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Bureaucrats as Entrepreneurs: Do Municipal Telecommunications Providers Hinder Private Entry?*

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Abstract

We consider how government-owned enterprises affect privately owned rivals. Specifically, we compare markets in which municipally-owned telecommunications providers in the United States serve and markets that competitive local exchange carriers (CLECs) serve. We find that while municipal participation and CLEC participation often occur in the same geographic markets, this is a correlation rather than a causal relationship. Importantly, we find that municipal participation does not preclude CLEC participation in markets served by only an incumbent telecommunications provider. Competition among CLECs and between CLECs and municipalities appear to be similar which supports advocates of allowing municipal telecommunications providers to compete in telecommunications markets nationwide. These results, and the finding that municipal entry restrictions have had little effect, are an important step in a more thorough analysis of the effects of municipal telecommunications provision on entry, investment and consumer welfare.

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I. Introduction

Situations arise in which government-owned enterprises compete against privately-owned firms. Examples include the state-run postal services competing against package carriers such as Federal Express, government-owned lotteries competing against private gambling businesses, and public schools in many countries that compete with privately-owned schools. For the government, which sets the rules for competitive markets, to also be a competitor raises issues of whether the government will play fairly. In a 2003 paper analyzing such competition, Sappington and Sidak show that government-owned enterprises may have greater incentives to create barriers to entry than do private firms. Similarly, Edwards and Waverman (2004) show that European national regulatory authorities have a greater tendency to favor incumbent telecommunications providers in issues related to competition when the providers are at least partially government owned. There are also concerns that simply the presence of a government-owned enterprise may dissuade a legitimate, private entrepreneur from entering a market.

On the other hand, a government-owned enterprise may provide a service that the citizens view as important, but that may not be commercially feasible for a private operator. For example, the American Public Power Association (APPA) argues that a municipally-owned utility providing telecommunications services enjoys unique cost advantages over a private company and so, in some instances, may be the only commercially-viable rival to an incumbent local exchange telephone company (APPA, 2006a).

In this paper, we consider entry and exit of competitive local exchange carriers (CLECs), taking into account the existence of other CLECs and government-owned enterprises that compete in the market. A CLEC is a privately-owned, telecommunications provider that enters a market in competition with an incumbent provider. Government-owned enterprises in this case

refer to municipalities that choose to provide telecommunications services in competition with an incumbent provider. We find that the presence of a municipal provider in a market does not negatively affect the probability that a CLEC also serves that market. We do not address questions about the effects of municipal provision of telecommunications on incumbent companies, customers, or taxpayers.

The literature describing changes within the telecommunications industry subsequent to The Telecommunications Act of 1996 is abundant.[1] Most closely related to our work are those papers focusing on CLEC entry. Zolnierek et al. (2001) find that CLECs are more likely to enter more urbanized areas and jurisdictions with more favorable CLEC entry policies. Roycroft (2005) also examines CLEC entry, focusing on a subset of California markets, using a different measure of geographic market boundaries, and using a different measure of regulatory influence than we use in our estimations. Jamison (2004) finds that when regulators require incumbents to charge lower prices for unbundled network elements relative to their costs, that incumbents act to limit CLEC entry by delaying negotiations with CLECs or making implementation of interconnection service difficult.[2] Other studies find that CLECs building their own networks are more successful than those that do not build but instead lease lines from the incumbent (Foreman, 2002; Crandall, 2002).

Currently there is controversy in the United States over whether municipalities should be permitted to offer telecommunications services in competition with private companies. Some observers believe that municipal investment in broadband telecommunications affords important competition for incumbent telecommunications providers and cable television providers. For example, the cities of Spokane, Washington, and Concord, Massachusetts, began offering

[1] For summaries of the literature, see Jamison (2004) and Roycroft (2005).
[2] Unbundled network elements are portions of an incumbent's network that CLECs are allowed to lease and use for providing service in competition with the incumbent.

broadband telecommunications for the stated purpose of providing citizens with more advanced broadband services than the incumbent telecommunications providers were offering (APPA, 2004a). There are a myriad of reasons municipalities have asserted for entering the telecommunications market including providing citizens with services private companies cannot or will not; offering lower prices than the incumbent; and taking advantage of scale economies available to municipalities providing power as well. This positive motivation, however, is not without question. Some observers raise concerns that government-owned service providers have an unfair advantage over private operators, are essentially subsidized by captive taxpayers, and crowd out more efficient private investment. Based on these or similar concerns, fourteen states have adopted either a complete ban on municipal entry in telecommunications, or have created significant barriers to entry (APPA, 2006b).

