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Interlocal Cooperation in the Supply of Local Public Goods: A Transaction Cost and Social Exchange Explanation

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Abstract

Although a multiplicity of local governments is often regarded as promoting efficiency in the supply of public services, political fragmentation can generate economies of scale and externality problems. Several exogenous solutions, including the creation of overlapping districts governments, consolidation of existing units and establishment of a metropolitan government, or direct state or federal intervention, have been offered. We argue that cooperative governance offers a potential endogenous solution to this dilemma. By combining transaction cost and social exchange theories within the institutional collective action framework, we investigate how local governments themselves address inefficiencies from externalities and economies of scale. An empirical analysis of Georgia cities reports that while cities' choice of service collaboration is affected by the transaction characteristics of services, their level of service collaboration is greatly influenced by the previous exchange that builds trust and by the level of fiscal pressure they face.

Key words: governance, service delivery, collaboration, intelocal agreements

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Interlocal Cooperation in the Supply of Local Public Goods: A Transaction Cost and Social Exchange Explanation

Local governments provide a wide variety of local public goods and services to their citizens. In a fragmented political setting, production of these services generates economies of scale and externality problems. For most local public goods and services, costs per unit decrease with the scale of production (Hirsch 1964). A large scale production allows sharing of capital equipment (such as a crime lab or fire truck) and labor (forensic expert or arson investigator) that reduce the per unit production cost. The limitations imposed by jurisdiction size prevents full realization of scale economies to many municipal governments, thus production remains inefficient.

Externalities also constrain efficiency because the actions of one government affect other units (Williams 1966). For example, a high level of police protection by one city may result lower crime in neighboring jurisdictions leading to a sub-optimal allocation of its law enforcement expenditures. On the other hand, excess demand on local facilities (for example, roads, parks, beaches, etc) by non-residents generates congestion in the supply of these services necessitating the local jurisdiction to overinvest. Several exogenous solutions to these problems have been offered, including the creation of overlapping districts governments, consolidation of existing units and establishment of a metropolitan government, or direct state or federal intervention.

Polycentricists look to establish overlapping special purpose governments as a mechanism to preserve the efficiency of public goods markets while addressing scale and externality problems (Ostrom, Tiebout and Warren 1961; Parks and Oakerson, 1989; Schneider 1989; Tiebout 1956).¹ Consolidationists and proponents of the “new

regionalism” advocate a metropolitan-wide general purpose government to address these problems (Downs 1994; Katz 2000; Lowery 2000). Scholars working in the tradition of fiscal federalism (Oates 1972; Peterson 1981, 1995) suggest externalities should be corrected by a central government either through direct provision or central mandate, or through price mechanism such as grants or tax to the local governments.

Each of these approaches suffers from several limitations. While consolidation, overlapping districts or higher level government intervention address scale and externality problems, they reduce local control, create allocation inefficiencies, and increases coordination costs (Brierly 2004). Although horizontal competition among local units can enhance efficiency, vertical competition among overlapping units has been shown to increase costs of government (Foster 1997). Overlapping governments also create a common pool resource problem as overlapping jurisdictions compete for the same tax base (Bae 2006; Berry 2002).

Consolidation of governments has proven exceedingly difficult to achieve and, in practice, is subject to coordination and transaction cost problems (Carr 2004). Finally, central correction of externalities has significant economic and political costs. The estimation of externalities and the determination of appropriate subsidies by a higher level government are difficult and complicated (Breton 1965); thus, objective compensation is unlikely. Besides, central intervention may also face goal incongruence (Nicholson-Crotty 2004), principal-agent problems (Chubb, 1985), or a tendency to over centralize, in which case efficiency gains from decentralized governance may be lost (Oates, 1999).

Horizontal federalism through interlocal agreements among local government units provides an endogenous alternative solution to scale and externality problems. Despite the

prevalence of cooperative arrangements in many metropolitan areas (ACIR 1985)), this approach has been given less attention by both scholars and metropolitan reformers (Katz 2000). Although several case studies recognized the importance of interlocal collaboration (see, Kurtz 1948; Satterfield 1947; Seyler, 1974), empirical works examining interlocal cooperation are limited, focused at an aggregate level of analysis, or deal exclusively with external conditions affecting interlocal collaboration (see, Campbell and Glynn 1990; Krueger and McGuire 2005; Krueger 2006; Liebman, et. al. 1963; Marando 1968; Morgan and Hirlinger 1991; Post 2002;).

We focus on service level analysis and examine how local governments can address the problems of economies of scale and externalities by themselves through interlocal cooperation (or cooperative governance). Interlocal cooperation involves voluntary transactions between two or more local governments to accomplish common goals. Interlocal cooperation does not require costly centralized solutions or political consolidation. Instead, local governments gain economies of scale and devise acceptable compensation to internalize positive or negative externalities through mutual bargaining and negotiation.

While this cooperative resolution is potentially superior to regional reform alternatives, it is also limited by transaction cost problems. These include problems related to the transaction cost properties of public goods and services, and problems of trust and commitment related to the service network relationships in which a local government is imbedded.

This article investigates how transaction cost risks and social structure influence collaborations across services and the extent of such collaborations. We apply an

innovative theoretical approach that combines elements of transaction cost and social exchange theories, since successful exchange is conditioned by both the transaction characteristics of the service and the social structure faced by the local governments. Building from an institutional collective action framework (Feiock 2004, 2005), we develop and test hypotheses linking interlocal service cooperation in metropolitan areas to the characteristics of services provided and to the trust produced by patterns of previous cooperation.

Interlocal Service Agreements – Mechanism of Interlocal Cooperation

Local political units commonly cooperate through voluntary service agreements (Friesema, 1971; ICMA, 1997; Thumaier and Wood 2002; Wood 2006). Fifty-two percent of cities surveyed by ACIR (1985) had formal intergovernmental agreements or contacts. Warner and Hefetz (2001) found about one-sixth of all services were delivered through joint provision of services or local intergovernmental contracting. These agreements emerge from a dynamic political contracting process between or among local government units and may be informal or formal. Informal agreements are often the results of ‘handshake’ deals among officials where the division of service responsibility is understood but never formalized (Post 2004). Formal cooperation involves written agreements where responsibilities of exchange partners are generally defined by contractual obligations and formal relationships.

