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The Collaboration Networks of Economic Development Organizations in Eastern Kentucky

By Sara Compion, Brandon Ofem, Walter Ferrier, Stephen Borgatti, Patricia Cook-Craig, Jane Jensen, and Seungahn Nah

This study describes the patterns of collaboration among economic development organizations (EDOs) in eastern Kentucky. Economic development organizations work to improve the economic conditions of their respective locales. They operate in a region facing many historical barriers to economic sustainability, and where resource scarcity is the norm. Given this distressed context, a deeper understanding of how these organizations work together provides valuable insight into practices that promote or discourage goal attainment. Employing a social network perspective, we examine the patterns of collaboration between ninety-eight EDOs currently operating in the region. Data were collected through in-depth interviews with EDO leaders and via an online survey. In this paper, we review the relevant literature and our methodology, identify the population of such organizations, describe their characteristics, and illustrate the various ways in which they collaborate. Our findings reveal that although EDOs share a common mission to promote local economic development, they vary widely in their service offerings and geographic scope, and only leverage about 8 percent of their networking potential.

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These organizations collaborate in a highly centralized fashion with a few core EDOs acting as key players in local economic development. We conclude with implications from the findings and suggest directions for future research.

Introduction

Since President Lyndon B. Johnson declared a "war on poverty" in 1964 from the front porch of an unemployed coal miner's home in Martin County, eastern Kentucky has served as a testing ground for numerous economic development programs and policies aimed at eradicating poverty and modernizing its rural economy. Yet, despite subsequent decades of reforms, as well as growth in the number of development organizations, this region has remained troubled by chronic economic distress (Eller 2008). The existing economic development organizations (EDOs) in eastern Kentucky, and how they work together to achieve their goals, are understudied. Grounded in social capital theory, our study addresses this gap and attempts to better understand their collective and individual efforts to promote local economic development.

Moreover, few researchers have examined the role of regional non-profit networks in promoting economic development within the rural United States. Much of the literature assessing the impact of networks on economic development has focused on network relationships between business *organizations* and value chains (Horvath 2001; Porter 2000) and on regional policy networks (Huggins, Johnston, and Steffenson 2008; Huggins 2000). As such, there is an opportunity to investigate and describe how non-profit organizations, which face a different set of challenges from for-profits and government, collaborate (or do not) in their efforts to accomplish their goals.

Although a variety of external agencies serve this region, we focus on locally based EDOs that target different issues related to economic development, such as job creation, policy research, investment and loans, skills training, or building infrastructure. We collected data from these organizations via interviews and an electronic survey, garnering responses from ninety-eight EDO representatives. While we targeted eastern Kentucky EDOs in particular, the findings may be applicable to other Appalachian contexts where rural non-profit organizations are the focus of analysis.

In this article, we do three things. First, we provide a background to the research study and review the literature on networks and social capital. Next, we outline the research questions and methodology, followed by a description of the participating EDOs and their service offerings to the region. Finally, we illustrate the various ways in which the participating EDOs collaborate with each other. Our aim is to pave the way for a greater

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dialogue about the optimal network practices among EDOs in eastern Kentucky.

The Local Economic Development Context of Eastern Kentucky

Appalachian communities, social relations, and infrastructure are systematically rooted in a complicated historical web of social, political, and economic processes that influence the region's economic trajectory (Billings and Blee 2000). Of all Kentucky counties classified as Appalachian by the Appalachian Regional Commission (ARC), 89 percent of forty-nine counties were considered especially distressed in 1960; 74 percent of fifty-four counties remain distressed today (ARC 2012). These counties are all located in eastern Kentucky. The "distressed" label is assigned based on an index related to unemployment, per capita market income, and poverty.

The region's problems stem from a highly rigid and complex system of social and economic stratification (Whisnant 1980). Given that so many counties in eastern Kentucky are distressed, a variety of economic development initiatives have been formed over the years to tackle poverty, unemployment, and economic uncertainty in the region. The origin of these locally based EDOs is rooted in attempts to provide homegrown strategies for sustainable economic development and improved quality of life.

The organizations launching these initiatives and operating in or serving the region tend to resemble one of two types: non-profit human service organizations or governmental economic development agencies (Eller 2008). The human service development organizations range from full-service Community Action Agencies to more specialized entities such as vocational training centers, downtown development agencies, and mobile health clinics. A few examples include the Center for Rural Development, the Northeast Kentucky Community Action Agency, Williamsburg Main Street Collective, Pathfinders of Perry County, and Pike County Tourism Commission.

More business-oriented service organizations include those such as the Mount Sterling Montgomery County Chamber of Commerce, or the Kentucky Highlands Community Investment Corporation, as well as industry-focused entities like the City of Jackson Industrial Development Authority. These organizations usually maintain close "horizontal" relations to local communities, businesses, schools, and other development entities.

State-sanctioned economic development agencies include the Area Development District (ADD) head offices as well as the broader, federally mandated ARC. These are larger, long-term organizations, positioned "vertically" as umbrella bodies that oversee collective initiatives undertaken by

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a group of smaller development partners. Jointly, these different organization types contribute to the goal of promoting regional and local economic development. Our study includes all types of these EDOs because their historical structuring still shapes their patterns of collaboration today, and defines the economic development landscape.

