The Currency of Connections: An Analysis of the Urban Economic Impact of Social Capital

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Abstract

Proponents of social capital theory have long argued that it is not only in the best interest of civic life to build social capital but that social capital is vital for the economic health of communities. Yet past studies have failed to distinguish among different types of social capital and have relied on inaccurate measures of economic health. This study reexamines what has become conventional wisdom by analyzing the social capital of American metropolitan areas and its impact on economic well-being. It improves on past studies by examining different types of social capital (i.e., trust, group membership, social networks) and substituting the change in competitive-advantage jobs from shift-share analysis for total job growth and other traditional economic development measures of wealth creation. The study finds that bridging social capital positively affects the economic welfare of communities with respect to job creation.

Keywords

social capital, urban economic development, regional economics

The first decade of the 2000s challenged many longstanding notions about economic development. The decade was capped by a recession on either end. Practitioners and academics alike sought to increase regional competitiveness during a period of stagnant wages and job loss. Many turned to the theories contained in Richard Florida's creative class hypothesis, even though several studies have demonstrated that measures of creative class are proxies for more traditional means of economic development, such as human capital aggregation and technological innovation (Donegan, Drucker, Goldstein, Lowe, & Malizia, 2008; Glaeser, 2005). Implicit in these arguments is an emphasis on increasing economic growth through the in-migration of new, talented, and creative individuals. This idea stands in contrast to another popular book of the past 20 years, Robert Putnam's *Bowling Alone*. Putnam's (1995) book spurred a rash of research on social capital that justified social capital's importance for economic growth. Most of this research was either international (Fukuyama, 1996; Knack & Keefer, 1997) or examined the relationship between social capital and individual economic well-being (Erickson, 2001; Glaeser, Laibson, & Sacerdote, 2002; Kim & Aldrich, 2005). The purpose of the current research is to better understand how the development and use of social capital manifests itself within a more local community structure.

Recent evidence suggests that communities with high levels of social capital are able to develop institutes to foster economic development. Y. Oh, Lee, and Bush (2014), in this journal, show that social capital does lead to the creation of intralocal and interlocal economic development partnerships. However, they do not directly measure the economic effect of these social capital partnerships. Therefore, an important and overlooked question is how measures of social capital are correlated with economic development at the level of a metropolitan area, where most economic development activity occurs.

Social Capital and the Growth of an Economy

Social capital is broadly defined as "the information, trust, and norms of reciprocity inherent in one's social networks" (Woolcock, 1998, p. 153). Early research, particularly in the field of sociology, emphasized how social structures facilitate human interactions that improve intellectual capital and social well-being (Granovetter, 2005; Nahapiet & Ghoshal, 1998). There has been an ongoing debate about whether the

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concept of social capital is an individual or a group phenomenon, which is likely unresolvable. However, empirical research using multilevel modeling in the past decade has shown that an individual's social relationships accrue benefits to larger units of analysis (e.g., teams, companies, partnerships). These benefits include access to resources and improved effectiveness (H. Oh, Chung, & Labianca, 2004). Several studies have also linked measures of greater social capital to higher levels of economic growth and per capita income (Helliwell & Putnam, 1995; Rupasingha, Goetz, & Freshwater, 2002). The rationales are twofold and align with the distinct concepts of bridging and bonding social capital as defined by Putnam and others.

Bridging social capital describes a relationship structure in which individuals are connected to a wide range of other individuals. These relationships may be superficial but provide access to nonredundant information. The quality of bridging social capital is judged by the number as opposed to the intensity of the social connections among individuals. While these connections may not be deep or strong, they serve an economic end by connecting individuals to a network of amenable customers and suppliers for the purpose of economic growth (Kim & Aldrich, 2005). Moreover, bridging social capital allows entrepreneurs to build coalitions necessary for economic growth and to overcome the vertical barriers to cooperation with those of unequal social status (Blair & Carroll, 2009). Sean Safford's (2009) recent study of Allentown, PA, and Youngstown, OH, suggests that Youngstown has failed to rebound from the economic crisis of the 1980s largely because bonding social capital was concentrated among the economic elite. In contrast, Allentown's social capital was based on ethnic and religious groupings that transcended economic class. As a result of this bridging capacity, when the economic elite faltered, social capital that cut across class remained to foster a new economy.

In contrast with bridging social capital, bonding social capital is based on the quality of the relationship. Those with a lot of bonding social capital may not have many relationships, but those relationships that they do possess are high in trust. Bonding social capital is mostly found in homogenous communities or in relationships based on shared history or experience (Coleman, 1988; Putnam, 2000), and these shared experiences are often central to the discussion of relational contracting (Macaulay, 2000). Although proponents of transaction cost economics emphasize the economic and social costs associated with enforcing economic relationships (Coase, 1937; Williamson, 1981), relational contract theory suggests that these costs can be minimized by fostering trust among parties (Macaulay, 2000). Relationships characterized by bonding social capital foster this type of trust and thus reduce transaction costs (Putnam, 2000). In the economic literature, this perspective was originally justified based on the presence of strong economic output among ethnic enclaves (Light, Kwoun, & Zhong, 1990). However,

more recent quantitative studies have supported these findings by demonstrating that those countries with the strongest norms of trust produce greater technological innovations than less trusting societies (Whiteley, 2000).

The literature on bonding social capital has also emphasized the importance of community-based groups (Putnam, 1995). These groups serve as incubators of strong social ties and foster generalized trust among their members, which has the potential to foster social ends. It is also worth noting that, increasingly, economic development activities have been coordinated by community-based groups and that nonprofit social enterprise groups are a rising vehicle for economic development (Borzaga & Defourny, 2001).