Formal cooperative arrangements include payment-for-service agreements, joint (service) agreements, and service exchange agreements (ACIR 1985; ICMA 1995). In payment-for-service agreements, one local government provides a service to another

government for an agreed upon price. Joint (service) agreements occur when two or more local governments share in planning, financing or delivering a service. Implementation modalities may vary. They may divide responsibilities, assign the responsibility to one partner or create an entirely a new entity (such as a library cooperative), for the production of the agreed service (in this case, library services). Finally, service exchange agreements are service quid-pro-quo arrangements in which exchange partners agree to mutually lend services to one another at their own cost. Mutual aid agreements for emergency medical service or fire are examples of service exchange agreements.

Local governments pursue various formal and informal cooperative agreements in an attempt to address externalities and achieve economies of scale they would otherwise be unable to capture on their own (Bish 2000; Feiock 2004). These voluntary service agreements provide institutional rules to guide the behavior of cooperative partners as well as a means to translate mutual commitments (Carr 2005; Gerber 2005; LeRoux 2006). Formal service agreements, particularly payment-for-service and joint agreements involve exchange of funds. Such financial transactions are substantial and their levels vary among services.²

Table 1 about Here

Theoretical Framework

Our model of interlocal service agreement begins with the Coase Theorem (1960): absent transaction costs, rational actors will achieve a Pareto-efficient allocation of resources through voluntary bargaining even in the presence of positive or negative externalities. When the transaction costs of cooperative agreements are low relative to the

gains from cooperation, participating local governments can enter into a cooperative agreement through mutual bargaining (Bish 1971).

Local governments, however, face potential transaction barriers. These include information, negotiation, enforcement, and agency costs associated with entering or maintaining the cooperative agreements (Feiock 2005). Incomplete or asymmetric information increases the cost of collaboration. While incomplete information increases search cost for a suitable partner, potential strategic use of information advantage over a partner puts cooperation at risk. Similarly, differences in bargaining power between actors increases negotiation costs. For example, large cities generally possess greater bargaining power than smaller cities with little potential to realize scale economies alone. Moreover, cities with higher service needs, shorter time preference, or facing fiscal stress and unemployment problems will be in weaker bargaining position (Steinacker, 2004). Negotiation becomes difficult when exchange partners perceive an unfair distribution from the joint gains.

Conditions of exchange such as need for the service, fiscal capacity, and political climate can change. These changes, or simply opportunistic behavior, may prompt partners to defect. Safeguarding cooperative agreements from such potential hazards increases enforcement costs. Cooperative agreements are also subject to agency problems. Since public officials negotiating cooperative agreements are motivated by their own individual interests, their preferences may depart from the preferences of the citizens they represent (Feiock 2002).

The ability of local government to minimize these transaction costs is contingent upon the external and internal conditions under which exchange takes place. These

conditions include the transaction characteristics of service, characteristics of communities, and the networks of participating units as well as the structure of social relations within which the economic transaction occurs. We focus on both the transaction characteristics of services and trust developed overtime to explain the interlocal cooperation.

Transaction characteristics of service and interlocal cooperation

Transaction cost economics (TCE) suggests that actors will choose a governance form that minimizes transaction costs associated with an exchange (Williamson 1981). This idea assumes the presence of alternative governance forms available to actors participating in exchange. Williamson (1991) documented several of these that include market, hierarchy (internal supply), and various hybrids such as long-term contracting, reciprocal investments, franchising. Interlocal cooperation is one such governance form. Following TEC logic, local governments would engage into interlocal cooperation when that governance form minimizes the transaction costs of exchange relative to other forms.

Bounded rationality and self-interest driven opportunism of actors produce risks in exchange relationships (Williamson, 1991). The limited ability of actors to foresee exchange hazards and the opportunism of partners produces uncertainties. As a consequence, they factor these uncertainties into agreements thus raising the transaction costs of collaboration. Two transaction cost factors extensively analyzed in a discrete choice setting are asset specificity and measurement difficulty in an exchange (Williamson, 1981). The argument is that these factors shape actors' transaction cost risks and thus determines the governance choice. We extend this theory to argue that these same factors

also affect the degree of risks actors would be willing to take ex-post the agreement in determining the level of collaboration.

Asset specificity and interlocal service cooperation

Asset specificity arises when a service transaction requires significant relation-specific investments that are largely non-deployable to alternative uses (Williamson 1991). For example, when city A installs additional machinery to increase the capacity of its sewage treatment plant to accommodate the mutually agreed upon needs of city B, then city A's investment becomes transaction-specific, as the added equipment can not be used for alternative purposes such as potable water treatment. Although relation-specific investments can take various forms³, a common consequence of such specific investments is that it increases potential for opportunism the more specialized the investment becomes (Williamson 1981). The dependency between transactors also deepens as the relation-specific investment becomes more customized because the parties are locked into the highly tailored investment (Williamson 1991). The continuity of the relationship becomes critical for mutual gain.

However, such relation-specific transactions suffer from opportunism and uncertainties. Behavioral opportunism arises when actors threaten to terminate the relationship in an attempt to appropriate a larger share of the joint gains. Uncertainties occur when the conditions of exchange change over time motivating partners to back out. Temptation to hold-up or renege increases the transaction costs of exchange. The transaction costs increase further when the exchange partners require coordination to safeguard the transaction through mutual adaptation.

Market governance based on coordination through price mechanisms is unsuitable to minimize uncertainties that arise due to specialized or customized investments in transaction. Local governments, instead, may opt for internal supply to minimize potential opportunism or coordination costs. Although it reduces these costs, it becomes unattractive if it increases delays, raise internal coordination costs, and results in the loss of economies of scale in production. Williamson (1991) suggested that intermediate governance or hybrid forms could be superior to market or hierarchy (in-house production) for exchange situations in which internal coordination costs are high relative to the gains from the exchange. Studies of inter-firm collaboration in the private sector support this idea. Firms confronted with this situation employ legal contracts to safeguard exchanges in which the governance form moves from market-like transactions to relational governance to unified governance with increased levels of asset specificity in exchange (Dyer 1997; Poppo and Zenger 2002; Zaheer and Venkatraman 1995).