Despite varied meanings and interpretations attached to the concept, local economic development is best defined by Blakely and Bradshaw (2002) as the "process in which local governments or community-based (neighborhood) organizations engage to stimulate or maintain business activity and/or employment. The principal goal is to stimulate local employment opportunities in sectors that improve the community using existing human, natural, and institutional resources" (xvii). By this definition, job creation for its own sake is not an optimal way to achieve that goal. Jobs must be high-quality, fit the employment needs of the local population, be equitable, and must also be created in diverse areas of industry for the sake of economic stability. In accomplishing this goal, local governments, public agencies, private companies, non-profit organizations, and local residents all need to participate in some way. Therefore, coordination and communication are essential to achieving substantial results at the local level.

Over the recent years, local economic development has become an institution-building process, requiring the establishment of strategic organizational systems and configurations that manage the development process over extended time periods (Park 2009). Often, local government initially spearheads this process, but control may later diversify among a more disparate set of non-governmental actors, changing the organizational relations. In such a setting, control is primarily localized among public organizations and gradually shifts to public-private organizations (Park 2009).

This study focuses on those non-profits that, as part of their core mission, seek to contribute to the progress of local economic development in eastern Kentucky. Since EDOs come in many forms, with an array of organizational structures (Blakely and Bradshaw 2002)—and for the sake of theoretical and analytical clarity—we define and bound the study population of EDOs as the broad range of non-profit private and/or public organizations that direct a majority of their organizational efforts to contributing to the goal of local economic development as defined above. Regional experts in development practice provided their grounded, "emic" perspectives to help us define and identify the final sample of EDOs for this study (Morey and Luthans 1984).

Networks and Social Capital

We examine the pattern of collaboration between EDOs in eastern Kentucky by employing a social network perspective (Borgatti and Foster 2003),

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and asking questions that are grounded in social capital theory. A network lens views various systems as a network comprised of nodes and ties. In the social sciences, the *nodes* are usually the people, teams, or organizations. The *ties* are the relationships that exist between them, such as friendships between people, information flows between teams, or collaborative ties between organizations. The pattern, structure, and nature of the ties/relationships between the nodes offer opportunities and constraints that have implications for the behavior and outcomes of the nodes.

Indeed, much network research in the organizational literature has established that the relationships in which social actors are embedded, not just the individual attributes of those actors, are important determinants of the actions and performance of those actors (Brass et al. 2004). The relational resources and coordination benefits offered from various network properties can be thought of as various forms of social capital that a focal organization can leverage to better accomplish its goals.

The core idea of social capital theory is that social networks have value because physical and human capital (e.g., money and talent) alongside social contacts can be productive. Social capital thus refers to the connections amongst individuals and to the potential capital that can be leveraged by the parties involved (Putnam 2000). However, it is not simply the accumulation of valued objects and social rank/prestige; it also entails a set of culturally sanctioned norms, flows of information, as well as a system of obligations and expectations (Coleman 1988). Bourdieu (1986) describes social capital as "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition" (243). Social capital is determined by physical space, social context, and access to material and non-material resources and services, and, as such, it is socially contingent.

Social capital can vary along two dimensions: bonding and bridging capital (Putnam 2000). In social networks, bonding capital is useful for reinforcing exclusive identities. It creates strong in-group loyalty and is foundational for mutual reciprocity and for strengthening bonds between actors. On the other hand, bridging capital is useful for linking to resources that are external to one's immediate network/group and for garnering new information (Putnam 2000). An individual or organization's social capital can influence their position in a network, but conversely the network composition can affect the social composition of its members (Agnitsch, Flora, and Ryan 2006).

Recognition of the importance of social capital to economic development has a long history. Since Marshall's (1961) influential work on the success and failure of geographically based economic clusters, a key concept in the economic development literature has been the availability of

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knowledge within geographically coherent clusters. As Marshall put it, knowledge within geographic clusters is "in the air" and potentially benefits all members of the cluster. However, Marshall did not specify a mechanism for how this knowledge was made available to multiple parties. Since then, it has been widely proposed that geographic clusters comprise a network of organizations, and the ties among these organizations serve as conduits for disseminating knowledge (Giuliani 2005). Thus the structure of the network determines the pattern of dissemination. Denser and well-distributed networks yield wider and more uniform diffusion of knowledge. The knowledge circulating in networks is then put to work in building the effective clusters that are the heart of many economic development strategies.

Networks have also been espoused as a mechanism for community capacity building, which is essential for the success of local and regional economic development efforts. For instance, Agnitsch, Flora, and Ryan (2006) found that building social capital by bridging weak network ties facilitated the efficient completion of local projects in rural communities. Because rural communities are typically under-resourced, the reliance on robust networks to facilitate capacity for development is magnified. Participation of community organizations in local networks can reinforce community capacity to act (Agnitsch, Flora, and Ryan 2006); foster or reinforce community identity (Thomas et al. 2008); influence revitalization (Oakley and Tsao 2006); and facilitate learning that promotes innovation (Shapira and Youtie 2008).

Another benefit of organizational social ties is coordination. A best practice adopted by firms in the business sector is fostering tight coordination with suppliers. In the production of complex products, coordination across the supply chain is essential for efficient and responsive production (Thomas and Griffin 1996). Similarly, since the disastrous events of 9/11 and Katrina, there has been considerable interest in how governmental and non-governmental aid organizations coordinate with each other in order to get things done (Kapucu 2005). To avoid insufficient resource allocation, omission of key tasks, and unnecessary duplication of efforts, inter-organizational coordination of activities is essential (Gillespie 2000). In these efforts to coordinate, the pattern and structure of inter-organizational ties is likely to facilitate or inhibit effective coordination. Indeed, a review of inter-organizational networks in the management literature reveals that effective coordination has often been linked to network structure (Provan, Fish, and Sydow 2007). The benefits that particular structures offer for purposes of effective coordination can be considered another form of social capital.

