ABSTRACT: This article considers the impact that the use of impact development fees has on the level of capital investment made by local governments in the United States. Using a sample of 85 cities, we find that the use of fees is associated with lower levels of capital spending. The data also reveal that the debt-to-expenditure ratio for these cities is associated with higher levels of capital spending, leading us to conclude that fees act as a quasi-pricing mechanism regulating the amount of capital investment demanded by developers.

Development impact fees are designed to transfer a portion of the capital cost for new infrastructure from the public to the private sector. Their specific purpose is to ensure that new development pays its own way, alleviating the burden that would otherwise fall to existing property owners. In many cities, fees are required of builders and developers to help pay for water and sewer systems, streets and street lighting, drainage systems, and parks or green space. Thus, part of the infrastructure or services normally provided by the local government is funded by the developer rather than by general revenue.

Eighteen states have passed legislation authorizing local governments to adopt development fees; one state, Florida, has used them for a number of years without specific enabling legislation. Fees have been defended successfully as an appropriate exercise of local government police power in the absence of state legislation (Nelson & Duncan, 1995). States generally have not set specific schedules of fees for cities. Local governments must decide on the percentage of the actual cost of infrastructure that they will attempt to recover. Portions of the fees paid by a developer are often negotiated on a case-by-case basis (Snyder & Stegman, 1987). The result is that fees vary among cities, and even within a city, fees may vary considerably over time or from one development project to another.

The variation in the manner of implementing fees, described by Snyder and Stegman (1987), raises a number of questions about the effects that fee adoption has on local government investment in infrastructure. In this article, we present a discussion of development impact fees and how local governments have used them. Then we conduct an empirical analysis using data from US cities to determine the effect that the use of development fees has on the level of capital investment made by...
USE OF DEVELOPMENT IMPACT FEES

Cities in California, Colorado, and Florida were among the first to adopt impact fees (Snyder & Stegman, 1987). In these states, property tax increase limitations and environmental concerns were major contributors to the fiscal stress that forced local governments to find new funding sources for infrastructure. Fees have also been adopted in jurisdictions where unusually high levels of growth would have placed an undue burden on the existing tax base.

Local governments adopt fees by ordinance and must comply with any enabling legislation passed by the state. Often, a set fee schedule is used for on-site exactions, while off-site exactions are negotiated on a case-by-case basis. On-site exactions are those paid per unit developed, such as a fixed fee per water connection in a residential development. Off-site exactions may be charged when a developer’s project creates additional demand, such as for water sewage treatment, that cannot be met without increasing the city’s investment in plant or equipment. For instance, the city may have to install a new lift station to handle increased sewer flows, or it may have to upgrade water mains to handle additional demand. If a city has unused capacity, developers may be charged a fee when they place a demand on that capacity. At least one city in this survey calls its exactions “equity investment fees,” referring to the consumption of existing system capacity or equity. A number of cities charge for arterial street improvements required to increase traffic capacity when a developer’s project creates demand beyond the city’s current unused capacity.

In their survey of Texas cities, Gilliland and Ramseur (1990) found a lack of consistency in the structure of impact fees even though the Texas legislature had passed legislation in 1987 that set guidelines for their use. In particular, cities have been slow to adopt fee structures in conjunction with a comprehensive development plan or capital improvement plan in order to avoid arbitrariness. The Texas law also requires consistency so that one developer or builder does not pay a higher amount than another. (A builder quoted by Snyder and Stegman (1987) said, “I don’t care how much infrastructure I need to build, as long as I know my obligation before I buy the land and all my competitors are being treated the same.”) The Texas law allows cities to set up separate districts, each with its own fee schedule that reflects the actual cost of development in that district. For instance, if a particular area, because of its geography, needs more sewer lift stations than another area, its fee structure may call for higher sewer connection fees. The law also stipulates that the districts be well defined and consistent with the overall development plan.

A second survey of Texas cities revealed that larger cities are more likely than smaller ones to adopt impact fees (Gilliland, Krebs, & Vanderberg, 1992). Only 5% of the smaller communities in that survey had adopted fees, whereas 37% of larger cities had adopted impact fees, primarily for water and sewer connections. Interestingly, the smaller cities that had adopted fees reported collecting 90% of the cost of infrastructure improvements while larger cities collected only 55% of costs (Gilliland et al., 1992). Apparently, smaller cities that adopted fees did so out of a great need for revenue. For all cities in this survey, the average impact fee charged was just over $1,000 for a single-family residence, typically collected at the time a building permit was issued. Only five of the 73 large cities included in the survey charged a fee for street improvements. The difficulty in determining an appropriate fee for street improvements also makes them susceptible to legal challenges, which are discussed below.

