

**The Effect of Growth Management Strategies:
Adequate Public Facilities Ordinances and Impact Fees
A Review of Existing Research**

Steven H. Ott
John Crosland, Sr., Distinguished Professor
of Real Estate and Development
Belk College of Business Administration
University of North Carolina-Charlotte
Charlotte, North Carolina 28223
704-687-2744
shott@email.uncc.edu

Dustin C. Read
Ph.D. Candidate in Public Policy
University of North Carolina Charlotte
Charlotte, North Carolina 28223
704-598-0505
dustinread@bellsouth.net

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Executive Summary

Intense residential development has encouraged communities across the country to implement various growth management strategies. Adequate public facilities ordinances (APFOs) and impact fees have emerged as two of the main techniques designed to fund new infrastructure and control the timing and amount of new construction. These regulations and fees are enacted in an attempt to ensure needed public services are in place or funded before new development is allowed to move forward.

While a number of communities have implemented these regulations, the potential for negative economic and social outcomes have generated considerable policy debate. Affordable housing advocates question whether APFOs and impact fees will increase price levels and exclude low income families from entering a community. Some smart growth proponents have also suggested concurrency regulation can lead to urban sprawl and low density development patterns. Finally, APFOs and impact fees can potentially create windfall economic gains for local governments and existing homeowners within a community, while passing the financial burden of infrastructure on to third parties.

A review of the existing literature that has examined the effect of growth management regulations, such as impact fees and development moratoria, provides guidance to evaluate the validity of these concerns. Below is a summary of the current findings.

Regulatory Delays and Uncertainty

Existing research suggests regulatory delays caused by an APFO can potentially decrease undeveloped land values by preventing development from occurring at the optimal time. Land values continue to fall as the length of the regulatory delay increases. However, positive externalities associated with slower population growth may partially offset this effect and preserve property values. Additionally, a reduction in new housing supply caused by a development delay puts upward pressure on existing home prices. Participants in a dynamic land market often respond to increased regulatory risk by reducing land bids and/or accelerating the timing of new development before regulation enactment.

Impact Fees

Economic theory and empirical research provide a great deal of guidance as to the expected outcome of an impact fee. Empirically it is shown that impact fees often increase the cost of new housing in an amount greater than the fee. Therefore, new home buyers tend to absorb a large portion of the cost increase associated with an impact fee. Existing residents are likely to experience capital gains as property tax savings and benefits of improved infrastructure are capitalized into existing home values. Local governments experience windfall economic gains as increasing home prices expand the property tax base. While economic theory suggests the effect of impact fees on undeveloped land values is ambiguous, empirical studies show land values are likely to fall as a result of developer uncertainty about the future costs of impact fees.

The Evolution of Adequate Public Facilities Ordinances

Research shows APFOs tends to increase the cost of housing and encourage suboptimal development patterns. The results often occur because traditional APFOs control only the timing of new development, without regard for its location or design. However, a number of communities have structured APFOs to meet their individualized planning objectives. Creative strategies such as affordable housing carve-outs, controls on location of new development, and other smart growth initiatives have been used to try to increase the utility of APFOs. However, land use regulations designed to address negative externalities may still introduce further inefficiency into the market.

Conclusion

Adequate public facilities ordinances and impact fees provide rapidly growing communities with a management strategy intended to limit or fund the pace of residential development. However, existing literature supports many of the economic and social concerns identified by opponents of these tools. These planning techniques can potentially limit the availability of affordable housing, reduce undeveloped land values, encourage development in more remote locations, speed up development before regulation enactment, and provide existing residents and local governments with windfall economic gains. The characteristics of the housing market and the structure of the APFOs and impact fees determine the extent of these effects. Several communities have attempted to develop APFO structures intended to reduce negative impacts and achieve individual planning objectives.

I. Introduction

Many rapidly growing communities struggle to provide infrastructure and public services needed to support new residential development. Adequate public facilities ordinances (APFOs or Concurrency Regulations)¹ have emerged as one growth management strategy designed to control the timing of new projects. These ordinances limit new development until needed infrastructure can be provided. Requiring concurrency between new construction and public service capacity is intended to help communities address some of the problems associated with population growth.