Local governments also face asset specific risks in collaboration. We expect higher level of collaboration when asset specificity is low because uncertainty is also low. But, at a very high level of asset specificity, the risks become great. Then the level of collaboration declines as local governments move from collaborative governance to internal supply of services. Based on this logic we hypothesize:

- H1: The relationship between asset specificity and interlocal service cooperation follows an inverted “U” shape: at lower levels, asset specificity increases cooperation, but beyond some point, further increases in asset specificity decrease cooperation.

Measurement difficulty and interlocal cooperation

Measurement difficulty occurs when neither service performance nor the activities to be performed are easily observed or measured (Brown and Potoski 2003). Even writing an agreement is difficult for such services because either their outputs are not tangible or production is complex (Ferris and Graddy 1986). Local government services differ in their degree of measurement difficulty. Some goods such as sewer, water, and refuse collection are easier to measure than others like fire, police or emergency services. Negotiation costs rise as fair distribution of benefits and costs become difficult to determine. Thus longer times are required to settle agreements. Even after agreement, measurement difficulties amplify uncertainties due to potential problems of free-riding and opportunistic behavior.

The relationship between measurement difficulty and interlocal service cooperation is complex. In general, cooperation is easier to achieve for services that are easily measured (Steinacker 2004) as opposed to services whose outputs are not tangible. Local governments may only enter into payment-for-service agreements when measurement difficulty is low. When measurement difficulty is moderate, jurisdictions may still engage into collaboration through joint or service exchange arrangements to minimize the potential free-riding or opportunism in exchange. But when measurement difficulty becomes extreme, the transaction costs of exchange are likely to exceed the gains from collaboration, thus motivating the parties to internalize service production rather than cooperate.

The dynamics may be opposite when local governments find alternative service providers to cater their needs. When measurement difficulty is low, local government may rely on private providers, as the gain from market transaction may be still be greater than

the cost of monitoring the private vendor. But, when measurement difficulty becomes very high, leading to high cost of monitoring private providers, these local governments may turn to their governmental peers because they can reduce uncertainties through joint initiatives. They may also consider their peers more reliable in comparison to private providers because of similar goal of public service.

In their study, Brown and Potoski (2003b) found support for the earlier argument. They show that local governments deliver easily measured services more often through external providers, including other governments; but when services are very difficult to measure, they reduce external reliance on production. Following this, we hypothesize that

- H2: The relationship between measurement difficulty and interlocal service cooperation has an inverted “U” shape: at low levels, measurement difficulty increases cooperation, but after some point measurement difficulty decreases cooperation

Social trust and interlocal cooperation

Service agreements among local governments occur in the context of multiplex relationship. Local officials of different communities are linked through personal relationships, professional associations, or working relations. This resembles Granovetter’s claim (1985) that economic exchange is embedded in social structure. These relationships help them know each other, create social capital and build trust. Gulati (1995) argues that familiarity between organizations through their prior alliances breeds trust.

Trust shaped by previous relationships improves cooperation in two ways. First, it mitigates transactional uncertainties, reduces both ex ante and ex post opportunism, and creates opportunities for exchange of services (Granovetter 2005; Poppo and Zenger 2002; Zaheer and Venkatraman 1995). For example, in the case of New York apparel business,

Uzzi (1996) found that the manufacturer shared its business relocation decision to Asia only with its close-knit suppliers (but not with other contractors) nine months ahead of the relocation in order to give them opportunities to adapt their business. The suppliers also reciprocated the manufacturer's 'trustworthiness' by maintaining quality supply although they could have exploited the situation to their advantage by supplying low quality goods. Norms associated with trust such as fair distribution of costs and benefits also generate flexibility among exchange partners to cope with uncertainties and to deal with worries related to measurement difficulty that arise in exchange.

Second, trust creates a foundation for continued and expanded future relationships. The potential of repeated interaction is high in the case of local governments because, unlike individuals and firms, they are geographically fixed (Feiock 2005). Expectations of future pay-offs from cooperative behavior encourage cooperation in the present. Such expectation is dependent on the actor's experience of past dealings. Sociologists maintain that trust furnishes the basis for offering and discharging subsequent commitments which then becomes concrete as actors reciprocate exchanges (Uzzi 1996). Repeated exchange provides information about the partners which allows them to make informed choices of who to trust and how much to trust. Granovetter (1985) argues that information gained from personal past dealing with an exchange partner is more trustworthy; hence, the partner's behavior becomes more predictable leading to sound basis for future cooperation. In the case of watershed partnerships, Schneider et. al. (2003) found that the emergence of trust and norms of reciprocity based on repeated interactions foster collective action. Likewise, Olberding (2002) showed that norms of cooperation promoted regional collaboration in economic development.

Local governments, however, may encounter temptation to break trust. Granovetter (1985) observes that the more complete the trust, the greater the potential gain from malfeasance. However, social structures help restrain such temptations. A generalized reputation of ‘trustworthiness’ developed through mutual dealings (Poppo and Zenger 2002) prevents local governments from breaking a trust. The political, economic and social costs of reputational damage from non-trustworthy behavior could be very high. Networks of exchange relationship among local governments also constrain opportunistic behavior through the quick spread of (bad) news within the network or through other forms of group sanctions. Consistent with Ostrom’s (1990) views, service agreements also shape the behavior of local governments in exchange. These agreements work as a basis for formalizing shared expectations and assumptions of what constitutes accepted behavior and, as a result, open up further avenues of cooperation that otherwise would not be feasible (Arrighetti, et. al. 1997). Hence, our hypothesis is:

- H3: The relationship between trust resulting from previous exchange and interlocal cooperation is linear: the greater the level of previous exchange, the higher the interlocal service cooperation.