The Government Finance Officers Association completed two national surveys in 1989 on the use of fees. The first survey found an increased use of fees for facilities related to growth. In a study based on the second survey, Leithe and Montavon (1990) determined that the percentage of infrastructure costs recovered through fees varied across states from an average of 2% in Texas to an average of 60% in California. Property tax limitations as well as growth probably determined California’s early and heavy reliance on development fees.
LEGAL ISSUES AND FEE CALCULATION

Most impact development fee structures have been subjected to legal challenges, primarily in state courts (Altshuler & Gómez Ibáñez, 1993). The legal doctrine that courts have developed is the rational nexus standard, which requires a logical link between the fee charged and the infrastructure provided. Table 1 contains the major elements of this standard. In addition to the logical link between the fee and the infrastructure provided, cities must determine that: (1) each development project is charged an amount that is in proportion to the demand it creates, (2) the facilities financed are part of a comprehensive plan for development, (3) occupants are not double-billed by paying first a fee and then property taxes (the fee must be net of property tax contributions used to finance infrastructure), and (4) the planned facilities are to be built in a timely manner.

Moore and Muller (1991) identify additional characteristics that fees must have to be effective. The fee structure must be understandable to the practitioner and layperson, and it must be elastic so that as economic conditions change, fee revenue remains sufficient for its purpose. The city officials and employees who administer the fees and the builders and developers who pay them must be satisfied with the outcome in terms of both equity and adequacy.

Two general methods of fee calculation have been devised to comply with the rational nexus standard. Inductive and deductive calculations determine the cost of a project’s impact (Nicholas & Nelson, 1988); the capital improvement plan-development impact fee linkage method assigns a development its share of projected needs for some period into the future (Nicholas, Nelson, & Juergensmeyer, 1990). It may be very difficult, however, to determine capital needs for a 20-year period, and rational people (officials and developers) will disagree about the total needs; most capital improvement plans contain projects that are planned for only a five-year period. Even if planners can determine needs for a longer period, the assignment of some portion of those costs to a particular development may be quite subjective since that requires estimating the total amount of development that will occur during the period.

The inductive method involves determining the cost and capacity of a particular facility that serves as a model for future construction. If we know from national averages that it costs X dollars to build water treatment capacity to serve 15,000 homes, a development containing 400 building lots would use 2.66% of that capacity and would be assessed the appropriate share of the projected cost. The same method would be used to calculate shares for sewer treatment expansion or improvements to arterial streets. The major limitation of this method is the failure to consider special needs of a community. In many cases, benchmarks and national averages can provide reasonable levels of revenue, and the benefits of more complex analyses may not be worth their cost.

Deductive calculations are based on the demand a development places on public infrastructure in a specific locale rather than relying on national benchmarks. This method is preferable in some cases

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<th>TABLE 1</th>
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<td><strong>Elements of the Rational Nexus Standard</strong></td>
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<td>1. Each exaction must be well-designed to meet service needs directly attributable to the project bearing the cost.</td>
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<td>2. Where facilities are to serve more than a single development, costs must be allocated in proportion to services rendered.</td>
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<td>3. Such facilities must be elements of a comprehensive local plan for service improvements.</td>
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<td>4. Where facilities are to be financed by a combination of tax and impact fee revenues, special care must be taken to ensure that project occupants, who pay taxes like everyone else, are not double-billed. The impact fee calculation, in other words, must be net of anticipated tax contributions.</td>
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<td>5. Impact fee revenues must be segregated until used and must be expended in a timely fashion (generally, within five to six years) for the purpose originally designated.</td>
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*Source: Altshuler and Gómez Ibáñez.*
since it is based on specific community needs and locally defined levels of service. Cities that have special water purification needs due to the quality of water entering the system or special sewage flow problems due to topography may need to calculate cost shares taking those variables into consideration. In the case of drainage projects, city officials would divide a project’s cost by the number of building lots served by the project.

