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Effects of Impact Fees on the Suburban Chicago Housing Market

by Brett M. Baden, Don L. Coursey, and Jeannine M. Kannegiesser*

Impact fees are charges assessed by counties and municipalities to developers to recover the part of the cost of infrastructure improvements that future tax revenues will not cover. Impact fees are an increasingly common tool that municipalities around the country use to pay for new schools, sewers, roads, parks, and other public amenities.

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In the case of utility infrastructure (e.g., water mains, electrical lines, and the like), the assessment of fees is straightforward–usually fees are determined per engineers' cost estimates. The impacts of new development on municipal services and amenities are more difficult to estimate: some municipalities use complex formulas to estimate the likely impact of one new home on the cost of providing and maintaining parks, schools, roads, and police and fire protection services. Many of these formulas are based on land valuations; these valuations are themselves often controversial. Sometimes developers are required to pay additional charges to

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cover some set of costs that the municipality deems important. These charges may be meant to cover unforeseen impacts on municipal government budgets or they may be destined to cover a neighborhood improvement that city planners want.

The ambiguity of the appropriate level of impact fees suggests several important issues for housing development policy. These issues include rent-seeking (unrestrained budget maximization by municipal politicians), subsidization of existing households at the expense of new entrants to the housing market, possible exclusionary practices toward minorities and the poor, and equity concerns regarding the payment for and distribution of benefits.

Impact fees are a relatively new form of taxation that is hidden from housing consumers. Since impact fees involve restrictions upon property sales and development rights, several municipal fee structures have been challenged in court as "takings," i.e. unconstitutional limitations on the use and transfer of property that reduce its value without compensation.[1] Arguments about impact fees and the reasons supporting and opposing them are part of the greater debate over "urban sprawl," frequently reported in the media.[2]

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A vigorous debate about impact fees has occurred in the suburbs of Chicago. Several experienced substantial growth in the 1980s and 1990s. Census data reveal that between 1980 and 1990, 24 municipalities in the Chicago Metropolitan Statistical Area grew between 20 and 50 percent; 6 municipalities grew between 50 and 100 percent; and 3 municipalities (Algonquin, Carol Stream, and Naperville) grew by over 100 percent.[3]

Important legal challenges to impact fees have been pursued in the Chicago suburbs.[4] In the last three years alone, Chicago-area newspapers have covered impact fee controversies in Aurora, Oswego, Yorkville, Geneva, St. Charles, Batavia, Naperville, Montgomery, Somonauk,

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[1]For a comprehensive history of the legal challenges to impact fees, see Robert F. Freilich and David W. Bushek, editors, *Exactions, Impact Fees, and Dedications: Shaping Land-Use Development and Funding Infrastructure in the Dolan Era* (Chicago, American Bar Association, 1995).

[2] For example, see Dave Barnes, "Council Takes Hit for Impact Fees," *Chicago Tribune*, May 31, 1998, Section 16, page 5; Phillip J. Longman, "Who Pays for Sprawl?" *U.S. News and World Report*, April 27, 1998, pages 22-23; Jeff Coen, "Pay as You Grow," *Chicago Tribune*, July 19, 1998, Section 16, page 6; Beth Burmahi, "Bedroom Additions Spared Extra Tax," *Chicago Tribune*, September 7, 1997, page 50; and Larry Finley, "The Hidden Cost of Housing," *Chicago Sun-Times*, May 9, 1997, pages 7-9.

[3] Chicago Fact Book Consortium, editors, *Local Community Fact Book, Chicago Metropolitan Area, 1990*. pages 14-37.

[4] For example, see *O.L. Krughoff et al. v. City of Naperville,* Case Number 48963, Illinois Supreme Court, October 5, 1977 regarding the legality of land dedications; and *Edward L. Brown et al. v. City of Naperville* and *Tom Bart Construction Inc. v. City of Naperville*, filed in 1997 in the DuPage County Circuit Court, concerning the propriety of impact fees for future road construction.

Fox Lake, Lisle, and Woodstock, among other communities.[5] Impact fees are a contentious municipal finance tool in the Chicago metropolitan area.

Part 1 begins the analysis by summarizing the history of impact fees. Part 2 presents the impact fee structures of eight Chicago suburbs and outlines the methodology for addressing the question, "What effect do impact fees have?" Part 3 presents the empirical analysis used to answer that question.

Impact fees are significantly increasing the costs of new housing in the eight Chicago suburbs studied.

Part 4 offers case studies that illustrate impact fee and development issues in five municipalities. Part 5 reviews those findings and addresses such normative questions about impact fees as: Are they fair? Are they a desirable public policy tool? The positive findings and normative considerations are summarized and discussed in Part 6, which is followed by several technical appendices.

The paper concludes that impact fees are significantly increasing the costs of new housing in the eight Chicago suburbs studied. Many of those increased costs—which municipal officials often claim are paid by developers—are (to varying degrees) being passed on to homebuyers. Impact fees may have a disproportionately negative effect on low- and middle-income families seeking to become suburban homeowners: not only do the fees represent a higher percentage of the sale cost of a lower-priced home than a higher-priced home, but they also may encourage developers to build higher-priced houses, thus pricing lower-income families out of suburban neighborhoods.

[5]Supra note 2.

PART 1

A Brief History of Impact Fees

There have been five periods of development finance.[6] Prior to the 1920s, extension of services to new development was funded from taxation on existing properties. In 1928, the U.S. Department of Commerce provided a framework for municipalities for zoning and land-use regulation development. The Standard Zoning Enabling Act was the basis for much of modern zoning regulation and the Standard Planning Enabling Act gave municipalities the power to require developers to construct streets, water mains, and sewer lines. Other neighborhood services, however, such as parks, schools, and arterial roads were not part of the legislation; the impact of development upon these services was paid for out of general tax revenues.[7]

Paying for neighborhood amenities is a problem of particular concern to suburban communities, where population growth has been rapid.

During the period from World War II to the 1970s, many of the neighborhood services not covered by the Standard Planning Enabling Act began to be funded by impact fees and cash-in-lieu land donation requirements (where developers paid cash to municipalities instead of making land donations). The 1970s were marked by changes that gave more power to municipalities for growth planning. Zoning was a favored development tool.

Current policy has reduced reliance on zoning and growth plans and is characterized by contracts between municipalities and developers concerning new housing construction. Today, impact fees are imposed by communities according to state legislation, municipal fee ordinances and formulas, and contractual bargaining between builders and city planners. Most subdivision development is based upon annexation agreements that specify ordinances, regular fees, bargaining results regarding additional fees, and enforcement conditions.

Paying for neighborhood amenities is a problem of particular concern to suburban communities, where population growth has been rapid and where preexisting infrastructure is often lacking. Millions of Americans have moved to the suburbs to find moderately priced housing, as suburbs were perceived as a way to find a balance between access to the central city and the neighborhood standard of living they desire. An initial impetus for suburban growth was provided by the improvements in transportation that construction of the interstate highway system made available. More recently, movement to suburbs has been fueled by efforts to find relief from the high crime rates and poor education systems of urban areas. Despite the completion of the interstate highway system, suburban growth continues.

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[6]See Robert H. Freilich and David W. Bushek, supra note 1, pages xxxiii-xxxiv.

[7]Joseph D. Lee, "Sudden Impact: The Effect of *Dolan v. City of Tigard* on Impact Fees in Washington," *Washington Law Review*, Vol. 71, No. 1, January 1996.

Beginning in the late 1960s, environmentalists and other critics of "suburban sprawl" framed suburban growth as a problem of subsidized expansion. They claimed that new homebuyers did not pay the full costs of their impacts upon undeveloped areas; both ecosystem and infrastructure costs were not being met by new construction. These critics questioned the then-current approach to financing suburban infrastructure and services and initiated a new dialogue, which in combination with growing demand by municipal officials for financial resources, often prompted the adoption of impact fees.

There has been a substantial amount of litigation challenging both impact fees and development.

Concurrent with much of the anti-growth sentiment, municipalities faced difficulties raising revenue due to taxation limits imposed by states and municipalities. In California, voters approved Proposition 13 in 1978 limiting property taxes to 1 percent of a property's assessed value. One result was sharp increases in impact fees by local governments not wanting to be so constrained.[8] On the other side of the country, in Dade County, Florida, an influx of new residents led to a 40 percent increase in school enrollment between 1984 and 1995, requiring a 360 percent increase in the district school construction budget between 1992 and 1995. As was the case in California, local officials were forced to seek out school funding options in addition to local tax revenues.[9]

There has been a substantial amount of litigation challenging both impact fees and development. Impact fee adjudication, however, is principally concerned with precedents set in two cases, *Nollan v. California Coastal Commission*, and *Dolan v. City of Tigard*. These two cases argue that impact fees set by municipalities must have a "rational nexus" with land use concerns and a "rough proportionality" with expected costs of municipality plans.

The case of *Nollan v. California Coastal Commission* was the result of the California Coastal Commission's requirement of an easement to connect two public beaches through property that the Nollans wished to build a larger house on. The Coastal Commission demanded the easement on the basis of diminishing blockage of the ocean view from the public roadway. However, the court found that the required easement constituted an uncompensated, and therefore unconstitutional, seizure of private property by the state and denied the Commission's requirement for the easement. This case set the precedent for the idea of the rational nexus.[10]

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[8]Marla Dresch and Steven M. Sheffrin, *Who Pays for Development Fees and Exactions* (San Francisco, CA: Public Policy Institute of California, June 1997), page v.

[9]Emil Malizia, Richard Norton, and Craig Richardson, "Reading, Writing, and Impact Fees," *Planning*, Vol. 63, No. 9, September 1997, page 17.

[10]Robert H. Freilich and David W. Bushek, "Public Improvements and the Nexus Factor: The Takings Equation after *Dolan v. City of Tigard*," in Robert H. Freilich and David W. Bushek, editors, "Introduction," *Exactions, Impact Fees, and Dedications: Shaping Land-Use Development Infrastructure in the 'Dolan' Era* (Chicago, IL: American Bar Association, 1995), page 5.

The rational nexus test has two requirements. First, the municipality must demonstrate the existence of a "reasonable connection between the need for facilities and the growth generated by the new development." Then, there must exist "a reasonable connection between the expenditure of the fees collected and the benefits received by the development" that paid the fees.

In *Dolan v. City of Tigard*, the Dolans wanted to demolish an existing building and erect a larger one to house a business in Tigard, Oregon's central business district. The city of Tigard's land use management program stipulated that easements be provided for stormwater run-off and construction of a bicycle pathway. Those easements amounted to 10 percent of the total Dolan property.[11] The U.S. Supreme Court, while granting that the rational nexus test of *Nollan* was met, further stipulated that municipalities must show a "rough proportionality" between their goals and the revenue or land they exact. Justice Rehnquist opined, "No precise mathematical calculation is required, but the city must make some sort of individualized determination that the required dedication is related both in nature and extent to the impact of the proposed development."[12]

Tax referenda and municipal bond proposals face opposition from voters, while property tax caps limit tax revenues.

School fees generally meet the rational nexus test since the fees can be used to buy land for or build schools that serve the children who move into the development. Furthermore, municipality school fee formulas, based upon calculations of marginal costs attributed to extra children, appear to satisfy the rough proportionality condition. Most municipalities with impact fees have some kind of school impact fee. Other impact fees, such as road or traffic impact fees, may not pass the rational nexus test as easily, and may encounter difficulties with the rough proportionality stipulation as well.

Impact Fees in Illinois

The "rational nexus" test developed in the *Nollan* decision has been rejected in Illinois as too vague and too broad. Rather, courts here apply the more stringent "specifically and uniquely attributable" standard developed in 1977, when the Illinois Supreme Court ruled in *O.L. Krughoff et al. v. City of Naperville*[13] that the city had the power to require dedication of land or money for the provision of school and parkland. The city's power was affirmed in situations in which the required contributions of land were "uniquely attributable to and fairly proportioned to the need for new school and park facilities created by the proposed developments." Additionally, the court ruled that such an ordinance "did not deny equal protection merely because developers of land

[11]Robert H. Freilich and David W. Bushek, supra note 1, pages 4-6.

[12]Ibid., page 6.

[13]*O.L. Krughoff et al., Appellants, v. City of Naperville, Appellee*, Supreme Court of Illinois. October 5, 1977.

which lay in the same school district, but outside of the city's planning jurisdiction were not required to make a dedication." The court also ruled that "it was constitutionally permissible to base the dedication requirements on population rather than property valuation."

Krughoff did not mark the end of controversy surrounding development impact fees in the collar counties. Indeed, the *Krughoff* ruling, combined with state legislation enabling road impact fees and cash-in-lieu-of-land donations, is considered the basis of most impact fee disputes in Northern Illinois. There has been a protracted debate between municipal governments and developers over the magnitude and direction of the impact of new development on current residents and municipal budgets. Developers cite positive effects in terms of increased tax revenue, while municipalities point to negative impacts arising from increased demand for municipal services.

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The 1977 ruling in *Krughoff v. Naperville* provided legal precedent for other municipalities to adopt similar ordinances. For many cities, Naperville has also served as a practical example of how to set fees. In Illinois, most of the municipalities with impact fee regulations are located in the quickly growing Chicago metropolitan area. A 1997 survey[14] of selected Illinois cities indicates that impact fees have generally not been implemented outside of the greater Chicago metropolitan area. Of those municipalities surveyed, only two Illinois municipalities outside the Chicago area had such regulations (Glen Carbon and Peoria).

Currently, DuPage County has a controversial "Road Improvement Impact Fee." This fee, collected from developers by the county, was intended to ensure that adequate roads would be in place when needed by new developments.[15] The fee varies by development types and by location within the county.

In June 1996, the County Board voted overwhelmingly to remove the fee.[16] Developers and other interest groups lobbied successfully that this fee was a "hidden tax" and as such should be eliminated. However, the DuPage County Board Chairman who presided over the 1996 vote to phase out the fee retired in April 1998. Since that time, DuPage County has been ordered to put approximately $6.3 million into escrow to refund impact fees collected in 1989 and 1990. Those fees were collected under an earlier state law and county ordinance that has been ruled unconstitutional by the Illinois Supreme Court. The court's decision is under appeal by DuPage County. Interim County Board Chairman John Case, who claimed that the funds ordered into escrow had already been budgeted, campaigned to overturn the decision to phase out the road

[14]William S. Foster, "Impact Fees in Illinois: Increasingly Popular—and Increasing Building Costs," *Illinois Tax Facts*, May 1997, pages 1-8.

[15]"Road Impact Fees General Information," fact sheet, Division of Transportation, DuPage County.

[16]"DuPage Impact Fees to End in '99," *Chicago Tribune*, June 26, 1996.

impact fees.[17] His campaign within the County Board was successful; the Board voted to extend the road impact fees through 2009.[18]

A similar Naperville ordinance faces possible elimination due to a lawsuit filed by a home builder, Edward Brown. Brown disputes the ordinance that requires developers to contribute to building and maintenance of roads through a "fair share assessment" at the time of development.[19] In response to the lawsuit, Naperville instituted a moratorium on issuing building permits.[20] A second suit, filed by Tom Bart Construction, challenges the legality of the municipality's requirement that builders waive their rights to future legal challenges in order to obtain a building permit.[21]

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The Naperville Transportation Advisory Committee voted in April 1998 to recommend reduction of Naperville's road impact fees. In late June 1998, the Naperville City Council raised impact fees for all new construction except warehouse and office space. These increases represent between a 35 and 50 percent increase in residential impact fees. Naperville's impact fees have been steadily rising; four fee structure adjustments have taken place in the last ten years.[22]

The Aurora City Council, in June 1995, voted to increase the fees to developers for the city to purchase land for schools and parks. The fees nearly doubled the previous fee structure, set in 1989. The valuation of unimproved city land was reset from $25,000 to $42,500 per acre. Developers pay fees based on the city-estimated land value in lieu of donating land parcels.[23] Aurora charges additional impact fees to provide revenue for fire protection services.[24]

In 1997, developers of a senior residential facility in Lisle unsuccessfully petitioned to have the $136,000 impact fee for their development reduced, claiming that the residents were unlikely to utilize the library or park district, and did not generate any traffic. Lisle Municipal Trustee

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[17]William Grady, "Board May Reconsider Impact-Fee Issue," *Chicago Tribune*, September 8, 1998.