Despite empirical evidence that social capital can substantially aid economic development processes and outcomes, assessments of economic

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development planning in the region suggest that building social capital is consistently a low priority for economic development agencies (Knight et al. 2009; Reese and Fasenfest 2003). If this is the case, one would expect to see suboptimal outcomes at the collective and organizational levels for EDOs participating in the network. For example, at the organizational level, some EDOs might not have access to valuable resources that could benefit their operations. At the network level, coordination might be difficult if the network is fragmented. And as the economic development literature has made clear, coordination is essential for effective regional planning (Blakely and Bradshaw 2002). Before these questions can be addressed, however, we must first determine how exactly these organizations work together.

Research Questions

Drawing upon the social capital and inter-organizational network theory discussed above, our study attempts to uncover how EDOs in eastern Kentucky collaborate. We pose three research questions:

1. What EDOs serve eastern Kentucky?
2. What activities do they engage in and what services do they offer?
3. How do they collaborate with one another?

The first question explores the range and characteristics of economic development organizations located in eastern Kentucky. This includes characteristics such as size, age, legal and financial status, location, and geographic reach of these organizations. The second question is concerned with the activities that EDOs engage in and the range of services they offer to people, business, or industry. The final question pertains to the patterns of collaborative partnerships EDOs form with each other, and to the whole network of EDO relationships in the region.

Methods

Data Collection

This multi-disciplinary, two-year study included both qualitative and quantitative analytical components with data collected through interviews and an online survey. The research team conducted six months of ethnographic, consultative interviews with sixteen key informants knowledgeable about, and engaged in, economic development activities within the study region. Interviewees included a former governor and current university president familiar with development activities, employees of one of the largest EDOs in the region, a banker involved in small business loans with a history of development work, as well as CEOs and presidents of

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medium-sized EDOs within the study region. The purpose of these interviews was to garner advice from experts about the range and function of EDOs, collect information about their various missions and activities, and qualitatively unpack the different ways in which EDOs collaborate with each other. We also used this knowledge to inform the survey design.

Next, in 2012–2013, we surveyed over two hundred EDOs located in eastern Kentucky. An online survey was developed using SurveyGizmo software that included specific network-related questions, and also collected information on organizational attributes. The measurement items were designed after the interviews and after a thorough examination of network, non-profit, entrepreneurial, and organizational alliance literature. We piloted a draft version of the survey and used the feedback to identify and fix problems with the e-mail distribution mechanism, survey clarity and intuitiveness, question wording or order, and overall burden of time.

Following Dillman's (2007) survey distribution principles on maximizing response rates, the survey was administered via a custom, personalized e-mail to the project director, chief executive, manager, or organizational leader of an EDO. The recruitment e-mail contained (1) a highly visible hyperlink directing participants to the online survey, to which they could return at any time once started; (2) a link to the project webpage containing detailed information about the research goals and the team members; and (3) an embedded video endorsement from the president of the university, encouraging the EDO leaders to participate in the study and, in doing so, to help the university fulfill its land-grant mission.

Study Target

The focal units of analysis in this study were non-profit organizations engaged in economic development activities in eastern Kentucky. In order to contain the scope of the project, we confined the study target to non-profit economic development organizations headquartered in any of the fifty-four Appalachian[1] counties of eastern Kentucky—although we recognize that many other EDOs work in this area but have offices outside our sample counties or across the country. Organizations included but were not limited to formal business alliances, chambers of commerce, area development districts, tourism commissions, community development corporations, community action agencies, downtown development authorities, and workforce training institutions. The interviews were critical in helping to identify the types and names of organizations to sample.

Using broad definitional criteria, we set out to identify all possible EDOs in this region that identify economic development as their central mission, starting with members of the Growing Local Economies Network[2]—a group purposively created to promote and facilitate collaboration among

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development practitioners in Kentucky (GLEN 2013). We added to this all non-profit organizations registered on the 2011 IRS non-profit database (IRS 2011) that met the criteria of promoting "social and economic wealth" for the people of eastern Kentucky. Such organizations were coded in the IRS registry as "community development," "economic development," and "workforce training" non-profits. Our criteria excluded organizations that may indirectly contribute to economic development but don't strategically prioritize it, such as schools, institutions of higher learning, or religious-based organizations. After completing our interviews and our EDO list, we then asked representatives from six different organizations engaged in economic development to review and add to our list.

Using this technique, we exhausted all possible mechanisms for obtaining a roster of almost three hundred organizations that provide economic development services to the Appalachian/eastern Kentucky counties. However, only 203 EDOs were successfully sent the survey because many organizations had incorrect or missing contact information, or existed only on paper.

Respondents

We asked 203 representatives from EDOs in the eastern Kentucky network to complete the survey. Data collection lasted for four months, from November 2012 to February 2013. According to Dillman and colleagues (2009), the average response rate of 13 percent for Web-based surveys can be increased substantially by switching to a second mode of data collection. Consequently, our follow-up technique included three e-mail reminders, a telephone call, and a hard-copy mailed reminder to non-respondents, resulting in a final survey response rate of 52 percent—appropriate for such studies (Dillman et al. 2009). Of the 105 completed surveys, seven were missing too much data or failed to meet the study criteria and were dropped from the final analysis, leaving a total of ninety-eight surveys to analyze.

Analysis

The interviews were qualitatively useful for informing our survey design. For the survey data, quantitative analysis of descriptive statistics for the responding EDOs was conducted using Stata12 computer software, and the network data were analyzed using UCINET. For analytical purposes, we included the list of 292 organization names in the survey so that when completing the network-related questions, respondents could choose from a vast list of possible EDOs that they collaborated with. Respondents were also able to add to this list using a designated text box.