The complexity of deductive calculations means that for many basic services, the inductive model is simpler. Moreover, the inductive method is generally sufficient to meet the legal tests of fairness.

**EFFECTS OF DEVELOPMENT IMPACT FEES**

Several studies have assessed various effects of development fees. Nelson, Frank, and Nicholas (1992) determined that fee usage in Sarasota County, Florida, had a positive effect on planning by eliminating the negotiating process that cities and developers had engaged in previously. The use of a fee schedule also ensured that development proposals were treated similarly, thereby promoting equity. They also found that fees generated a large portion of the revenue needed to extend facilities that served new developments.

Altshuler and Gómez Ibáñez (1993) hypothesized that if fees were higher in central cities than in suburbs because of the intense fiscal pressures cities face, the use of fees might have the unintended consequence of promoting urban sprawl and continued migration to the outlying areas within a metropolitan region. However, they cited a San Francisco study by the Association of Bay Area Governments that found fees in outlying areas (suburban and exurban) to average more than five times those of the central city. This difference might not be sufficient to discourage urban sprawl; conversely, the difference may not be so small that such actions are encouraged. Without additional analysis, the effect that fees have on this type of behavior is not known. Moreover, this finding may or may not be indicative of other major metropolitan areas.

Development impact fees have been associated with higher land prices. Nelson, Frank, and Nicholas (1992) analyzed data for single-family building lot sales between 1981 and 1987. After controlling for time and distances from shopping, beaches, and towns, they found that fees had a positive impact on lot prices. Other analyses that assume the incidence of fee payment is shifted forward to homeowners have shown the effect of fees on mortgage payments and incomes needed to qualify for a mortgage (Snyder & Stegman, 1987). They conclude that this will happen only where the developer, through lack of competition, is able to shift those costs forward. Assuming fees are capitalized into property values, their costs generally will be borne by the landowner at the time of their introduction.

**DEVELOPMENT IMPACT FEES AND CAPITAL INVESTMENT**

As we discussed previously, development fees transfer a portion of the burden of infrastructure cost to the private sector; builders and developers help pay for the infrastructure that provides access, utilities, and other amenities critical to a development’s success. One reason cities provide infrastructure is to attract development to generate additional revenue through increased property values. The build-it-and-they-will-come philosophy of many cities is evident from the vacant industrial parks and subdivisions that can be seen in all parts of the United States. In this article, we ask whether the use of impact development fees contributes to investment in infrastructure. Does transferring cost to developers encourage cities to invest in more infrastructure? One may believe so since the revenue provides a price effect for the government. For example, if the fee recovers 25% of the cost, one dollar in infrastructure costs the city only 75 cents. However, from the developer’s perspective, the fee makes infrastructure more expensive and thus may reduce the development community’s demand for infrastructure.

Part of the expense imposed on developers may be shifted backward in the form of lower prices paid to original landowners. Yinger (1998) concludes from a review of existing research that as much as 25% of the burden imposed by fees may be borne by landowners who sell their property to developers. Yinger suggests that the remaining portion is paid by new home purchasers, whereas ex-
existing homeowners may actually receive a small capital gain as their property values rise in response to the increased cost of new construction. Yinger’s analysis is based in large part on studies by Singell and Lillydahl (1990) and Delaney and Smith (1989a, 1989b) that use data from Colorado and Florida, states that pioneered the use of impact development fees.

One reason cities have adopted fees is to provide needed revenue where legal (property tax limitation actions) or political (voter objections) reasons preclude additional property tax revenue (Grasewicz & Ernst, 1989; Nelson, Frank, & Nicholas, 1992) or to replace lost federal grant funding. Mullins and Joyce (1996) found that the use of nontax revenue sources is associated with property tax limitations, and Man and Bell (1993) conclude that federal grants-in-aid shifted from infrastructure investment toward transportation projects, research, training, and other technical assistance. Bland and Laosirirat (1997) found that truth-in-taxation legislation in Texas had little effect on property tax revenues, while Cornia, Wheeler, and Smith (1990) found evidence that similar legislation in Utah slowed the growth of county ad valorem revenue.