Recent research has found that there are industrial and occupational effects to social capital whereby the industrial and occupational composition of communities is associated with higher levels of social capital in those communities (Engbers, 2011). This research flips this question on its head by attempting to show that the existing social capital in a community influences its economic outcome—specifically, its rates of job growth, and per capita income. It does so in the understudied context of U.S. cities.

Economic Growth in a Metropolitan Context

Of the few studies to investigate social capital within the United States, Rupasingha et al. (2002) found that the number of civic institutions per 10,000 individuals, which they used as their measure of bonding social capital, was positively and significantly correlated with growth in per capita income. Income inequality was negatively related to per capita income growth, and greater ethnic diversity was positively correlated to growth. All else being equal, greater levels of social capital should be correlated with higher levels of economic development. Mathur (1999) points out that in terms of economic development, human capital is a public good that is underprovided by the market. Because social capital links individuals to their surrounding social structure, it causes human capital mobility to become sticky. Social ties increase the opportunity cost of moving, and thus human capital tends to accumulate unevenly. Granovetter (1985) makes a similar point about embeddedness, or the degree to which individuals are enmeshed in a social network; therefore, higher levels of embeddedness should also be correlated with higher levels of economic development.

While studies of social capital at the national level are valuable in establishing the overall impact of these factors, such studies do not reveal how social capital actually functions in job creation. To understand this aspect of social capital's effects, social capital should be investigated at the metropolitan level, where the relative contribution of various factors to job creation can be ascertained.

Although there are many studies of job growth at the metropolitan level (Baade, 2008; Donegan et al., 2008; Ó hUalláchaín & Satterthwaite, 1992), these have focused on the total number of jobs or changes in the number of jobs, either at the aggregate level of all industries or, occasionally, disaggregated by industry type. A more meaningful measure is jobs created due to each area's competitive advantage. Using such a measure controls for the effects of the overall national growth rate and the impact of the industry mix on the regional economy, thus more clearly delineating the economic development success or failure associated with each area. While separating out these effects is common within the fields of regional science and urban economics, growth of competitive-advantage jobs has not been used as a common dependent variable in studies of economic development. Rubin and Wilder (1989) used this technique in the late 1980s, but few other studies have used this method for analysis of local initiatives in U.S. cities. The use of shift-share analysis further enables us to focus on social capital's impact, since local social capital is likely exogenous from national growth and the impact of an area's industrial mix.

On the other hand, social capital can be seen as a potential factor affecting a metropolitan area's competitive advantage through its impact on human capital, business climate, and creative class attraction or generation. The impact of social capital on economic development has been best articulated by Woolcock (1998). Woolcock summarizes the theory of social capital in economic development and suggests that there are four aspects of social capital along the twin dimensions of embeddedness/autonomy and micro/macro scales. Social capital at the micro level can be *integration* and intracommunity ties (embeddedness) or the *linkage* between extra community networks (autonomy). These concepts of *integration* and *linkage* have also come to be associated with the related concepts of bonding and bridging social capital, respectively. At the macro level, social capital can be thought of as the *synergy* of state–society relations (embeddedness) or the *organizational integrity* of institutional capacity (autonomy),[1] each of which plays a role in income and job creation. Synergy (macroembeddedness) helps groups overcome parochial ties to benefit from long-term development opportunities. For example, one might think of how local government requirements for commissions or comment periods foster involvement that encourages good governance while mobilizing community actors to get involved beyond their personal interests. Organizational integrity (macroautonomy) is a fundamental extension of Weberian bureaucracy. The social capital inherent in organizations helps individuals overcome collective action problems to achieve more socially optimal economic outcomes. In this sense, local governments who have sufficient administrative structures to deliver services in effective and trustworthy ways foster trust in government and a willingness to invest. Thus, just like bridging and bonding social capital among individuals, macro social capital fosters

Table 1. Woolcock's Taxonomy of Social Capital.

	Embedded	Autonomy
Micro	Intracommunity ties: Segregation	Extra community ties: Voluntary activity
Macro	Synergy of state/society: Number of nonprofits	Organizational integrity of institutional capacity: Crime rates

"the internal structures that establish and perpetuate capacity and credibility, and the external ties to clients and constituents" (Woolcock, 1998, p. 170).

At the micro level, integration (microembeddedness) fosters access to vital economic services and resources that would not be available to individuals were they not part of tight social relationships such as families, religious groups, or other tight-knit communities. Integration is most commonly found among homogenous communities where there are high barriers to entry but strong norms of reciprocity. This integration has strong economic benefits to insiders but increases transaction costs to outsiders. Consequently, to maximize economic benefit, linkages social capital (micro-autonomy) is necessary to reach out beyond the parochial interests of the community. Without linkages social capital, economic resources are more likely to be drained by the community of origin and provide access to low-cost resources outside the community (Woolcock, 1998). This typology can be seen in Table 1.

With respect to the mechanism by which social capital affects metropolitan economic growth, we hypothesize that this occurs not only because of the effects of direct expenditures by NGOs but, more important, also because of the generation of linkages arising from both bonding and bridging social capital. The latter are assumed to enhance the effect of the regional income/employment multiplier by channeling horizontal and vertical transactions and flows of information. Bridging social capital should result in vertical transactions and information flows between individuals and institutions, institutions and government, and institutions and the private sector. Bonding social capital should result in horizontal transactions and information flows between an individual and other individuals in the same ethnic or minority group, or flows between NGOs at the same level. By enhancing these linkages, the effect of these transactions and information flows are multiplied in the same manner as income or employment, thus yielding indirect and induced effects.