Proponents of APFOs believe these regulations simply codify regulatory powers traditionally granted to local governments to ensure orderly growth.² However, landowners and real estate developers have questioned local government authority to implement concurrency regulations. Additionally, these regulations face legal challenges on state and federal constitutional grounds as violations of Due Process, Equal Protection, and the Just Compensation Clause, (Ott and Read, 2006). APFOs have overcome these challenges in some jurisdictions and are recognized as a legal land use planning mechanism. Despite their legality in these jurisdictions, the economic and social benefits of APFOs have been brought into question.

APFOs can potentially increase the cost of residential development, thereby increasing the cost of housing. Affordable housing advocates question whether the price increase will exclude low income families from entering a community.³ Some smart

¹ Adequate public facilities ordinances are often referred to as APFOs or concurrency regulations. These terms will be used interchangeably throughout the study.

² White, S. Mark, and Elisa L. Paster, 2003. Creating Effective Land Use Regulations Through Concurrency, 43 *Nat. Resources J.* 753, 756.

³ Pelham, Thomas G. 1992. Adequate Public Facilities Requirements: Reflections on Florida's Concurrency System for Managing Growth. 19 *Fla. St. U. L. Rev.* 974, 980. Connerly, Charles E. 1988.

growth proponents have also suggested concurrency regulation can lead to urban sprawl and low density development patterns.⁴ Finally, APFOs can potentially create windfall economic gains for local governments and existing homeowners within a community, while passing the financial burden of infrastructure on to third parties. These concerns have spurred a considerable amount of research examining the effects of growth control ordinances on housing cost, land values, and development timing.

The structure of a concurrency regulation influences the potential economic implications. If infrastructure capacity is unavailable and new construction is temporarily prohibited, an APFO operates in a manner similar to a development moratorium until the city can provide needed public services. Alternatively, many communities allow real estate developers to voluntarily pay for infrastructure improvements in order to accelerate the development process. These APFOs effectively act as an impact fee if the developer elects to pay for needed infrastructure. A significant amount of research has examined the economic implications of regulatory delays and impact fees. These studies provide guidance when evaluating the potential effects of an adequate public facilities ordinance.

II. Regulatory Delays and Uncertainty

When existing public services are insufficient to support new residential development and a local government does not have funds available to make the needed improvements, an adequate public facility ordinance may temporarily prohibit new development. Regulatory delays create uncertainty for real estate developers because

The Social Implications of Impact Fees. *Journal of the American Planning Association*. 54:1, 75-78. Connerly goes further, stating impact fees perpetuate racial segregation because of income differentials between white and black households.

⁴ White and Paster (2003). Increased development costs may encourage development in more remote areas where excess infrastructure capacity exists, resulting in urban sprawl.

they limit the private sector's ability to determine the appropriate timing of new development. The private sector's response to uncertainty can potentially influence future development timing and undeveloped land values.

Brueckner (1990) describes the relationship between growth control ordinances and land values as the net effect of two changes.⁵ First, the implementation of a growth control ordinance delays the point in time at which land can be developed, which lowers land value. Second, lowering a community's population growth path creates positive externalities by improving quality of life factors.⁶ The benefits of decreased traffic congestion, improved air quality, and reduced crime are capitalized into land values. Growth control measures can increase or decrease the value of undeveloped land due to these offsetting effects. Brueckner's model shows growth controls increase the value of all undeveloped land in the effected community when minimal delays occur in the development process. Values increase due to the positive externalities of a lower population growth path. Alternatively, continuous limitations on development may increase or decrease land values in complex spatial patterns.

Riddiough (1997) incorporates anticipated regulatory delays into a real-options model to determine the effect on vacant land value and development timing.⁷ He examines the effect of an anticipated regulatory taking, considering both the probability of a regulatory taking and the level of compensation received by the landowner. The analysis concludes investors require a greater expected rate of return to compensate for

⁵ Brueckner, J. K., 1990. Growth Controls and Land Values in an Open City, *Land Economics*, 66 pp 237-248.