DATA AND FINDINGS

Data for this analysis came from a sample of 85 US cities. We sent a survey requesting data on general fund and capital spending, the use of fees, and other data to 350 cities that comprised a stratified sample based on population. All cities over 250,000 in population were included, as were 50 cities in the population ranges 5,000 to 50,000; 50,000 to 100,000; and 100,000 to 250,000. The stratified sample may help improve external validity. For example, larger cities benefit from production economies of scale in their operating and capital budgets. Including cities of various sizes ensures that the results are not driven by those considerations.

The overall response rate was 23%, and each stratification was represented (17, 23, 20, and 21, respectively) in the response. Other important characteristics needed for the research have also been met. For instance, sample size is substantial and well divided between cities that have adopted fees (39%) versus those that have not (61%). Additional data came from the 1990 US Census and Moody’s Municipal & Government Manual, 1995.

Dependent Variable

The dependent variable for the analysis is capital spending per capita for 1995. This choice has some limitations, but most are negated by the sample size. It may be the case that a city in the sample issued a large bond in 1994 and that its spending in 1995 was much higher than normal. The sample of 85 cities, however, gives some assurance that a few such cases should not distort the findings. Also, in our survey we requested data for capital spending in both 1994 and 1995; we noticed no great disparity between the amount of spending that occurred between the two years for cases included in the sample. Moreover, when cities issue debt, it is not often the case that the entire amount is spent in a single year. Spending typically occurs over a number of years due to resources needed to manage projects, suggesting that any given year has a high probability of being representative of a city’s spending. Finally, a cross-section analysis avoids the methodological pitfalls of a pooled time series.

Independent Variables

The independent variable of interest is a dichotomous variable that is given a value of one (1) if the city uses development fees, and zero (0) if it does not. This dichotomous variable cannot measure the magnitude of the price effect that the fee structure may have, but it will be able to determine if such an effect is consistent across jurisdictions that have adopted fees. In our survey, we requested that city officials indicate the percentage of the city’s cost that the fees for various types of infrastructure (streets, water, and sewer were the most common) were designed to recover. In nearly every case, the survey respondents indicated that they could only guess at that figure.

A number of additional variables control for characteristics that have a bearing on the level of capital spending. Per capita income is used as a general measure of wealth. Higher levels of wealth
should be associated with greater demands for public services, including those funded through the capital budget. We expect that communities with a higher percentage of their population over 65 years of age experience less demand for capital acquisition since this segment, especially those on a fixed income, generally resist tax increases for operations or debt service. What is expected to be associated with a higher demand for capital spending is the level of owner-occupied housing.

We include the debt-to-expenditure ratio as a control for fiscal stress. Cities with a high ratio of debt to expenditures may have less capacity to acquire capital. A dichotomous variable identifies those cities in states with a truth-in-taxation law that requires city officials to publish information about property tax rate and levy increases. Bland and Laosirirat (1997) suggest that in Texas this requirement has little or no effect on property tax revenue; Cornia, Wheeler, and Smith (1990), on the other hand, found that it had a dampening effect on county property tax revenue in Utah. Finally, we control for southern cities because we anticipate that their fiscal conservatism may limit investment.

### Regression Results

The results of the regression analysis are presented in Table 2. The dummy variable for the existence of an impact fee has a negative coefficient and is significant at the 0.001 level. This indicates support for the price effect that a fee structure has, from the developer’s position. For this sample of US cities, the use of impact fees is associated with lower levels of capital acquisition. Other things being equal, cities that use impact fees spent $175 less per capita in 1995 than did cities without a fee structure. Truth-in-taxation laws have the expected effect; in states that require cities to publish tax rate and levy increase information, capital investment is reduced by nearly $200 per capita, suggesting that the measures have reduced government expenditures for infrastructure.

Among the remaining control variables, per capita income, percentage of population 65 or older, and percentage of owner-occupied housing units have the predicted sign; the control variables for southern cities and for debt-to-expenditure ratio did not have the expected effect. Wealth, measured as per capita income, has a positive and statistically significant association with the level of capital acquisition. Assessed property valuation per capita has a similar effect when substituted for per capita income in the regression equation. Cities with higher per capita incomes experience higher levels of capital spending, no doubt due to a greater demand for municipal services. The coefficients for percentage of owner-occupied housing and population 65 or older were not statistically significant. A variable for percentage of the population 18 or younger was removed from the model as its effect was small and not significant.