[18]"County Extends Highway Impact Fees," *Chicago Tribune*, October 14, 1998.

[19]Jeff Coen, "Builders Challenge Naperville's Fees," *Chicago Tribune*, February 8, 1997.

[20]Jeff Coen, "Naperville, Builders Fight over Fees," *Chicago Tribune*, March 27, 1997.

[21]*Tom Bart Construction Inc. v. City of Naperville*.

[22]See Jeff Coen, "Consensus Building," *Chicago Tribune*, June 14, 1998, and Jeff Coen, "Pay As You Grow," *Chicago Tribune*, July 19, 1998.

[23]Hal Dardick, "Fees on School, Park Land Go Up," *Chicago Tribune*, July 7, 1995.

[24]Hal Dardick, "Higher Impact Fees Ok'd to Aid Fire Department," *Chicago Tribune*, June 12, 1997.

Luke Brandonisio, referring to the refusal of fee reductions on the land (originally zoned for commercial development), stated "This is our only opportunity to collect any fees."[25]

The City Council of Woodstock, Illinois, increased the city's impact fees 80 percent in March 1998. City Council member Brian Sager admitted that the procedure to increase impact fees did not allow for sufficient public discussion and debate, a concern that developers expressed.[26] The consensus among builders and Realtors was that the fees increased in a dramatic and unanticipated manner.

The City Council of Woodstock, Illinois, increased the city's impact fees 80 percent in March 1998 and met with immediate outrage by developers.

Also in 1998, a similar increase in impact fees in Fox Lake more than doubled the per-room school fee for houses with more than two bedrooms. Library district fees increased 88 percent and parks department fees increased 500 percent.[27] In an attempt to increase revenue and keep pace with other municipalities, St. Charles increased its land valuation for cash-in-lieu donations to $100,000 per acre in early 1998.[28] In 1997, West Chicago increased its land valuation from $35,000 to $125,000 per acre. Setting land valuations higher increases the revenues municipalities are able to collect from development.

[25]Laura Zohn Pohl, "Impact-Fee Reduction Denied," *Chicago Tribune*, December 4, 1997.

[26]Dave Barnes, "Council Takes Hit for Impact Fees," *Chicago Tribune*, May 31, 1998.

[27]Betsy Boldt, "Fox Lake: Developers to Pay More School Fees," *Chicago Tribune*, July 18, 1998.

[28]Kathy Guyer, "St. Charles May Build Up Permit Fees," *Kane County Chronicle*, November 21, 1997.

PART 2

Assessing the Effects of Impact Fees in the Chicago Suburbs

Very little empirical research has been done, either nationally or specifically in Illinois, on the actual cost to developers of impact fees and exactions or the effects of those fees on housing prices.

A two-part article by Tom Parisi of the Aurora, Illinois *Beacon News*[29] compared the "entrance fees" of several municipalities in suburban Chicago. Parisi compared the per-home fees that a hypothetical 65-acre subdivision with 130 three-bedroom houses of 2,100 square feet, basements, and garages would pay in fourteen municipalities in the western collar counties of Chicago. He reports those fees ranged from $2,345 in North Aurora to $7,568 in Oswego.

Some municipalities had Byzantine fee structures, while others, such as West Chicago, outright refused to provide information requested under the Freedom of Information Act.

This study uses impact fee information for eight Chicago suburbs. The suburbs studied in this paper are those that were forthcoming with useable and comprehensive impact fee guidelines. Legally and historically, Naperville has been at the center of impact fee controversy. For that reason, data collection on impact fees focused on the Western suburbs in and around DuPage County (which contains most of Naperville).

Research into municipality impact fee structures was complicated by several obstacles. Some municipalities had Byzantine fee structures, while others, such as West Chicago, outright refused to provide information requested under the Freedom of Information Act.

Table 1 on page 12 compares the fees for a four-bedroom, detached single-family home on a 1/4-acre lot between 1995 and 1997. The totals range from $2,223.56 in Aurora to $8,942.31 in Burr Ridge. The table shows the individual fees that comprise the totals for each community. In addition, Table 1 displays both the median family income and population growth rate for each community from the 1990 census, to allow a comparison between community characteristics.[30]

The sample studied may be biased by the availability of information. This bias may understate the costs of impact fees across all the Chicago suburbs, if the municipalities that were not

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[29]Tom Parisi, "'Entrance Fees' Highest in Oswego," *The Beacon-News*, November 9, 1997, page A1, A6; Tom Parisi, "Managing Growth Amounts to No Small Task," *The Beacon-News*, November 10, 1997, page A1, A6.

[30]Chicago Fact Book Consortium, editors, *Local Community Fact Book, Chicago Metropolitan Area, 1990*, pages 15-33. Data are not available for Burr Ridge.

forthcoming with impact fee information had higher fees than those who were. Though the bias in information collection may limit the generalizability of the study results, the sample has many positive merits:

- Inclusion of municipalities both within and outside of DuPage County allows an assessment of the controversial DuPage Road Impact Fee.
- Inclusion of Naperville allows assessment of an affluent community with high population growth (Naperville's population increased 102 percent from 1980 to 1990).[31] Additionally, Naperville has changed its impact fee structure many times in the last decade. Many of the challenges to impact fees have occurred in Naperville.
- Use of Aurora data provides a contrast to Naperville; Aurora is substantially less affluent. Furthermore, Aurora has also changed its impact fee structure repeatedly, and is only partially affected by the DuPage County Road Fee.
- The variation of the sample allows investigations of municipalities that experienced rapid expansion, as well as suburbs where very few new houses were being built.

While biased, the sample includes some very important locations with substantial impact fee controversy. The sample also allows comparison between communities with varying demographic characteristics.

[31]Ibid., page 27.

Table 1
Impact Fees in Eight Chicago Suburbs

Comparison of impact fees assessed
on a four-bedroom single-family home on 1/4-acre lot

Municipality (1990 Census Data)	Fee Description	Fee Amount
Aurora	School Site	$906.81
Median Family Income: $38,564	Park Site	$848.75
1980-90 Population Growth: 22%	Aurora Public Works	$125.00
	Fire Department	$250.00
	DuPage County Transportation*	$93.00
	Total	$2,223.56
Bolingbrook	School Site	$1,426.04
Median Family Income: $65,779	Park Site	$1,108.80
1980-90 Population Growth: 9%	Total	$2,534.84
	School Site	$3,170.22
Burr Ridge	Park Site	$2,315.09
Census Data Unavailable	Water Capital Fund	$1,000.00
	Village Capital Fund	$2,000.00
	DuPage County Transportation	$457.00
	Total	$8,942.31
Darien	School Site	$1,129.00
Median Family Income: $58,569	Park Site	$1,047.00
1980-90 Population Growth: 26%	Library	$141.12
	City Impact Fee	$125.00
	DuPage County Transportation	$457.00
	Total	$2,899.12
Downers Grove	School Site	$2,453.39
Median Family Income: $80,262	Park Site	$2,283.33
1980-90 Population Growth: 10%	DuPage County Transportation	$457.00
	Total	$5,193.72
Glen Ellyn	School Site	$2,318.00
Median Family Income: $62,274	Park Site	$2,230.00
1980-90 Population Growth: 5%	Library	$304.00
	Fire Department	$250.00
	DuPage County Transportation	$249.00
	Total	$5,351.00
Naperville*	School Site	$1,923.68
Median Family Income: $101,073	Park Site	$1,426.37
1980-90 Population Growth: 102%	Fair Share Assessment*	$1,665.00
	DuPage County Transportation*	$93.00
	Total	$5,108.05
Wheaton	School Site	$1,282.50
Median Family Income: $75,609	Park Site	$1,570.39
1980-90 Population Growth: 20%	DuPage County Transportation	$249.00
	Total	$3,101.89

*The DuPage County Transportation fee impact fees for Aurora, Bolingbrook, and Naperville are only applicable for houses within DuPage county.
**Naperville has since increased its Fair Share Assessment to $2,645.

Comparison of the municipalities shows an apparent relationship between higher impact fees and higher median family incomes. Aurora had the lowest median family income and lowest impact fee structure, and the impact fees are higher in more affluent communities. The

relationship between the 1980-1990 population growth and impact fees is not as striking, but follows a general, mutually increasing relationship.

An Economic Model for Understanding the Effects of Impact Fees

The information provided by articles such as Parisi's and the data presented in Table 1 are illustrative of impact fee structures. However, while it may be intuitive to say that the impact fees on a four-bedroom house in Aurora raise the price of the house by $2,223.56 (from Table 1), the actual effects of the fee may be quite different. If the housing market were perfectly competitive, all houses are substitutes, and the imposition of fees raises no other associated costs, then the increase in home prices would be the same as the nominal fee. However, in reality, the imposition of fees is much more complex. Markets are not perfectly competitive and all houses are not equal substitutes. More importantly, as this analysis demonstrates, imposition of impact fees can cause other associated costs of construction to rise.

Depending on the sensitivity of house buyers to increases in price (housing demand elasticity), house builders may make changes in the price or quality of housing. If the housing market were perfectly competitive and houses in all locations were perfect substitutes among consumers (perfectly elastic housing demand), then the amount of the impact fee would result in a corresponding decrease in the quantity of new housing produced. However, if the demand for housing is relatively inelastic due to non-substitutability between municipalities for consumers and restrictions on entry (regulations, certification requirements) among builders, then impact fees would result in both a price increase and a quantity decrease.

The economic analysis that follows allows an assessment of the short-term housing market, where impact fees represent variable costs of construction due to the frequency of changes in the fee structure and the uncertainty of when changes will occur.

Use of a simple economic model can help illustrate possible effects of impact fees on the housing market. Econometric analysis, based on the simple model, can answer the question, "Are impact fees actually raising the cost of new housing?" which is not possible to assess simply by reading Table 1. More importantly, the economic analysis that follows allows an assessment of the short-term housing market, where impact fees represent variable costs of construction due to the frequency of changes in the fee structure and the uncertainty of when changes will occur.

While it is plausible that a homebuyer may choose to live anywhere he or she pleases, it is more reasonable to assume that most people have a set of amenities they desire that leads them to focus their research on a particular location.[32] The amenities may include good schools for their

[32]See R.N.S. Harris, George Tolley, and C. Harrell, "The Residence Site Choice," in Douglas B. Diamond Jr. and George S. Tolley, editors, *The Economics of Urban Amenities* (New York, NY: Academic Press, 1982), pages 55-68.

children, access to parks, open spaces, and greenery, or some desired level of population density. Concerns about crime and community composition are also factors. Proximity to the place(s) of employment and transportation infrastructure is often an important factor. Some or all of these factors will narrow the universe of acceptable homes to a definite subset of all possible housing locations that contains the potential homebuyer's primary choices.

Most homebuyers have a set of amenities they desire that leads them to focus their research on a particular location. The amenities may include good schools for their children, access to parks, open spaces, and greenery, or some desired level of population density.

Within the favored locations, the potential homebuyer may choose to rent, buy a new home, or buy an existing home. The decision to buy rather than rent is a complex one, but people usually decide to buy when preparing for a family or after finding reliable employment. This analysis will focus on the decision to buy a new or existing house. Direct estimation of the effects of impact fees on the rent-or-buy decision are beyond the scope of this research, although some inferences may be possible.

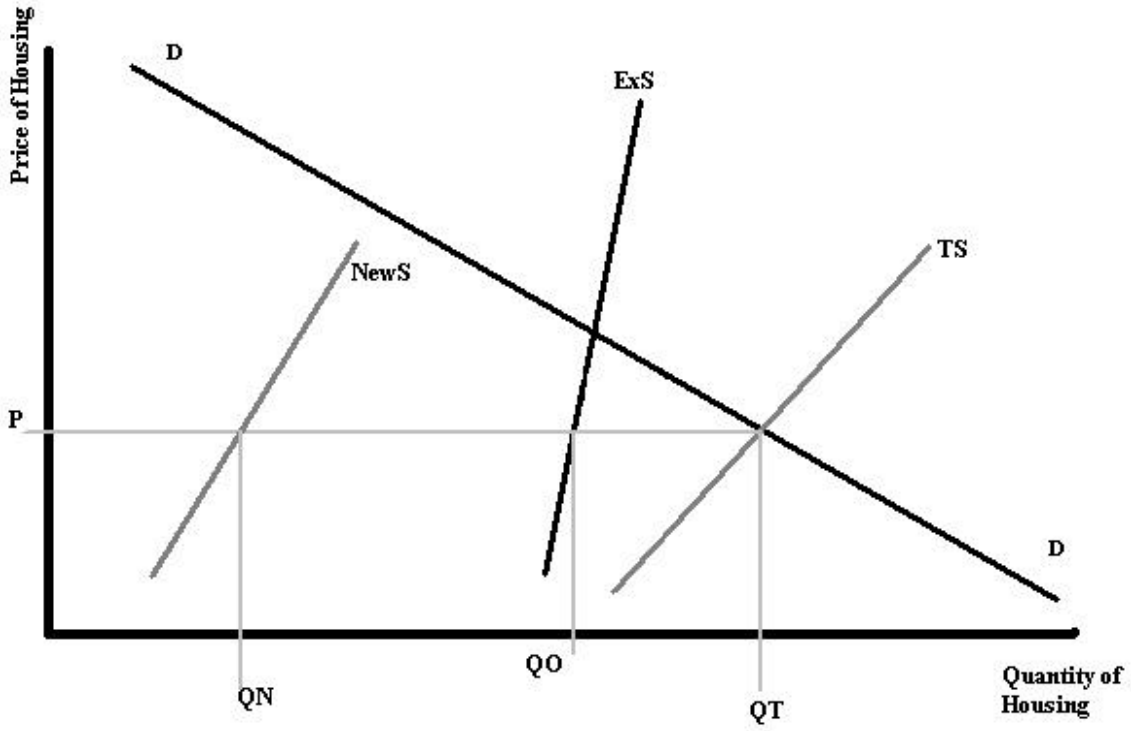
Figure 1 on the following page depicts a simplified model of the housing market.[33] The horizontal axis represents the quantity of housing units and the vertical axis is the price of housing. The descending line marked **D** is the total demand for housing in the economy. It slopes downward because the quantity of housing demanded increases as the price of housing falls. The rising line labeled **TS** is the total supply of housing. It is rising because more housing is produced as the price of housing rises.

Figure 1 shows a segmented housing market where there are new homes and existing (old) homes. The curve **ExS** is the existing supply of housing. It is steeply upward sloping (highly inelastic) because, at least in the short term, owners of existing homes are not as sensitive to small changes in housing prices as are house builders; the supply of existing homes put up for sale does not increase dramatically as prices rise. The curve **NewS** is the supply of new homes. It is more elastic than the supply of existing homes because when prices increase, developers are motivated to build more new homes.

The point at which the demand curve, D, and the total supply curve, TS, intersect reveals the average price at which all houses that are for sale will eventually be sold, and the total quantity of housing that will be sold. This is called the "market-clearing price." That price is P, and the total quantity of housing sold at this price is QT. Figure 1 also reveals the quantity of new homes, QN, and of existing homes, QO, that will be sold at the market-clearing price. QN plus QO will equal QT.