As can be seen from this discussion, the relationships between social capital and economic development are complex and are likely to play out in multiple ways. To better understand how social capital affects economic development, this study will use a number of measures, including two types of economic development. The research looks at the effects of social capital on the growth of jobs that originate from a

metropolitan area's competitive advantage, as well as the more traditional indicator of growth: per capita income. As will be shown, the effects are not the same; they differ depending on the type of social capital in the community.

To answer the important question of how social capital affects economic development, we use a traditional analytic tool in a novel manner. Shift-share analysis has been used since the 1960s (Dunn, 1960; Perloff, Dunn, Lampard, & Muth, 1960) to separate the change in jobs into the relative contribution from a national growth effect, an industrial growth effect, and a regional or competitive-growth effect.[2] A typical critique of shift-share analysis is that it only offers a descriptive accounting of job changes, without providing inferential evidence for that change (Gabe, 2006). A few studies have noted that regression techniques combined with shift-share analysis may be unstable for prediction purposes (Andrikopoulos, Brox, & Carvalho, 1990), but few, if any, studies have combined shift-share analysis with regression for formal hypothesis testing.[3] To fill this void, we use the competitive-advantage component of the shift-share analysis for the change in jobs by industry at the two-digit NAICS (North American Industry Classification System) level. We apply this to the period from 2000 to 2009 as the dependent variable in a series of models that includes traditional measures of economic development. This series provides new insights into measures of social capital, which allows us to address the great divide between economic development theory and economic development practice by more appropriately considering the change in the number of jobs that regional planners can control through development measures (Currid-Halkett & Stolarick, 2011).

The Metropolitan Context

This study chooses to focus on the metropolitan context for several reasons related to both economic development and social capital. First, economic outcomes often accrue to metropolitan areas, as job loss or growth in one subsection of a metropolis spill over to other subsections. The same is true for other measures that are more under the control of local governments, such as education and policing. Likewise, social capital relationships are unlikely to be structured around political barriers, but rather operate in a general geographic area that transcends formal city boundaries. Second, economic development policies and governance institutions that operate to implement economic development commonly operate at the metropolitan statistical area (MSA) level. Third, metropolitan areas are units of analysis in which policy makers may exert some level of control. Attempts to shape economic development and social capital at the state and national levels are less precise. Last, social capital can be conceived of as a community phenomenon. Just as an individual maintains a level of social capital based on his or her connections, a community such as an MSA can exhibit a measurable level of social capital.

Data

To test this relationship, we selected the top 50 MSAs from the 2000 decennial census, based on total population.[4] Because several of the data sources aggregate individual-level data to the metropolitan level, the top 50 cities were selected to ensure that enough observations were present to draw meaningful municipal statistics. A focus on MSAs reduces statistical concerns related to spatial dependence in the error term, which has been observed in county-level studies (Li, Cheng, & Haynes, 2011; Rupasingha et al., 2002). In the year 2000, the top 50 MSAs represented 59% of the total U.S. population. Metropolitan areas are defined by the U.S. Office of Management and Budget and are reviewed and revised once every 10 years, to correspond with each decennial census.[5] The current MSA codes were developed in June 2003, and these codes have been used in the American Community Survey since 2005.[6]

The findings for this study are based on the employment data provided by the U.S. Census Bureau in its annual data series County Business Patterns (U.S. Census Bureau, 2012b) and on personal income data obtained from the Bureau of Economic Analysis (2011). Shift-share analysis uses industry-specific employment data and the United States as the reference economy.[7]

Employment data at the regional (i.e., metropolitan area) industry level was decomposed through a traditional shift-share methodology[8] into three components: (a) a national growth effect, (b) an industry growth or industry mix effect, and (c) a regional or competitive-advantage growth effect.

Shift-share analysis makes the assumption that, if the effects of industry growth (the mix of fast- versus slow-growth industries) and the growth of the national economy are controlled for, the remaining change in an industry's growth or decline is due to factors that are internal to the region. Without using shift-share analysis, any growth in the local economy might be attributed to either national trends of the industrial mix of the community. It is this competitive-advantage effect that reveals the potential impact of regional development polices and factors on economic development. To calculate this competitive-advantage effect, we subtract the change in national industry employment over the period from the change in regional industry employment. This then represents the competitive-advantage effect as a percentage change. The final step in calculating this element is to multiply this percentage difference by the regional industry employment for the base year, in this case 2000. Thus, the competitive-growth effect accounts for the change in jobs that an industry's location in a given MSA has over the typical industry in other regions. As noted above, this isolates the impact of regional factors and policies on economic development. Descriptive statistics for these dependent variables are described in Table 2.

Table 2. Descriptive Statistics of Dependent Variables Evaluated at the National, Total Industry Level.

	N	Mean	SD	Minimum	Maximum
Competitive advantage	950	13,554	50,106	−61,774	576,258
Per capita income % change	50	1.16	1.31	−0.49	5.53

To develop an empirical model of the effects of social capital on metropolitan economic development that avoids misspecification errors, it is necessary to incorporate traditional indicators of economic development in a model that includes social capital variables. Thus, our causal model for job and income growth reflects many of the same variables used by Donegan et al. (2008), who provide an explanation for the inclusion of these variables based on past research. They identify educational attainment, total population size, industrial mix, and measures of entrepreneurship as "traditional" explanatory factors for explaining differences in the economic growth of regions. Educational attainment represents the impact of human capital on regional development. Donegan et al. (2008) use the percentage of the population age 25 years or older with a college degree to operationalize this concept. Population size can be thought of as both a control variable and a proxy for agglomeration economies that enhance the regional income/employment multiplier effect. Industrial mix is represented as the percentage of earnings from manufacturing and the percentage of earnings from business services. These two variables allow for capturing the differential effects of production versus service activities. Finally, the percentage of earnings from proprietorships is used as a measure of entrepreneurship and serves as a proxy for new business development.