This paper addresses a gap in the literature by analyzing whether municipalities' increasing propensity to offer telecommunications services appears to affect participation of CLECs. Our primary finding is that while municipal entry is increasing, it appears that municipalities do not inhibit CLEC entry, but rather entry and exit are correlated as shown in Figure 1. In markets served only by an incumbent local exchange provider (ILEC), the presence of a municipal provider does not decrease the probability of a CLEC also serving that market. In markets already served by at least one CLEC, the presence of a municipal provider is positively correlated with CLEC entry rather than exit. This result is unexpected for those fearing municipalities crowd out private entry. Finally, it seems that restrictions that various states have imposed on municipal telecommunications provision have not deterred municipalities from providing telecommunications services.

[INSERT FIGURE 1 HERE]

II. Background

US statutes provide that no state regulation should prohibit any entity from providing telecommunications services, but in 2004 the US Supreme Court ruled that this does not prohibit states from adopting restrictions on local governments providing telecommunications services.[3] The Supreme Court ruling has not stopped legislators from continuing the battle. In May 2006, Texas representative Joe Barton submitted a bill to the US House of Representatives including a condition against prohibiting municipal provision of broadband services. Also in May 2006, Senator Ted Stevens of Alaska submitted a bill with a similar provision.[4] A majority of states (39) use Dillon's Rule to define formally legal rights of local governments, however its application in the case of telecommunications provision is ambiguous.[5] Although the main reason for allowing states to restrict municipal provision is a states' rights argument and the federal government generally remains concerned about inhibiting competition, the result of the ruling is still the same: states may restrict municipal provision of telecommunications services, or may choose not to grant permission for provision. As of June 2006, the following states had passed laws restricting municipal entry into telecommunications: Arkansas, Florida, Minnesota, Missouri , Nebraska, Nevada, Pennsylvania, South Carolina, Tennessee, Texas, Utah, Virginia, Washington, and Wisconsin. The setback for municipalities is not complete however, as the Federal Communications Commission (FCC) has indicated that while states may have the right to restrict municipalities, states should not inhibit competition.[6]

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[3] U.S. Supreme Court, 541 U.S. (2004), Numbers: 02-1238, 02-1386, 02-1405. March 24, 2004.
[4] See Title IV – Municipal Provision of Services, Section 401, and Senate bill S2686, The Communications, Consumer's Choice and Broadband Deployment Act of 2006.
[5] Dillon's Rule states allow local governments only that authority specifically granted to them by state law.
[6] See the Opinion of the Court delivered by Justice Souter, U.S. Supreme Court, 541 U.S. (2004), Numbers: 02-1238, 02-1386, 02-1405. March 24, 2004.

It is important to address the question of restrictions on municipal provision of telecommunications as the number of municipalities providing such services steadily increased from 207 in 1999 to over 506 in 2003 despite restrictions.[7] Overall, a total of 675 municipalities participated in providing some form of communications service from 1999 to 2003. Given that the number of CLECs decreased from 1,528 in the year 2000 to 843 in 2002, one might wonder whether some of these CLECs were displaced by municipal providers. Figure 2 shows the total number of municipal and CLEC telecommunications providers per year from 1999 through 2002.

[INSERT FIGURE 2 HERE]

For their part, state and local governments have been taking up the question and addressing related concerns often through consideration of studies of municipalities that have already entered the telecommunications market. Such case studies are often well–documented and the results hotly contested. Giovanetti (2004, p. 1) states: "These projects frequently go sour. In fact, all across the country, cities are beginning to suffer from ill-fated municipal broadband projects." The article continues to cite an instance in which "millions of dollars of cost overruns have forced the city to borrow from other city funds in order to cover the overruns." The Progress and Freedom Foundation has reported similar findings.[8] Countering the objections are groups like APPA, which maintains a database of public power companies that have entered the broadband market, and publishes both a brief fact sheet and a booklet titled "Community Broadband: Separating Fact from Fiction," in which many of the concerns raised by private executives and public officials are addressed.

[7] These data are from the APPA Annual Directory and Statistical Reports covering the years 1998 to 2002.
[8] See Progress on Point Releases 9.7, 10.17 and 11.3 for additional details.