[33]The following graphs are based on Figure 1 in Larry D. Singell and Jane H. Lillydahl, "An Empirical Examination of the Effect of Impact Fees on the Housing Market," *Land Economics*, Vol. 66, No. 1, February 1990, page 84.

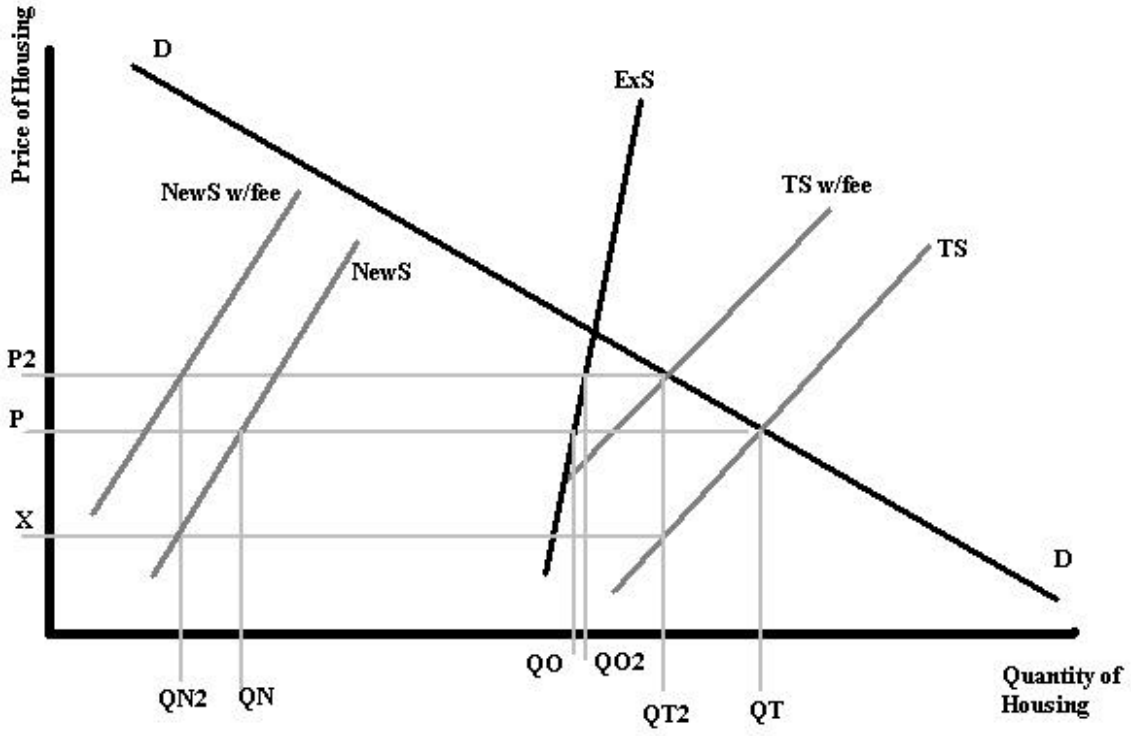
Figure 1
Simple Model of a Segmented Housing Market



When municipalities adopt impact fees, all other things being equal, developers will be willing to sell less housing at any given price, since they must now attempt to recover their own cost of producing the housing as well as the cost of the fee. This would be represented by an upward shift in the supply curve for new housing. Because the fee applies only to new housing, the supply curve for existing housing does not shift.[34] However, the curve representing total housing supply, being the sum of new and existing housing, must shift upward as well. Figure 2, below, is the same as Figure 1 except for the addition of two new supply curves: new housing supply with fees **(NewS w/fee**) and total housing supply with fees (**TS w/fee**).

[34]This assumes there is no immediate conversion of spare rooms and basements to accommodate new occupants. While such transformations may occur, the effects are likely to be limited in the short run. In this model, additional houses brought onto the housing market are "new houses"—there is no such thing as a "new-old house."

Figure 2
Model of a Segmented Housing Market with Impact Fees



The point at which **TS w/fee** crosses the demand curve has shifted up and to the left. As a result, the market-clearing price rises from **P** to **P2**, and the total quantity of housing purchased falls from **QT** to **QT2**. The difference between **P2** and **X** is the amount of the impact fee, since together the developer and purchaser must pay that fee. There may be a small incremental increase in the number of existing houses put on the market (from **QO to QO2**), since the purchase of an existing house is a substitute for the purchase of a new house.

To assess the extent to which impact fees affect the housing market, empirical analysis should determine if fees are significant in raising the prices of new homes; if price rises from **P** to **P2**. In addition, a determination of the incidence of the fee can estimate the portion of the fees paid by new house buyers versus that absorbed by housing developers. For the model described above, the price premium paid by house buyers for the quantity **QN2** of new homes in the market with fees imposed, is the distance **P2 - P**. The price difference that developers have to pay is **P-X**.

This model is based on the assumption that there is volatility and uncertainty in the fee structure over time (see Part 1). If the costs of impact fees and regulation were known in advance with certainty, they would be capitalized as a decreased value in the price of land sold for development, and landowners would absorb the cost of the fees. Furthermore, this analysis also

assumes that the demand for housing is somewhat inelastic. This assumption is plausible if people have differing preferences about which municipality they choose to live in and these preferences render all municipalities imperfect substitutes. The assumption of somewhat inelastic housing demand enables the house builder to decrease housing quantity supplied less than under elastic demand, and pass some of the cost on to the house buyer.

Using home purchase prices poses some methodological problems as well. It is possible to estimate the effect of fees upon the market for existing (used) houses, but such estimation is based on the assumption that the purchase of existing homes is a close substitute for the purchase of new homes. This assumption may be unwarranted. If new homes consist of large, multi-bedroom structures on large lots, while existing homes are smaller and are built on smaller lots, then each kind of house may not be a close substitute for the other.

PART 3

Empirical Analysis of Impact Fees

Larry D. Singell and Jane H. Lillydahl examined Multiple Listing Service house sale data for Loveland, Colorado, between January 1983 and December 1985.[35] Their regressions of sale prices on housing characteristics, time variables, and fees revealed that the imposition of fees increased the sale prices of both new and existing houses. The methodology used in their paper provides the basis for this analysis.

To date there have been few empirical studies of the positive economic effects of impact fees upon the market for houses.

A 1997 study by Marla Dresch and Steven M. Sheffrin for the Public Policy Institute of California examined the incidence of impact fees (that is, which portion of fee-induced price increases was paid by homebuyers, and which portion was paid by developers) for new and existing houses sold in Contra Costa County, California. Housing sale data from Contra Costa County between Oakland and San Francisco was regressed on impact fee and school bond information, along with housing characteristics, to examine the effects on new and existing housing. The findings indicate that homebuyers paid one-quarter of the price increase due to fees, while developers/land owners absorbed the rest.[36] However, Dresch and Sheffrin's use of a simple linear model imposes several limitations on their results.

A study commissioned by the Urban Land Institute examined the capitalization of impact fees into the price of land sold for development. This analysis evaluated the effect of fees upon the price of new housing in Sarasota County, Florida, between July 1, 1981, and June 30, 1987. Central to the analysis were the authors' assumptions that the regional housing market was competitive among municipalities; that fees were predictable due to clarity and specificity of the municipal governments; and that the existence of fees guaranteed adequate services would be available to new developments, thus increasing the value of the land.[37] The authors used multivariate analysis of housing sales, locational variables, lot sizes, times of sales, and fees to estimate the influence of those fees. The positive significance of the fee variable in the Sarasota County housing market was interpreted as an indication that fees, assumed to be a contractual exchange for certainty that sufficient services would be provided, increased the sale price and value of new houses.

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[35]Larry D. Singell and Jane H. Lillydahl, supra note 33.

[36]Marla Dresch and Steven M. Sheffrin, supra note 8, page 75.

[37]Arthur C. Nelson, James E. Frank, and James C. Nicholas, "Positive Influence of Impact-Fee in Urban Planning and Development," *Journal of Urban Planning and Development*, Volume 118, Number 2, June 1992, pages 59-64.

The capitalization argument made in the Sarasota County study is much weaker if made for the metropolitan Chicago area. It is not clear that the purchase of a new house in one municipality is a perfect substitute for another municipality; the competitive housing market assumption is suspect. While impact fees of a municipality may indeed guarantee a level of services, these services are bundled with the unique (non-substitutable) aspects of each community; i.e., Naperville annexation (contingent upon fee payment) guarantees Naperville-quality services. If fees are viewed as guarantees of service in this way, then fees serve to segment the market as a function of location, reducing the competitiveness of the overall housing market.

If impact fees were constant, or increasing at an expected rate, then it is likely that the cost of the fees would be capitalized into the value of land. However, fees in the Chicago suburbs have not been constant.

The most vulnerable of the capitalization assumptions, however, is that the impact fee structure eliminates uncertainty in development, and hence the fees can be treated as fixed costs of development. If impact fees were constant, or increasing at an expected rate, then it is likely that the cost of the fees would be capitalized into the value of land. The value of land for development would decrease by the amount of the fee or the expected amount of the fee at the time of development. However, as discussed in Part 1 above, fees in the Chicago suburbs have not been constant, nor has the increase in fees met developers' expectations.

The fact that Naperville road impact fees have been changed four times in the past decade, and that many changes in Naperville and other suburbs have been of magnitudes of 100, 200, and 300 percent, indicates there is high volatility and uncertainty surrounding impact fees for development. This volatility and uncertainty create barriers to accurate capitalization of fee costs into land values; impact fees remain marginal costs of construction. Furthermore, if the volatility and uncertainty of impact fee assessment continues, the view that fees are simply added to the price of housing may be theoretically true in the hypothetical long-term, but never actually true at any given point in time.

Other studies have concluded that impact fees increase property sale prices. Sakburskis and Qadeer found that from 1977 to 1986, impact fees caused lot prices in Toronto to increase an average of $1.88 for every $1.00 in fees.[38] Delaney and Smith found that, at least in the short run, impact fees caused housing prices to rise in Dunedin, Florida relative to other cities in Peinellas County, Florida between 1973 and 1978.[39] In other research, Delaney and Smith found that impact fees on new housing caused the price of existing housing to increase, though less than the increase in the price of new houses.[40]

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[38]Andrejas Sakburskis and Mohammad Qadeer, "An Empirical Estimation of the Price Effects of Development Impact Fees," *Urban Studies*, Vol. 29, No. 5, 1992, pages 653-667.

[39]C.J. Delaney and M.T. Smith, "Impact Fees and the Price of New Housing: An Empirical Study," *Journal of the American Real Estate and Urban Economics Association*, Vol. 17 No. 1, 1989, pp. 41-54.

[40]Charles J. Delaney and Marc T. Smith, "Pricing Implications of Development Exactions on Existing Housing Stock," *Growth and Change*, Fall 1989, pages 1-12.

No empirical studies have addressed the price effects of impact fees in Illinois. In 1998, Mark Skidmore and Michael Peddle found that impact fees in DuPage County slowed the rate of residential development from 4.3 percent to 3.0 percent from 1977 through 1992. This represents a reduction in residential growth rates between 29 and 31 percent.[41] While Skidmore and Peddle examined the supply responsiveness of housing construction to impact fees, they did not examine the direct price effects, although increased prices are implicit in a slower residential growth rate. Moreover, Skidmore and Peddle considered only municipalities with impact fees in place through 1992. That year, the municipalities of Burr Ridge, Downers Grove, and Glen Ellyn did not have impact fees. In 1995 they did, providing support for our finding that the use of impact fees is increasing throughout the greater Chicago metropolitan area.

Methodology

This paper employs hedonic analysis[42] to assess the effect of impact fees upon the housing market. Housing sale prices are regressed on attributes of the houses and the fee structure of the municipality where it is located. If fees are noticeably increasing the price of housing, then the fee coefficient in the regression should be statistically significant and positive.

Some housing characteristics are intuitively obvious and widely used in the literature: the total number of rooms (as well as the number of bedrooms and bathrooms), the size of the garage, the size of the house, the age of the house, and the size of the lot on which the house is built.

The regressions used to detect the effect of impact fees on sale price follow the hedonic procedure of regressing the sale price of the house on attributes that contribute to its worth, in addition to the variable of interest (in this case the housing fee per household). There are housing characteristics that are intuitively obvious and widely used in the hedonics literature. Among these are the total number of rooms (as well as the number of bedrooms and bathrooms), the size of the garage, the size of the house (floor area in square feet), the age of the house, and the size of the lot on which the house is built.

Many other variables can easily be imagined: the style of the house, the number of floors, the proximity of the house to schools and parks, and several other buyer-specific items. For the simple model employed here, those additional factors are not included.

Empirical analysis is limited by the quality of the data available. This investigation utilizes data from the Multiple Listing Service of Northern Illinois (MLSNI), a listing of house attributes

[41]Marc Skidmore and Michael Peddle, "Do Development Impact Fees Reduce the Rate of Residential Development?" *Growth and Change*, Fall 1998, pages 383-400.

[42]Hedonic analysis is the use of regression techniques to estimate the implicit prices of components of a composite good. Hedonic analysis allows estimation of the price of bedrooms in a house, when the price of the house is the only observed information.

available to real estate agents throughout the region. The sample considered consists of pooled housing sale information for new houses in several municipalities between January 1, 1995 and December 31, 1997. The municipalities considered are Aurora, Bolingbrook, Burr Ridge, Darien, Downers Grove, Glen Ellyn, Naperville, and Wheaton.

The MLSNI database is structured to be useful to real estate agents. Use of this data for empirical analysis requires substantial data cleaning and correcting. Many observations were missing values for variables of interest. These deficiencies in the data require careful consideration while performing analysis. Two principal variations of the central empirical model are reported and interpreted together to avoid errors due to over-reliance on missing data.

The variable that denotes the size of the lot has many missing observations. Use of the lot size variable reduces the sample size by 11.3 percent. To compensate for missing variable values, two regressions are performed for each sample. The regression that excludes lot size has a larger sample size but excludes a potentially important determinant of housing prices. The regression that includes lot size has a smaller sample size, and may introduce some bias due to unknown factors in the excluded observations. When lot size is included, an indicator concerning whether the lot is irregular (not rectangular) is included to control for differently shaped lots, such as those around cul-de-sacs. Both models are presented and considered jointly during the discussion of results.

The principal model posits that the sale price of a new house is a function of housing characteristics and the impact fee structure. This approach has also been used in previous empirical investigations of the effect of impact fees.[43]

A small number of houses that sold for exceptionally high amounts might skew the regression results; the log transformation reduces the likelihood of this event.

Dresch and Sheffren use a linear hedonic equation to estimate the incidence of fees. While this approach is frequently used, it assumes that all variables have a linear relationship with the price of the house. Taking the logs of all the regression variables allows estimation of the curvature between housing attributes and prices that is implied by the law of diminishing marginal utility.[44] The economic law of diminishing utility simply states that the per-unit value of consumption decreases as consumption increases. In other words, the log-log hedonic specification allows the marginal utility of extra floor space devoted to each room to become less important as the floor space increases. In addition, the log transformation of variable values de-emphasizes the effects of data points that are much greater than those in the majority of the data. A small number of houses that sold for exceptionally high amounts might skew the regression results; the log transformation reduces the likelihood of this event. Singell and Lillydahl used a log-log regression model as well.

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[43]Marla Dresch and Steven M. Sheffrin, supra note 8; and Larry D. Singell and Jane H. Lillydahl, supra note 33. Both investigations use fewer housing characteristic variables than are used in this analysis.

[44]Denise DiPasquale and William C. Wheaton, *Urban Economics and Real Estate Markets* (Englewood Cliffs, NJ: Prentice Hall, 1996), page 70.