⁶ Id. at 239. Within a closed-city, consumers are unable to relocate and are packed into a smaller area, which eliminates the positive externalities associated with limiting growth.

⁷ Riddiough, Timothy J. 1997. The Economic Consequences of Regulatory Taking Risk on Land Values and Development Activity, *Journal of Urban Economics*, 41 pp 56-77.

the risk of the taking, therefore reducing the amount they are willing to pay for vacant land. When a regulatory taking is expected in one year and no compensation is expected for the taking, the model depicts a 70% decrease in vacant land value. Under the same parameters, the study found the probability of development increases from 10% to 70% when a regulatory taking is imminent in a two year time period.

The second portion of Riddiough's study analyzes the effect of an interim regulatory taking after a land use regulation has temporarily prohibited development. In this scenario, land values decrease because the interim taking prohibits the investor from developing property at the optimal time. Assuming the property is ripe for development when the interim taking is implemented and the property generates no interim cash flows, land values decrease as the length of the interim taking period increases. Riddiough's example depicts a 14% loss in property value over a two year regulatory delay, 30% over five years, and a considerable 75% over a 20 year period.

Riddiough's results show regulatory delays can decrease the value of individual properties. However, the author acknowledges "demand-side amenity benefits" must be taken into account when analyzing a growth control ordinance affecting an entire community. APFOs are implemented to ensure necessary infrastructure is in place to support new development, presumably increasing a community's quality of life. If these benefits increase demand for property within a community, the negative effects of the growth control ordinance can be offset and property values may actually increase despite restrictions on development.

Turnbull (2004, 2005) acknowledges land use regulations may be justified to account for negative externalities associated with residential development.⁸ However, urban growth is a dynamic process in which market participants anticipate land use regulation and attempt to mitigate negative impacts.⁹ The proposed enactment of an APFO signals to market participants that future development may be denied approval on grounds of inadequate infrastructure capacity. Developers ultimately unaffected by the APFO still respond to the proposed regulation by reducing land bids and developing properties more rapidly than would otherwise be optimal without the perceived risk. This “efficiency gap” widens as the probability and duration of the regulatory delay increases.

Turnbull also considers capital density to apply the model to spatial land markets. He finds longer anticipated development moratoria decrease the planned capital density for land in locations where demanded density is increasing over time. Development is accelerated to avoid delays associated with the moratorium and the density of construction is chosen to reflect existing market conditions. The density of development may be suboptimal if demanded density is increasing over time. Conversely, the chosen density level may exceed future demand if demanded density is decreasing in the future. Under these conditions, temporary moratoria designed to address externalities may still induce inefficiency in the market because of regulatory risk.

Theoretical real options models evaluating growth management regulations have been supported by recent empirical work. Cunningham (2006a) addresses two key

⁸ Turnbull, Geoffrey K. 2005. The Investment Incentive Effect of Land Use Regulation. *The Journal of Real Estate Finance and Economics*. 31:4, 357-395. Turnbull, Geoffrey K., 2004. Development Moratoria, *Journal of Housing Economics*, 13, pp 155-169.

⁹ Turnbull (2005).

conclusions of real option theory applied to real estate markets.¹⁰ First, the existence of a real option should delay the timing of residential development because investors have an incentive to wait until additional market information becomes more available. Postponing development limits the risk of building at a suboptimal density level or converting raw land to residential use too early.¹¹ Second, the existence of a real option should increase the value of undeveloped land because it provides the developer with the ability to build at the optimal time and density level in the future. The delay in development timing and the economic value of the real option should increase with the amount of price uncertainty in the housing market.¹²

Cunningham tests for the existence of a real option in the Seattle housing market by determining if price uncertainty delays development or increases undeveloped land prices. Uncertainty in the housing market is calculated by using a hedonic regression model to estimate constant-quality home prices throughout the market for each quarter between 1982 and 2002.¹³ The price of a constant-quality home is then estimated for one year in the future. Uncertainty in the housing market is defined as the moving variance in the price residual in the preceding four quarters. A one-year period was chosen for the uncertainty calculation because it is the estimated time required to construct a new home.