Donegan et al. found that, based on model fit and adjusted R^2 statistics, these traditional indicators provided greater overall explanatory power than did creative class indicators derived from Richard Florida's work (e.g., see Florida, 2002, 2005). Because of their lack of impact, this study does not include the creative class indicators.

While creative class indicators do not appear relevant to our model, there has been recent evidence that occupational mix, which is related to creative class concepts with respect to professional versus blue-collar employment, may be a key indicator in explaining metropolitan economic growth and structure (e.g., see Markusen, 2004; Markusen & Barbour, 2007; and Nolan, Morrison, Kumar, Galloway, & Cordes, 2011). Thus, we have included change in the percentage of the labor force employed in professional, scientific, artisanal, and managerial occupations (identified collectively as professional employment), and change in the percentage of the labor force employed in blue-collar occupations (identified as blue-collar employment), as explanatory variables in our model of metropolitan economic development (Bureau of Labor Statistics, 2013).

Although a complete review of the independent variables that have been shown to correlate with economic development is beyond the scope of this article, we have included those from the recent literature that have been identified and used as potential causal factors in metropolitan development. Reese and Ye (2011) suggest that the basics of good local government—quantified as spending and institutions for schools, public services, and security—are the most important predictors of median family income, unemployment, poverty, and median individual income. Similarly, Donegan et al. (2008) find that human capital and industry composition are the most important determinants of metropolitan employment and income growth. Li et al. (2011) consider county-level employment growth from 2002 to 2007 and find that human capital, business intensity, and new firm formation are all significant.

From the 2000 and 2010 censuses, we include measures for the number of individuals older than 25 years with a college or professional degree to control for human capital. From the U.S. Census Bureau's public school financial data, we added total expenses for elementary and secondary education spending. Here, expenditures represent an imperfect measure of school quality, defined generally as the resources available within a region. To account for the effect of industry share with respect to manufacturing versus nonmanufacturing activity, we use data provided by the Bureau of Economic Analysis (2011) and include the share of earnings by the manufacturing sector and the business sector (defined as the sum of professional/business services, finance, insurance, and real estate). We also include earnings from new proprietorships, which proxies for new firm formation. Additionally, occupational mix or percentage change in professional and blue-collar jobs are included as control variables. These data come from the Occupational Employment Statistics (Bureau of Labor Statistics, 2013). Data on Gini coefficients to measure income inequality were obtained from Harvard University's diversitydata.org website for 1999 and 2010. Finally, to account for unobserved regional effects, we included dummy variables at the regional level (West, South, Midwest, or Northeast), and also at the metropolitan level (for Boston, Los Angeles, and New York). The city-specific controls are intended to capture the definitional complexity of these MSAs, which changed during the study period.

The data for social capital were meant to approximate the constructs of bridging and bonding social capital (Putnam, 1995) and *integration, linkage, synergy, and organizational integrity* (Woolcock, 1998). Despite overlap between these two frameworks for conceptualizing social capital, both are included in the study. The bridging/bonding distinction has become the most common theory, but Woolcock's approach is directly relevant for economic development policy. The Woolcock theory is represented by four proxies. Although certainly imperfect, they do fit

Table 3. Taxonomy of Social Capital Variables.

Concept	Meaning	Operational measures
Integration (microembeddedness)/ Bonding social capital	Strong norms of cooperation and trust that exist among individuals	Level of racial segregation in the community; Bonding social capital (hours/per capita nonprofits)
Linkages (microautonomy)/ Bridging social capital	Numerous connections among disparate individuals and groups in a society	The per capita number of group memberships; Bridging social capital (hours/nonprofits)
Synergy (macroembeddedness)	Organizational structures that help individuals overcome collective action problems	The number of nonprofits
Organizational integrity (macroautonomy)	Quality of governance and levels of general social trust	Crime rates

with past findings on individual and social determinants of social capital. These proxies include

- *Crime rates as a measure of government credibility.* Governments that are effectively able to manage crime levels demonstrate the administrative capacity associated with *synergy.* While governments are limited in their ability to govern crime rates since many forces that drive crime are outside government influence, there has been a demonstrated correlational relationship between crime rates and both quality of government and governmental trust (Keele, 2007; Knack, 2002; Lederman, Loayza, & Menendez, 2002). There is a popular conception that if government is well-run, then there will be less crime, less social strife, and more social capital (Knack, 2002).
- *Degree of segregation.* Segregated communities are more likely to possess a shared experience and the common cultural norms associated with Woolcock's notion of *integration* (de Souza Briggs, 2005). Racial segregation can be associated with lower out-group social capital (Lochner, Kawachi, & Kennedy, 1999), but it remains an important measure because of its association with within-group social capital. Additionally, it has been used in past research as a measure of shared norms (Fieldhouse & Cutts, 2010).
- *Number of nonprofits.* Nonprofits are a mobilizing mechanism that help groups overcome narrow interests and thus creates a capacity for organized action and voluntary habits found with *organizational integrity.* Nonprofits and other associational groups build organizational integrity because they facilitate greater interaction between both similar and different individuals to achieve shared goals (Fukuyama, 2001; Wollebaek & Selle, 2002). While many nonprofits do pursue parochial or even rent-seeking behavior, they nonetheless fit with Woolcock's conceptualization of organizational integrity. For the organizational integrity concept of social capital, the groups themselves do not need to build bonds between different people. They only need to reduce the costs associated with

cooperation on personal interests. Moreover, associational membership represents a form of "schools of democracy" (Fukuyama, 2001, p. 11), where individuals gain the skills necessary for broader collective action.
- *Group membership.* Communities in which individuals are members of multiple groups would suggest the *linkages* in which individuals possess an inclination to work across organizations. Past research suggests that belonging to multiple associations does, in fact, increase social capital (Wollebaek & Selle, 2002). Consequently, in communities where individuals are involved in multiple groups, there is an increased likelihood that they will come in contact with a larger number of other people, even if the quality of these interactions is low.