The control variable for southern cities was expected to be negative due to the fiscal conservatism of this area. Actually, southern cities spent about $184 more per capita than non-southern cities, all else being equal. This suggests that although many southern cities may remain fiscally conservative,

| Variable                        | Coefficient | |t|  
|---------------------------------|-------------|-----|
| Constant                        | −73.10      | 0.47|
| Impact fee                      | −175.02     | 3.31**|
| Per capita income               | 8.07E-03    | 4.94**|
| Percentage of population 65+    | −7.91       | 1.23|
| Percentage owner-occupied housing | 4.35       | 1.81|
| Debt-to-expenditure ratio       | 83.95       | 3.41**|
| State truth-in-taxation law     | −192.67     | 3.12*|
| South                           | 184.18      | 3.14*|

n = 81; R = 0.71; R² = 0.50; Error of the estimate = 220.24; F = 10.67**.
*p < .01 (two-tailed test); **p < .001
the capital demands of strong growth and southern migration have forced cities to rethink their reliance on current revenues. Much of that migration consists of persons from other parts of the country who possibly are more comfortable with the use of debt as a means to finance municipal projects. Rapid population growth is no doubt resulting in greater need for all types of infrastructure. We had included a variable for population increase that turned out to be insignificant and collinear with the dichotomous variable for southern cities; this finding supports the idea that migration is changing the fiscal complexion of the south.

The variable for the debt-to-expenditure ratio has a positive and significant coefficient. We had theorized that a high debt-to-expenditure ratio would create downward pressure on capital acquisition as capacity was depleted. This finding suggests that few cities in our sample have reached the limit of their debt capacity and that they continue to issue new debt as old debt is retired.

CONCLUSIONS

Among the cities included in this analysis, the use of development impact fees is associated with lower levels of capital acquisition. There are a number of possible explanations for this association. The first is that cities facing fiscal stress have adopted development impact fees as a means of collecting sufficient revenue to meet their basic infrastructure needs. However, the finding that cities with a higher ratio of debt to expenditures argues against this explanation. As a measure of fiscal stress, we had expected this variable to have a negative effect on capital investment. This is not the case, however; cities that have acquired larger amounts of debt continue to fund capital needs.

An explanation supported by this analysis is that the link between fee use and a lower level of investment results from a price effect. From the development community's point of view, fees increase the costs of development. The fees act as a quasi-pricing mechanism and reduce the amount of capital investment demanded by developers. Just as any user charge for city services such as water, electricity, or recreational facilities limits use of the service, development impact fees may ration investment and help officials gauge the demand for new development. To the extent that they do, cities may obtain a more efficient mix of capital and operating expenditures.

Possibly contributing to the negative relationship between fees and acquisition is the no-growth policy of some cities. Municipalities that wish to limit growth may do so by adopting development fees. The rational nexus requirement prevents a city from adopting a fee schedule simply as a means of generating general revenue, but it does not proscribe the use of fees to curb growth, which may be the effect if nearby cities have adopted lower fees or none at all. If city A charges impact fees for certain types of development and can satisfy the rational nexus test and city B has no fee, development is likely to move to city B. Limiting commercial or residential growth with fees is not likely to be an explicit policy, but it can be an intended or unintended outcome of fee adoption.

Truth-in-taxation laws have the expected effect and, possibly, the intended effect of those who advocate such legislation. Cities in states with these laws on the books have significantly lower levels of capital investment per capita. Ladd (1978) suggests that the effects of tax limitation laws could have potentially serious costs for governments. To the extent that a decrease in capital acquisition causes a jurisdiction to consume its capital faster than it replaces it, the consequences could be serious indeed. Thomassen (1990) warns that state and local governments have focused on capital acquisition rather than the more important consideration of capital consumption. Whether lower levels of investment and development are an intended or an unintended consequence of the fee structure, cities should be cautious about their impact on capital consumption.

Future research on the use of development impact fees will need to sort out the questions posed here. Are cities resorting to fees primarily when other revenue sources have been limited? Are fees used to curb or limit growth? Developers have their own—and not insubstantial—incentives for determining the viability of projects and avoiding overinvestment. Cities must be cautious that they do not reduce the demand for development too much. The motivations for adopting fees should be considered carefully, as should the long-term effect that a fee schedule will have on development and infrastructure needs.
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REFERENCES


