Demographic Change and Municipal Expenditure, 1980-1990

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To test the hypothesis that population growth has no effect on municipal expenditures, data was collected from 50 cities for the period 1980 to 1990. The data were examined to uncover relationships between population increases or decreases and changes in municipal expenditures. In the cities examined, expenditures rose at approximately twice the rate of population growth until they leveled off at an increase of 600%. A quadratic trend was evident. Population growth is significantly related to growth in all categories of expenditures and debt. Regression models failed to account for even half of the variance in all categories of expenditure indicating the relationship between population and spending growth is not easy to describe.

Major demographic shifts occurred during the decade from 1980 to 1990. Media stories, published research, and Census Bureau statistics depict the movement away from the “rustbelt” toward the “sunbelt” (Barks and Scelsi 1991; Census Bureau 1996a, 1996b; Ellis 1992; Franscese 1985; Morrison 1993; Russell 1981). Dozens of American cities have experienced tremendous population growth; others have lost population.
How have municipal governments responded to this growth? Scholars and journalists have posited that cities will face huge service demands as a result of their increased populations and that such demands will cause an explosion in many types of municipal expenditures (Bahl and Duncombe 1993; Ellis 1992; Farnham 1985; Holloway and Peach 1988; Locke 1979; Nation's Business 1977; Nunn and Schoedel 1997). A larger public may burden governments to provide a greater range of services. In 1979, Locke predicted cities would be forced to spend more for power, transportation, hospitals, and schools as a direct result of population growth. The American Journal of Economics and Sociology in 1995, posted results of a National League of Cities’ survey that showed tremendous increases in municipal expenditures from the late 1980s to the early 1990s but did not provide statistical evidence as to the cause of the increases (1995). Infrastructure, mandates, and health care benefits expenditures were suggested as causes. No mention was made of population increases.

This study tests the hypothesis that municipal population growth has no effect on expenditures for services commonly provided by city governments. I seek to broaden the research in the area of population growth and municipal expenditures. My expectation is that governments of cities that have experienced greater than average growth rates will increase their expenditures and debt concomitantly to meet citizens’ needs and demands. If this is true, we can predict a city’s expenditures.

BACKGROUND

This study uses data from 1980 to 1990, the latest year for which accurate, complete census data on municipal finances is available. The decade was a volatile one for urban areas marked by declining federal aid (Berman 1997; Rubin 1992),

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high inflation and interest rates, the imposition of municipal tax and expenditure limitations (Mullins and Joyce 1991), creation of many more special districts (Census Bureau 1982, 1992), growing infrastructure needs, and economic decline in many cities. The Reagan administration cut funding for many local capital spending grants and eliminated General Revenue Sharing in 1986. Other factors such as the 1987-1988 stock market crash, the failure of general obligation referenda and the Tax Reform Act of 1986 negatively influenced borrowing costs for municipalities (Hawthorne 1989). The National League of Cities reported that, by 1990, over 85% of America’s cities raised or imposed fees because they were unable to pay bills (Henkoff 1991). Revenue deficits of up to 25% were documented (American Journal of Economics and Sociology 1995).

DETERMINATES OF EXPENDITURES

The expectation that population increases would lead to budgetary expansion has been noted. Scholars have investigated the relationship between expenditures, debt, and a number of factors. Studies of the direct effects of population on expenditures and debt, however, are scant. Bahl and Duncombe, in their study of the determinants of state and local debt from 1988 to 1990, suggested that population increases were positively associated with debt but subsequently claim that population growth and debt are not related (1993, 38). They also found that demands for service brought on by increases in population were positively associated with increased expenditures. While they cite evidence that water and energy usage and school enrollments correlate with increased expenditures, they do not identify which cities were included in the study or the cities’ growth rates (1993). The link between expenditures and population was not clearly established. Cahill, et al. (1994), assert that service de-
mand, brought on, in part, by demographic shifts, is responsible for a portion of variance in municipal expenditures, but provide no statistical analysis to support their assertion.

An increase in population aging had mixed effects on municipal expenditures in Oregon from 1984 to 1989. Simonsen noted that an increase in a city’s population over age 65 depressed municipal spending; public safety expenditures were an exception, increasing with population age (1994a). Fitzpatrick and Logan, in a study of 54 metropolitan regions, claimed that suburbs with aging populations spent more on a whole range of municipal services including public safety, housing, hospitals, and transportation (1985). A 1989 British study predicted expenditure increases in housing, health care, and social services as a result of an aging population, but no statistical connection was made (Pearson, Smith, and White 1989). In a study of three Appalachian communities experiencing in-migration of retirees, Rowles and Watkins suggested a relationship between pressure on service demands and creation of a “special needs” population (1993). They hypothesized both would increase municipal expenditures.

Farnham noted that as communities grow, so, too, does their debt, perhaps due, in part, to wider access to credit markets (1985). Larger cities have higher bond ratings and therefore lower borrowing costs, a fact that may propel them to borrow more. Marlow found population increases positively associated with increases in debt and expenditures only in 1986 (1995). Sharp found population growth to be positively associated with growth in debt, but did not isolate rapidly growing cities, explain how cities were chosen for the study, or explain what growth factors were salient (1986).