III. Theory and Hypotheses

We assume that a CLEC decides whether to enter a market based on its expected profit in that market. Intuitively, entry occurs only if potential entrants expect prices after entry to be great enough to cover costs. More specifically, we can assume that CLECs' profit expectations are based on estimated profits prior to entry, relative to entry barriers. [9] These profit expectations are determined by anticipated customer demand, projected costs, regulatory policies, and the expected number of rivals. Estimating demand as a prerequisite for understanding determinants of CLEC entry involves consideration of expected future prices (post CLEC entry) and costs; in other words, expected marginal revenue and marginal cost. Estimating demand in telecommunications markets is, however, more complex than in perfectly competitive markets. Under imperfect competition, changes in the elasticity of demand caused by any exogenous variable alter the expected marginal revenue of entrants. This makes the determination of demand given entry more difficult to estimate. In this paper, we do not attempt to estimate demand or to determine the optimal number of telecommunications providers in any particular area. Rather, we take demand as exogenously determined and estimate the effects on CLEC entry based solely on whether a competitor is another CLEC or a municipality. This allows us to focus on inherent differences in type of provider, assuming factors affecting participation are exogenously determined. Therefore, we expect greater customer demand, lower provider costs, and pro-CLEC regulatory policies to result in a higher probability of CLECs serving a market. This is consistent with the empirical research that we cite in the Introduction to this paper. If CLECs view a municipal provider as a competitor with an unfair advantage, then we would expect the presence of a municipal provider in a market to decrease the probability of CLEC presence in that market. This leads to our main hypothesis, namely, that CLECs view a

[9] See Bain, 1956.

municipal provider as providing competition equivalent to that of another CLEC. That is, municipalities either do not have or do not take advantage of any benefit they may have as a result of being a government owned entity in a manner that deters CLEC entry. If our hypothesis is true, we would expect CLEC entry in the presence of a municipal provider at the same rate as CLEC entry in the presence of another CLEC, all else equal. We test this hypothesis by comparing CLEC entry and exit in the presence of municipal providers and in the presence of other CLECs. Our analysis then considers entry and exit of CLECs in competitive environments characterized by varying numbers of competitors, and addresses the effect(s) of the competitive environment on CLEC entry and exit. Central to the issue for this research is the presence or absence of a municipality providing telecommunications services.

IV. The Dataset

We compiled a dataset that includes all CLEC and municipal providers by city in the US telecommunications market over the four-year period from 1999 through 2002. We then aggregate the city level data to the county level, accounting for the number of cities per county and the overall size of the county in terms of both population and geographic area. Tables 1 and 2 describe and summarize the variables for our models in addition to listing the data sources. The data can be divided into three categories: demographic indicators of demand; data on the competitive environment with respect to telecommunications; and regulatory environment indicators.[10]

[10] Services supplied by municipal providers include those used for the city's own operations (meter reading, municipal data network, supervisory control and data acquisition, and voice) and those provided to others (cable television, long distance telephone, Internet access, broadband, fiber leasing, local telephone, etc.). Municipal provider data is from the APPA. CLEC data is from the annual CLEC Reports from New Paradigm Resources Group, Inc., and includes both planned and operational voice and data network services provided by CLECs.

With respect to the first category of variables, we expect demand to be positively related to household income therefore we measure this factor using the median annual household income within the county (*Median Income*). Because penetration rates for telecommunications services are close to 100% within the US, it is difficult to predict the factors that potential competitors would consider when deciding if there is enough demand to support their entry. We might assume that more highly educated individuals will understand and appreciate the availability of advanced services or reduced prices offered by a competitor so that education may influence demand; therefore, we measure the proportion of people with a college education or higher by county (*Education*). Because age, race and ethnicity may affect demand, we include the median age of the county (*Median Age*), and the proportion of heads of households who are white (*Percent White*), although we are unable to predict whether this will be a positive or negative association.[11]

With respect to the competitive environment, of primary interest are the number and type of competitors. Because our dependent variable incorporates entry and exit of CLECs, we expect whether a municipality provides any external telecommunications services to consumers will be important. Our dependent variable is the number of CLECs per county (*Number CLECs*). Our variable *Municipal* equals 1 if the municipality provides such services. We do not predict the effect of municipal telecommunications provision on CLEC participation. Note that our entry and exit data is based on city level entry by both CLECs and municipalities. Because our demographic variables are at the county level, we roll up our city level entry data to the county level and control for the number of cities per county and the total population. We expect service

[11] We considered additional population characteristics such as other races and ethnicities, language, and other measures of population density, such as urban classifications, and various demographic indicators such as the employment growth rate and personal bankruptcy rate. These variables proved to be insignificant and did not affect results, so they were excluded from the model.