Analysis

This analysis considers the effects of fees in two ways. The principal estimation focuses on the entire housing market (the effects on total supply, TS, of figures 1 and 2). This specification provides robust estimates that do not vary with the inclusion or exclusion of non-fee variables, and give similar results when lot sizes are included and excluded. These are the best estimates of this analysis, and are used to calculate Tables 3 and 4, which help illustrate the effects of fees on new and existing house prices.

A secondary estimation is included that concentrates solely on the effects of fees on new houses (new houses considered separately). The regression estimates for this specification are significant only when lot sizes are excluded, and are not as robust to different specifications. This approach also creates more multicollinearity problems (see Methodological Appendix), which make estimation more difficult. These results are included in Table 5, and the approximate effects on housing prices are listed in Table 6.

The basic model is:

$$\ln(\text{Sale Price}) = \alpha K + \beta * \ln(\text{Housing Features}) + \theta * \ln(\text{Suburb Features}) + \delta * \ln(\text{Amount of Fees}) + \varepsilon$$

where K is a constant. Each regression coefficient can be interpreted as the percentage change in the sale price that a percentage change in that particular variable would cause.[45] Each municipality is differentiated in the "General" regression by its 1990 population. While a more complete description of the community would be more desirable, other attempted specifications caused severe econometric problems (see Methodological Appendix). The "Municipal Indicator" regression uses indicator variables to control the effects of each community separately. The Municipal Indicator model captures the differences between the municipalities by indicating, in the estimation procedure, which town each house is in. This does not explain why one suburb would have higher-priced housing than another; it simply controls the net effect, allowing the fee effect to be estimated more precisely.

For example, consider the case of a house's predicted sale price equal to $100,000 with impact fees of $1,000, and a fee coefficient (δ) from the regression equal to 2. A $1 increase in the impact fee (a change of $1/$1000 = 0.1 percent) would produce a change of .002 in the logarithm of the sale price, resulting in a new predicted sale price equal to 1.002 times the old predicted price. The effect of a $1 increase in the fee would thus lead to a $200 increase in the predicted price of the house.[46]

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[45]The log-log model is a linear specification and assumes that all relationships are linear. The model diagnostics indicate a good fit of the data with the linear regression relationship. K is an intercept, which does not require that the regression line pass through zero. Robust standard errors are computed by the Huber-White procedure in Stata.

[46]The authors express their appreciation to Professor Stephen M. Robinson for clarifications he made to an earlier draft of this paper.

Table 2 presents the results of the empirical estimation for the effects of impact fees the total supply of housing. The data consist of the sale prices of all single-family houses in the eight municipalities between January 1995 and December 1997.[47] Impact fees are assessed on new houses only. Column 1 presents the results when lot size is excluded from analysis, and column 2 shows the results when lot size is included. Only the fee coefficients and statistical significance are displayed. The full regression results are in Appendix 2.[48] All of the regression results show a positive and significant effect of impact fees. These effects are similar in magnitude and are robust to alternate models. These results indicate that impact fees do raise the price of housing. The result is very significant, because impact fees alter the prices of all 14,997 houses in the sample (both existing and new) when levied only on the 1,513 new houses.

Table 2
Impact Fee Elasticities for the Entire Housing Market

Model Type	Model 1 Lot Size Excluded	Model 2 Lot Size Included
General	Fees: + 0.0119046 t = 17.412	Fees : + 0.0140201 t = 18.972
Municipal Indicator	Fees: + 0.0606846 t = 16.847	Fees : +0.0123239 t = 17.572

All of the regressions are essentially consistent in the non-fee explanatory variables (see Appendix 2, Sections A and B). The explanatory variables have the expected signs and are statistically significant: increases in the total number of rooms, bathrooms, size of the garage, size devoted to bedrooms 1-4, the kitchen, living room, and dining room, and remaining area of the house contribute to increasing the sale price of the house. Increases in the size of a fifth bedroom tend to decrease the value of a house. A larger fifth bedroom, however, is likely to be included in a house that has less floor area devoted to other rooms.[49] The presence of a great room increases the price of a new house as well. Model 2 shows that houses on larger lots and irregular lots tend to sell for more. This is consistent with the observed preference for (irregular) cul-de-sac lots. Older houses tend to sell for less; the effect of the house age variable decreases house prices.

[47]House prices and fees are adjusted by the Bureau of Labor Statistics' Consumer Price Index for All Consumers, Series ID CUSR0000SAH, Seasonally Adjusted U.S. City Average Monthly CPI for Housing. Use of this CPI transforms all prices and fees from 01/01/95 - 12/31/97 dollars to constant December 1997 dollars.

[48]Results for the basic model applied only to housing characteristics and time dummies are also included in Appendix 2. Inclusion of impact fees does not change the basic model.

[49]The sample of new houses sold in Aurora has no houses with five bedrooms.

To assist in interpretation of the regression results, Table 3 lists the full market effect of the fees for a new four-bedroom house in each community. The fee effect on price is calculated for a four-bedroom house on a ¼ acre lot, with the impact fees listed in Table 1.[50] The first column lists each municipality. The second column includes the average sale price for new four-bedroom houses by community along with the total impact fees from Table 1. The third column displays the results for the General regression specification where each community is differentiated by its 1990 population. The fourth column shows the results for the Municipal Indicator regression specification, where all effects of each municipality are controlled separately. Each cell in columns 3 and 4 contains the estimated fee effects when lot sizes are excluded (on top) and included (below).

Table 3
Increases to the Average Price of New Four-Bedroom Houses

Municipality	Average Sale Price/ Total Impact Fees	Estimated Impact Fee Effect (General) Model 1/ Model 2	Estimated Impact Fee Effect (Municipal Indicator) Model 1/ Model 2
Aurora	$257,526 $2,224	$3,066 $3,611	$2,752 $3,174
Bolingbrook	$200,992 $2,535	$2,393 $2,818	$2,148 $2,477
Burr Ridge	$780,556 $8,942	$9,292* $10,943*	$8,340* $9,619*
Darien	$435,964 $2,889	$5,190 $6,112	$4,658 $5,373
Downers Grove	$361,536 $5,194	$4,304 $5,069	$3,863 $4,456
Glen Ellyn	$409,006 $5,531	$4,869 $5,734	$4,370 $5,041
Naperville	$302,069 $5,108	$3,596 $4,235	$3,227 $3,723
Wheaton	$334,997 $3,102	$3,988 $4,697	$3,579 $4,128

*There were fewer than 10 four-bedroom houses in the sample for this estimate.
Note: Model 1 excludes the effect of lot size; Model 2 includes lot size. The "General" regression analysis does not include a variable accounting for the effect of differences between municipalities; the "Municipal Indicator" analysis includes such a variable.

[50]Calculations are made with the fee elasticity and mean values for four-bedroom houses for each community in the sample. To be commensurate with the data in Table 1, the house is specified as having four bedrooms, does not have a great room, and is not on an irregular lot (where applicable).

Table 3 demonstrates that the regression estimates for the price increases due to the fee are approximately equivalent, when not greater than the total amount of the fee. This indicates that at least the entire amount of the fee is being passed on to new house buyers. In Downers Grove and Naperville, the fees are not entirely passed on to consumers. Sakburskis and Qadeer reported a result consistent with this finding. They found that the lot price increases due to impact fees in Toronto were generally greater than the amount of the fee, but were less than the full amount of the fee in communities with the highest rate of growth.[51]This may indicate that fees shifted too much to be anticipated and passed on to consumers by developers. The inability of developers to pass on fees is especially likely for small contracting companies, whose narrow contract may not allow for reactive negotiation. When the fee effects are larger than the actual amount of the fees, as in Aurora, Burr Ridge, Darien, and Wheaton, the fee can be thought of as a proxy for other costs that are associated with the fee, such as costs of uncertainty and delay. This results in housing prices rising more than proportionately with the amount of the fees.

Singell and Lillydahl found a similar effect.[52] They posited that either developers added other attributes associated with the fees to the house, or that the additional price difference captured an incremental value of the services being provided by the fees. The authors of the Urban Land Institute study of impact fees in Sarasota County, Florida, assert that impact fees may have a disproportionate effect on new home prices because they guarantee delivery of adequate municipal services, thereby increasing the value and sale prices of new homes.[53]

More than the entire value of the fee is being passed on to consumers in Aurora, Bolingbrook, and Wheaton. In Naperville, housing prices increase by less than the entire cost of the fee.

However, the fees summarized in Table 1 measure only a lower bound of the costs of compliance with building regulation. The most likely reason why impact fees can cause more than a dollar-for-dollar increase in housing prices is the volatility and uncertainty associated with impact fees and the permitting process. Municipal officials may deliberately prolong the regulatory approval process to pressure developers into making more concessions. Permitting delays, legal representation and possible litigation costs, information search costs, and work stoppages and capital interest, are all examples of costs that developers may face in building new homes. Because fees in suburban Chicago are highly variable, they contribute to more rather than less uncertainty, making it plausible that the fees are raising housing costs by introducing transaction cost inefficiencies into the housing market.

In Naperville housing prices rise by less than the full value of the fees. This means that the fees are split between homebuyers and land-owners/developers/builders. The study on fees in Contra

[51]Andrejas Sakburskis and Mohammad Qadeer, supra note 38.

[52]Larry D. Singell and Jane H. Lillydahl, supra note 33.

[53]Arthur C. Nelson, James E. Frank, and James C. Nicholas, supra note 37.

Costa County, California, addressed the issue of fee incidence (who pays what part of the fee) by simplification. The authors cite a lack of profitability data for developers as an impediment to their determining if fees are capitalized into land values. They do not make a distinction between the portion of fees paid by developers and that portion of fees capitalized into land values (paid by land-owners as a change in the land values). The incidence they examine is what portion of price increases due to fees the homebuyer or the land-owner/developer/builder pays.[54] While it is the position of this paper that immediate capitalization of fees into land values is unlikely in the Chicago suburbs, the Dresch and Sheffrin approach is appropriate. Without more extensive analysis, it is impossible to determine whether developers or the people who sold the land for development pay the fees in cases where less than 100 percent of the fees is passed through to new homebuyers.

When impact fees increase new home prices by less than the amount of the fees, as is the case in Naperville, developers or landowners absorb the difference. Intense competition among homebuilders or a declining market for new homes could make it impossible for developers to pass through to consumers the entire cost of fees and compliance costs. In such cases, however, the costs absorbed by developers do not amount to a "free lunch" for either municipalities or homebuyers. Developers change their behavior in response to impact fees by building less housing, building in areas that may be less suited to commuting patterns and community planning, and by building larger and more expensive homes in order to recover the fees through higher margins.

Developers change their behavior in response to impact fees by building less housing, building in areas that may be less suited to commuting patterns and community planning, and by building larger and more expensive homes in order to recover the fees through higher margins.

The regression results from the total housing market that yield the fee coefficients in Table 2 can also be used to estimate the effects of impact fees on the sale prices of existing houses. The fee coefficient uniquely identifies the effect of impact fees; this identification can be used to estimate the fee effects on the market for existing housing as well. Both the General and Municipal Indicator regressions indicate that the imposition of fees on new houses raises the price of all houses.[55]

Any increase in the price of existing housing can be viewed as a windfall gain by the sellers. However, any such price increase is also a loss to potential home-buyers looking at existing, rather than new, houses.

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[54]Marla Dresch and Steven M. Sheffrin, supra note 8, page 54. They also note that many of the developers in their sample were also land-owners.

[55]Dresch and Sheffrin created hypothetical impact fees to show how each existing house would have been affected. This analysis differs by simply assessing whether or not there is an effect of the fee for all houses, when only new houses are affected by the fee. In essence, this approach, contrary to Dresch and Sheffrin, looks at what actually occurred.

Table 4 illustrates the effects of impact fees imposed on new houses upon the sale price for existing, older houses. Specifically, Table 4 provides the price increases due to the fees on new houses from Table 1 for each community, upon the sale price of a 25-year-old house. It should be noted that in some suburbs, such as Burr Ridge, Glen Ellyn, and Wheaton, the average 25-year-old-house sale price was greater than the average new sale price.

This table is complicated by the fact that in Burr Ridge, Darien, Downers Grove, and Glen Ellyn there were very few 25-year-old four-bedroom houses sold. The estimated fee results thus may indicate the effects of fees on some highly desirable and highly idiosyncratic houses, and not reflect the overall trend of the market.

Table 4 should be read in the same manner as Table 3: the first column lists the municipality, the second column displays the actual fee and average sale price, the third contains the estimates from the General regression, and the fourth column provides the estimates from the Municipal Indicator regression.

Table 4
Increases to the Average Price of 25-Year-Old Houses

Municipality	Average Sale Price/ Total Impact Fees	Estimated Impact Fee Effect (General) Model 1/ Model 2	Estimated Impact Fee Effect (Municipal Indicator) Model 1/ Model 2
Aurora	$224,616 $2,224	$2,674 $3,149	$2,400 $2,768
Bolingbrook	$196,430 $2,535	$2,338 $2,754	$2,099 $2,421
Burr Ridge	$971,189 $8,942	$11,562* $13,616*	$10,377* $11,969*
Darien	$351,990 $2,889	$4,190* $4,935*	$3,761* $4,338*
Downers Grove	$330,179 $5,194	$3,931* $4,629*	$3,528* $4,069*
Glen Ellyn	$450,472 $5,531	$5,363* $6,316*	$4,813* $5,552*
Naperville	$302,818 $5,108	$3,605 $4,246	$3,235 $3,732
Wheaton	$352,693 $3,102	$4,199 $4,945	$3,768 $4,347

* There were less than 10 four bedroom houses in the sample for this estimate.
Note: Model 1 excludes the effect of lot size; Model 2 includes lot size. The "General" regression analysis does not include a variable accounting for the effect of differences between municipalities; the "Municipal Indicator" analysis includes such a variable.

For the four suburbs of Aurora, Bolingbrook, Naperville, and Wheaton, which had a substantial number of four-bedroom, 25-year-old houses, none of the impact fee effects are as large as the corresponding effect of the impact fees upon the prices of new houses. This result is both intuitively and methodologically sound—the effects of the fee are less for existing housing where the fees operate as an outside force, compared to for new housing, where the fees actually increase construction costs.

In Burr Ridge, Darien, Downers Grove, and Glen Ellyn, consumers bought a select few 25-year-old houses that were more expensive than new ones, and faced impact fee-induced price effects that were higher than the effects on new houses. Since the existing houses in these four suburbs sold for more than the new houses, the home-buyers clearly considered them to be superior substitutes to new houses. The fact that impact fees on new houses more than proportionally raised the prices of these 25-year-old houses indicates that impact fees can significantly raise the cost of compelling substitutes for new houses.

Table 5 presents results from what should be considered an experimental approach. This table presents the estimated fee effects from regressions on new house prices considered separately. This approach reduces the sample size from approximately 15,000 house sales to 1,500. There are econometric problems with this regression, probably due to limitations of the sample size. The fee coefficient differs in sign and significance when the lot size variable is added (for the lot size model, fees are not significant, and statistically indistinguishable from zero). Furthermore, multicollinearity issues make it impossible to estimate the municipal indicator regressions. These results, presented in Appendix 2 as regressions C Models 1 and 2, are not as robust to inclusion of other variables as those reported in Table 2. However, these results are included because there is some indication that the lot size excluded variable is robust to some specification changes. This estimation should be viewed with caution; these results are more suggestive than conclusive.