Data, Measures and Method

In order to test the above hypotheses, we use regression analysis to estimate the impact of transaction characteristics of service and social trust on the likelihood and the level of interlocal cooperation for all Georgia cities with populations above 2,500 listed in *The Municipal Year Book 2002*. Our analysis is cross-sectional and uses the latest Census of Government Finance data for the year 2002. The unit of analysis is city and service type for eleven different city level services chosen because measures of asset specificity and measurement difficulty are available for each of them⁴. Data were obtained from the

Census of Government Finance, The Municipal Year Book 2002, and the Census of Population 2000.

We first discuss the measures that affect the level of cooperation followed by the factors that determine the likelihood of cooperation. The details of the variable construction are reported in Table 2.

Table 2 about Here

Measures for the Level of Interlocal Cooperation

For the analysis of the level of interlocal cooperation, the dependent variable is the amount of expenditure (or payments) a city has made to other local governments for the supply of each of the eleven public services. Our measure of interlocal service collaboration is fiscal and is consistent with the previous studies (see Bickers and Stein 2004; Campbell and Glynn 1990; Post 2002; Rawlings 2003). It includes a city's expenditure for payment-for-service and/or joint service agreements to other local governments. Furthermore, this is the only fiscal measure available by service types suitable to our unit of analysis⁵. However, this measure is conservative as it excludes informal and non-fiscal portions of formal cooperation⁶. We transformed the variable into a per capita measure to account for heteroscedasticity.

Asset specificity and measurement difficulty of a service in exchange are the key independent variables. We employed the asset specificity and measurement difficulty scales developed by Brown and Potoski (2003). These measures are based on the perception ratings of randomly selected city managers and mayors across the country. These values are the average of the ratings given to each measure on a scale of 1 to 5 for

each service. Higher values for a particular service in the respective scales indicate higher asset-specificity and greater measurement difficulty. We use linear terms - *asset specificity*, *measurement difficulty* - and their corresponding quadratic terms - *asset specificity squared*, *measurement difficulty square* - in order to capture the hypothesized inverted U-shaped relationship between each of these measures and interlocal collaboration (H1, H2).

Another independent variable of interest is *the level of trust* between cooperating cities as indicated in their previous cooperative interactions. We operationalized these relationships based on a city's level of interlocal service expenditure in the past. Since a city's interlocal expenditures are investments in payment-for-service or joint service agreements with other local governments, a higher degree of investment in these activities would generally mean greater level of trust between exchange partners. We used 1997 per capita interlocal service expenditure to capture this measure. This is the latest census available which is conducted in every five year intervals.

Two fiscal variables included in the analysis are *city's per capita property tax revenue* and *per capita intergovernmental grants* (federal and state). Cities fiscal health is largely dependent on their fiscal capacity and on federal and state grants. Any decline in these revenue sources would put them under severe fiscal pressure. When cities are fiscally stressed, they tend to seek alternative delivery mechanisms to cut down delivery costs (Ferris and Graddy 1986; Nelson 1997). Cooperation with other local governments in service provision is one obvious option since it gives cities leverage to cope with fiscal hardships (Stein 1990). We expect that cities facing greater fiscal stress will cooperate more than those that are in less fiscal pressure.

Measures for the Likelihood of Interlocal Cooperation

In addition to characteristics of services, social trust, and fiscal measures, we include several other variables that affect the likelihood of collaboration. These include externalities, economies of scale, demographic heterogeneity, form of government, demand for services, and the availability of potential providers.

Externalities and economies of scale motivate cooperation. We follow Post (2002) and Bickers and Stein (2004) and use geographical density of local governments to capture the externalities effects. Since the geographic density measures the spatial distribution of local governments, it has potential to capture the inter-jurisdictional spillovers. Higher density of local governments implies greater spillover effects. We operationalize the variable by dividing the number of general purpose local governments in a county by the land area of the county. A U-shape relationship is expected between spillover effect and the likelihood of cooperation. When spillover problems are low, cities may be less willing to cooperate because the gain from service cooperation may not be high enough to outweigh the transaction cost risks involved. But after some point, when the spillovers effects get higher, they may be willing to enter into service collaboration because the gains from collaboration could be higher than the transactions cost risks. *Spillover* and *spillover squared* variables are used to capture the hypothesized nonlinear relationship.

Generally, larger size increases the likelihood of gain from economies of scale. Hence, smaller cities may find scale economies easier to achieve by turning to an area-wide government provider (Morgan and Hirlinger 1991) or by joining other local governments. Large cities, on the other hand, may feel less pressure to join with other local governments to gain from economies of scale because of their greater size, even though they may also

gain by cooperating with others. Scale is typically measured by population size (Nelson 1997; Jossart-Marcelli and Musso 2005). Hence, we use population in thousand to measure the *economies of scale*.

Demographic heterogeneity increases transaction costs, reducing the likelihood of collaboration. It reflects economic and political power asymmetries that create problems for fair division of benefits between different groups. Aggregating community preference is more difficult in a heterogeneous community than in a homogeneous community; thus, demographic heterogeneity also increases agency costs for local officials negotiating agreements on behalf of cities. We calculated a weighted racial heterogeneity index from the racial composition data which is the sum of the squared proportion of the population of each race in a city⁷.

A *council-manger government* dummy variable, coded 1 if the city has a council-manger government, and 0 otherwise, measures the form of government. Council-manger government is often considered innovative and efficiency oriented in comparison to mayor-council government (Ruhil, et. al. 1999). Furthermore, professional managers share information and diffuse best practices in an isomorphic fashion through the profession (Brown and Potoski 2003). This reduces information search costs for transactions. Thus, service cooperation is expected to be more likely in cities with council-manger government than in cities with mayor-council government.

Median household income is included to measure the residents' effective demand for services. Since the nature of the need and ability to pay for the service differ between poor and rich communities, both communities may opt for interlocal service agreements (Morgan and Hirlinger 1991). Communities with low income may be motivated for

collaboration in order to maintain or increase their services by cutting down the costs. Rich communities, on the other hand, may enter into cooperation for additional quantity or higher quality services because of their increased ability to pay for those services. A U-shape relationship is expected between community income and the likelihood of interlocal cooperation.