provider costs to be fall with the amount of urbanization or population density and choose to measure this as population per square mile (*Pop per Square Mile*). If incumbents are able to affect entry, then we would expect a negative relationship between the variable capturing revenue per line and the price of unbundled network elements, and the probability of CLEC presence in a market. Therefore, following Jamison (2004) we include a variable to capture the potentially conflicting effects of regulation on incumbent and CLEC incentives. Regulators require incumbents to provide unbundled network elements[12] to rivals. If an incumbent finds it more (conversely, less) profitable to provide retail services than to provide unbundled network elements, we would expect the incumbent to try to limit (conversely, promote) entry. To capture this effect, we include as a variable the ratio of incumbents' revenues per line to the price charged for unbundled local telephone lines (*ILEC Profit*). This variable reflects both the competitive and the regulatory environment so may equally be incorporated into the third category of variables.

With respect to the final category of variables, the regulatory environment, we expect flexible regulation for CLECs to increase the probability of the presence of CLECs in a market, but we cannot predict in advance how this might affect municipal providers. In a few markets, regulators impose price floors on CLECs. We expect this to have a negative impact on CLEC presence. We measure these effects with the variable *Flexible Regulation* (with the excluded category all other types of regulation). We are unable to predict the possible effects of public service commissioners being appointed rather than elected (*PSC Appointed*) although it seems

[12] Leasing portions of an incumbent's network is called purchasing unbundled network elements. For example, a CLEC could lease a local telephone line from the incumbent provider. The line would connect to the incumbent's building. It could then connect to the incumbent's switch or the entrant's switch, depending on how the entrant wishes to use the incumbent's facilities. Our variable is a state-wide average based on the loop, port and switching rates per month.

logical that this would affect the regulatory environment.[13] Presumably elected commissioners are more responsive to immediate citizen concerns, but it is unclear whether this means that the commissioners might favor CLECs, incumbents, municipal providers, or none of the above. We expect the presence of effective restrictions to decrease the probability of the presence of a municipal provider so include the variable *Municipal Ban* to indicate the presence of any restrictions on municipal entry into telecommunications services. Lastly, we include a variable that measures the discretionary authority of each state's public service commission. This variable (*Discretionary Authority*) was is a ranked integer from 1 to 50 representing the fifty states. [INSERT TABLES 1 AND 2 HERE.]

V. Empirical Model and Results

We evaluate CLEC entry and exit using an ordered probit model: exit = -1; entry = 1; and no change = 0. Table Two gives results for changes in CLECs from 1999 to 2002 (using both the existence of municipals in 1999 and in any year from 1999 to 2002) and the results for yearly changes. The results in Table Two are incorrect since we lump together cities that have at least one CLEC prior to the change with those that do not. We estimate the probability of entry and exit, but exit cannot happen if no CLECs exist. Furthermore, we expect that the probability of entry will vary among cities with and without CLECs.

At each period, CLECs choose to enter cities, and this choice is influenced on the pre-existence of CLECs. In each year of our data, the change in CLECs (entry or exit) will be a function of existing CLECs. There are characteristics of cities with CLECs that have led them to be in the "CLEC > 0" sample, and there are characteristics of cities without CLECs that have led

[13] We generically refer to state regulatory agencies as public service commissions. Some states elect their commissioners. In other states they are appointed. The appointment processes vary across the states, but the processes generally involve both the governor and the legislatures.

them to be in the "CLEC = 0" sample. Thus, we can treat these two samples as selected samples using a Heckman correction. The first-stage probit estimation is reported in the Appendix, Table A-1.

Table Three reports the results from the estimation on the selected samples. For the CLEC = 0 sample, we use a simple probit since there are only two possible outcomes: entry and no change. For the CLEC > 0 sample, we use an ordered probit since there are three possible outcomes: entry; exit; and no change. The conditional probabilities are generated from the first-stage probit in the Appendix.[14] Concentrating on the CLEC changes 1999-2002, we find that the existence of a muni increases the probability of entry no matter what the pre-existing number of CLECs. Table Three also reports the marginal effect of munis on CLEC entry, with munis having a relatively larger effect when no CLECs exist and a smaller effect when using muni1999-2002.[15] The pattern of other variables is interesting. Profit is positively correlated with entry when CLEC = 0, but they are negatively related when CLEC > 0. Sample selection is significant for CLEC = 0 but not for CLEC > 0. Psuedo-R2 indicates that the model goodness-of-fit is better for CLEC = 0.