Table 5
Supplementary Regressions of New Houses Considered Separately

	Model 1 Lot Size Excluded	**Model 2 Lot Size Included**
Fee Coefficient	Fees: + 0.071654	Fees : - 0.0412968
t-statistic	t = 2.167	t = -0.995

The result of interest in Table 5 is the fee estimate for Model 1, equal to approximately 0.07. This is a much larger predicted effect than in Table 2, where the estimated elasticities were between 0.005 and 0.010. This larger predicted effect leads to a much greater price increase due to impact fees, as is displayed in Table 6.

Table 6 Supplementary Regression Price Increase Estimates		
Municipality	**Total Impact Fees**	**Estimated Impact Fee Effect**
Aurora	$2,224	$18,453
Bolingbrook	$2,535	$14,402
Burr Ridge	$8,942	$55,930*
Darien	$2,889	$31,239*
Downers Grove	$5,194	$25,906
Glen Ellyn	$5,531	$29,307
Naperville	$5,108	$21,644
Wheaton	$3,102	$24,004
* There were fewer than 10 four bedroom houses in the sample for this estimate.		

While it is unlikely that these predictions are completely accurate, there is a plausible case to be made that the lot excluded regression has some validity. This would indicate that impact fees may be causing price increases for new houses to rise much higher than the rate of the fees. Such costs would relate the lower-bound information contained in the data collected to other, more hidden costs such as uncertainty, regulatory delay, and risk associated with building in a municipality with fees. More data will be needed to better re-estimate this particular regression.

Some builders say they build houses of the size and other amenities suited to a price range that they estimate by multiplying the price of the lot by three or four.[56] Assessors apparently sometimes use this "rule of thumb" as well.[57] Impact fees, according to these sources, are added to the price of the lot, increasing the price range of new houses by three times the amount of the fee as builders build bigger and more expensive homes. This account is plausible, though anecdotal, and may help explain the dramatic increase in the prices of new houses relative to the cost of fees. Our empirical analysis does not depend on this account of builders' behavior.

In summary, the empirical analysis finds that impact fees in eight Chicago suburbs are significantly increasing the prices of both new and existing houses. Price increases of existing houses represent a capital gain to current home owners, who have an incentive to raise fees on new houses and enjoy the windfall. This capital gain is not free, however, because an increase in prices will result in fewer houses being sold. This result, too, may be viewed as desirable by current home owners concerned by rising congestion, obstructed views, etc.

Housing price increases may and often do exceed the actual values of the fees. When the sale price of a new house increases more than proportional to the amount of the fee, it may be due to such associated factors as risk premiums, time delays, and hidden fees. Furthermore, the analysis of new house sales alone reveal that there may be substantial hidden costs that raise prices (as shown in Tables 5 and 6), which would indicate that impact fees have a much greater than proportional effect. What is certain is that impact fee taxation generates costs that are imposed on buyers of both new and existing homes.

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[56]Mac Airhart, a builder interviewed in the next section, reported this to the authors.

[57]Two professional appraisers confirmed this rule of thumb: Glen Hultquist, MAI, PE, Appraisal Services, Inc., Norcross, Georgia; T.J. McCarthy, SRA, IFA, T.J. McCarthy & Associates, Tinley Park, Illinois.

PART 4

Case Studies for Five Chicago Suburbs

As large as they sometimes are, the impact fees summarized in Table 1 on page 12 may understate the true costs of impact fees, fee volatility and uncertainty, and other costs imposed on developers by municipalities. Many costs are unique to each project and therefore cannot be averaged, such as time lost due to regulatory delays or compliance costs that cannot accurately be labeled an impact fee. Case studies reported below suggest that these uncounted costs exceed the amounts recorded in Table 1. These case studies may be illustrative of what costs associated with the payment of impact fees may further increase the price of housing. The following case studies also document how differently impact fees enter into house building among several communities.

Naperville

When a developer purchases land within the jurisdiction of a municipality, he is making an investment in a project that he hopes will proceed expeditiously. Risk is a part of any investment and has its costs. Some risk cost can be mitigated through the purchase of insurance or spreading the land investment across municipalities or markets. Other risks are more difficult to manage. One such risk is that of unplanned delays in subdivision or annexation approval or permit issuance. It is possible that even when the developer meets all the official requirements, approval can take many months—or even years.

> As large as some of them are, the fees analyzed above may underestimate the true cost of impact fees, fee volatility and uncertainty, and other costs imposed on developers by municipalities.

Delays in municipal approval can cost developers thousands of dollars. Every day that the land is in the developer's possession, he must pay interest (if he borrowed to finance the project), or an opportunity cost of approximately the same amount.[58] If the delays stretch beyond the amount of time that the developer budgeted, the interest costs due to regulatory delay are added to the price of homes when they are finally built and sold.

According to Mac Airhart[59] of Airhart Construction, a builder of high-priced homes in the western suburbs, the cost of Pheasant Glen, a 33-home development in Naperville, Illinois, was increased significantly by municipal delay. During the nearly three years that passed between his

[58]"Opportunity cost" is the value of the next best available use of the resource.

[59]Jeannine Kannegiesser interviewed Mac Airhart in his offices on January 23, 1998. This case is based on that interview and the supporting documents that he provided.

application for subdivision and its ultimate approval, interest on the nearly $1 million plot of land for the subdivision cost him thousands of dollars.

Reasons for delay vary. In this case, Airhart claims that despite his request that technical questions be directed to him before the public hearing in the approval process, Naperville repeatedly delivered these questions at the last minute. It is Airhart's preference that technical questions be addressed by the appropriate staff before the public hearing so that issues more relevant to the public form the basis of the hearing.

In addition to the delays caused by untimely municipal comment on documentation provided by Airhart Construction, the agreement changed substantially over the months. In the original plan for Pheasant Glen, Airhart Construction had included park areas, a lake, and bike trails. Initially, Naperville had showed enthusiasm for these improvements. However, later in the process, the Naperville Park District decided not to allow these recreational improvements as a credit applicable to the company's Park District donation. Instead, Airhart Construction was required to donate both land and cash to meet the park donation amount of $38,000. The donated lot, valued on the market at approximately $100,000, was credited by the municipality at approximately $19,000 for park site donation purposes. The devaluation of the donated property was a significant cost to the company.

A detailed description of the various fees paid to Naperville by Airhart's company is shown in Table 5. While most of the fees are administrative or user fees, some are considered impact fees. Airhart has a slightly different definition of an impact fee: a fee or regulation that has "unfair impact on the cost of the project." This means that any regulation that increases delay, direct cost, or indirect cost would be considered an impact fee by Airhart. This definition differs from the more common definition of an impact fee: a fee set to recover the costs to a municipality that are uniquely attributable to said development.

Table 5
Actual Charges Incurred by Pheasant Run Development

Fee Description	Amount
School	$55,918.44
Park (cash)	$27,337
Park (Land, 40 x 144' parcel)	$19,000
Naperville Road Impact Fees	$54,615
Naperville Engineering Review	$6,838
Naperville Annexation Fee	$1,405
DuPage County Stormwater and Wetland Application Fee	$3,045
Illinois EPA Sewer and Water Permits	$1,065
Naperville Electrical Distribution System	$48,954
Naperville Tree, Parkway and Miscellaneous Fees	$1,427
Naperville Electric Connection Fees	$18,678
Naperville Sewer Connection Fees	$33,000
Naperville Water Connection Fees	$35,640
DuPage County Road Impact Fees	$14,157
Naperville Building Permit Fees	$22,836
TOTAL	**$343,917**

Dividing the total cost of these fees by the number of houses in the development reveals a cost of $10,421 per house, more than twice the fee amount indicated in Table 1. According to Airhart, such fees are routine in the sense that most developers face them in most municipalities.

In the case of Pheasant Glen, these were not the only expenses incurred to address municipal requirements. A recapture agreement cost an additional $25,000, and off-site impact costs of $50,000 were added to the bill. Property adjacent to the development, owned by the Burlington Railroad, was sold to Airhart as part of the requirements for subdivision. The property cost $31,500 to purchase and was used by Airhart as part of almost three acres of open land incorporated into Pheasant Glen. None of the three acres was accepted by Naperville as credit against Airhart's required Park Donation.

Once Pheasant Glen had been approved by Naperville, Airhart Construction began to make the improvements to the land. Some trees needed to be removed before construction could take place. Airhart Construction consulted the city's arborist and then marked trees for either removal or preservation. The company contacted the arborist again and requested that he complete the tree inspection before the company began removal. Three days later, the company removed trees marked for removal. Unfortunately, in those three days, the arborist had not made his inspection or approval. Airhart Construction was assessed a fine of approximately $50,000. Again, municipal delay, along with miscommunication, had cost the company money.

Mac Airhart estimates that in order to navigate the regulatory process, he spent $228,329.33 to hire civil engineers, do environmental and archeological studies, and pay legal fees and interest due to process delays and land planning design costs.

In addition to the tree incident, a road underlayment mishap cost Airhart $83,400. Toward the end of the 1996 construction season, he was ready to finish the underlayment for a road entering the new division. Before that layer was installed, vandals broke through barriers protecting the graded subsurface and left tire tracks behind. Tracks, Airhart claims, would have been simple to repair, but the inspector insisted that the road be regraded and inspected again. Regrading took only a few hours, but the inspector left on vacation without performing another inspection. Nobody in the building department or public works department was qualified or willing to inspect Airhart's road. The road contractor left to finish another project and cold weather set in. Airhart's company finished the road five months later. Airhart reports the cost of the delay in terms of interest and restaging was $83,500.

Mac Airhart expressed dissatisfaction in the fact that the regulations and delays in Naperville had cost him hundreds of thousands of dollars. He estimates that in order to navigate the regulatory process, he spent $228,329.33 to hire civil engineers, do environmental and archeological studies, and pay legal fees and interest due to process delays and land planning design costs. Airhart indicated that these costs force him to upgrade the type of home he builds in order to pay for the unnecessary expenses from the larger margin delivered by more expensive homes.

While Airhart's experiences with Naperville and the Pheasant Run Development may be unusual, they illustrate many of the costs of compliance with a municipal building authority. Many of the fees were straightforward, such as electrical and plumbing expenses. Others, such as various impact and permitting fees, may have seemed high, but were expected. However, there were substantial costs due to negotiation and uncertainty.

Darien

This case represents a municipality that made every attempt to accommodate both the property developer and the existing residents. The developer also made numerous concessions and spent years negotiating the agreements that eventually governed the annexation and subdivision of the property. While those involved in this issue cited this case as unusual, it is an illustration of how boards and committees involved in the process of annexing and subdividing property for development can lead to delays and expenses.

This case represents a municipality that made every attempt to accommodate both the property developer and the existing residents. The developer also made numerous concessions and spent years negotiating the agreements that eventually governed the annexation and subdivision of the property.

In January 1993, Edward G. Page of Pagemark Construction Co., Inc. gained the City of Darien's approval to develop the piece of land known as Betty's Subdivision.[60] This subdivision consists of four lots on 67th Street in Darien, Illinois. Among the usual details worked out in the agreement between developer and municipality, drainage was of particular importance for this development. Section 4 of the annexation agreement outlines the stormwater management responsibilities that were required as a condition of the agreement.

The size of the subject property exempts it from stormwater requirements of both DuPage County and the City of Darien. The city was concerned with the combination of this property and the undeveloped property to the north. The city anticipated that the developer might later choose to subdivide the property north of Betty's Subdivision. Section 4 of the annexation agreement indicates that if that were to occur, the developer would be responsible for all stormwater runoff generated by Betty's Subdivision.

Meeting the requirements of Section 4 led to a round of negotiations in the Darien Plan Commission and City Council that took several years to resolve. Later in 1993, Queen's Court Partnership (Edward Page and Julio P. Alessandro) petitioned to rezone and subdivide the property north of Betty's Subdivision, also known as High Ridge Point, into 13 residential lots. Queen's Court Partnership submitted the application in February 1993, just

[60]This case is based on a review of the records kept by the City of Darien for Betty's Subdivision and High Ridge Point.

days after the agreement concerning Betty's Subdivision was approved. When High Ridge Point's improvements were finally approved, four years had passed and numerous letters, hearings, and negotiations had taken place concerning this property and the potential problems its development could present to the City, its residents, and their neighbors.

The primary worries of High Ridge Point's neighbors were stormwater drainage and the traffic generated by construction and the completed homes. Traffic concerns ranged from the location of the subdivision access point to the number of trips that might be taken by new residents of a completed High Ridge Point. While the entrance could not be relocated, city staff determined that the traffic increase would not be significant. The stormwater runoff from Betty's Subdivision posed a genuine problem to homeowners who lived downstream of the subdivision. Ultimately, Queen's Court Partnership included a detention area sufficient to contain the runoff from both subdivisions.

The chronology of the meetings that Darien held concerning High Ridge Point illustrates the time and energy expended in meeting the development regulations. Table 6 presents a selection of some of the important meetings and correspondence. This chronology also demonstrates the process by which developers and municipalities determine the extent to which development will occur.

Table 6
High Ridge Point Chronology

February 22, 1993	Rezoning Application filed with Mayor and City Council and $915.00 subdivision fee paid by developers.
April 8, 1993	A neighbor to the development wrote a letter to the City Clerk expressing her concern about the traffic that would be generated on Richmond Avenue due to the construction of High Ridge Point. She estimated that at least 26 additional cars would make use of the thoroughfare because of the proposed construction and urged the City Clerk to convey her wishes to the proper authorities.
May 27, 1993	Another neighbor wrote a letter to Queen's Court Partnership complaining of the potential increase in traffic. She also expressed regret that she and her neighbors (in unincorporated DuPage County adjacent to the proposed development) paid to bring sewer service to Ridge Road ten years earlier. She believed that this action has enabled the construction of High Ridge Point to become a possibility. She is frustrated that her unincorporated DuPage County address prevents her from having any influence over the proposed development.
November 6, 1993	An engineer approached by the parties interested in High Ridge Point Subdivision submitted a letter to Mayor Carmen Soldato and the Darien City Council. The letter proposes that the ordinance authorizing Betty's Subdivision be amended to exclude the "requirement 'to manage the volume of runoff generated as a result of this resubdivision (Betty's).'" He requested that the High Ridge Point Subdivision agreement provide for off-site drainage.

June 15, 1994	The Plan Commission agenda included a public hearing on the petition to request annexation and rezoning for High Ridge Point. Several issues arose that the Plan Commission asked the developer to address prior to plan approval. The issues that appeared on the agenda included: ● Betty's Subdivision, located along the south boundary of the subject property, was approved by the City with the requirement that when the subject property was resubdivided, it must take into account its own stormwater run-off. ● The DuPage County Engineers, City Engineer, and the City's consulting engineer agreed that the preliminary engineering and detention figures indicate the proposed detention area sufficient to meet the aforementioned requirement. ● One member of the public expressed concern about road access to the subdivision. The proposed location of the access point was accepted by the commission and preferred because moving the road access point would limit visibility. ● Some of the home lots were found to be below minimum size requirements.
June 15, 1994 (7: 35 p.m.)	The plan commission met for its public hearing on the High Ridge Point Annexation and Rezoning petition. The commission listened to testimony from the following individuals: ● Partner, Queen's Court Partnership ● Director of Building and Zoning ● Neighbor to the east of the proposed development who is also the engineer and author of the Nov 6 letter. ● Neighbors who own about an acre where the storm drainage water settled. ● A neighbor who lives directly east of where the detention pond would be located. At the conclusion of the regular meeting, the board decided to postpone a decision to give the developer a chance to address issues that were raised in the agenda for this meeting and to include Betty's Subdivision in the plan.
July 11, 1994 (6: 32 p.m.)	Planning and Development Committee Meeting. The motion to recommend granting of the subdivision was approved subject to the following conditions (an attempt to answer the public's concerns regarding the petition). ● Construction traffic to enter and leave the site from south along Richmond Ave. ● Stormwater drainage from Betty's Subdivision to the south must be included with this subdivision. ● Lot 2 of the subdivision must not be built upon for 2 years as an assurance that the stormwater system will work as proposed. ● Public improvements for the subdivision will not be accepted by the City for a period of 2 years. ● A letter of credit, in an amount equal to 25 percent of the detention improvement cost, must be maintained for a period of 2 years. ● The retaining wall in the detention area must be constructed of cement interlocking paver blocks. ● Subdivision plans to be sent to DuPage County for comment.