Finally, the availability of potential service providers and their proximity also affect the likelihood of interlocal cooperation. Availability of potential providers may generate market-like conditions for a city (Stein 1990) or it may increase cities' potential for entering into service agreements since they may find other local government providers to work with (Morgan and Hirlinger 1991). Because of this ambiguity, Krueger and McGuire (2005) suggested to measure heterogeneity (or homogeneity) between local governments, not simply their counts, to capture the notion of interlocal competition. They argued that homogeneous local governments compete while heterogeneous local governments cooperate although this relationship is not substantiated in an MSA level study (Krueger 2006). Since geographic proximity matters in the case of local service provision, we included two binary location variables - *metropolitan status of a city* and *whether a city is located in a populous county* - to capture both the potential availability of external providers and the notion of geographic proximity. For a city, location in a populous county better represents closeness than location in an MSA. We expect a higher likelihood of either effect (competition or cooperation) in the case of former. These binary measures are coded 1 if the city is located in the MSA/micropolitan area or above average populous county, 0 otherwise.

The summary statistics reported in Table 2 show that there are 1,793 observations in the sample, of which 116 report interlocal service expenditures. The means and standard deviations indicate variation across observations. With respect to binary variables, about 54 percent of the cities have council-manger form, 22 percent are located in metropolitan areas, 36 percent are located in a more populous county and about 8 percent have previous fiscal exchanges. Although the sample (N=163) consists of more than 90 percent of total municipal population, it includes only 32 percent of Georgia cities because the sample does not include cities with populations below 2,500.

Estimation strategy

Not all cities engaged in interlocal service collaboration, and cities that did not collaborate report zero interlocal service expenditures. As a result, degree of collaboration is observed only for the cities that collaborate. Analysis of only cities that entered into service collaboration, or of all cities (including those that did not collaborate) separately would lead to biased estimates. Since we are interested in investigating both the likelihood interlocal service collaboration as well as the level of collaboration conditional on the choice of collaboration, we employ a Heckman two-step sample selection model (Wooldridge 2003). The Heckman two-step procedure consists of two equations in a single model and jointly estimates the likelihood of a city entering into collaboration taking into account all the cities in the sample, and the level of service collaboration, given the city's likelihood collaboration in the first place.⁸ The procedure uses probit estimation in the first stage using all observations and computes the inverse mills ratio. In the second stage, it estimates an OLS model of outcome equation including the inverse mills ratio in the model

using the subset of the sample. When two equations are correlated, use of probit or OLS alone would produce biased estimates.

Results and Discussion

The results of the estimation are presented in Table 3⁹. The model is statistically significant. The selection parameter, ρ , is also significant. This confirms that the error terms of both equations are correlated justifying the use of sample selection model for empirical estimation.

Table 3 about Here

The overlap of some independent variables in both equations and the presence of quadratic terms for some variables increase the complexity of interpreting the estimates. Predicted marginal effects of the individual variables, holding all other variables constant at their mean, were calculated for substantive interpretation of the coefficients. The predicted marginal effects of significant variables are summarized in Table 4.

Table 4 about Here

Transaction characteristics of services (H1, H2)

The results indicate that the asset specificity and measurement difficulty both have significant impacts on the likelihood of cooperation. They are statistically significant with the hypothesized inverted U-shaped relationships. The calculated marginal effects of these variables on the changes in the probability of interlocal service collaboration reveal that the asset specificity has the largest effect. When asset specificity is low to moderate, a change of one unit in its scale above and below the mean (3.16) would increase the probability of service cooperation by about sixty-five percent; but when the asset specificity is very high,

above the mean, the same one unit change in its scale above and below the mean would decrease the likelihood of cooperation by about ten percent. In the case of measurement difficulty, the corresponding increase and decrease in the probability of service cooperation with one unit change in its scale above or below mean scale (2.65) and beyond its mean would be about twelve percent and about two and half percent, respectively.

Figure 1 shows the inverted U-shaped relationship. The vertical axis depicts the probability of entering into interlocal collaboration holding all other independent variables at their means. The horizontal axis represents the degree of asset specificity and measurement difficulty measured in scales from low to high. The figure indicates that as the asset specificity and measurement difficulty increase from their low values to moderate level (for example, to their means), the likelihood of engaging into interlocal collaboration increases. In the case of asset specificity, when its value goes up from minimum to mean, the probability of interlocal cooperation increases by about 0.08. For measurement difficulty, the increase in probability of interlocal cooperation is about 0.02 when the scale of difficulty increases from its minimum to the mean. Once the levels of asset specificity and measurement difficulty get beyond their respective means to their maximum values, the corresponding likelihoods of entering into interlocal collaboration decrease by about 0.07 and 0.03 respectively.

Figure 1 about Here

However, neither of our transaction costs variables have the expected impact on the level of service collaboration. The coefficients for the asset specificity and measurement difficulty are not statistically significant. Asset specificity has the expected direction of relationship with the level of service cooperation indicating that the amount of service

collaboration increases with the increase in the asset specificity. The coefficient for the measurement difficulty shows negative sign which is opposite to hypothesized direction of relationship. Although the reported relationship is linear, the most likely estimated relationship is U-shaped. This is contrary to our expectation of an inverted U-shape relationship¹⁰. This indicates that the transaction costs dynamics that involves both the choice and the amount of collaboration are different from the transaction uncertainties that entail only whether to collaborate or not.