VI. Conclusion

This research indicates that municipalities may not pose a significant competitive threat to CLECs, due primarily to demographic characteristics that encourage municipal as opposed to CLEC participation. CLECs locate in more urban areas where incomes are higher and the possibility for higher revenues through selling more services to those interested in expanded capabilities is greater. Municipalities provide telecommunications services in areas heretofore

[14] The standard errors reported in Table Three are not corrected and should be viewed with caution.
[15] An ordered probit estimation results in three marginal effects of each independent variable: on entry, on exit, and on no change. We report only the effect on entry for comparison to the probit estimation for CLEC = 0.

underserved by CLECs, in which revenues are limited by both population and income of customers. Anecdotal evidence suggests municipalities participate in markets in which some residents believe services provided by the incumbent are either inadequate (typically too slow a pace of innovation to attract businesses) or too expensive. It appears further that municipal participation does not preclude CLEC participation, although the reverse may be true. These results, and the finding that entry restrictions have had little deterrent effect, are the first step in a more thorough analysis of municipal telecommunications provision. To more comprehensively analyze the possibility of crowding out, this research might be extended to incorporate effects on prices and investment, and should then be tied to theoretical research regarding the relative efficiency of private versus public entities.

An important further step is to consider who (the municipal provider, the municipality's citizens, or someone else) absorbs the commercial risk when the city becomes a telecommunications provider. Cities have claimed they do not need the high rates of return that private companies need in order to justify their investment. Considering revenues, prices and municipal funding of telecommunications investments should allow us to empirically answer the question of whether public or private entities are better able to manage risk.

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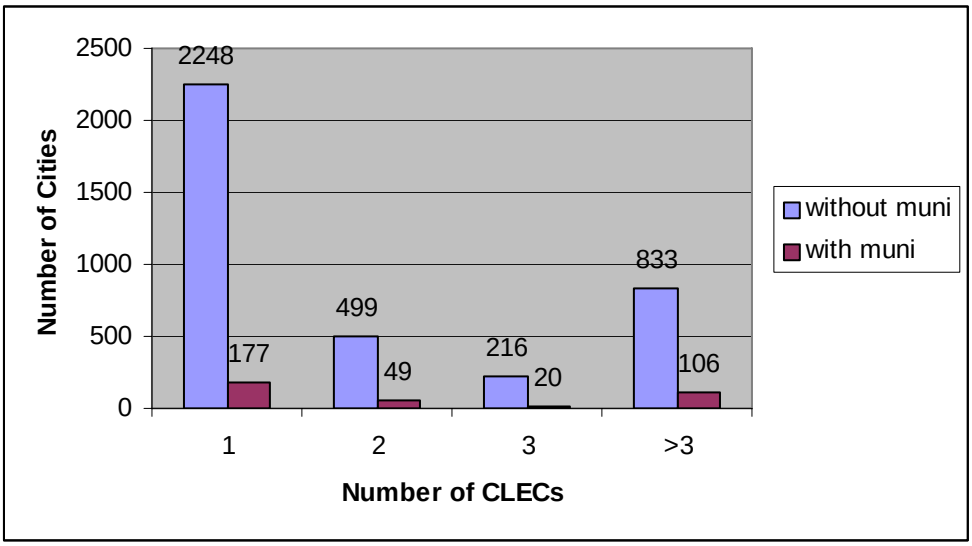
Figure 1. Total Number of United States Cities with CLECs with and without Municipal Competition, 1999 – 2002.