September 19, 1994 (6: 03 p.m.)	Planning and Development Committee Meeting. The latest revisions to the annexation agreement for the High Ridge Point petition were reviewed. A Home Owners Association was created to maintain the detention area as an alternative to a special taxing district. A motion to approve the annexation agreement and preliminary subdivision approval (subject to the inclusion of wording into the annexation agreement to limit water coming from Betty's Subdivision) carried.
October 3, 1994	The Annexation Agreement for High Ridge Point was entered into by the City of Darien, the owners (Irene Wrobel, Estate of Helen Cotter, Evelyn Wrobel, Dorothy M. Wrobel and John A. Onesti), and the Queen's Court Partnership. The annexation agreement includes provisions for the securities on the public improvements including the lot surety and letter of credit to be held for a period of two years.
October 6, 1997	Resolution Accepting the Public Improvements in the High Ridge Point Subdivision was passed and approved by the Darien City Council. This resolution includes the City's acceptance of the conveyance and dedication of all public improvements installed in the High Ridge Point Subdivision subject to two conditions: 1. The developer must file a satisfactory completion bond of $3,800 to guarantee the completion of parkway improvements. 2. The developer must file a satisfactory 24-month maintenance and security bond of $24,384.80 to guarantee the improvements and maintenance of improvements installed in the subdivision.

The High Ridge Point subdivision story illustrates how current residents are likely to find a sympathetic ear among their city officials, who may rely on their votes to remain in office. The developer is unlikely to be so well received. Since neither city officials nor existing residents suffer financial losses when a development is delayed, they have little incentive to expedite the approval process and, for negotiating purposes, may deliberately extend the process. The developer, who must pay every time there is a delay in the process, is under considerable pressure to make concessions.

This case study also reveals the limitations of the public hearing process. Some of the neighbors who would bear the majority of the impact of the increased stormwater runoff lived in unincorporated DuPage County and not within the Darien borders. The political borders limited the influence that these individuals could have in the case. While the final agreement addressed most of these neighbors' concerns, this may not always be the case in similar situations.

Following the public hearing, at which special commissions of the municipal government are also heard, the City Council normally makes a decision concerning the development. When questions or problems arise, the process may be repeated numerous times until an acceptable proposal is approved. In this case, the delays often seemed to be due to engineering concerns related to the stormwater detention plan and the traffic impact. Once these concerns were adequately addressed, the proposal was approved.

This case illustrates the time cost involved in development and permitting. It took four years from the permit application to final approval.

Wheaton

The City of Wheaton calculates its Park and School Dedications in a manner similar to the method used by other municipalities surveyed for this project and will be presented here to illustrate the calculation method. Using a table that estimates the ultimate population by dwelling unit, the City estimates the population that will be generated by a proposed subdivision. The estimated population generated in each of several age categories is then translated into an acreage requirement for schools (by multiplying by the anticipated increase in school-age population by the acreage per population) and parks (by multiplying the acreage per population ratio for park sites).

Table 7 is Exhibit A in the Wheaton City Code, Article V. It demonstrates the population generated by one dwelling unit of a given type for several age categories and a total population per unit.

Table 7

TABLE OF ESTIMATED ULTIMATE POPULATION PER DWELLING UNIT

	Children per unit						
Type of unit	*Preschool 0-4 years*	*Elementary grades K-5 5-10 years*	*Junior high grades 6-8 11-13 years*	*Total grades K-8 5-13 years*	*High School grades 9-12 14-17 years*	*Adults (18 and over)*	*Total per unit*
Detached Single Family:							
Two-bedroom	0.125	0.120	0.026	0.146	0.018	1.700	1.989
Three-bedroom	0.308	0.381	0.174	0.555	0.146	1.978	2.987
Four-bedroom	0.472	0.513	0.314	0.827	0.313	2.195	3.807
Five-bedroom	0.402	0.620	0.420	1.040	0.327	2.650	4.419
Attached Single Family:							
One-bedroom						1.050	1.050
Two-bedroom	0.051	0.075	0.011	0.086	0.021	1.741	1.899
Three-bedroom	0.217	0.212	0.022	0.234	0.051	1.775	2.277
Four-bedroom	0.333	0.316	0.166	0.482	0.180	2.333	3.328
Apartments:							
Efficiency						1.000	1.000
One-bedroom						1.190	1.190
Two-bedroom	0.038	0.065	0.021	0.086	0.035	1.500	1.659
Three-bedroom	0.208	0.157	0.037	0.194	0.082	2.330	2.814

The school dedication in Wheaton requires 1.5 acres per 100 of estimated ultimate student population (grades K-12). For the two-bedroom detached single family house, the school dedication is 0.00246 acres (or the sum of 0.146 and 0.018, multiplied by 1.5 divided by 100). If the municipality prefers to use a cash donation, this acreage requirement must be multiplied by the assessed valuation of land of $75,000 per acre. The dedication therefore would be met by a cash donation of $185.50.

The park dedication for the City of Wheaton requires a minimum of 5.5 acres per 1,000 of ultimate population. This means that a two-bedroom detached single family house requires a dedication of 0.01094 acres of parkland (or 1.989 multiplied by 5.5 acres divided by 1,000). Using the $75,000 per acre valuation of land, this translates into a $820.46 donation on a two-bedroom detached single-family house.

The park dedication for the City of Wheaton requires a minimum of 5.5 acres per 1,000 of ultimate population.

These calculations must be repeated for each type of dwelling unit and multiplied by the quantity of each type of dwelling unit to be built in a subdivision to determine the total dedication requirement of the developer. In Wheaton, as in most municipalities with a coded land valuation, developers may contest the valuation by submitting a formal appraisal showing the fair market value of the subdivision. The City Council makes the final decision concerning the value of land based on the appraisal or other information submitted by park districts, school districts, or others.

Other municipalities use similar population tables, although the population generated by each dwelling unit varies by municipality. The acreage requirement for parkland donation is constant at 5.5 acres per 1,000 population among the municipalities surveyed.

Although Wheaton does not, many municipalities have varying requirements for school acreage per pupil depending on the level of the school. An elementary school site is often required to have 11 acres minimum to serve a maximum of 600 students. A middle school must have 19 acres for a maximum of 900 students. A high school site has a 48-acre minimum to serve a maximum of 2300 students. The final factor in calculating park and school site donations is land valuation and this varies by municipality. In those municipalities surveyed, this value ranged from $42,500 per acre in Aurora to $115,000 in Downers Grove.

As discussed previously, these regulations are based on the ordinance defended successfully by Naperville in 1977. Wheaton, like many of its municipal neighbors, includes a clause in its code that requires the money collected for school and park sites to be spent within ten years. If the school or park money is unspent after this period, it must be refunded to the owners of the property from which the funds were collected.

Elgin

Roger Dahlstrom, Director of Planning for the City of Elgin, devised a system of development impact fees that attempts to address both the positive and negative impacts of development.[61] Title 17 of the City of Elgin Municipal Code (the Development Impact Fees Regulations of the City) outlines a complicated series of measurements that are combined to create a set of pricing

[61]Jeannine Kannegiesser interviewed Roger Dahlstrom on November 18, 1997. This case is based on that interview and materials provided by Dahlstrom, including Title 17 of the Elgin Municipal Code.

tables for development impact fees. Within Title 17, chapter 4, there are six different calculations of development impact fees. The entire plan appears below.

The fee structure aims to capture the net impact of development and is based on the idea that new development causes increased demand for public facilities and services as it increases revenue through property tax collection. The regulation incorporates data from the various service districts within the city, along with estimates of the revenue collection potential of development.

Elgin's fee structure aims to capture the net impact of development and is based on the idea that new development causes increased demand for public facilities and services as it increases revenue through property tax collection.

Perhaps the only municipal services for which development is not assessed a fee (in Elgin) are fire and police protection. Dahlstrom indicated that it is very difficult to calculate the impact of new development upon services such as fire protection. Fire risk is highly variable and difficult to determine. Some municipalities such as Aurora are currently assessing an impact fee for fire protection, but these fees are not calculated in a manner similar to other Elgin fees.

Calculation Plan for Impact Fees in Elgin

1) School District Capital Improvement Development Impact Fee
   a) Requirement
      i) Estimated number of students to be served by school district *multiplied by*
      ii) The capital costs per student, excluding school site costs *multiplied by*
      iii) A factor of 50% (increases 5% each year until it reaches 100%)
   b) Credit
      i) Given for the present value of future stream of real estate tax payments attributable to debt service for school district capital improvements
      ii) Given for the present value of future stream of real estate tax payments allocated to the annual school district capital improvement budget
      iii) Given for the per student amount of State financial aid allocated to school district capital improvement budget
   c) Information Sources
      i) Dwelling unit population formula
      ii) Capital improvement budget data from the school district serving the development

2) School Site Development Impact Fee
   a) Requirement
      i) Estimated number of students to be served in each school classification *divided by*
      ii) The maximum number of students to be served in each classification *multiplied by*
      iii) The recommended number of acres for a school site of each school classification
   b) Information from population and school classification tables in the regulation

3) Park Site Development Impact Fee
   a) Requirement
      i) Estimated population to be served by the park system *divided by*
      ii) 1,000 acres *multiplied by*
      iii) The sum of the recommended acres of park site for each park classification (10)

b) Credit
    i) Given for private park site included on a site plan
    ii) The extent of a credit is at the discretion of the City Council

4) Library District Capital Improvement Development Impact Fee
   a) Requirement
      i) The estimated population to be served by the library district *multiplied by*
      ii) The cost per capita of library district capital improvements required to serve the development
   b) Credit
      i) Given for the present value of the future stream of real estate tax revenue attributable to debt service for library district capital improvements
      ii) Given for the present value of the future stream of real estate tax payments allocated to the annual library district capital improvement budget
      iii) Given for the per capita amount of State financial aid allocated to the annual library district capital improvement budget
   c) Information Sources
      i) Unit population formula
      ii) Capital improvement budget data from the library district serving the development

5) Water System Development Impact Fee
   a) Requirement
      i) The estimated population to be served by the water system *multiplied by*
      ii) The estimated average daily residential consumption *multiplied by*
      iii) The net per gallon cost of water system capital improvements required in the water service zone of the development
   b) Credit
      i) Given for the present value of the future stream of water service payments attributable to debt service for water system capital improvements
      ii) Given for the dedication of land for water system capital improvements
   c) Information Sources
      i) Dwelling unit population formula
      ii) Data from the City of Elgin Water System Distributional Analysis
      iii) Current population projections report of the City Planning Department

6) Sanitary Sewer Collection System Development Impact Fee
   a) Requirement; *the sum of*
      i) The cost of each of the downstream portions of the sanitary sewer collection system capital improvements *divided by*
      ii) The total number of acres in each of the downstream service areas *multiplied by*
      iii) The gross acreage of the development site
   b) Information Source: The City of Elgin Interceptor Sewer Master Plan

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The calculation of each fee includes two phases. First, the "requirement" is calculated using such factors as the population to be generated by the development and the cost of providing services for that population. Second, a "credit" is calculated based on the present value of the future stream of real estate tax payments that might reasonably be applied to the service under consideration. Credit is also given, in the case of school capital, for state financial aid that can be applied to the district's capital improvement budget. In all cases, the sum of the credits may not exceed the total fee requirement; the developer cannot pay a negative impact fee, though it goes to zero for the most expensive homes.

To implement the city's program, Dahlstrom created a computer program that performs the matrix of calculations necessary to determine the fair amount for each impact category.[62]

The formulas used by planners in Elgin appear to gauge future tax revenues with some measure of precision. However, as with other communities, it is unclear if Elgin's calculations accurately predict how much and what kind of services will be demanded, or the costs of delivering those services. Consequently, it cannot be known if the fees in Elgin are set to reflect the cost of development. The complexity of Elgin's fee structure makes verification of the appropriateness of the fees very difficult.[63]

[62]Dahlstrom markets this program to other municipalities through a company called Applied Planning Technologies.

[63]Elgin's fee structure is so complex that taxes on a typical four-bedroom home in the city could not be modeled for this study. For that reason, Elgin is not one of the cities included in the regression analysis.

PART 5

Public Policy Issues

The empirical analysis in Part 3 showed that impact fees have a significant impact on new house prices. The case studies in Part 4 show that advance knowledge of the costs of fees, regulations, and bureaucratic delays is not always possible. Impact fees and city development policies vary over relatively short time periods (through legal challenges and new regulations), and widely from municipality to municipality.

The case studies show that advance knowledge of the costs of fees, regulations, and bureaucratic delays is not always possible.

There are several important public policy issues in the impact fee debate. These involve incentives for predatory behavior, ambiguity, and the distributive effects of impact fees upon consumers of housing.

The ambiguity of the appropriate level of impact fees may create an incentive for municipal officials to behave in a fiscally irresponsible manner. The temptation to use hidden taxes to maximize government revenues regardless of actual needs is called rent-seeking.[64] Government officials may, in other words, charge developers more than the appropriate level of impact fees simply to increase the municipality's treasury. The opportunity to do so may be especially great if the developer needs to have an unincorporated property annexed to a specific municipality, giving that municipal government an asymmetric bargaining advantage at the expense of the developer. Many municipalities apparently desire high-value housing development, and direct their growth policies to achieve such development, because such growth generates greater tax revenues relative to the cost of public services demanded or used by their owners.

Rent-seeking tendencies are, however, restrained by competition among different communities; if a municipality's government raises costs by seeking to enrich itself, residents may "vote with their feet" and settle in a town with more fiscal restraint.[65] Regardless of the limitations upon rent-seeking behavior, government officials face incentives to impose and raise impact fees to increase general revenues because the effects of the taxation are largely hidden.

A second reason why impact fees may be set too high is because high impact fees can lead to a wealth transfer from new homebuyers to current home owners. Because existing homes can be substitutes for new homes, sellers of existing homes may enjoy a windfall profit when high impact

[64]See James M. Buchanan, *Public Finance in Democratic Process: Fiscal Institutions and Individual Choice* (Chapel Hill, NC: The University of North Carolina Press, 1967); Thomas E. Borcherding, editor, *Budgets and Bureaucrats: Sources of Government Growth* (Durham, NC: Duke University Press, 1977).

[65]See Charles M. Tiebout, "A Pure Theory of Local Expenditures," *Journal of Political Economy*, Vol. 64, 1956, pages 416-424.

fees are imposed on new homes. Home owners who do not choose to sell their homes enjoy improved creditworthiness due to the increased value of their homes. Both groups of current homeowners have a financial incentive to support municipal policies that increase the cost of new housing above the level necessary to cover the true costs of new development. While this analysis could not prove that the price of existing houses increased, other studies have found these effects.[66]

In 1997 the Real Estate Center at Texas A & M University pursued extensive research into municipal budgets and taxation.[67] Their findings indicate that for Tyler, Texas, taxes generated by new houses brought in more revenue than was necessary to pay for the additional services required by the increased population. With the exception of Elgin, Illinois, this study found no evidence that communities in suburban Chicago were explicitly crediting developers with the future revenues their houses would generate.

Municipal planners claim that impact fees force developers and new homebuyers to pay for their marginal impact upon municipal services. But a more efficient fee structure would be to charge a fee to new residents based on the quantity they actually used.