A hazard model is then used to identify the variables influencing the amount of time a parcel of land remains undeveloped before a new home is constructed. The uncertainty variable is negative and statistically significant.¹⁴ The model shows a one

¹⁰ Cunningham, Christopher R. 2006. House Price Uncertainty, Timing of Development, and Vacant Land Prices: Evidence for Real Options in Seattle. *Journal of Urban Economics*. 59, 1-31.

¹¹ Id. at 3.

¹² Id.

¹³ Id. at 14-15.

¹⁴ Id. at 17.

standard deviation increase in the price uncertainty variable delays the timing of development by 10.7%. The impact of housing price uncertainty is then included in an OLS regression model to determine the impact on undeveloped land values. After estimating constant-quality undeveloped land prices in each market segment, the model found a one standard deviation increase in price uncertainty increased undeveloped land prices by 1.6%. When housing prices were examined according to distance from the CBD, a more substantial price increase of 9.1% was found 12-16 miles from the central business district. The identified relationship between price uncertainty, development timing, and undeveloped land prices in the Seattle housing market supports the existence of real options.

Cunningham (2006b)¹⁵ next examines the impact of a growth management regulation on development timing by considering an urban growth boundary (UGB) imposed in Seattle. Within a real options framework, land use regulations can limit future alternatives and reduce the incentive to postpone development. Dummy variables were included in the previously developed hazard model to reflect the implementation of the UGB and the location of undeveloped parcels inside or outside of the boundary.¹⁶ The findings show the regulation would have reduced development by 42-48% without the existence of a real option. However, the regulation only reduces development by 28-39% when the real option is considered because the regulation limits future options, therefore accelerating development. The study of Seattle's UGB provides insight into the potential effects of other types of growth management regulations, such as APFOs, on development timing.

¹⁵ Cunningham, Christopher R. 2006. Growth Controls, Real Options and Land Development. Forthcoming.

¹⁶ Id. at 18-22.

The Economic Consequences of Regulatory Delays and Uncertainty

Existing research suggests regulatory delays caused by an APFO can potentially decrease undeveloped land values by preventing development from occurring at the optimal time. Land values continue to fall as the length of the regulatory delay increases. However, positive externalities associated with slower population growth may partially offset the effect and preserve property values. Unfortunately, land use regulations designed to address externalities may still introduce inefficiency into the market. Participants in a dynamic land market respond to regulatory risk by reducing land bids and accelerating the timing of new development. The impact on land values and capital density differs at various locations throughout the market.

III. Impact Fees

Adequate public facilities ordinances often allow a developer to avoid lengthy regulatory delays by voluntarily funding infrastructure improvements needed to support new development. In these situations an APFO operates as an impact fee. An impact fee can be defined as a charge required by a local government from a developer to provide infrastructure for a development or to contribute to larger scale infrastructure expansion.¹⁷ The use of impact fees has increased dramatically in recent years as communities struggle to increase local property taxes.¹⁸ Voluntary impact fees provide an alternative source of revenue to fund infrastructure and public service improvements required by an APFO.

¹⁷ Levine Jonathan C., 1994. Equity in Infrastructure Finance: When Are Impact Fees Justified, *Land Economics*. 70(2), p 210.

¹⁸ Altshuler, Alan A. and Jose A. Gomez-Ibanez, 1993. Regulation for Revenue: The Political Economy of Land Use Exactions, *The Brookings Institute*, Washington, D.C. pp 18-20. In the period before 1960 until the mid 1980's, the use of exactions increased from 10% of communities to 90%.