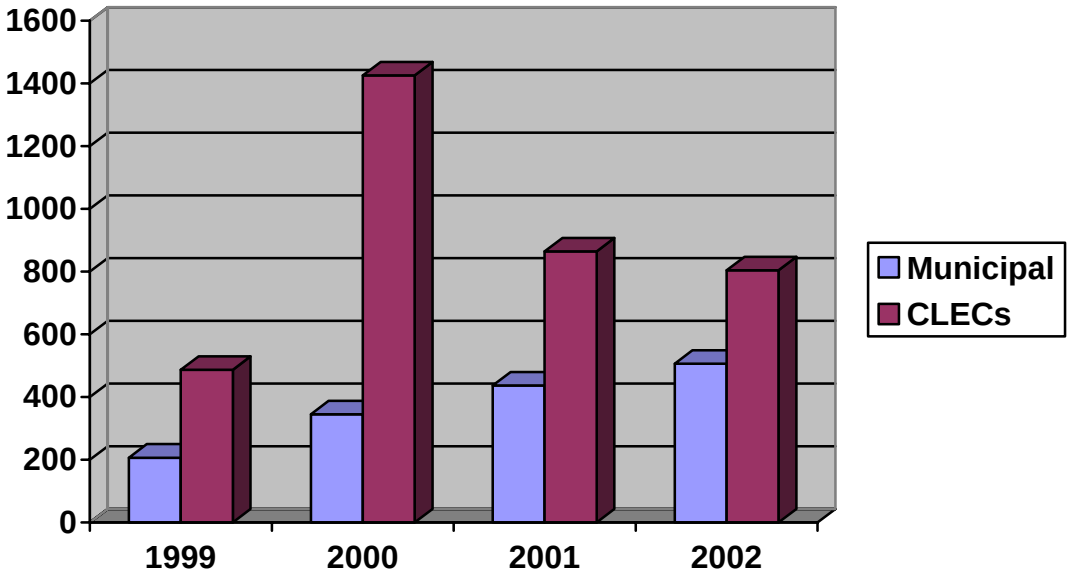


Figure 2. Total Municipal Telecommunications Providers and CLECs in the United States by year, 1999-2002.

Table One
Summary Statistics: 1999-2002
n = 203,220

Variable	Mean	Std. Dev.	Min	Max
Number of CLECs	0.050	0.724	0	48
CLEC Change 1999-2002 (n = 50,799)	0.007	0.125	-1	1
CLEC Change 1999-2000 (n = 50,799)	0.024	0.161	-1	1
CLEC Change 2000-2001 (n = 50,801)	-0.019	0.154	-1	1
CLEC Change 2001-2002 (n = 50,807)	-0.004	0.068	-1	1
Municipal 1999-2002 (n = 50,799)	0.010	0.101	0	1
Municipal 1999 (n = 50,799)	0.004	0.064	0	1
Municipal 2000 (n = 50,801)	0.007	0.082	0	1
Municipal 2001 (n = 50,807)	0.009	0.092	0	1
Municipal Ban	0.047	0.211	0	1
PSC Appointed	0.810	0.393	0	1
Flexible Regulation	0.544	0.498	0	1
Discretionary Authority	23.762	13.792	1	51
ILEC Profit	1.581	0.431	0.744	2.639
Population per Square Mile/1000	0.366	1.393	0.0001	52.419
Percent White	0.873	0.144	0.003	1.000
Median Income/1000	48.288	12.805	15.174	108.756
Education	0.847	0.077	0.474	1.000
Median Age	37.026	3.684	20.000	58.600

Table Two
Unconditional Ordered Probit Estimation Results
Dependent Variable = CLEC Change (exit, no change, or entry)

	1999-2002 n = 50,799 *municipal 1999*	1999-2002 n = 50,799 *municipal 1999-2002*		1999-2000 n = 50,799 *municipal 1999*	2000-2001 n = 50,801 *municipal 2000*	2001-2002 n = 50,807 *municipal 2001*
muni	1.160*** (0.105)	0.864*** (0.077)		1.450*** (0.094)	-1.097*** (0.080)	-1.040*** (0.108)
profit	-0.105*** (0.034)	-0.106*** (0.034)		-0.199*** (0.030)	0.172*** (0.030)	0.139** (0.060)
popsq	0.016** (0.007)	0.016** (0.007)		0.032*** (0.006)	-0.015** (0.007)	-0.036*** (0.008)
hhinc	0.007*** (0.001)	0.006*** (0.001)		0.018*** (0.001)	-0.015*** (0.001)	-0.017*** (0.002)
white	-0.107 (0.119)	-0.120 (0.119)		-0.076 (0.109)	-0.033 (0.110)	0.864*** (0.189)
educ	0.103 (0.202)	0.103 (0.203)		0.409** (0.186)	-0.137 (0.183)	-0.861** (0.377)
medage	-0.011*** (0.004)	-0.011*** (0.004)		-0.030*** (0.004)	0.021*** (0.004)	0.010 (0.008)
psca	-0.038 (0.037)	-0.032 (0.037)		0.076** (0.035)	-0.121*** (0.035)	0.108* (0.064)
clecx	0.132*** (0.029)	0.132*** (0.029)		0.026 (0.026)	0.039 (0.026)	-0.032 (0.051)
disauth	-0.007*** (0.001)	-0.007*** (0.001)		-0.001 (0.001)	-0.002** (0.001)	0.002 (0.002)
muniban	0.100 (0.063)	0.091 (0.063)		0.065 (0.054)	-0.037 (0.055)	-0.068 (0.109)
cut1	-2.993 (0.196)	-2.990 (0.196)		-3.330 (0.182)	-2.044 (0.174)	-2.956 (0.362)
cut2	1.965 (0.194)	1.972 (0.194)		1.865 (0.176)	2.874 (0.176)	3.331 (0.367)
pseudo-R^2	0.027	0.028		0.082	0.052	0.110
marginal effect of muni on prob(entry)	0.110*** (0.021)	0.060*** (0.010)		0.246*** (0.031)	-0.002*** (0.0002)	-0.0003*** (0.0001)