Another uncertainty of impact fees involves the supposed efficiency of the fees. Municipal planners frequently state that impact fees restore efficiency to development. They claim that impact fees force developers and new homebuyers to pay for their marginal impact upon municipal services. However, impact fees may not be the efficiency-maximizing panacea that many municipal planners believe. Impact fees are only a proxy for the actual marginal usage of the public services that the new residents require.[68] New residents may utilize the services more or less than the actual cost of the impact fee. This is illustrated by the case of the senior citizens center development in Lisle that was charged impact fees for services they would most likely underutilize.[69] If full recovery of the true cost of public services is the goal, then it would be more efficient to charge new residents according to the quantity of services they actually use, rather than impose a complex and cumbersome impact fee structure on new homes.

Furthermore, impact fees rarely vary within municipalities. School, park, and library fees are likely to be the same for the same type of house, no matter where it is in the same city. However, different geographical locations may have different marginal costs. For example, school fees for houses further from existing principal highways (transportation access) and schools should

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[66]Larry D. Singell and Jane H. Lillydahl, supra note 33; Marla Dresch and Steven M. Sheffrin, supra note 8.

[67]Mark G. Dotzour, *The Fiscal Impact of New Residential Subdivisions on the City of Tyler, Texas*, Technical Report No. 1204 (College Station, TX: Texas A & M University Real Estate Center, November 1997).

[68]See Jose Antonio Gomez-Ibanez, "The Debate Over Impact Fees," *Illinois Real Estate Letter*, Winter/Spring, 1996, page 2.

[69]Laura Zohn Pohl, "Impact-Fee Reduction Denied," *Chicago Tribune*, December 4, 1997.

probably be higher than school fees for new houses with easier access to schools. A school fee difference based on transportation difficulties would better capture the marginal cost of transportation (busing). This wedge between impact fees and actual marginal impact costs further weakens the efficiency argument and weakens the argument that fees lead to spatially efficient development. If impact fees neither increase spatial efficiency nor accurately measure true development impacts, then these fees should be viewed primarily as municipal devices for generating revenue.[70]

If impact fees neither increase spatial efficiency nor accurately measure true development impacts, then these fees should be viewed primarily as devices for generating revenue.

A further ambiguity concerning the optimal fee level allows substantial revenue generation. Cash-in-lieu donations, where a developer pays the municipality a sum instead of donating land, is a common practice. However, there is considerable debate as to what value the land should be assessed at. Municipalities tend to require cash-in-lieu donations that value land intended for parks or schools near the value of improved land for housing. Developers argue that the valuation should be lower, which would decrease the amount of cash donation. There are many possible scenarios: land for donations could be assessed at housing values, values comparable to what municipalities pay when they purchase parkland, or simply at the value of the nearest parcels, regardless of its intended use. While the formulas adopted by most municipalities for the effects of marginal additions to population upon schools and parks may meet the "rough proportionality" standards of *Dolan v. City of Tigard*, the unresolved ambiguity concerning the appropriate valuation for land impacted by those formulas creates opportunities for inefficiency and controversy.

Finally, there are the distributive effects of impact fees. The case studies indicate that fees, exactions, construction delays, and other costs related to complying with municipal housing regulations impose sizeable costs on developers. The empirical analysis discussed in Part 3 indicates that for six of the eight community markets studied, all impact fees are passed through to buyers of new houses. For Naperville and Downers Grove, the cost of fees is shared between homebuyers and developers/land-owners.

The costs absorbed by developers do not amount to a "free lunch" for either municipalities or homebuyers. Developers change their behavior in response to impact fees by building less housing, building in areas that may be less suited to commuting patterns and community planning, and by building larger and more expensive homes in order to recover the fees through higher margins. These distortions can lead to much higher prices for new homes, where prices increase by at least the size of the fee, and possibly by several times the size of the fee.

One of the unintended consequences of increasing housing costs may be a tendency to price some long-time residents out of the local housing market. As prices for new houses increase, so

[70]Jose Antonio Gomez-Ibanez, supra note 68, page 2.

do the prices for existing homes in the market. Impact fees, along with other building restrictions that require minimum sizes for new homes, may be a deterrent for lower-income families seeking to become first-time new homebuyers.

Impact fees may also have a disproportionately negative effect on low- and middle-income families because school, park, and library fees are generally computed on the basis of the marginal contribution of individuals to usage of existing services. This marginal contribution is the same whether the house is priced at $150,000 or $500,000. The fee structure therefore constitutes a higher percentage of the sale price of the lower-priced home than of the higher-priced home, and is therefore more likely to push moderate-income homebuyers out of the market than more affluent buyers. A fee structure, such as Elgin's, that credits a homeowner with future property tax payments makes the effect of impact fees even more regressive.

Impact fees may have a disproportionately negative effect on low- and middle-income families seeking to become suburban home owners.

If buyers of expensive homes are less sensitive to marginal increases in the price of their purchases (as predicted by economic theory), then developers have an incentive to build higher-priced houses. This, too, has the consequence of pricing low-income people out of suburban neighborhoods. To the extent that income is correlated with race, impact fees may create barriers against the migration of minorities into the suburbs.

In the long term, unnecessarily high housing costs may have a negative effect on job creation and income growth in the region by encouraging employers to look to cities where moderately priced housing means lower salary demands. The ultimate outcome might be a decline in home values as those amenities, such as proximity to employment, that initially made the area desirable are diminished as businesses relocate to less expensive areas.

PART 6

Summary and Concluding Remarks

Impact fees are a relatively new form of municipal taxation that is hidden from housing consumers. Since the fees involve restrictions on property sales and development rights, impact fee structures in several municipalities have been challenged in court as unconstitutional "takings"—limitations on the use and transfer of property that reduce its value without compensating its owner.

> Impact fees in Illinois have increased repeatedly, dramatically, and unpredictably.

The imposition of impact fees in communities across the country is largely guided by legal standards set in two court cases originating in California and ultimately decided by the U.S. Supreme Court. In 1987, the Court's decision in *Nollan v. California Coastal Commission* outlined the "rational nexus test" requiring that city projects be directly linked to impact fee regulations. In 1994, the Court ruled in *Dolan v. City of Tigard* that fee requirements must be "roughly proportional" to the municipal project proposed.

Impact fee regulation in Illinois, while influenced by these national cases, is founded more squarely on a 1977 state supreme court ruling. In *O.L. Krughoff et al. v. City of Naperville*, the state court held that impact fees could recover only those costs that are "specifically and uniquely attributable" to new development.

Impact fees have been highly controversial in Illinois. Fees have been increased repeatedly, dramatically, and unpredictably, making it difficult for developers simply to incorporate impact fees into the fixed-cost components of their projects.

This paper studied the effects of impact fees in eight Chicago suburbs with a simple economic model of the housing market. The model employed in this study treats impact fees as marginal costs that predict an increase in the prices of both new and existing houses. Fee structure data were provided by eight western suburbs; housing sale data from the Multiple Listing Service of Northern Illinois for those eight suburbs were analyzed.

The empirical results of this study conclusively show that fees increase the price of new and existing homes. The increase of house prices that is associated with the imposition of fees ranges between 70 percent and 210 percent of the actual amount of the fee imposed. For new houses, large price increases from relatively small impact fees are probably due to the imposition of fees causing substantial uncertainty and delay costs, as well as other fee and regulatory costs that are not explicitly defined in the fee variable. There is some evidence to suspect that fee effects may be several times larger than the value of the fees.

The price of existing homes was also significantly affected by impact fee taxation. Fees increased the price of older homes by amounts almost equal in magnitude to the fees, without any fees being attached to them. Existing homes that sold for prices greater than or equal to the price of new homes had price increases similar in size to those for new homes; this indicates that impact fees raise the costs of better substitutes for new homes relatively more. The price increase for existing houses is a windfall capital gain to existing home-owners, and may induce them to support higher impact fees on new houses. As the price of existing homes increases, fewer home sales take place. The decrease in housing supply that an increase in house prices would cause, as predicted by the model of this paper, has been verified for DuPage County housing by Skidmore and Peddle, who estimated that residential growth rates slowed between 29 percent and 31 percent in municipalities with impact fees.

The impact fee price effect for new houses and existing houses is consistent with economic theory and intuition. Impact fees increase the prices of new houses on which they are actually levied (and close substitutes to those houses), and increase the prices of existing houses that are poorer substitutes to a lesser extent.

Case studies offered in Part 4 of this paper have illustrated the often-lengthy and cumbersome process of development approval for several communities with impact fees. Those case studies, combined with the discussion in Part 5 of public policy implications, highlight several problems with the use of impact fees as financial tools.

Impact fees may provide incentives for municipal officials to behave irresponsibly and, because of the ambiguity regarding the correct levels of fees to set, are likely to be inefficient. Impact fees are also often regressive: They may encourage developers to produce more expensive homes, thus pricing lower-income buyers out of the market, and they may also place a disproportionate burden upon poor and middle-income homebuyers, since fees represent a higher percentage of the sale cost of a lower-priced home than a higher-priced home.

Municipal officials ought to pay careful attention to the unintended economic and social consequences created by their use of impact fees.

Impact fees are only one of several tools used by municipal officials to raise revenue. Such fees are not wholly borne by developers, as municipal officials frequently contend, and they raise serious efficiency and equity issues. For these reasons, municipal officials ought to pay careful attention to the unintended economic and social consequences created by their use of impact fees.

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Appendices

Appendix 1
Empirical Methodology

Appendix 2
Full Regression Results

Appendix 1
Empirical Methodology

This section discusses the methodology used in the empirical analysis. The discussion is intended to be very general and attempts to describe complex econometric topics in simple language. This section also includes information on the various specifications attempted by the authors.

"Basic Empirical Model":

ln(Sale Price)=αK + β*ln(Housing Features) + θ*ln(Suburb Features)+ δ*ln(Amount of Fees)+ ε

This is specified in two ways: 1) where K is a constant and the suburb's features are described by the suburb's 1990 population, and 2) where K is omitted, and each suburb is entered as a separate indicator variable. This specification treats the sub-matrix of suburb dummies as the constant, and ascribes the between-city variation to them.

Housing Characteristics comprises a vector of characteristics unique to each house: the number of rooms; the number of bathrooms; the area in square feet of the master bedroom, second through fifth bedrooms, kitchen, dining room, living room, and sum of the rest of the rooms; the presence of a great room; and the size and characteristics of the lot the house is situated upon. The amount of fees applies the municipalities' fee structures to that house. The ε represents the unexplained components of the sale price of the house.

The usual custom of using the number of bedrooms as a predictor of housing value is not used in this model to avoid multi-collinearity in the impact fee variable. Multi-collinearity is an econometric problem where predictor variables in the model (such as the number of bedrooms and the fee structure) are highly correlated. Since most school and park impact fees are calculated as a product of the number of bedrooms and an amount determined by the municipality, the number of bedrooms and the impact fee variable are highly correlated. The high correlation may cause the fee variable to capture all of the effects due to the number of bedrooms (or vice versa). This problem makes interpretation difficult.

To avoid multi-collinearity, this analysis uses bedroom sizes (in square feet of floor space). The total floor space (area) of a house is an important factor in the sale price. By entering the individual rooms with their areas separately, both house area and number of rooms (and bedrooms) can be included in the regression. Inclusion of the sizes of the other principal rooms (kitchen, dining room, living room) and the area of the rest of the house sums to the total floor area of the house. The presence of a great room (one of the remaining rooms) is considered to be a particularly strong selling point for houses.

Use of the actual size of the rooms also shows what trade-offs consumers are willing to

make in terms of house purchases. In many of the regressions of Part 3, the coefficient for the size of the fifth bedroom is negative. This means that, given a house of a specific size with floor space allocated to different uses, houses with larger fifth bedrooms (as opposed to larger kitchens, living rooms, family rooms, etc.) sell for less. In Appendix 2, Section A, the living room variable is also negative. This means that homebuyers prefer other rooms to be larger, such as the dining room, kitchen, bedrooms, etc., to having a large living room.

When analyzing housing data in regions that contain subregions (such as cities), it is important to identify what components of a house's value should be attributed to its own characteristics and what part of the price is due to its location. There is likely some part of a house's value that derives from attributes of the community it is located in. These community attributes can be captured in a model that generally describes the community, or in a more refined model that controls for each community's separate effects.

The municipal indicator model indicates the separate effects of each municipality in the regression. This approach basically says, for example, that a house in Aurora has the attributes of Aurora (unknown), and thus differs from houses in other cities, which have their own indicators. It is almost impossible to specify all the attributes about Aurora that might have an impact on housing value. This approach makes that specification unnecessary.

The more general model should attempt to fully specify the attributes of a community that affect housing prices. While it is impossible to include all of the factors in a municipality that may contribute to changes in the price of housing, it is not too difficult to capture the principal components of a municipality's effect on housing value. Factors such as the crime rate, quality of education, distance from the urban core, density of housing structures, and neighborhood income levels are relatively easy to find data for, and are likely to account for much of the increment of a house's value that is dependent on the municipality.

In practice, however, it was difficult to find useable data for this approach. For example, both community median family income and community per capita income (widely used proxies for socioeconomic status) were highly correlated (correlation > 0.9) with impact fees. The multicollinearity problems were sufficiently severe to make all demographic variables except for the 1990 population total per municipality unusable. Average commute time to work, unemployment rate, and education levels were among several variables that were too homogenous among the communities to assist in the regressions.

Similar to the lot size variable, the variable for house age also has many missing observations. Inclusion of this variable decreases the sample size by 19.13 percent. This decrease in sample size may be random, but there may be an unknown bias as well. Use of both house age and lot size combine to reduce the sample size by 27.97 percent. Many of the MLS entries had no age value or date when built listed. Many of the listed values were also suspect. The house age is logged for the regression on existing houses only; this means

that the effect is linear in the logs. Specification attempts using indicator variables for periods of housing age did not produce meaningful results.

The empirical model considered the basic physical characteristics of houses (room sizes, garage sizes, lot sizes) as components of the total house price. While other factors are surely influential in determining the sale price of the house, the primary importance of these omitted variables for this study is their possible effect upon the significance of the fees. Several important factors, such as municipal school quality indicators, were included in earlier regressions but left out of the final regressions because they were insignificant and did not vary widely across the sample of communities studied. Other factors that may influence the home-purchase decision which were not available included a measure of local amenities, such as parks and recreation facilities. If the fees served as proxies in the regression for these omitted variables, then it may be that the significance of the fees reflects the value of amenities for these houses, as discussed in Part 3. However, if municipal services and amenities that correlate with the fees are similar and provided for most new houses, then the fee significance is more likely capturing the influence of other costs associated with fee compliance in development.

Appendix 2
Full Regression Results

Variables used in regressions		
Variable	**Meaning**	**Calculation**
lnsp	House Sale Price	ln (sale price)
lnbth	Number of Bathrooms	ln (# of bathrooms +1)*
lnmbs	Size of Master Bedroom	ln (size of room)
lnb2s	Size of 2nd Bedroom	ln (size of room +1)
lnb3s	Size of 3rd Bedroom	ln (size of room +1)
lnb4s	Size of 4th Bedroom	ln (size of room +1)
lnb5s	Size of 5th Bedroom	ln (size of room +1)
lnkts	Size of Kitchen	ln (size of room +1)
lndrs	Size of Dining Room	ln (size of room +1)
lnlrs	Size of Living Room	ln (size of room +1)
lnrorms	Size of Rest of House	ln (size of rest of house + 1)
gr	Great Room	1 = room present; 0 = otherwise
lncars	Number of Cars Garage Holds	ln (# of cars +1)
lnlotsz	Size of Lot	ln (size of lot)
irreg	Lot is not rectangular	1 = not rectangular; 0 = otherwise
"Aurora," etc.	House is in Aurora, etc.	1 = house in Aurora; 0 = otherwise
lmpoptot	1990 Municipality Population	ln (population)
lnha00	House Age	ln (house age)
lallfee1	Impact Fees on New Houses, not lot dependent	ln (fees + 1)
lallfee2	Impact Fees on New Houses, dependent on lot size	ln (fees + 1)
lnatotf1	Imputed Impact Fees on Existing Houses, not lot dependent	ln (fees + 1)
lnatotf2	Imputed Impact Fees on Existing Houses, dependent on lot size	ln (fees + 1)

* When the natural log of a variable that may have some values of zero is taken, 1 is added prior to taking the log.
Aurora, etc. refers to the indicator variables in the fixed effects models for municipalities: (aurora = Aurora; bbrk = Bolingbrook; burrdg = Burr Ridge; darien = Darien; downergr = Downers Grove; glenel = Glen Ellyn; naper = Naperville; wheaton = Wheaton).