Impact fees are often considered an equitable public finance method because they presumably shift the cost of residential development to new residents responsible for the increase in infrastructure demand.¹⁹ The justification is based on the assumption infrastructure costs outweigh the increase in property tax revenues generated by new residential development.²⁰ Impact fees can also be justified as a means of addressing greenspace and fiscal externalities associated with low density development patterns.²¹ Forcing homebuyers and developers to consider these externalities may limit residential construction to an economically efficient level.²² However, Levine (1994) articulates the concern posed by many opponents of impact fees: “For the most part the fees have arisen more out of fiscal necessity than economic rationale; legal and political constraints against traditional property tax financing of infrastructure, sometimes coupled with anti-growth sentiment, have multiplied.”²³ Rather than fully considering economic implications, existing residents within a community may use regulatory powers to retain benefits funded by the community at large, while shifting the burden of future growth to other parties.²⁴ These concerns have resulted in a number of studies examining the economic benefits and burdens of impact fees.

¹⁹ Anderson, John E. 2005. Taxes and Fees as Forms of Land Use Regulation. *The Journal of Real Estate Finance and Economics*. 31:4, 413-427.

²⁰ Skidmore, Mark and Michael Peddle, 1998. Do Development Impact Fees Reduce the Rate of Residential Development?, *Growth & Change*, Vol. 29, Issue 4, p 1. The costs and benefits of real estate development continue to be debated. See the following articles for competing positions: Walden, M. (1998) “Economic Impacts of Residential Construction,” Study prepared for the Homebuilders Association of Raleigh-Wake County, North Carolina State University. Renkow, M. (2001) “The Cost of Community Services in Wake County,” Report prepared for the Wake County and the Triangle J Council of Governments, North Carolina State University.

²¹ Turnbull, Geoffrey K. 2004. Urban Growth Controls: Transitional Dynamics of Development Fees and Growth Boundaries. *Journal of Urban Economics*. 55, 215-237.

²² Brueckner, Jan K., 1997. Infrastructure Financing and Urban Development: The Economics of Impact Fees, *Journal of Public Economics*, Vol. 66, Issue 3, pp 383-407.

²³ Levine (1994).

²⁴ Turnbull (2005).

Huffman et al. (1988) provide a theoretical framework to analyze the potential effects of an impact fee.²⁵ Impact fees shift the cost of infrastructure development from the community at large (via property tax revenues) to owners of developable land and buyers of new homes. The characteristics of the housing market dictate how these additional costs are distributed. If the demand for new housing is relatively inelastic, a large portion of the impact fee is passed forward to the homebuyer in the form of an increase in new home prices. Alternatively, if the demand for housing is relatively elastic developers will reduce land bids passing the cost of the impact fee backward to owners of developable land. In a competitive housing market, developer profits are unaffected by the impact fee because it is absorbed by landowners and/or homebuyers.²⁶

Communities with impact fees are often presumed to have relatively inelastic demand for new housing because a limited number of close substitutes are available.²⁷ Additionally, new housing supply is generally presumed to be elastic due to the mobility of real estate developers. These conditions allow developers to pass a large portion of an impact fee on to buyers of new homes. The result suggests impact fees may succeed in shifting the burden of infrastructure to those responsible for growth. However, the work of Yinger (1998), Ihlanfeldt and Shaughnessy (2004) rejects the assumption of inelastic housing demand. Their analysis assumes mobile households and a competitive construction industry.²⁸ Household mobility limits a developer's ability to pass the

²⁵ Huffman, Forrest E., Arthur C. Nelson, Marc T. Smith, and Michael A. Stegman. 1988. Who Bears the Burden of Development Impact Fees? *Journal of the American Planning Association*. Winter, 54:1, 49-55.

²⁶ Developers are only affected to the extent they currently own undeveloped land or hold an inventory of existing homes. Additionally they could be affected in the long-term due to a reduction in housing demand.

²⁷ Singell, Larry D. and Jane H. Lillydahl, 1990. An Empirical Examination of Impact Fees on the Housing Market, *Land Economics*, v 66. n 1. pp 82-92.