* significant at 10% level
** significant at 5% level
*** significant at 1% level

Table Three
Ordered Probit Estimation
Conditional on Existence of CLECs
Dependent Variable = Change in CLECs (exit, no change, or entry)

	1999-02 If clec = 0 n = 50,312 *municipal 1999*	1999-02 If clec > 0 n = 487 *municipal 1999*	1999-02 If clec = 0 n = 50,312 *municipal 1999-2002*	1999-02 If clec > 0 n = 487 *municipal 1999-2002*		1999-00 If clec = 0 n = 50,312 *municipal 1999*	1999-00 If clec > 0 n = 487 *municipal 1999*	2000-01 If clec = 0 n = 49,378 *municipal 2000*	2000-01 If clec > 0 n = 1,423 *municipal 2000*	2001-02 If clec = 0 n = 49,945 *municipal 2001*	2001-02 If clec > 0 n = 862 *municipal 2001*
muni	1.387***	0.805***	1.237***	0.441***		1.498***	0.296	0.965***	0.149		-0.099
	(0.121)	(0.229)	(0.084)	(0.170)		(0.106)	(0.254)	(0.182)	(0.137)		(0.143)
profit	-0.388***	0.679**	-0.394***	0.670**		-0.443***	0.804**	-0.251***	-0.153	0.022	-0.098
	(0.052)	(0.312)	(0.053)	(0.312)		(0.040)	(0.333)	(0.093)	(0.218)	(0.309)	(0.258)
popsq	0.067***	-0.063	0.067***	-0.062		0.075***	-0.045	0.079***	0.027	0.005	0.005
	(0.010)	(0.043)	(0.010)	(0.043)		(0.009)	(0.055)	(0.018)	(0.031)	(0.074)	(0.036)
hhinc	0.024***	-0.024	0.024***	-0.024		0.038***	-0.048*	0.028***	0.017	0.015	0.010
	(0.002)	(0.024)	(0.002)	(0.025)		(0.002)	(0.026)	(0.005)	(0.017)	(0.017)	(0.021)
white	-0.184	-0.344	-0.239	-0.272		-0.022	-0.436	-0.371	-1.009**	-0.201	1.372**
	(0.162)	(0.735)	(0.163)	(0.734)		(0.139)	(0.802)	(0.266)	(0.505)	(0.834)	(0.583)
educ	1.044***	-2.357	1.037***	-2.441		0.669***	-1.179	3.020***	-0.144	0.768	-0.799
	(0.304)	(1.563)	(0.307)	(1.560)		(0.226)	(1.681)	(0.620)	(1.003)	(1.671)	(1.219)
medage	-0.045***	0.080	-0.044***	0.076		-0.055***	0.102*	-0.061***	-0.011	-0.056	-0.052
	(0.006)	(0.055)	(0.006)	(0.055)		(0.005)	(0.058)	(0.012)	(0.038)	(0.038)	(0.046)
psca	-0.052	-0.157	-0.037	-0.169		0.048	0.165	-0.089	-0.375***	0.003	0.143
	(0.053)	(0.153)	(0.054)	(0.153)		(0.043)	(0.162)	(0.092)	(0.108)	(0.312)	(0.127)
clecx	0.141***	-0.009	0.144***	-0.032		0.090***	-0.125	0.233***	0.042	0.006	-0.009
	(0.042)	(0.116)	(0.042)	(0.116)		(0.030)	(0.128)	(0.073)	(0.079)	(0.225)	(0.097)
disauth	-0.007***	-0.013***	-0.007***	-0.013***		-0.002**	-0.003	-0.009***	-0.006*	0.002	-0.002
	(0.002)	(0.005)	(0.002)	(0.005)		(0.001)	(0.005)	(0.003)	(0.003)	(0.008)	(0.004)
muniban	-0.020	0.631**	-0.047	0.662**		0.032	0.660*	-0.411*	-0.019		-0.218
	(0.090)	(0.292)	(0.091)	(0.291)		(0.062)	(0.357)	(0.239)	(0.174)		(0.222)
conditional	-3.834***	1.691	-3.867***	1.700		-9.430***	2.886**	-3.871***	-0.536	-0.752	-0.982