When studying inter-organizational collaboration from a network perspective, we can visualize the overall pattern of collaboration with a

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network diagram. Various structural characteristics of the network can be calculated to describe the network, such as degree centrality, network density, and tie heterogeneity, among others.

Degree centrality is a measure of the number of ties that an actor has within a network. We asked the survey respondents to list all other EDOs with which they collaborated.[3] Collaboration was broadly defined as sharing information, sharing money and/or monetary resources, working together on projects, and/or share referrals. Network density is the total number of ties divided by the total number of possible ties. Tie heterogeneity is a measure of the network's collaborative attributes. It reflects the diversity of different types of collaborative partnerships that EDOs in the network have. It was calculated using Blau's (1977) index of heterogeneity, computed as $1 - \Sigma P_i^2$, where P is the proportion of ties in a category and *i* is the number of categories.

Findings

Findings for the three research questions regarding organizational characteristics, services offered, and collaboration networks are presented below. It should be noted that the results presented here are applicable to the responding organizations only, although the findings may offer anecdotal evidence as to broader collaborative patterns between other EDOs in the region.

Organizational Characteristics

In this sub-section, we provide answers to the first research question concerned with the type and characteristics of EDOs located in eastern Kentucky.

Size: Economic development organizations are small entities. Roughly 45 percent of the responding organizations employ one to five full- or part-time people. Almost one-third (27 percent) are even smaller, with no full-time employees. Three large EDOs stand out in the region, employing over 100 people each. On average, EDOs employ nine full-time employees and two part-time employees.[4] Small, volunteer-based organizations may struggle to network. As one EDO representative put it: "With part-time staff and volunteers, our collaboration is all informal and infrequent" (EDO respondent, Adair County 2013).

Age: Most of the responding EDOs were started in the latter half of the twentieth century, corresponding with the increased financial injection for such initiatives during the "war on poverty" in the 1960s. Figure 1 shows the founding date for each responding organization in our sample. Twenty-eight percent of the organizations were founded in the past fourteen years, 35 percent were founded during the 1980s and 1990s, and the rest were formed earlier. The responding organizations are on average thirty years old, with an age range from two to ninety-one years.

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Legal and financial status: Amongst the responding organizations, the majority (83 percent) are classified by the IRS as not-for profit entities, IRS 501(c), and at least 33 percent of them self-identify as public organizations, as opposed to private or hybrid entities. The IRS data for thirty-eight of these EDOs indicate that between 2006 and 2010, the median asset worth was $133,335.50 (mean = $2,158,762.24). During this time period, EDOs reported a median income of $105,910.50 (mean = $1,050,340.32). The highest valued organization was worth over $24 million in assets in 2010, and the highest earning EDO reported an income of over $13 million in 2010.

Like many other kinds of non-profits, EDOs are financial *bricoleurs*, sourcing funds for their operations from multiple revenue streams. We asked respondents to classify their sources of funding. On average, they relied on funds from at least two different sources at the same time, although one-third of EDOs relied on three or more different sources. Figure 2 shows where the EDOs in our study receive their monies. Most are financed through access to government grants, but one-third of EDOs receive income from membership dues and/or private contributors. Only seventeen organizations—such as Bluegrass Pride, Morehead State University Center for Regional Engagement, and the Kentucky Science and Technology Corporation—receive funding from the ARC. A handful accrue interest from financial investments, are financed through commercial deals and rental incomes, benefit from taxes on services, or conduct one-off funding drives and sales of goods.

Figure 1: Number of EDOs founded per year in eastern Kentucky (1922–2012).

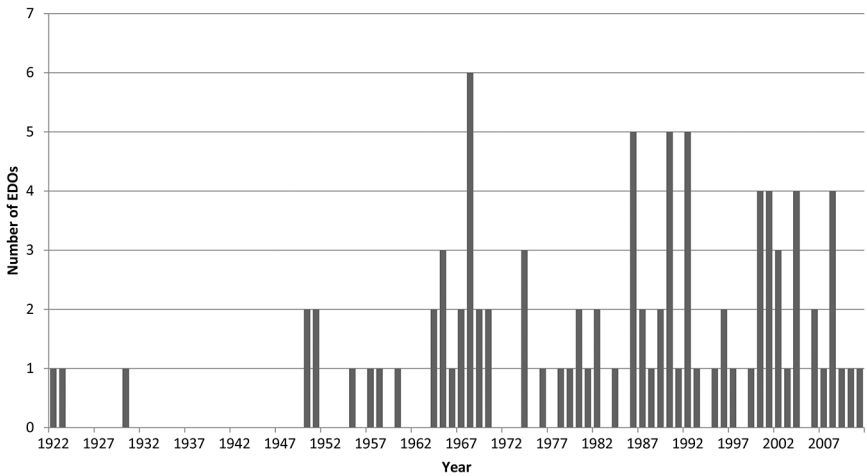

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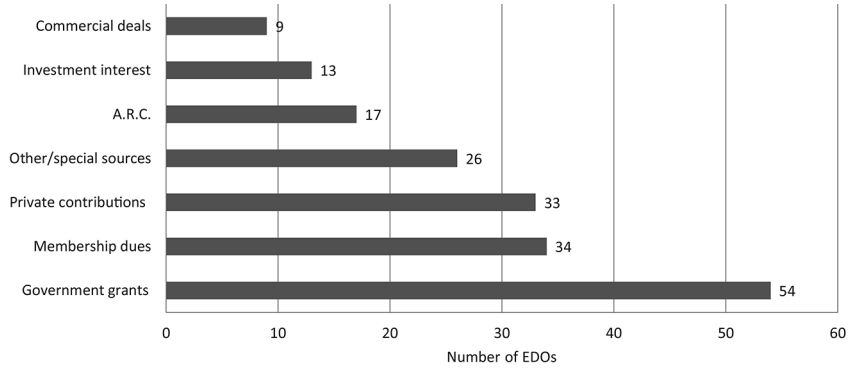
Figure 2: EDO self-reported sources of funding.