A1. Regression Results for All Houses

```
NO LOT SIZE
Regression with robust standard errors                Number of obs =   14679
                                                      F( 16, 14662) = 1439.70
                                                      Prob > F      =  0.0000
                                                      R-squared     =  0.6710
                                                      Root MSE      =   .2327

------------------------------------------------------------------------------
             |               Robust
      lnsp97 |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnbth |     .58211   .0211091     27.576   0.000       .5407335    .6234865
       lnmbs |   .2357639   .0270119      8.728   0.000       .1828172    .2887107
       lnb2s |   .1724038   .0241998      7.124   0.000       .1249693    .2198384
       lnb3s |   .0046724   .0029142      1.603   0.109      -.0010397    .0103846
       lnb4s |   .0252151   .0013069     19.294   0.000       .0226534    .0277767
       lnb5s |  -.0037729   .0024685     -1.528   0.126      -.0086114    .0010656
       lnkts |   .0775158   .0079054      9.805   0.000       .0620201    .0930114
       lndrs |   .0334401   .0014708     22.735   0.000       .0305571    .0363231
       lnlrs |   .0127917   .0044845      2.852   0.004       .0040015     .021582
     lnrorms |   .0225613   .0015356     14.692   0.000       .0195513    .0255713
          gr |   .1384109   .0327765      4.223   0.000       .0741648    .2026569
      yr1995 |   .0237829   .0047742      4.982   0.000       .0144249     .033141
      yr1996 |   .0131698   .0045502      2.894   0.004       .0042508    .0220889
    lmpoptot |  -.1124703   .0049511    -22.716   0.000       -.122175   -.1027656
      lnha00 |  -.0596921   .0226664     -2.634   0.008       -.104121   -.0152631
    lnallfee |   .0119046   .0006837     17.412   0.000       .0105645    .0132448
       _cons |    10.0976   .2168701     46.561   0.000       9.672508    10.52269
------------------------------------------------------------------------------
```

A2. Regression Results for All Houses

```
WITH LOT SIZE
Regression with robust standard errors                Number of obs =   13094
                                                      F( 18, 13075) = 1345.45
                                                      Prob > F      =  0.0000
                                                      R-squared     =  0.6966
                                                      Root MSE      =  .22459

------------------------------------------------------------------------------
             |               Robust
      lnsp97 |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnbth |   .5300157   .0214087     24.757   0.000       .4880515    .5719798
       lnmbs |   .2242451   .0268194      8.361   0.000       .1716752     .276815
       lnb2s |   .1552121   .0247922      6.261   0.000       .1066159    .2038083
       lnb3s |   .0058229    .002801      2.079   0.038       .0003325    .0113132
       lnb4s |   .0245519   .0013223     18.567   0.000       .0219599    .0271439
       lnb5s |  -.0040001   .0024304     -1.646   0.100       -.008764    .0007639
       lnkts |   .0631618   .0080957      7.802   0.000        .047293    .0790306
       lndrs |   .0322927   .0014779     21.850   0.000       .0293958    .0351896
       lnlrs |   .0054221   .0048846      1.110   0.267      -.0041525    .0149967
     lnrorms |   .0199739   .0015118     13.212   0.000       .0170105    .0229373
          gr |   .1061499   .0367094      2.892   0.004       .0341941    .1781057
      yr1995 |   .0177331   .0048793      3.634   0.000        .008169    .0272972
      yr1996 |   .0083881    .004639      1.808   0.071      -.0007049    .0174812
    lmpoptot |  -.1147531    .005231    -21.937   0.000      -.1250066   -.1044996
      lnha00 |  -.1206005   .0237408     -5.080   0.000       -.167136    -.074065
       irreg |   .0308759    .004025      7.671   0.000       .0229863    .0387656
     lnlotsz |   .1243077   .0101446     12.254   0.000       .1044228    .1441927
    lnlotfee |   .0140201    .000739     18.972   0.000       .0125716    .0154687
       _cons |   9.598711   .2214054     43.354   0.000       9.164724     10.0327
------------------------------------------------------------------------------
```

B1. Municipal Specification without Lot Size

```
Regression with robust standard errors                Number of obs =   14913
                                                      F( 23, 14890) =       .
                                                      Prob > F      =  0.0000
                                                      R-squared     =  0.7801
                                                      Root MSE      =  .19602

------------------------------------------------------------------------------
             |               Robust
      lnsp97 |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnbth |   .5346569   .0172248     31.040   0.000        .500894    .5684197
       lnmbs |   .2050353   .0224402      9.137   0.000       .1610497    .2490209
       lnb2s |   .1208477   .0183603      6.582   0.000       .0848593    .1568362
       lnb3s |   .0095411    .002286      4.174   0.000       .0050603    .0140219
       lnb4s |   .0188797   .0010539     17.913   0.000       .0168138    .0209455
       lnb5s |   .0012948   .0020132      0.643   0.520      -.0026512    .0052409
       lnkts |   .0696931   .0067231     10.366   0.000        .056515    .0828712
       lndrs |   .0251136   .0011101     22.623   0.000       .0229376    .0272895
       lnlrs |   .0018562    .004064      0.457   0.648      -.0061097    .0098221
     lnrorms |   .0183252   .0011845     15.470   0.000       .0160033     .020647
          gr |   .1183887   .0313886      3.772   0.000       .0568632    .1799141
      aurora |   10.80763   .1906684     56.683   0.000       10.43389    11.18136
        bbrk |   10.71607   .1892322     56.629   0.000       10.34515    11.08699
      burrdg |   11.47607   .1961657     58.502   0.000       11.09156    11.86058
      darien |   11.06263   .1910322     57.910   0.000       10.68819    11.43708
    downergr |   11.11707    .192672     57.699   0.000       10.73941    11.49473
      glenel |   11.23369   .1931645     58.156   0.000       10.85507    11.61232
       naper |   10.99526   .1923304     57.169   0.000       10.61827    11.37225
     wheaton |   11.13559   .1923962     57.878   0.000       10.75847    11.51271
      yr1995 |   .0183582   .0039558      4.641   0.000       .0106043    .0261121
      yr1996 |   .0083093   .0038364      2.166   0.030       .0007894    .0158292
      lnha00 |  -.3724868   .0213241    -17.468   0.000      -.4142846   -.3306889
    lnallfee |   .0106846   .0006342     16.847   0.000       .0094415    .0119278
------------------------------------------------------------------------------
```

B2. Municipal Specification with Lot Size

```
Regression with robust standard errors                Number of obs =   13290
                                                      F( 25, 13265) =       .
                                                      Prob > F      =  0.0000
                                                      R-squared     =  0.7886
                                                      Root MSE      =  .19215

------------------------------------------------------------------------------
             |               Robust
      lnsp97 |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnbth |   .5055841   .0177876     28.423   0.000       .4707179    .5404504
       lnmbs |   .2000689   .0229186      8.730   0.000       .1551453    .2449926
       lnb2s |    .108298   .0194913      5.556   0.000       .0700923    .1465038
       lnb3s |   .0094691   .0022668      4.177   0.000       .0050259    .0139123
       lnb4s |   .0187567   .0010884     17.233   0.000       .0166233    .0208901
       lnb5s |   .0011986   .0020391      0.588   0.557      -.0027984    .0051956
       lnkts |   .0612851   .0069873      8.771   0.000        .047589    .0749812
       lndrs |   .0246487   .0011484     21.464   0.000       .0223977    .0268997
       lnlrs |  -.0030528   .0044793     -0.682   0.496      -.0118329    .0057273
     lnrorms |   .0167644   .0012114     13.839   0.000       .0143899    .0191389
          gr |   .0934452   .0347622      2.688   0.007       .0253063    .1615841
      aurora |   10.27241   .1999572     51.373   0.000        9.88047    10.66436
        bbrk |   10.17918   .1982647     51.341   0.000       9.790555    10.56781
      burrdg |   10.87076   .2059873     52.774   0.000         10.467    11.27452
      darien |    10.5196   .2002266     52.538   0.000       10.12713    10.91207
    downergr |   10.56591   .2019353     52.323   0.000       10.17008    10.96173
      glenel |   10.67978   .2025382     52.730   0.000       10.28278    11.07678
       naper |   10.44782   .2016378     51.815   0.000       10.05258    10.84305
     wheaton |   10.58587   .2016888     52.486   0.000       10.19053     10.9812
      yr1995 |   .0154191   .0041182      3.744   0.000       .0073468    .0234914
      yr1996 |   .0051681   .0039829      1.298   0.194      -.0026389    .0129751
      lnha00 |  -.3685079   .0220918    -16.681   0.000      -.4118109   -.3252049
     lnlotsz |   .0774781   .0072697     10.658   0.000       .0632284    .0917279
       irreg |    .041071   .0034444     11.924   0.000       .0343194    .0478226
    lnlotfee |   .0123239   .0007013     17.572   0.000       .0109492    .0136986
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C1. Regression Results for New Houses

Column 1, Lot Size Excluded
Regression with robust standard errors

Number of obs = 1456
F(15, 1440) = 211.16
Prob > F = 0.0000
R-squared = 0.7350
Root MSE = .17155

lnsp97	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnbth	.8047452	.0613429	13.119	0.000	.6844141	.9250763
lnmbs	.3601952	.0367836	9.792	0.000	.28804	.4323503
lnb2s	.2534082	.0326106	7.771	0.000	.1894389	.3173776
lnb3s	.1233864	.0383364	3.219	0.001	.0481853	.1985875
lnb4s	.020134	.0035407	5.686	0.000	.0131885	.0270795
lnb5s	-.0055111	.0073368	-0.751	0.453	-.0199031	.0088809
lnkts	.0429261	.0112905	3.802	0.000	.0207785	.0650737
lndrs	.0131008	.0057177	2.291	0.022	.0018848	.0243167
lnlrs	.0118183	.0097242	1.215	0.224	-.0072567	.0308933
lnrorms	.0885587	.0206772	4.283	0.000	.047998	.1291195
gr	.1860239	.0706997	2.631	0.009	.0473384	.3247094
yr1995	.0345992	.0116744	2.964	0.003	.0116986	.0574999
yr1996	.0130661	.0109614	1.192	0.233	-.0084358	.0345681
lmpoptot	-.0730809	.0168515	-4.337	0.000	-.106137	-.0400249
lnallfee	.071654	.0330651	2.167	0.030	.0067932	.1365149
_cons	6.77481	.3559098	19.035	0.000	6.076653	7.472967

C2. Regression Results for New Houses

Column 2, Lot Size Included
Regression with robust standard errors

Number of obs = 1100
F(17, 1082) = 120.25
Prob > F = 0.0000
R-squared = 0.7197
Root MSE = .16397

lnsp97	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnbth	.7083368	.0723275	9.793	0.000	.5664187	.850255
lnmbs	.3302593	.03808	8.673	0.000	.2555402	.4049784
lnb2s	.245485	.0377736	6.499	0.000	.1713672	.3196028
lnb3s	.1127299	.0333031	3.385	0.001	.047384	.1780758
lnb4s	.0278128	.0052096	5.339	0.000	.0175907	.038035
lnb5s	-.0058608	.0069955	-0.838	0.402	-.0195871	.0078655
lnkts	.027178	.0154788	1.756	0.079	-.0031939	.0575499
lndrs	.01556	.0092997	1.673	0.095	-.0026875	.0338074
lnlrs	.0148196	.0112959	1.312	0.190	-.0073449	.036984
lnrorms	.0760687	.019535	3.894	0.000	.0377379	.1143995
gr	.1969242	.083988	2.345	0.019	.0321263	.361722
yr1995	.035335	.0128509	2.750	0.006	.0101196	.0605505
yr1996	.0007347	.0121894	0.060	0.952	-.0231828	.0246523
lmpoptot	-.05868	.0197232	-2.975	0.003	-.0973801	-.0199799
irreg	.0291014	.0106098	2.743	0.006	.0082832	.0499197
lnlotsz	.1023377	.0204558	5.003	0.000	.0622003	.1424752
lnlotfee	-.0412968	.0414838	-0.995	0.320	-.1226946	.040101
_cons	7.183011	.4078126	17.614	0.000	6.382818	7.983204

Appendix 3

In the regressions, the year variables (included to capture independent effects by year) are positive. This is reflected in the data; the correlation between successive months over the period in constant December 1997 dollars is -.0226. Appendix Table A3 examines this result in more detail.

Table A3, Summary of Sale Price Statistics by Year

Year	Obs	Mean	Std. Dev.	Min.	Max.
NEW HOUSES					
1995	465	289,502	106,933	96,624	929,943
1996	496	280,139	107,390	130,263	1,018,155
1997	552	285,895	115,931	73,202	860,787

Table A3 displays the summary statistics of the (constant December 1997) sale prices of all new houses in the sample for each year. The sale prices in 1995 had the fewest number of new houses sold, but also the largest mean sale price. The maximum sales price for the entire sample was in 1996. Since the data are in constant dollars, the coefficients for the year variables accurately reflect the variation in the sample for each year.

The following regression displays the basic econometric model with only the housing characteristic and time variables included. As the R-squared indicates, the housing characteristics explain approximately 66 percent of the variation in housing sale prices. Regressions A through C improve upon the core regression by explaining an additional 7-14 percent of the variation in housing sale prices. It is also important that regressions A through C do not substantially affect the core regression results.

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Regression with robust standard errors                Number of obs =   18546
                                                      F( 13, 18532) = 1945.03
                                                      Prob > F      =  0.0000
                                                      R-squared     =  0.6569
                                                      Root MSE      =  .26181

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             |               Robust
      lnsp97 |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnbth |   .7116388   .0194824     36.527   0.000       .6734516     .749826
       lnmbs |   .2116891   .0210695     10.047   0.000        .170391    .2529872
       lnb2s |   .1418184   .0149666      9.476   0.000       .1124826    .1711543
       lnb3s |   .0056011   .0026105      2.146   0.032       .0004843    .0107179
       lnb4s |   .0220631   .0011741     18.791   0.000       .0197617    .0243645
       lnb5s |  -.0010913   .0024993     -0.437   0.662      -.0059901    .0038076
       lnkts |   .0752807   .0070559     10.669   0.000       .0614506    .0891108
       lndrs |   .0314281   .0013869     22.661   0.000       .0287097    .0341465
       lnlrs |   .0257999   .0045071      5.724   0.000       .0169656    .0346341
     lnrorms |   .0291527   .0014663     19.882   0.000       .0262787    .0320267
          gr |   .1745424   .0319806      5.458   0.000       .1118574    .2372274
      yr1995 |   .0291291   .0047948      6.075   0.000       .0197308    .0385274
      yr1996 |   .0159379   .0045762      3.483   0.000       .0069682    .0249076
       _cons |   8.619908   .1090308     79.059   0.000       8.406198    8.833618
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