probability	(1.027)	(1.379)	(1.033)	(1.380)		(1.113)	(1.468)	(1.206)	(1.008)	(5.198)	(1.195)
cut1	1.929 (0.287)	-4.681 (3.457)	1.981 (0.290)	-4.918 (3.455)		1.714 (0.211)	-7.910 (3.708)	3.583 (0.561)	0.855 (2.071)	2.993 (1.565)	0.691 (2.700)
cut2		-3.865 (3.456)		-4.108 (3.454)			-7.049 (3.705)		2.420 (2.074)		3.671 (2.702)
pseudo-R^2	0.099	0.047	0.112	0.041		0.098	0.034	0.102	0.028	0.064	0.034
marginal effect of muni on prob(entry)	0.118*** (0.024)	0.293*** (0.090)	0.086*** (0.013)	0.151** (0.063)		0.218*** (0.032)	0.104 (0.083)	0.017** (0.008)	0.005 (0.005)		-0.003 (0.004)

* significant at 10% level
** significant at 5% level
*** significant at 1% level

Appendix
Table A-1
Ordered Probit Estimation
Combined Sample of Yearly Changes
Dependent Variable = Change in CLECs (exit, no change, or entry)

	1999-2002 each year n = 152,407	1999-2002 each year n = 149,635 if clec = 0	1999-2002 each year n = 2,772 if clec > 0
muni	-0.272*** (0.063)	1.265*** (0.084)	0.092 (0.087)
profit	0.003 (0.019)	-0.330*** (0.034)	0.101 (0.138)
popsq	-0.002 (0.005)	0.062*** (0.007)	-0.009 (0.019)
hhinc	0.0001 (0.0006)	0.028*** (0.002)	-0.003 (0.010)
white	0.021 (0.069)	-0.001 (0.118)	-0.119 (0.322)
educ	0.023 (0.114)	0.851*** (0.204)	0.595 (0.653)
medage	-0.002 (0.002)	-0.047*** (0.004)	0.006 (0.024)
psca	-0.007 (0.021)	0.043 (0.038)	-0.082 (0.071)
clecx	0.027* (0.016)	0.109*** (0.028)	0.003 (0.052)
disauth	-0.001** (0.0006)	-0.003*** (0.001)	-0.004** (0.002)
muniban	-0.003 (0.036)	-0.001 (0.058)	0.031 (0.119)
year2000	-1.155*** (0.026)	-0.550*** (0.046)	-2.770*** (0.272)
year2001	-0.782*** (0.024)	-1.589*** (0.106)	-1.571*** (0.153)
conditional probability		-4.255*** (0.587)	0.309 (0.630)
cut1	-3.293 (0.112)	1.949 (0.191)	-3.273 (1.560)
cut2	1.907 (0.110)		-1.420 (1.558)
pseudo-R^2	0.095	0.200	0.278
marginal effect of muni on prob(entry)	-0.003*** (0.0004)	0.039*** (0.007)	0.009 (0.009)

* significant at 10% level
** significant at 5% level
*** significant at 1% level

Table A-2
Probit Estimation
Existence of CLEC
n = 203,220
Dependent Variable = muni

profit	-0.175*** (0.022)
popsq	0.033*** (0.003)
hhinc	0.020*** (0.001)
white	-0.354*** (0.062)
educ	0.848*** (0.119)
medage	-0.041*** (0.002)
psca	0.030 (0.022)
clecx	-0.001 (0.016)
disauth	-0.002*** (0.0006)
muniban	-0.051 (0.035)
year2000	0.468*** (0.022)
year2001	0.238*** (0.023)
year2002	0.209*** (0.023)
employ	0.006*** (0.002)
looprate	-0.001 (0.002)
portrate	-0.046*** (0.009)
constant	-1.938*** (0.126)
pseudo-R^2	0.109

* significant at 10% level
** significant at 5% level
*** significant at 1% level

Table A-3
Additional Summary Statistics: Exclusion Restrictions
n = 203,248

Variable	Mean	Std. Dev.	Min	Max
Employment Growth Rate	-0.019	0.154	-34.2	41.4
Loop Rate	15.696	4.349	7.01	27.75
Port Rate	2.446	1.137	0.73	5.34