Location and geographic reach: Figure 3 shows a map of Kentucky locating each of the responding EDOs in our study. Economic development organizations are well spread out across eastern Kentucky, but eleven counties have no locally based EDO. Madison County boasts the most EDOs (eight), followed by Boyd, Laurel, Pulaski, and Rowan counties that each host five EDOs. Most EDOs (52 percent) only operate in one county, implying that they serve their very local interests and do not reach out to other counties. For example, downtown development corporations and chambers of commerce usually focus on serving the communities in one city or town and have no need to expand their operations to other regions. There are at least fifteen EDOs—for example, Community Action Kentucky, Community and Economic Development Initiative of Kentucky (CEDIK), and Appalachian Alternative Agriculture (3AGC)—that have a large scope and work in all fifty-four Appalachian counties of the state.

Among those EDOs working in more than one county, they serve on average twenty-four counties (ranging from one to fifty-four). Some counties are extremely popular places for economic development initiatives. Further research could explore why this might be the case, based on preliminary hypotheses regarding the need for EDOs, or that certain factors are conducive to maintaining such initiatives. We found that thirty-one EDOs provided services to Letcher County although they may not be headquartered here; followed by Harlan County and Perry County, where twenty-eight EDOs work; and Carter, Floyd, Knox, Laurel, and Pike counties where at least twenty-seven EDOs work. This implies that there is a potential for service overlap and resource waste in these areas if existing collaboration is not transparent and coordinated. It also means that these

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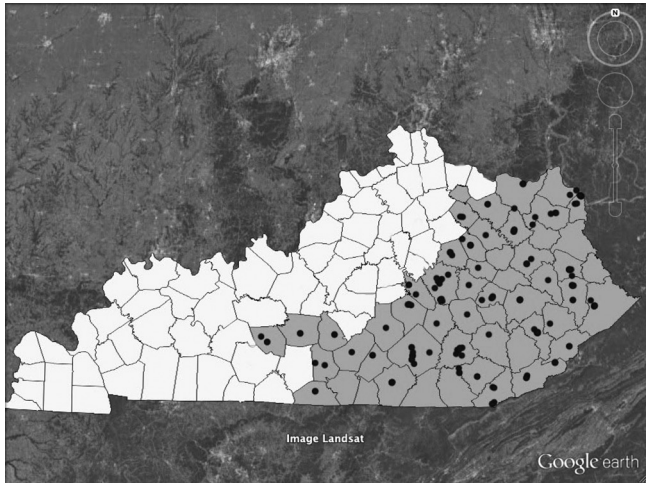
Figure 3: Location of surveyed EDOs in eastern Kentucky (2012).



counties should be seeing greater socio-economic gains compared to counties that are serviced by few EDOs, assuming that the EDOs are successful at achieving their goals. An abundance of EDOs does not automatically produce high-quality outcomes. Their presence and impact in persistently distressed places remains to be investigated.

Economic development organizations in eastern Kentucky tend to be concentrated in population hubs and counties with more people, possibly because these counties have the human, physical, and socio-political infrastructure to maintain EDOs. Consequently, those living in more remote parts of eastern Kentucky may have limited access to local grassroots EDOs—although they might be "serviced" by outside organizations. The lack of physical infrastructure can present substantial challenges for partnership-building amongst EDOs. One respondent articulates this issue: "Travel is generally involved when we speak of collaborations. It seems that due to our curves and narrow roads no one likes to come to us. With limited time and travel funds it is difficult for us to build the necessary partnerships" (EDO respondent, Owsley County 2013).

EDO Activities and Services Offered

This sub-section pertains to the second research question about the types of activities that EDOs engage in and the services they offer to the public. Over half of all the EDOs studied devote more than 75 percent of their time and effort to economic development activities. A small number

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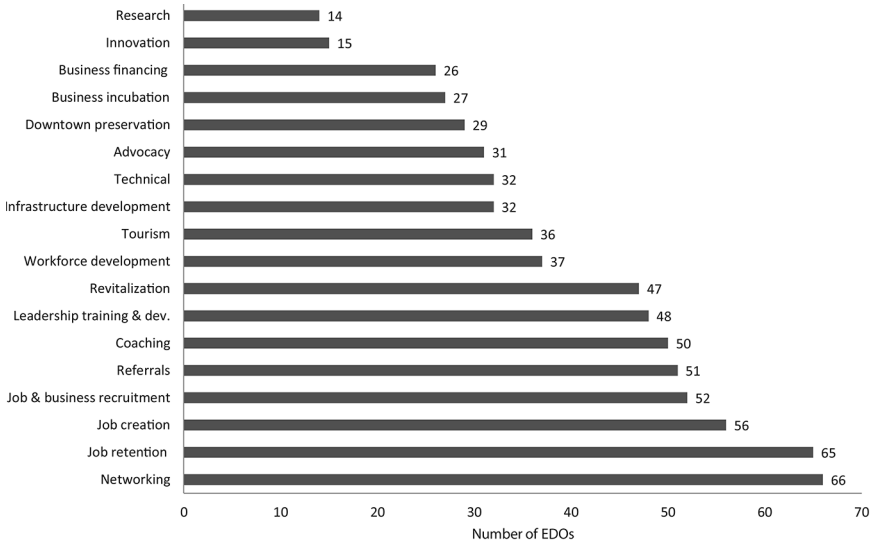
of them (11 percent) spend less than a quarter of their effort on this issue, despite development being one of their focal objectives.