These proxies (Table 3) do not cleanly break into each 2 × 2 cell; for example, crime is known to have direct effects on employment, independent of its indirect effect on social capital. Likewise, high levels of segregation can produce high levels of integration but low levels of linkage. Future research should more carefully investigate these claims with alternative measures. The following paragraphs introduce the variables used to measure these concepts.

Data on the violent crime rate, defined as the number of murders, rapes, robberies, and aggravated assaults per 100,000 individuals, and the property crime rate, defined as the number of burglaries, larcenies, and motor vehicle thefts per 100,000 individuals, were included from the FBI Uniform Crime Reports as a control for state–society relations (Federal Bureau of Investigation, 2012). Measures of racial segregation from Diversity Data, a website supported by the Harvard School of Public Health, were included for the year 2000; they measure the dissimilarity of locations within a metro area for a given racial group with respect to other groups (Harvard University School of Public Health, 2012). This was included to capture a sense of integration and intracommunity ties. The number of nonprofits in a city was calculated from the Internal Revenue Service business master file reported by the National Center for Charitable Statistics

Table 4. Descriptive Statistics of Independent Variables Included in Level Form.

	Mean	SD	Minimum	Maximum
Per capita income	23,477	4,569	18,518	49,255
College graduates	623,748	757,462	130,622	4,313,375
Segregation	.54	.32	.36	2.62
Income inequality	41.04	2.02	37.50	47.50
Violent crime	1,146	528	33	2,781
Property crime	6,235	1,949	453	10,537
N	47			

Table 5. Descriptive Statistics of Independent Variables Included in Change Form.

	Mean	SD	Minimum	Maximum
Manufacturing earnings	−0.03	0.02	−0.08	0.01
Business earnings	0.00	0.01	−0.02	0.03
Proprietorship earnings	−0.01	0.01	−0.04	0.01
Professional employment	0.10	0.07	−0.05	0.35
Blue collar employment	−0.04	0.03	−0.11	0.03
College graduates	0.33	0.13	0.09	0.69
Total education expenditures	0.64	0.17	0.21	0.99
Hours volunteering	0.01	0.28	−0.53	0.65
Number of nonprofits	0.27	0.12	0.09	0.60
Bridging social capital	−0.09	0.26	−0.54	0.72
Bonding social capital	−0.03	0.21	−0.50	0.44
N	47			

at the Urban Institute (Internal Revenue Service, 2012). The Internal Revenue Service business master file contains information for all registered 501(c)(3) organizations and represents the institutional capacity of an MSA to provide for the services identified in Donegan et al. (2008).

Data on the volunteer habits of individuals within an MSA were obtained from the National Bureau of Economic Research archive of the Current Population Survey for both 2002 and 2009 (U.S. Census Bureau, 2012c). We calculated both the mean number of hours spent volunteering per respondent within an MSA and the mean number of organizations with which the average individual in an MSA volunteers. These data are aggregated from individual surveys and thus maintain some inherent self-selection bias associated with survey research. That said, the lowest response rate for the individual-level surveys used in this study is 91% for the 2000 American Community Survey (U.S. Census Bureau, 2012a). The mean number of hours spent volunteering per respondent and the mean number of organizations with which the average individual in an MSA volunteers serve as proxies for the extra community networks within an individual city. To capture the effects of bonding and bridging social capital, we also included the interaction of hours with organizations. The total aggregate volunteer hours within a city were divided by the number of nonprofits in the city to capture the labor resources per organization. This represents a measure of bridging social capital, as communities that spread a fixed number of volunteer hours across a larger number of nonprofits would anticipate a greater number of connections. Bonding social capital is measured by per capita volunteer hours divided by the per capita number of organizations to get a sense of how many hours each individual spends with a given organization. Thus, a high measure would suggest a greater degree of intense interaction among individuals in those organizations. Tables 4 and 5 include summary statistics for relevant independent variables.

For the purposes of our analysis, all variables are aggregated to the MSA level. As one reviewer noted, some of the variables in this study—such as education, crime, and social capital—are largely localized phenomena. While this is decidedly true, aggregation to the MSA level is appropriate for several reasons. First, localized phenomena have spillover effects at larger units of analysis (H. Oh et al., 2004). One only need to consider how the 2014 police shooting and the subsequent riots in Ferguson, MO, raised racial sensitivities and altered law enforcement practices in the larger St. Louis MSA. Second, past studies of social capital have aggregated to larger units of analysis; among these studies are ones by Keele (2007), who considers the effects of crime on social capital at the national level, and Lederman et al. (2002), who analyze crime and social capital in Italian provinces.

The dependent variable is broken down by industry within each MSA. Gabe (2006) used a shift-share analysis to show that employment growth rates differ by industry, and that regions with the strongest growth from 1999 to 2003 had some of the weakest growth in creative class industries between 1990 and 2000. Therefore, to account for differences by industry, we also include 19 industry-level dummies. Thus, our model most closely approximates a one-way fixed-effects panel that varies by industry. The shift-share technique also adds a temporal dimension to the analysis, since it focuses on industry-specific employment change over the 2000-2009 period.

