use the proportion of locally purchased inputs to forecast economic multipliers. In contrast, Jane Jacobs (1970) argued that ability to import is the sign of a vibrant place. In this Jacobs supports the viewpoint of traditional economic developers, who argue for focusing on the economic base (export) industries as a way of creating a strong local economy, and promote recruitment incentives for manufacturing firms (Loveridge, 1996). The Jacobs argument is also consistent with the neoclassical concept that specialization and exchange leads to overall efficiency through comparative advantage.

The true effects of import substitution strategies are difficult to

\* Corresponding author.

E-mail addresses: [dparedes@ucn.cl](mailto:dparedes@ucn.cl) (D. Paredes), [Loverid2@msu.edu](mailto:Loverid2@msu.edu) (S. Loveridge).

quantify, in part because the shock itself may be difficult to measure and in many cases can be expected to be small relative to total economic activity, and in part because adequate control groups may not be available. Thus activists on both sides of the question continue to put forth reasoned arguments without substantial empirical support. While many buy local campaigns are small and possibly episodic, for the analysis here we rely on a large legally established commodity market—the electric cooperatives (EC). Unlike other locally produced goods and services, customer uptake is binomial: with few exceptions, they either buy or don't buy from their local EC, depending on the service territory in which the customer resides. Furthermore, as a basic input, electricity works its way through cost structures for most businesses, non-profits, government, and households. So if the impacts of local purchases are to be found, they might be more likely to be found with ownership and management of electricity providers than more commonly discussed import substitution items. Thus the impacts implied by our study might be viewed as being situated towards the upper end of possible effects in the import substitution debates. Using information about EC service areas and market share, we find impacts on economic growth, with positive results for the most rural areas of the United States. In more urbanized areas, the impacts on growth are not significant.

The rest of this article is laid out as follows. We sketch out how the electric utilities are structured in the United States, and relate the differences to import substitution ideas. We describe the data used in our modeling, including zip code market distribution share data provided by the National Rural Electric Cooperatives Association. We then use graphical and econometric approaches to explore how Electric Cooperative share relates to economic growth, finding that controlling for other factors, a higher share of Electric Cooperatives is associated with higher rates of rural growth.

## 2. Cooperative structure and relationship to import substitution concepts

There are three basic forms of electric utility in the United States: investor-owned, publicly owned, and cooperatives. The EC movement dates to the 1930s, when the federal government put into place policies to encourage more widespread access to electricity in underserved or unserved areas (NRECA, 2015.) Among other policies designed to encourage ECs, they are exempt from federal income taxes so long as at least 85% of their income is collected from member-owners for the sole purpose of meeting losses and expenses of providing the service (NRECA, 2015), so this subsidy may help plug “leakages” to higher forms of government. Other organizational forms of electric utilities also qualify for various federal subsidies, so the ECs may not be very different in terms of the proportion of the revenues subsidized, although Yadoo and Cruickshank (2010) report they have lower subsidies than other forms of electric company in the rural US. Stronger import substitution elements likely present themselves in the form of ownership. The ECs are owned by their rate payers, so revenues in excess of expenses are returned to customers.

The ECs are managed by democratically elected boards of directors as opposed to directors selected by equity shareholders. Thus shareholder-owned utility board members may be located anywhere in the world. The EC board, being composed primarily of locals, seems more likely to take into consideration impacts of its decisions on the broader local community than would the board of a non-local shareholder-owned business. In fact, candidates for board member are expected to provide a vision for how their work can improve the quality of life in the community while maintaining the viability of the organization (Tucker, 2016). This is the “cooperative spirit” advantage of the organizational form described by Bonus (1986). For example, in recent years electric coops have organized financing to maintain a hospital, helped organize a local economic development authority, and obtained grants for revitalization of a poverty-stricken area (Gallant, 2012).

While a growing array of organizational forms for cooperatives has evolved (see Chaddad and Cook, 2004, for a review) ECs have primarily maintained what Chaddad and Cook (2004) term the “traditional cooperative” form, with member investment non-proportional to use. Electric cooperatives sell only to member-owners. However, direct investment is often limited to a one-time sign-up fee upon request for service, and can be as low as \$25 (Tucker, 2016). We focus here on distribution ECs. Distribution ECs may purchase their electricity from Generation and Transmission Cooperatives in which they are whole or part owners, or from the market. Roughly 54% of distribution EC power comes from coal-fired plants with natural gas and nuclear next most important at 18% and 14% respectively. Despite increased interest in forming cooperatives around renewables in Europe (Huybrechts and Mertens, 2014) where only 1% of ECs rely on fossil fuels (Yildiz et al., 2015), less than 4% of US EC energy comes from non-hydroelectric renewable sources (Tucker, 2016). The average US EC employs 46 people, for a total of about 80,000 nationally (Tucker, 2016). There is some evidence that the cooperative structure may be more efficient than investor-owned firms (Makinen and Jones, 2015), but we posit that regional-level impacts may also arise from characteristics of top-level leadership, distribution of profits, or perhaps, as noted by Yildiz et al. (2015) in their review of the literature, the cooperative's “values beyond profit maximization” such as social responsibility and communal self-help.

While publicly owned electric utilities have some of the same local connections as a cooperative, there are federal incentives for financing through bonds, which are of course repaid to bondholders nationally, while ECs may opt for financing via unsubsidized federal loans. Public utilities also may filter their interests via the sponsoring entity (e.g. city) even when serving rate-payers outside that jurisdiction. Finally, in selecting the executive to run the day-to-day operations, the local ownership nature of the cooperative structure may create natural advantages for candidates who have ties to the area. A manager with family or social ties to an area may take a longer-term or broader perspective about the utility's role in local economic development, and individuals with local ties might be more likely to retire in place than an outside hire, so that they continue to contribute to demand for local services and may fill other community leadership positions post-retirement. While in their management role, locally-recruited individuals may be more likely to rely on local businesses for purchased inputs due to personal connections with owners of those businesses, mirroring what others (Bonus, 1986) have termed, “intimate knowledge” that would not be feasible for an outsider to quickly collect. Furthermore, close personal relationships with suppliers and customers may create some additional flexibility in terms if one side of the relationship encounters temporary difficulties. These close personal connections might also play out in negative ways via nepotism effects if costs are allowed to be higher than necessary, or terms are otherwise too favorable. Furthermore, longstanding schisms in the community could cause an EC manager to avoid using lowest cost providers due to local politics. For example, Robison et al. (2002) found that land prices in rural areas often depend on prior relationships among those buying and selling the land. They found that pre-existing social relationships could increase or decrease costs, or even result in refusal to sell, depending on the experience of the seller and buyer (or their ancestors) with each other preceding the transaction. Similar issues might arise within EC input purchases. Another consideration is the size of the cooperatives. Bonus (1986) hypothesized that large cooperatives (> 10,000 members) might encounter agency problems that offset the “cooperative spirit” advantage. A final potential effect may come from lower ability of the EC to expand into new markets and capture economies of scope or scale through purchase of other operations. However, it seems EC costs may be lower than other organizational forms; Savitski (2003) found that localities switching from investor or municipal-owned to cooperative ownership tended to gain lower average rates.

All these considerations mean that the impact of rate-payer versus

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