The range of activities aimed at promoting economic development is vast, and organizations in this region offer up to at least eighteen different kinds of services. The most popular services include job retention, job creation, and job and business recruitment. All EDOs can be located on a service specialization-generalism continuum that describes the range of services or activities of each organization (Hannan and Freeman 1977; Wholey and Huonker 1993). A generalist EDO offers a broad range of services such as business coaching, investment funding, and leadership development, while a specialist organization has a very circumscribed, narrow niche of services, perhaps only offering one service. Organizations in our study provide, on average, seven types of service (ranging from one to seventeen), suggesting that they have more generalist operations, rather than specializing in one or two undertakings. Further investigation could explore why this may be the case and if EDOs strategically take a generalist approach.

Figure 4 lists the types of services EDOs engage in, and shows that they are very much in the business of networking with clients, those relevant to their work, and other EDOs in pursuit of community and economic development. One quote by an EDO practitioner encapsulates this networking

Figure 4: Type of services and activities offered.



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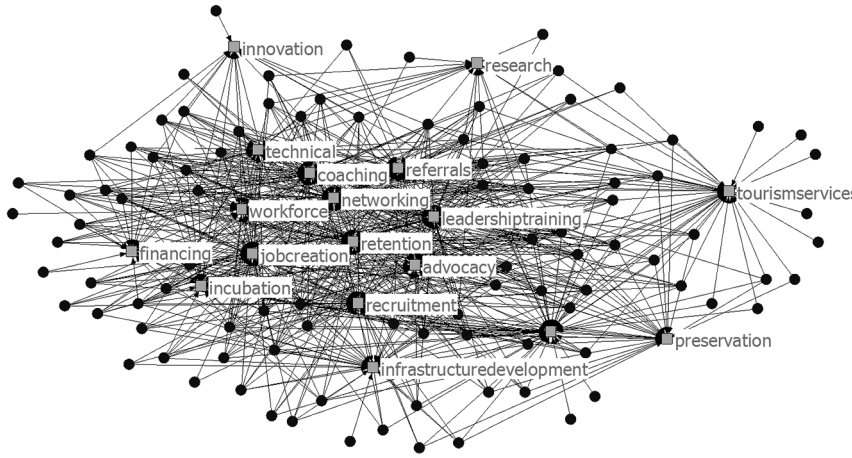
endeavor: "We have worked hard the past few years to bring other organizations to the table as we create our work plan. Though it is difficult at times, creatively developing partnerships are the only way a community can truly succeed" (EDO respondent, Laurel County 2013).

Networking is important for economic development—especially for generalist organizations. Previous studies suggest that generalist organizations accrue positive strategic benefits from collaboration partnerships, more so than do specialist organizations (Arya and Lin 2007). Generalist organizations provide a wide variety of services, usually accompanied by more staff/volunteers and resources to deliver these services. Their higher need, and ability, to commit organizational resources "motivates them to form productive relations with network partners" (Arya and Lin 2007, 697), which arguably attracts non-monetary resources.

Figure 5 depicts the popularity of certain EDO services offered in this network of ninety-eight responding organizations. It is a two-mode network, in which the circles represent the organizations and the squares represent the services that are provided. Commonly offered services like job creation, workforce development, recruitment, and leadership training are located near the center of the diagram. Activities located at the edge of the diagram are less popular amongst these EDOs. This figure also shows that some organizations tend to specialize in one particular activity, such as tourism, while other EDOs offer a broader range of services.

Figure 5: Two-mode network of EDO services and activities.



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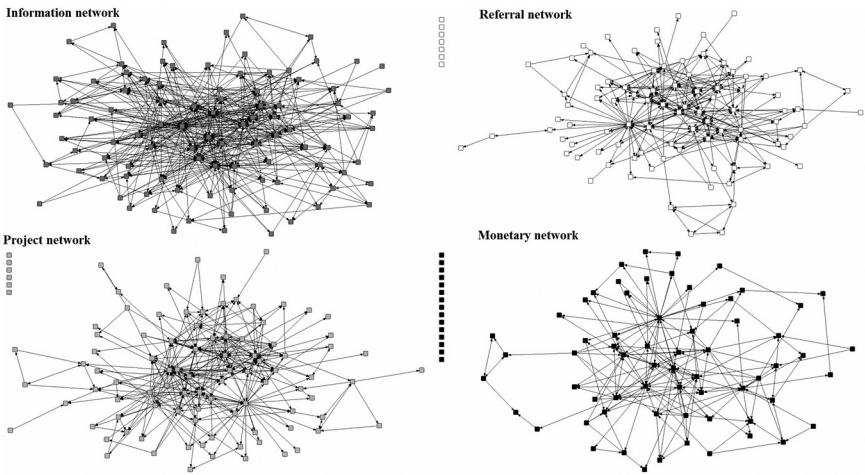
EDO Collaboration Networks

This sub-section addresses the third research question about EDO collaboration networks. We can picture the EDOs and their partnerships with each other as a regional web with particular structural characteristics. Analysis of the regional network reveals that, on average, responding EDOs collaborate with fifteen other EDOs (ranging from zero to ninety-seven possibilities), and that the density of the EDO collaboration network between responding organizations is 0.079. This means that out of the total possible number of ties that could exist, EDOs only make 7.9 percent, suggesting that many of the EDOs in the network are disconnected. Moreover, tie heterogeneity ranged from 0 to 0.75, with an average of 0.611. Since there were only four types of ties measured (i.e., working on projects, sharing information, sending/receiving referrals, and/or sharing material resources), 0.75 is the highest possible score for this measure. The tie heterogeneity average of 0.611, therefore, is relatively high. This indicates that collaboration tends to span multiple types of ties.