Method

We estimated each model with the independent variables in per capita form as either a base-level measure for the year 2000 or a change measure over the study period, depending on the potential and actual impact of the specific variables. For example, for some variables, such as crime rate, the initial level has a greater impact in explaining economic development than the change over the study period. Education and income inequality were included in both change and level forms. When change forms were used, the change was based

either on the percentage change between 2000 and 2009 (for variables that represent a nominal number, such as the per capita expenditure on education or the per capita number of nonprofits) or on the difference in the 2000 and 2009 data (for variables that represent a percentage, like the percentage of earnings or violent and property crime rates). We estimated two models based on the following general specification:

$Dependent\,Variable_{i,j} = \beta_0 + \beta_j\,Industry\,Dummy_j$

$+ \beta_{2j}PCIncome00 + \beta_{3j}RegionalDummies$

$+ \beta_{4i}\Delta ManufacturingEarning + \beta_{5i}\Delta BusinessEarning$

$+ \beta_{6i}\Delta ProprietorEarning + \beta_{7i}CollegeDegree$

$+ \beta_{8i}\Delta CollegeDegree + \beta_{9i}\Delta PCTotalEducationExpenditures$

$+ \beta_{10i}Violent\,Crime00 + \beta_{11i}PropertyCrime00$

$+ \beta_{12i}PSegregation00 + \beta_{13j}Gini00 + \beta_{14i}\Delta Gini$

$+ \beta_{15i}\Delta HoursVolunteered + \beta_{16i}\Delta PCNumberofNonprofits$

$+ \beta_{17i}\Delta BridgingSocialCapital + \Delta\beta_{18i}BondingSocialCapital$

$+ \Delta\beta_{19i}MajorCityDummies_i + e$

$$\text{where } i = \text{MSA code and } j = \text{industry code} \qquad (1)$$

The dependent variable in the first model is the change in competitive-advantage jobs for each MSA, and in the second model it is the change in per capita income for each MSA.[9] Given that per capita income is another often-used measure of economic development, we have also included this as a dependent variable. And given the lack of data, the income analysis is at the MSA level, as opposed to the industry-MSA level. This leaves us with 874 industry-MSA observations and 47 MSA-level observations.

Given the presence of heteroscedasticity in early models, the current models were estimated with ordinary least squares using robust standard errors in Stata Version 12. This is the same method used for past research on similar topics (Donegan et al., 2008). Therefore, parameter estimates may not be at minimum variance, but hypothesis test results are reliable. The models were tested for multicollinearity, and only the occupational mix variables and the nonsignificant variable, segregation, were highly correlated.

Results

Table 6 presents the standardized coefficients for the independent variables for the change in each dependent variable between 2000 and 2009. Although the results indicate a highly significant regression for the change in per capita income, which explains 48.7% of its variation, only two independent variables are significant. These are (a) the change in percentage of those with a bachelor's degree and (b) the change in income inequality. Both are significant in the anticipated positive direction, with the impact of the

education variable having a slightly greater effect than the income inequality variable (standardized coefficients of 0.726 and 0.547, respectively). The lack of significance of the other explanatory variables in this model indicates that income change is almost exclusively driven by the effects of education and income inequality in metropolitan areas, and that neither social capital variables nor the other traditional indicators of economic development have an effect. These results are consistent with those of Donegan et al. (2008), who also find that only two explanatory variables are relevant for per capita income change. These variables are percentage with bachelor's degree, which has a positive sign, and manufacturing earnings, which displays a negative association with per capita income. Given that occupational mix is not included in Donegan's model, it is conceivable that manufacturing earnings may have been picking up its effects.

In contrast, the change in competitive-advantage jobs is driven by a number of explanatory variables, including several social capital variables and occupational mix. Overall, this model explains a larger percentage of variation in the dependent variable, with an adjusted R^2 of .547. Place effects are somewhat relevant, with cities in the Midwest and West showing a decrease in competitive-advantage jobs, as does the dummy variable for Boston.

The relationship between proprietorship earnings, manufacturing earnings, and business services earnings (defined as the sum of professional/business services, finance, insurance, and real estate), on one hand, and economic development, on the other, is contrary to past findings (Donegan et al., 2008). While Donegan et al. find that share of earnings from manufacturing has a negative effect and share of earnings from proprietorships has a positive effect on job creation, we find no effect for the latter but a slight, positive effect for both manufacturing earnings and business services earnings (using standardized coefficients of 0.043 and 0.075, respectively). These differences may be due to the use of competitive-advantage jobs as a measure of metropolitan economic development rather than aggregate job change. Alternatively, it may reflect specification errors that occur when variables such as occupational mix and social capital are omitted from the model.

As with past research, human capital continues to drive economic development, with the base level in college attainment explaining a significant portion of job creation. The standardized coefficient for percentage with a bachelor's degree in 2000 is 0.736, which represents the largest and most significant effect of all independent variables in the model. Surprisingly, changes in per capita expenditures on education are negatively related to changes in competitive-effect job growth. This is a modest effect, with a coefficient of −0.170. This finding conflicts with Reese and Yi (2011), who advocate for greater spending on services, particularly education services, when considering economic development goals. Given that the study does not measure the initial

Table 6. Impact of Social Capital and Other Independent Variables on Economic Outcomes (Expressed as Standardized Coefficients Using Robust Standard Errors).