Other factors have been linked to municipal expenditure increases. Bartle’s findings (1995) supported earlier evidence by Gramlich and Galper (1973) that suggested federal aid—but not
state aid—was positively associated with municipal spending. Logan and Schneider (1981) noted that variance in municipal expenditures was primarily explained by the level and range of local government services provided. The wider the range and the broader the degree of services, the higher the expenditures. Mullins and Joyce noted municipal tax and expenditure limitations (TELs) had little effect on expenditures (1996). In contrast, Shabegian claimed that TELs limited municipal expenditures from 1970 to 1990 by 10% (1998).

In 1996, a study of 124 cities with a mean population of 124,000 showed that increases in municipal non-capital, per capita expenditures were associated with an ethnically homogeneous city council, longer term audits, published and circulated opinions of auditors, and the use of a large, national auditing firm. In cities with appointed city managers, the expenditures were lower. The use of the initiative was not a statistically significant predictor of lower public expenditures (Luehlfing 1996).

Much evidence suggests that cities besieged by TELs create more public authorities than cities that are not so burdened (Axelrod 1995; Bollens 1986; Henriques 1986; Leigland 1990, 1995; Nunn and Schoedel 1997). What is the financial impact on cities with more special districts? Nunn and Schoedel found no evidence to support the assertion that a reliance on special districts was related to debt expenditure increases (1997). Park found that the size of a special district was associated with increased expenditure levels in metropolitan statistical areas but that the number of districts was associated with a decrease in expenditures (1995). He suggested that competition decreased expenditures. It is also well known that many, if not most, authorities are subsidized by their parent governments (Axelrod 1995, Henriques 1986, Leigland 1995, Pack 1992, Sanders 1997, Smith 1992, Walsh 1978).
There has been steady erosion of federal and state aid to cities since the peak in 1977, when intergovernmental revenue was $24 billion, or, 32% of local revenue (Berman 1997, Rubin 1992, Census Bureau 1982, 1992). By 1987, though, total federal aid to cities in current dollars was $37 billion and the percentage of municipal revenues had decreased to 22%. Might we expect a slight, offsetting decline in expenditures? Devolution of functions and mandates also put the financial squeeze on American cities. By 1988, 13 states passed anti-mandate laws that either restricted state/local mandates or provided some measure of funding (Book of the States 1990-91).

We thus know some of the factors that effect a rise in municipal expenditures. Studies that specifically link higher than average growth to increases in municipal expenditures are absent. The issue of population has been tested either indirectly, not at all, or treated anecdotally as if population growth, a priori, causes expenditure increases.

And why should we care? Most of us live in incorporated municipalities. Their fortunes effect our fortunes and our quality of life. Huge population increases probably mean more traffic, more congestion, more power, school, and medical needs. Governments depend upon our tax and fee revenues to provide those services. If increases in population are associated with or cause concomitant expenditure and debt increases, we may be able to predict expenditures, and thus revenue needs, in cities with higher than average growth rates.

**METHODS**

Population data for 50 cities in 1980 and in 1990 was collected from Census Bureau records. The 50 cities included the 25 cities having the highest growth rates and the 25 cities having...
the lowest growth rates. These cities were selected to assess the effects of population growth or loss on expenditures and debt. Every city in the Census Bureau database (over 30,000) was included in the pool. The rate of change in each city’s population was calculated. The rate of expenditure change for a wide range of government services and debt for each of these 50 cities was also calculated for 1980 and 1990.

The rate of change in population growth was tested for its effect on expenditures. Dependent variables include change in (1) total municipal expenditures, (2) per capita expenditures, (3) total debt, (4) roads, (5) parks, (6) public housing, (7) hospitals, (8) sewers, (9) and public safety. Few cities spent funds for school functions so education expenditures were not included. To test the hypothesis that population has no effect on expenditure patterns, descriptive statistics, correlations, paired T-tests, and regression analyses were performed. Cities that experienced large growth rates during the decade were given the dummy code variable “1” and cities that lost population during the decade were assigned a “0.” Using this dummy variable, a point biserial correlation was performed. There were no missing values for any of the cities. Descriptive statistics are provided in Table 1, T-test results and regression analysis in Table 2.

**FINDINGS**

As Table 1 shows, there is tremendous variability in population and expenditure data between cities with the fastest growing and fastest declining populations. The mean population increase for cities that gained population is 154%, the mean population loss, almost 13%; the overall mean for the entire sample is a 50% gain in population. The mean expenditure increase for cities that gained population is 529%, for cities that lost population expenditures increased by just over 55%. An in-
flation rate of 61% during the decade can account for the expenditure gain in the cities that lost population but can hardly account for the gains in the other categories across all cities (Department of Labor 1998).