Specialized networks: Figure 6 shows the information, referral, project, and material/monetary networks of the responding EDOs in the region. Each node (or dot) represents an EDO, and the lines represent a tie or relationship between them. All EDOs are well connected to the information-sharing network, although some organizations are clearly more central sources of information than are others. Similarly there are some central organizations that make referrals and that are often referred to; however,

Figure 6: Four different EDO collaboration networks.



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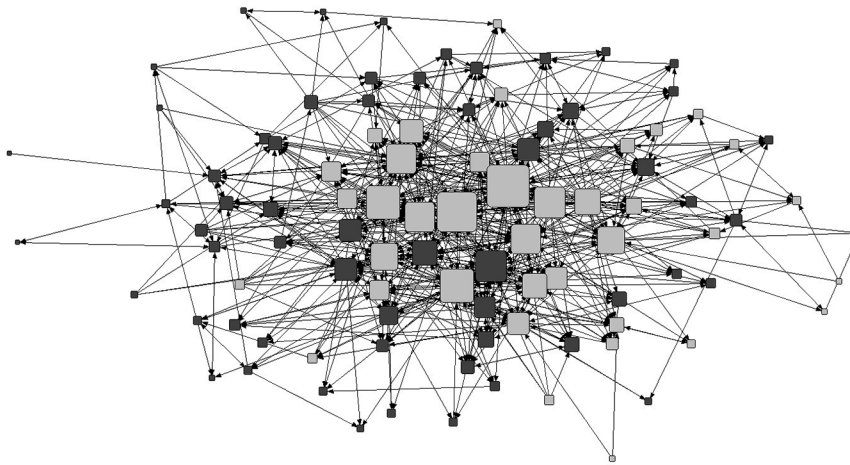
there are at least six EDOs that have no referral partners. When it comes to working on projects together or sharing material and monetary resources, EDOs collaborate in smaller clusters, creating a more fragmented network structure, and once again, there are isolates that are unconnected to the EDO network. Information network has a density of 0.064. Referral network has a density of 0.038. Project network has a density of 0.035. Monetary network has a density of 0.022. The information network has the densest structure while the monetary/material resource network has the least dense structure.

The Big Picture: Eastern Kentucky EDO Network

The breakdown of the network types is useful for specifying the different relational properties of EDO collaboration; yet we can expect that EDOs working together on projects also share information or resources. When network types are combined, a more complete collaboration picture is revealed. Figure 7 shows the broader collaborative network of ninety-eight responding EDOs in eastern Kentucky, with larger dots reflecting more central organizations and smaller dots showing the more peripheral ones. The visualization shows a tightly knit group of central organizations, with others on the periphery. This suggests that a core group of the responding EDOs are engaged in the most collaborative activity within the network. The centrality of an EDO in the network can be measured using a method of eigenvector centrality, which captures the centrality of a node (one EDO) taking into account the centrality of its alters (the EDOs list of

Figure 7: EDO collaboration network in eastern Kentucky (EDOs working in the Promise Zone counties are shown in light grey).



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collaborative partners). It is considered a measure of power and influence. In other words, organizations that are more "central" in the network may have more influence regarding economic development decision making in the region. For example, an EDO with such greater influence might be in a better position to garner inter-organizational support for a cause or to more effectively distribute information to other members of the network.

Furthermore, the EDOs in lighter grey are organizations serving counties in the recently designated "promise zone," an area designated by a federal initiative aimed at assisting the nation's poorest communities (Carroll 2014). Interestingly, EDOs serving these counties tend to be working together and are more central in the network. One reason for this might be that the primary organization spearheading the "promise zone" application is also very central in this network. This organization tends to work with others serving those particular promise zone counties. In addition, we find that organizational size, organizational age, service area, and the number of service offerings have statistically significant correlations with the eigenvector centrality measure at $p < 0.05$. Hence, it could be that both structural and organizational characteristics led to some EDOs gaining more central positions.

The EDO network of these responding organizations is geographically clustered. Geographic proximity facilitates relationship formation (Borgatti and Cross 2003; Festinger, Schachter, and Back 1950). Thus it was unsurprising to find that EDOs tend to collaborate with other EDOs in their immediate vicinity. Ties tend to exist within ADD regions, but not as much across regions. For example, EDOs located in the Barren River area have ties to each other, but are unconnected to the core organizations or to EDOs located in the Cumberland Valley. The exception to this is the set of Bluegrass organizations that exhibit both strong bonding capital through within-district ties, as well as extensive bridging capital, provided by their collaborative ties across districts.

Clustering has important benefits for building strong, reciprocal, trusting partnerships that are usually longer-lasting and mutually reinforcing (Putnam 2000). Conversely, tight clustering and an inward focus possibly limit access to new information and diverse assets. In this instance, it implies that some EDOs remain unconnected to organizations in another ADD, but that an existing central core of EDOs has the potential to strengthen collaborative network ties by acting as a bridge to the peripheral and unconnected organizations. The efforts of a few key/central EDOs could go a long way in helping other EDOs connect to the information, referral, monetary, and project networks.