	Competitive-advantage job creation	Per capita income, % change
New York dummy	0.05	Omitted for collinearity
Boston dummy	−0.18***	0.06
Los Angeles dummy	0.05	0.65
Per capita income (Year 2000)	0.00	−0.20
West region	−0.10*	0.55
South region	−0.01	0.28
Midwest region	−0.15**	−0.12
Change in manufacturing earnings	0.04*	−0.21
Change in business earnings	0.08*	−0.09
Change in proprietorship earnings	−0.06	0.16
Change in professional employment	0.22***	0.388
Change in blue collar employment	0.18*	0.126
% with bachelor's degree, Year 2000	0.74***	0.73**
% change in college attainment	−0.16	0.085
% change in spending on education	−0.17***	−0.472
Violent crime rates	−0.24***	0.067
Property crime rates	0.11**	0.155
Segregation levels, Year 2000	0.05	−0.802
Change in economic Inequality (Gini)	0.01	0.55
Economic inequality (Gini), Year 2000	0.02	0.296
% change in per capita volunteer hours	−0.45*	−0.258
% change in no. of nonprofit organizations	0.22**	−0.357
% change in bridging social capital	0.49*	−0.094
% change in bonding social capital	−0.08	0.150
N	874	46
Adjusted R^2	.55	.49
F	9.10***	9.08***

*Significant at the .05 level, two-tailed test. **Significant at the .01 level, two-tailed test. ***Significant at the .001 level, two-tailed test.

quality of schools, this negative association may arise from the tendency of lower- performing schools to increase funding to compensate for poor performance. Future research that more narrowly focuses on the role of education should consider additional measures of school quality.

Consistent with past studies, both occupational mix variables are significant, with a moderate effect. The change in the percentage of professional employment has the expected positive sign, with a standardized coefficient of 0.222 and a *p* value smaller than .001, indicating a moderate but highly statistically significant effect on the growth of competitive-advantage jobs. On the other hand, blue-collar percentage employment change also has a positive sign, albeit with a weaker but still significant impact at the .05 level. This standardized coefficient of 0.179 indicates an impact almost equal to that of professional employment. While the direction of the sign on professional employment change is consistent with both the occupational mix literature and the creative class literature, the indication that an increasing percentage of blue-collar employment increases competitive-advantage job growth seems confounding. However, this may not be the case, since the percentage change in blue collar employment indicates a growth of jobs in the service and retail-wholesale trade sectors, which in many metropolitan areas are increasing as manufacturing jobs are declining. Moreover, even though unionization has been declining in the private sector, an increase in these jobs generally brings more union representation in manufacturing and related industries, thereby potentially enhancing wages and job generation. Finally, there is a high correlation between the professional and blue collar employment variables ($r = −0.837$), indicating that near multicollinearity may account for some of this effect.[10]

The level variables, violent and property crime rates, are both statistically significant with moderate effect sizes (standardized coefficients of −0.235 and 0.107, respectively) in terms of competitive-advantage job creation, although only the measure for the violent crime rate is negatively correlated. This negative impact can be interpreted in several ways. First, with regard to social capital, this study attempts to make an argument that crime is a proxy for social trust. This is consistent with past findings that show crime rates and social trust moving inversely (Lederman et al., 2002).

Second, Woolcock's (1998) concept of social embeddedness suggests that social capital is also concerned with trust in the formal "organs of society," such as corporations. As crime increases, trust in government decreases (Chanley, Rudolf, & Rahn, 2000). Third, the impact of crime is also likely direct. As crime rates rise, many employers relocate out of the community (Lucas, 1988).

The positive coefficient found between property crime and job creation is puzzling. The model may be reflecting a reverse causality where, as income rises, the community becomes a greater target for crime. This would be consistent with the findings on income inequality with respect to the per capita income equation. As inequality increases in this model, so does per capita income. The increasing income of the community is accumulating to a shrinking elite. Past research has shown that decreasing social capital and income inequality are associated with rising levels of crime (Kennedy, Kawachi, Prowthro-Stith, Lochner, & Gupta, 1998). In contrast to the per-capita-income model, the two income-inequality variables are insignificant in the competitive-advantage job change model, indicating that income inequality may be more of a factor in raising per capita incomes than in creating jobs.

Segregation serves as a proxy for community ties. Although certainly an imperfect measure, segregation has the potential for interesting social capital implications. Theoretically, high levels of segregation could produce economic gains associated with high within-group integration (Light et al., 1990) or economic loss if businesses are unable to link outside their community of origin (Putnam, 2007). The results of our study find no significant impact with respect to segregation, either in the job change or per capita income change models. This could potentially be the result of a larger unit of analysis in which gains to the ethnic community are offset by social loss associated with limited bridging social capital at the MSA level.

The effect of social capital appears to be driven by the number of nonprofits and the bridging social capital in the community. It is worth noting that the study's most individualized measure of social capital, per capita volunteer hours, is unrelated to economic development. Likewise, none of the social capital measures were related to personal economic advancement in the form of rising levels of per capita income. The investment model of volunteering suggests that an important benefit of volunteerism is to increase one's own wage potential. Volunteering assists with skill acquisition as one is exposed to new work opportunities, deepens social contacts through shared effort that may yield future economic benefit, and signals a willingness to perform (Hackl, Halla, & Pruckner, 2007). However, when measured from the community level, intense volunteerism appears to have no such effect. One possible hypothesis is that, although volunteering may increase skills and social networks, the time substitution involved detracts from economic activities that would have a greater effect.