Although it is not possible to test this directly from our data, we believe that the possible explanation for the likely U-shape relationship at the level of collaboration lies in the trade-off between the gains from the collaboration and the capacity to manage the uncertainties. With an increase in measurement difficulty, up to a point, the cities perhaps can manage (or bear) the transaction costs risks against the gains from collaboration. Cities generally have some internal managerial capacity for monitoring the activities which help them to manage the risks associated with the measurement difficulty. This would imply that the cities would continue to engage into payment-for-service type service collaboration with decreasing level of financial involvement as the uncertainties from measurement difficulty gets higher. But, after some point, when the transaction costs risks become too for an exchange of high financial involvement, cities perhaps switch to joint investment activities or multilateral compacts to minimize the transaction cost risks. This tendency would then lead to increase in the amount of service collaboration beyond some point as the risk of financial involvement gets higher associated with the measurement difficulty in transaction. Further investigation is required in this regard.

Previous Exchange (H3)

The result supports the hypotheses that social trust built through past exchange affects both the level and the likelihood of service cooperation. The marginal contribution of previous exchange for all cities is about 0.045; that is, an increase of one hundred dollars in the past interlocal service expenditures to other local governments above or below its mean would increase the interlocal service collaboration by about four and half dollars. For cities already in the collaboration, the expected marginal collaboration with the same amount of past exchange in service collaboration would be about fifty six dollars.

Regarding the likelihood of collaboration, an increase in the mean previous exchange would increase the marginal probability of service cooperation about two percent. This finding is consistent with Thurmaier and Wood (2002) who contend that local governments prefer to engage into service agreements with other local governments relative to the private sector because of lower monitoring costs due to greater degree of mutual trust compared to the private vendors.

Other variables

Consistent with our general expectation, cities facing decline in their own fiscal capacity (measured by property tax revenue) increased their level of interlocal service cooperation. However, the effect is small. The marginal effect of a decrease of thousand dollars in per capita property tax revenue, holding all other variables constant at their means, would increase the marginal interlocal service cooperation by about one and half dollars for all cities and by about thirty dollars for cities that already engage in cooperation. The externalities, measured by the density of local governments, also significantly affected

the likelihood of service collaboration. The predicted U-shape relationship is statistically significant confirming that cities do not cooperate when spillover effect is low or moderate. But they enter into collaboration when the spillover effect is very high and these gains outweigh the transaction costs. When the density of local government is low to moderate, one unit change in the density above or below its mean (1.67) would decrease the probability of service collaboration by about two and half percent. But when the density of local government is very high, the same one unit change in the above or below the mean of the squared density of local governments would increase the likelihood of service cooperation by about four percent. We also find support for our expectation that cities located in more populous counties are more willing to collaborate on services than those located in less populous counties indicating a market-like affect from multiple providers in their vicinity. However, the marginal impact is very small, about one and one-half percent decrease in the probability of service collaboration. Intergovernmental grants did not significantly influence either the likelihood or the level of interlocal service collaboration. Likewise, other variables in the analysis such as economies of scale, cities located in MSA, council-manger government, median income, and demographic heterogeneity did not significantly affect the likelihood of interlocal cooperation.

Conclusion

We argued that transaction cost risks across service types and generalized social trust grounded in repeated action are critical in determining the likelihood as well as the extent of interlocal service collaboration in the supply of local public goods. While the findings consistently support our contention with respect to the likelihood of interlocal collaboration, we did not find evidence of the impact of the asset specificity and

measurement difficulty on the level of interlocal service collaboration. The results clearly reveal that the transaction characteristics of goods are significant in influencing the collaboration choice of cities – the first stage of the collaborative decision process. This is consistent with the basic transaction cost theory which predicts the behavior of actors in choosing discrete governance mechanisms in a transaction cost minimizing way (Williamson 1991). But once they are engaged in collaboration, the level of collaboration depends on the degree of their past dealings – which shape social trust - and the amount of fiscal pressure they face.

This analysis contributes to the existing literature on institutional collective action in several ways. First, the findings provide additional evidence that the local governments can and do solve problems of mutual interests collectively. Second, we bring social exchange theory into the transaction cost analysis of institutional collective action to better understand the intricate connection between social structure and embedded economic exchange that affect collective action. This is consistent with observations made from several scholars calling for a need to bring theories from other disciplines to complement public organization theory to better explain the complex real world reality (Brown and Potoski 2003b; Feiock 2005; Thurmaier and Wood 2002). Third, while previous studies have employed aggregate-level analysis, we investigate interlocal collaboration across various service types to uncover the more complex transaction cost motivations and risks associated with service exchange. Fourth, we explicitly modeled the two-stage decision process involved in interlocal collaboration which, to our best knowledge, has not been done before and which better approximates the reality than extant research. Finally, the further evidence of local institutional collection action produced here helps advance the

discourse on local governance and policy choices. If local governments can collectively solve problems of mutual interests arising out of economies of scale and externalities without third party involvement, then the existing role of higher level governments needs to be reconsidered. Instead of creating distortions in local collective action and governance processes, either through the regulation or price mechanism, higher level governments might, instead turn toward facilitating local collaborative processes for solutions to local problems.

This study is limited to Georgia cities; hence, generalization cannot be made across all cities or to other units of the local governments in general. However, our focus on service level may give some leverage to extend the finding across service types. Future research should examine whether our results apply more generally by including larger sample of local governments and/or larger portfolio of services. Another limitation is that this study highlights the snapshots of collaborative behavior of cities. We do not know how transaction cost risks and other factors influence interlocal collaboration over time. Use of panel analysis should provide further insights on the dynamics underlying such behavior. Furthermore, our fiscal measure of trustworthiness is imperfect. We tried to capture the notion of experience-based trust based on the idea of repeated action and norms of reciprocity. Future studies should develop alternate measure of trust such as a perception-based scale to better match the theoretical construct.

Finally, interlocal service collaboration research should advance in two further dimensions. One, the transaction cost theory assumes symmetric distribution of transaction risks between or among exchange partners. But this may not be the case. Actors, cities in our case, vary in their capacity to assess and manage transaction risks. Hence, they are

likely to face different level of risks in exchange which may affect their propensity of collaboration differently. Examining of risk asymmetry among actors will greatly improve our understanding of the transaction cost uncertainties affecting the interlocal collaborative behavior and its outcome. Two, study of interlocal service collaboration is incomplete if the pattern of such collaboration is not investigated. Local governments create networks in service collaboration. Different network structures are thought to be the responses to different transaction cost problems that arise in exchange. We still know very little about how these network structures emerge and how they help minimize the exchange hazards.