Finally, when we asked EDO representatives how satisfied they were with their organization's existing portfolio of partnerships/collaborations

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with other organizations, 58 percent were satisfied or very satisfied. Nevertheless, just under half stated that strengthening or expanding relations with other organizations, their members, or their donors would benefit their EDO. One respondent stated that he "would like to know more about some of the other organizations, what they offer, and how best to collaborate/partner with them" (EDO respondent, Hart County 2013). Another said: "A more set schedule with some of the EDOs of the region would be helpful. A more coordinated and focused effort of EDOs on workforce development issues would be helpful" (EDO respondent, Rowan County 2013).

A number of EDO representatives also reflected on the difficulty of establishing partnerships due to a competitive environment. Others highlighted the importance of collaboration for eroding the competition, such as this respondent from Boyd Country: "[We need to] remove the barriers caused by competition that leads to fragmentation of efforts and wasting resources. Collaboration and cooperation need to replace competition" (EDO respondent, Boyd County 2013).

From the findings, it appears that collaboration between the responding EDOs is based primarily on the need for information and for referral partners. The network reveals that these EDOs tend to work with those nearby, and that some rural-based organizations struggle to network with others because of poor physical infrastructure and their geographic isolation. Encouragingly, about one-third of the responding EDO representatives are generally satisfied with their collaboration partnerships, although at least half of them would like to see expanded collaborative ties in order to improve their organization's work.

Summary and Discussion

In eastern Kentucky, roughly two hundred identified EDOs purposively aim to contribute to local economic development. This study points out the strengths that EDOs have to offer in terms of their operational capacity, geographic reach, and service offerings. But most importantly, it illustrates how EDOs collaborate with one another, and it highlights how such collaborations are beneficial for increasing social capital in pursuit of economic development.

In terms of operational capacity, the responding EDOs are generally small non-profit organizations working with midsized budgets. Due in part to government support, they are relatively stable entities over time that can generate a small revenue for the region and create employment opportunities. For example, a recent report by the Community and Economic Development Initiative of Kentucky (CEDIK) found that one in nine Kentuckians is employed by a non-profit organization. The non-profit sector in Kentucky employs 12 percent of all workers, making it the third largest

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industry in the state after government and manufacturing, and larger than retail (Lane Report 2014). As one type of non-profit entity, EDOs not only serve to generate employment opportunities through their activities, but they are employers themselves. They solicit grant funding and raise broader awareness of the need to invest in Kentucky communities, business, and its people.

Geographically, most of the responding regional EDOs serve where needed, such as in the promise zone counties, and these EDOs also tend to be the more central in the collaboration network. However, these few EDOs also seem to concentrate in population hubs and well-populated counties.

When it comes to services and activities on offer, EDOs really *do* economic development. Although these organizations offer a wide range of services, most devote more than half of their time and effort solely to economic development activities, revealing a focused mission. The most popular services offered are job retention, job creation, and job and business recruitment.

The collaborative network of ninety-eight EDOs in eastern Kentucky has a few salient characteristics. First, the network has a clear core-periphery structure, characterized by a group of highly central organizations with many others operating at the margins as rather weakly connected entities. The organizations in the core tend to have more employees, have an earlier founding date, serve more counties, and offer a wider range of services. A core-periphery structure is optimal for coordination and getting things done, as long as the core is capable and not overburdened.

Second, specific collaboration networks have slightly different features. The information network has the densest structure, suggesting that EDOs collaborate to share information more than anything else but that central EDOs have access to more information than do the peripheral EDOs. In addition, there are isolates in each of these networks that are unconnected to others. Other researchers may be interested in conducting a qualitative study of these specific organizations to establish why this might be the case.

Third, EDOs tend to have a rather diverse set of ties, suggesting that collaboration in this context crosses multiple types of partnerships. This finding indicates that some organizations rely on each other for many purposes. Such multiplex ties might result in partnerships that last longer and result in more efficient allocation of material and human resources, as well as more effective goal attainment (Agnitsch, Flora, and Ryan 2006).

Conclusion

This study contributes to knowledge of economic development by applying the social network perspective to the study of EDOs operating within the Appalachian region of eastern Kentucky. In assessing their

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collaborative landscape, we documented their range of service offerings, their geographic scope, and various characteristics of their patterns of collaboration. We identified and described a core-periphery structure, in which the network seems to be centralized around a few key EDOs. We found that information is the most commonly shared resource between network members, and that collaboration tends to cluster around distinct geographic regions. We also found that about two-thirds of EDOs are satisfied with their collaborative ties, but still want to expand their network or work on strengthening existing relationships.

In light of these observations, future work should focus on explaining them. For example, how exactly did the core organizations arrive in the more central positions? Why don't the periphery organizations have many ties across regions? What factors lead to a successful collaborative partnership between EDOs? Future work could also explore how EDOs might beneficially change or harness these various structural properties. For example, what actions could the core EDOs take to facilitate new partnerships between organizations on the periphery? How might core EDOs use knowledge of their central position to better accomplish their goals? In what ways could the centralized structure be leveraged to benefit the region as a whole? We hope this study serves as a useful starting point in addressing such questions, and in turn, contributes to development efforts in this region.

Acknowledgments

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Notes

1. These counties are classified by the Appalachian Regional Commission.
2. The University of Kentucky's Appalachian Center started the Growing Local Economies Network (GLEN) in 2010.
3. Respondents could choose from a given list of over three hundred EDOs and/or they could add organizations by names in a separate text box.
4. Three outlier organizations employing over one hundred full-time employees are omitted from this calculation because they would bias the results.

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