TABLE 1
Population Gainers and Losers:
Top 25 and Bottom 25 cities

<table>
<thead>
<tr>
<th>Variable</th>
<th>Population Gainers</th>
<th>Population Losers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>Population</td>
<td>154.97%</td>
<td>86.89</td>
</tr>
<tr>
<td>Expenditures</td>
<td>529.08</td>
<td>439.03</td>
</tr>
<tr>
<td>Parks</td>
<td>705.84</td>
<td>695.53</td>
</tr>
<tr>
<td>Roads</td>
<td>618.96</td>
<td>579.47</td>
</tr>
<tr>
<td>Housing</td>
<td>2059.24</td>
<td>3363.24</td>
</tr>
<tr>
<td>Hospitals</td>
<td>183.84</td>
<td>330.17</td>
</tr>
<tr>
<td>Public Safety</td>
<td>399.28</td>
<td>195.37</td>
</tr>
<tr>
<td>Sewer</td>
<td>681.60</td>
<td>1381.92</td>
</tr>
<tr>
<td>Debt</td>
<td>6684.56</td>
<td>15929.19</td>
</tr>
<tr>
<td>Per Capita Exp.</td>
<td>199.96</td>
<td>202.37</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, Finances of Municipal Governments, 1992, 1982

Table 2 reports a correlation of .61 between population growth and expenditure growth. Correlations between population and expenditures for parks (.54) and public safety (.60) also indicate a fairly strong relationships. Other correlations were weaker. As the R-squares in Table 2 indicate, changes in population accounted for 36.3% of the increase in total expenditures, for 28% of the growth in park expenditures, 13.5% of the increase in road spending, and 34.6% of the growth in public safety expenditures; the remaining categories—housing, hospitals, sewers, and debt—the R-squares are negligible.
TABLE 2
T-Test and Adjusted R-Squared for Population Gainers and Losers

<table>
<thead>
<tr>
<th>Variable</th>
<th>t-Value</th>
<th>p-Value</th>
<th>Adjusted R-Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Exp.</td>
<td>5.242*</td>
<td>&lt;.0001</td>
<td>.363</td>
</tr>
<tr>
<td>Parks</td>
<td>-4.643*</td>
<td>&lt;.0001</td>
<td>.280</td>
</tr>
<tr>
<td>Roads</td>
<td>-4.936*</td>
<td>&lt;.0001</td>
<td>.135</td>
</tr>
<tr>
<td>Housing</td>
<td>-3.438*</td>
<td>.0012</td>
<td>.075</td>
</tr>
<tr>
<td>Hospital</td>
<td>-2.991*</td>
<td>.0043</td>
<td>.069</td>
</tr>
<tr>
<td>Public Safety</td>
<td>-7.432*</td>
<td>&lt;.0001</td>
<td>.346</td>
</tr>
<tr>
<td>Sewer</td>
<td>-2.540</td>
<td>.0143</td>
<td>.078</td>
</tr>
<tr>
<td>Debt</td>
<td>-2.101</td>
<td>.0408</td>
<td>.059</td>
</tr>
<tr>
<td>Per Capita Exp.</td>
<td>-6.280*</td>
<td>&lt;.0001</td>
<td>.133</td>
</tr>
</tbody>
</table>

Source: Data compiled from U.S. Census Bureau, Finances of Municipal Governments, 1982-1992.
* p<.01 and 49 df

DISCUSSION

Predicting 36.3% of municipal expenditure variance from population growth is still not much in the way of solid forecasting. Furthermore, we do not know exactly how population works to increase expenditures. Bahl and Duncombe's and Logan and Schneider's findings may be validated if one assumes a larger public demands more services. Duncombe's "median voter demand" model rests on this assumption. However, a larger public may not be a vocal public. These results do support Farnham and Sharp in their assertion that population growth is associated with debt growth. Nunn and Schoedel's claim that tax and
expenditure limitations do not, in fact, limit expenditures is also supported.

The mechanism by which population growth works to increase spending may have more to do with Lewis' assertion of the specificity of jurisdictional concerns. Groups in some locations may demand a different level and variety of services not demanded in other locations. A National League of Cities' study (1995) cites infrastructure costs as the number one factor of expenditure growth. Aggregated data cannot determine a city's mandate, devolution, and infrastructure costs. Service demand could be determined only by a close investigation of each city's dynamics.

Given the variability in the data, idiosyncratic factors may be more predictive of each city's spending calculus. Such factors are difficult, but not impossible, to uncover. A search of municipal web sites uncovered some interesting clues to the reasons for expenditure variation. Among cities that gained population, economic development and annexation stood out as factors that were not present in cities that lost population. Attractions and events, such as major league baseball, rodeos, military bases, and casinos, were more plentiful in cities that gained population than cities that lost population. It may be the type of activity in which the public is engaged, the level of private sector spending, and, perhaps, the area annexed into city limits that, when combined with the demands of infrastructure, devolution, and mandates, provide a more complete picture of the factors involved in municipal expenditures. These factors may help explain how population works to increase expenditures as well as the rest of the expenditure pie that has not been predicted thus far. Research efforts in that direction may be much more predictive than massive population growth.
REFERENCES


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