¹ Provision and production units need not be the same in their model. Provision unit is a political authority that aggregates community preference, allocates resources, decides on means or makes rules governing the behavior to meet the demands (for example, zoning laws). Production unit, on the other hand, could be a department of a provision unit itself or a private sector, including non-for-profits that actually produces and delivers the service decided by the provision unit (Ostrom, Tiebout and Warren 1961).

² The study sample, Georgia cities, shows that cities spent on average \$50 per capita for interlocal collaborative activities compared to total expenditures of about \$1,953 per capita for all activities in 2002. A cross service comparison reveals that the mean per capita total expenditure was the highest for the police service (\$216.36) and was the lowest for the parking services (\$0.68). The highest mean per capita interlocal expenditure was about \$4.5 for solid waste management service whereas the services like financial administration and parking did not have interlocal expenditure in the year 2002 (Table 1).

³ These are site specificity (fire stations close to the communities), physical asset specificity (water treatment plant for the production of potable water), human-asset specificity (forensic expertise), temporal specificity (distribution of emergency medical vehicles for timely emergency response), and process-specificity (customized computerized billing). For details, see Williamson (1991) and Zaheer and Venkatraman (1995).

⁴ The Census of Government Finance reports 21 services. The study includes 11 services. They are financial administration, fire protection, public health, roads/streets, library, parking, parks and recreation, police protection, protective inspection, sewerage, and solid waste management for which the asset specificity and measurement difficulty scales are available. These scales are not available for housing and community development, natural resource management, welfare, and water transport. Air transportation, correction, education, hospital, and transit services are excluded because they are generally managed at regional levels.

⁵ Revenue measure – local intergovernmental revenue – is available, but it lacks disaggregation by service type. See Krueger and McGuire 2005 and Krueger 2006 for the use of the revenue measure.

⁶ In the case of Minnesota, the size of informal cooperation was reported to be as high as 28 percent (Beth Water Honadle and Patricia Weir Love, *Choice for Change: A Guide to Local Government Cooperation and Restructuring in Minnesota* (<http://www.extension.umn.edu/distribution/citizenship/DH6541.html>))

⁷ The formula used in calculating the weighted racial heterogeneity index is: $1 - \sum (n_i/N)^2$, where N is total population in a city and n_i is the number of people belonging to the i-th race (Annett, Anthony, 2001, “Social Fractionalization, Political Instability, and the Size of Government”. IMF Staff Paper, Vol. 48:3).

⁸ More formally, the two equations can be written as

$$y^* = \beta x_i + \varepsilon_i \quad (1)$$

and
$$y = \gamma \omega_i + v_i \quad (2)$$

where y^* (equation 1) is the outcome dependent variable measuring the level of interlocal collaboration, and y (equation 2) is the selection dependent variable measuring the likelihood of service collaboration (scored 1 if the city enters into collaboration, otherwise 0). y^* is observed when $y > 0$. x_i and ω_i are outcome equation and selection equation independent variables, respectively. β and γ are coefficients corresponding to outcome equation and selection equation variables. The two parts of the model are tied together through the joint error process, which is represented as bivariate normal distribution in which the correlation is determined by the parameter ρ . The explanatory variables x_i are subset of ω_i to satisfy the exclusion restriction condition (Wooldridge 2003).

⁹ We used Stata 9 to estimate the models. The model without ‘city located in populous county area’ was also estimated because there was a correlation of .64 between ‘populous county area’ and ‘density of local government’ variables. However, we did not find major difference on the results. Since these two variables measure different theoretical concepts, we included both variables in the final model.

¹⁰ The quadratic terms of these variables were dropped from the final analysis because they were not statistically significant. For the measurement difficulty, the first term was significant at about $p = .05$ and the second term was significant at $p < .1$ levels. When the joint effect of the variable was calculated including the quadratic term, the coefficient was not significant at $p < .05$ level (at 95 % confidence interval: -23.18 to 0.89); hence, we dropped the quadratic term from the outcome equation in the final model.

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Table 1: Per Capita Mean Total and Interlocal Expenditure by Service in Sample Cities, 2002 (in dollars; N=163)

Service	Per capital total expenditure		Interlocal expenditure	
	Mean	Std. dev.	Mean	Std. dev.
Financial service	23.06	29.79	0.00	0.00
Fire protection	80.18	62.80	1.08	9.05
Health	3.46	16.48	0.05	0.47
Roads	119.44	164.68	0.35	2.14
Library	8.22	17.67	2.33	8.29
Parking	0.68	6.22	0.00	0.00
Parks & recreation	68.71	187.90	2.13	7.40
Police protection	216.36	145.39	1.91	14.96
Protective inspections	11.09	15.89	0.00	0.00
Sewerage	133.70	152.25	0.00	0.00
Solid waste management	93.45	61.44	4.47	12.44