Whereas volunteering has no effect, nonprofits are much more of a mixed bag for the local economy. The capacity building potential associated with nonprofit organizations increases the job opportunities for the community. The percentage change in the number of nonprofit organizations is significant both statistically and practically for competitive advantage job change, with a standardized coefficient of 0.219. However, since this variable is insignificant in the per-capita-income model, these jobs are not accompanied by any increase in per capita income. While the number of nonprofits is, in part, a measure of social capital capacity, a portion of this effect may come from nonprofit hiring directly. While nonprofit jobs continue to be one of the most robust parts of the economy, showing steady growth since 2000, they often pay less than private- and public-sector jobs.[11]

Consistent with recent research (Safford, 2009), the primary social capital driver of economic growth is bridging social capital. In fact, the standardized coefficient for bridging social capital is 0.488, second only to the percentage of college graduates (0.736) in terms of explaining job creation. These findings suggest that bridging social capital plays a pivotal role in economic development by fostering coalitions among diverse people and institutions. These loose networks provide access to information necessary for economic improvement. Unlike bonding social capital, which has no statistically significant effect on income or job creation, bridging social capital allows communities to overcome economic hurdles to prosper in a competitive environment (Blair & Carroll, 2009; Safford, 2009). Consequently, while many pundits have argued for the importance of building civic capacity for improving a community's economic well-being, capacity building needs to be tailored to foster particular types of social capital.

Conclusion

This study provides evidence that, at the metropolitan level, social capital—measured as both the autonomy and embeddedness of individuals and institutions—matters for competitive-advantage job creation. Both the change in the number of nonprofits and the percentage change in bridging social capital prove to have statistically, and practically, significant effects on job creation. Thus, this study paves the way for a more detailed understanding of the role of social capital in urban economic development.

This research represents a significant improvement over past work in its ability to distinguish among different types of social capital and to isolate the effects of regional variables in explaining economic development. Understanding different types of social capital is important, as policy interventions differ depending on the type of social capital sought. Our approach quantitatively removes industry mix effects and national growth effects that are unrelated to local policies and institutions, thus allowing for a more accurate consideration of

the relative impact of local factors. We present this novel use of the traditional shift-share analysis to estimate the impacts of social capital on economic development. Our findings point to the importance of using shift-share analysis when evaluating the impact of local policies and characteristics such as social capital. Our results make the case that models of economic development that omit social capital variables and occupational mix are incomplete and may yield misleading results when estimated.

One implication of these results is that the recent emphasis on economic development through the lens of the creative class may have ignored another popular and competing belief in the form of social capital. While the creative class may not be looking for strong relationships and powerful community institutions, that group is no less important for understanding the growth in community economic health.

Given that social capital may have a much greater impact on metropolitan job creation than previously thought, and that the social capital factors addressed in this research appear to be as important as traditional indicators of economic development growth, these results have important implications for economic development planners and practitioners. To maximize the potential success of economic development plans, policies, and programs, social capital should be included as a strategic resource. Concomitant attention should be paid to nonprofit organizations, connections between nonprofits and government agencies, and social groups such as neighborhood associations. Mobilizing these organizations as active participants in economic development activities will enhance and extend the linkages that create bridging social capital.

Declaration of Conflicting Interests

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Notes

1. We have italicized Woolcock's original naming conventions for these four types of social capital.
2. Several studies have since further developed shift-share analysis to include component parts for efficiency (Dinc & Haynes, 1999), productivity (Dinc & Haynes, 2005), and sector interaction (Marquez, Ramajo, & Hewings, 2009). Our purpose here is to emphasize the relative importance of place-based indicators of social capital on local development conditions. Therefore, we restrict our attention to just the traditional "competitive advantage" component.
3. Kresl and Singh (1999) created a measure of urban competitiveness ranking as the sum of change in manufacturing value added, change in retail sales, and change in business service receipts and used it as a dependent variable. This is similar in concept to the competitive advantage presented here, but it does not remove the industry or national effect.
4. Four cities had to be dropped because the Gini coefficient was not available for these cities.
5. http://www.census.gov/population/metro/data/index.html
6. To maintain a consistent definition of each MSA, we used the crosswalk between 1999 MSA definitions and 2003 core-based statistical areas that is available from the U.S. Census Bureau. In general, the new MSA codes represent a more detailed view of American cities. Therefore, when possible, we aggregated 2009 data by their corresponding 1999 MSA codes, to create a consistent "city" over time. However, for some independent variables it was not always possible to aggregate data by 1999 MSA codes for every 2003 MSA. Instead, we selected the "most representative" MSA in 2003 of the 1999 definition based on population for the year 2009. Independent variables for GDP share, crime, and social capital in the 2009 period were merged with the final data set based on these core MSAs.
7. In the event that employment figures would identify individual firms, the County Business Pattern data provide a range of data values. We replaced these "missing" data observations with the midpoint of the given range. In the year 2000, a few industries are right-bounded—that is, firms with more than 100,000 employees are identified as having 100,000. This likely underestimates employment in these cities and industries. We replaced 23% of all employment data (230 records out of 1,000), but the highest number of imputed employment totals is in the industries agriculture/forestry, mining, utilities, management, education, and arts/recreation, respectively. While this appears to be a significant imputation, it only accounts for 4.2% of the total number of jobs in our sample, since it primarily imputes for smaller industries. In 2009, the corresponding figures are 67 observations and 0.7% of the total number of jobs.
8. Shift-share analysis is a technique used to decompose changes in urban or regional economic development. The method works by separating out the percentages of job growth that can be attributed to national job growth, the industry mix of the community, and regional growth.
9. We also estimated the models in level form as a robustness check against endogeneity of the job change variable. The results for the social capital variables were similar and thus not reported in this study.
10. We attempted to remove this near-multicollinearity problem through several methods, including the creation of interaction terms and dropping the blue-collar employment change variable. However, these efforts resulted in more problematic misspecification errors, so the decision was made to leave both variables in the model. The potential near-multicollinearity effect does not extend to any other of the explanatory variables, whereas the misspecification effect can conceivably affect all the other variables in the equation to the extent they are correlated.
11. Within management occupations, the average nonprofit employee earns $34.24/hour compared with $41.86 and $39.75 for private and local government employees, respectively (Butler, 2009).

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