Table 2: Descriptive Statistics and Variable Construction

Variable	Variable Construction	Mean	Std. Dev.	Min	Max
<i>Dependent Variable</i>					
Interlocal cooperation	A city's per capita expenditure (payments) to local governments by service in 2002 in dollars (Census of Government Finance, 2002)	1.11	7.42	0.0	170.64
<i>Independent Variables</i>					
Asset specificity	5-point scale average (Brown & Potoski, 2003)	3.16	0.53	2.36	4.09
Asset specificity ²	5-point scale average squared	10.26	3.38	5.56	16.72
Measurement difficulty	5-point scale average (Brown & Potoski, 2003)	2.65	0.63	1.53	3.74
Measurement difficulty ²	5-point scale average squared	7.42	3.46	2.34	13.98
Level of Trust (past relation)	A city's 1997 per capita expenditure to local governments by service in dollars (Census of Government Finance, 1997)	1.04	6.09	0.00	118.92
Own source revenue	A city's 1997 per capita property tax revenue in dollars (Census of Government Finance, 1997)	140.69	227.17	0.00	2619.90
Intergovernmental grants	A city's 1997 per capita grants from federal and state governments (Census of Government Finance, 1997)	41.45	82.10	0.00	800.88
Policy spillover (density/100 sqm)	Geographic density of general purpose local governments controlling for the County area in 100 square mile (Census of Government, 2002)	1.67	0.92	0.22	4.72
Policy spillover ²	Policy spillover squared	3.65	4.38	0.04	22.37
Economies of scale	A city's population in thousand (US Bureau of Census, 2000)	16.18	38.75	0.22	416.47
Demographic heterogeneity	Weighted racial heterogeneity index: sum of the squared proportion of the population of each race in a city (US Bureau of Census, 2000)	0.45	0.12	0.07	0.70
Council manager	Scored 1 if city has council-manger form of government, 0 otherwise (The Municipal Year Book, 2002)	0.53	0.49	0	1
Income	Median household income in 1000 dollars (US Bureau of Census, 2000 and city-data.com website)	33.30	12.53	16.4	84.03
Income ²	Income squared	1265.91	1103.57	268.96	7062.38
City located in metropolitan area	Scored 1 if the city is located in metro or micropolitan areas, 0 otherwise (Office of Management & Budget)	0.22	0.41	0	1
City located in populous county area	Scored 1 if the city is located in a county with population above the mean population across counties, otherwise 0.	0.26	0.44	0.00	1

Table 3: Heckman two-stage results for the level of interlocal cooperation between Georgia cities, 2002

Independent Variables	Coef.	Std. Error
<i>Level of Cooperation (outcome equation)</i>		
Asset specificity	11.58	8.10
Measurement difficulty	-5.19	5.40
Level of trust	1.14***	0.22
Own source revenue	-0.04***	0.02
Intergovernmental grants	0.0004	0.018
Constant	-31.34	26.62
<i>Likelihood of Cooperation (Selection equation)</i>		
Asset specificity	16.62***	2.71
Asset specificity ²	-2.46***	0.40
Measurement difficulty	3.12**	1.38
Measurement difficulty ²	-0.62***	0.23
Level of Trust	0.05***	0.006
Own source revenue	-0.0013**	0.0006
Intergovernmental grants	0.0007	0.0006
Spillover	-0.61***	0.23
Spillover ²	0.11**	0.04
Economies of scale	0.0006	0.002
Demographic heterogeneity	0.26	0.58
Council-manger	0.12	0.11
Income	-0.0008	0.0073
City located in metropolitan area	-0.06	0.15
City located in populous county area	-0.49*	0.25
Constant	-32.32***	5.35
Lamda	12.55**	6.03
Rho	0.55	
Wald chi2	145.7***	
Number of observations (uncensored)	1793 (116)	

*** p <.01; ** p <.05

Table 4: Predicted marginal effects of independent variables on the extent and probability of interlocal cooperation of Georgia cities, 2002

Variable	Δ Level of Interlocal Cooperation		Δ Probability of Cooperation
	Conditional	Unconditional	
<i>Outcome equation</i>			
Level of trust	0.56	0.04	
Own source revenue	-0.03	-0.001	
<i>Selection equation</i>			
Spillover			-2.4 %
Spillover ²			0.4 %
Level of trust			0.2 %
Own source revenue			-0.005 %@
Asset specificity			65.2 %
Asset specificity ²			-9.6 %
Measurement difficulty			12.2 %
Measurement difficulty ²			-2.4 %
Populous county area			-1.5 %

@ Significant at $p < .1$

Figure 1

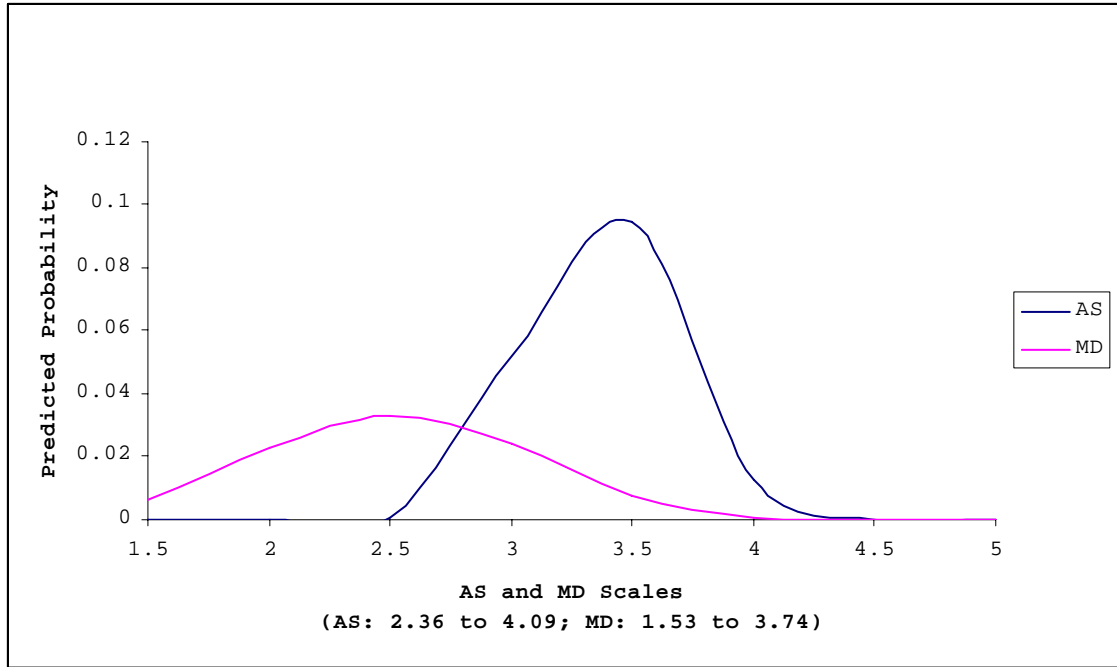


Figure 1: Predicted Probability of Cooperation by Asset Specificity (AS) and Measurement Difficulty (MD)