²⁸ Yinger, John, 1998. The Incidence of Development Fees and Special Assessments, *National Tax Journal*, v 51, i 1, pp 23-42. Ihlanfeldt, Keith R. and Timothy M. Shaughnessy, 2004. An Empirical

expense of impact fees on to the consumer because a homebuyer can move to a jurisdiction without an impact fee. Therefore, price increases only occur to the extent infrastructure improvements or property tax savings are capitalized into new housing prices.²⁹ Since homebuyers do not directly bear the burden of impact fees and development profits remain stable in a competitive market, owners of undeveloped land will bear the burden of impact fees if the new infrastructure does not create a benefit equal to the cost.³⁰

The analysis presented by Yinger, Ihlanfeldt and Shaughnessy provides an explanation for “over-shifting” of impact fees. Infrastructure improvements can potentially provide a benefit greater than their cost of construction. In this case, the price of housing would increase in an amount greater than the impact fee as the improvements are capitalized into housing values. Developer profits remain stable in a competitive market, therefore bids for undeveloped land increase. The situation results in a windfall gain for owners of undeveloped land as infrastructure benefits funded by impact fees are capitalized into land values.

Impact fees may also create windfall economic gains for existing home owners and a local government. In a competitive housing market, impact fees should be capitalized into the price of existing housing throughout the jurisdiction. Delaney and

Investigation of the Effect of Impact Fees on Housing and Land Markets, *Regional Science and Urban Economics* 34, pp 639-661.

²⁹ Id. at 219.

³⁰ Id. at 231. Yinger concludes undeveloped land prices may fall by approximately 25% even if the cost and benefit of infrastructure are equal. Even when the cost of new infrastructure equals the benefits and the benefits are capitalized into new housing prices, the developer is not fully compensated for the cost of the fee. Full compensation would require the present value of the housing price increase to equal the amount of the impact fee, therefore, the price change falls short of the fee amount under the cost-benefit assumption. Ihlanfeldt and Shaughnessy (2004) reject Huffman et al.’s argument that impact fees are generally not passed backwards because landowners will not sell their land below a reservation price. Depressed residential construction will eventually result in a decline in land values.

Smith (1989b) outline the reasons for this effect.³¹ Impact fees reduce future property tax payments by shifting the cost of infrastructure development to new residents. Improved infrastructure may also provide spillover benefits to existing homes. These direct benefits are capitalized into the price of existing homes throughout the market. Impact fees also indirectly influence the price of existing housing by increasing development costs. The increase in cost reduces the supply of new units. The reduction in the supply of new housing puts upward pressure on demand for existing homes. Since the supply of existing homes is fixed, increased demand results in an increase in price. The indirect effect can flow through to other communities throughout the housing market depending on the substitutability of housing units.

A community implementing an impact fee ordinance may observe a notable increase in new and existing housing prices if market factors prevent the fee from being capitalized throughout all communities in the housing market. This may occur if the community is considered a superior alternative to other surrounding locations.³² Imperfect market information, limited mobility, and transaction costs may also prevent residents from moving to alternative locations where infrastructure costs are paid by the community at large.³³ In these situations, existing residents and the community implementing the impact fee experience windfall economic gains. Existing homeowners benefit from capital gains as the value of their home increases. The value increase in both new and existing homes provides the local government with increased property tax revenues without a corresponding increase in public services.

³¹ Delaney, Charles J. and Marc T. Smith, 1989b. Pricing Implications of Development Exactions on Existing Housing Stock, *Change and Growth*, 20, pp 1-12.

³² Delaney, Charles J. and Marc T. Smith. 1989a. Impact Fees and the Price of New Housing: An Empirical Study, *American Real Estate and Urban Economics Association Journal*. 1989. pp 41-54.

³³ Id. at 50-52.

The economic implications of an impact fee become even more complex when the dynamic nature of an urban land market is included in the analysis. Dynamic models consider adjustments market participants make in anticipation of policy change. (Turnbull 2005)³⁴ Impact fees are generally thought to slow development timing and reduce housing supply in the long-run. However, developers may anticipate the imposition of a fee and speed up development in the short-run.³⁵ This market adjustment may lead to sub-optimal development timing and economically inefficient growth.

Economic theory shows the potential consequences of an impact fee are more complex than a mere shift of infrastructure costs to new home buyers. Existing residents, developers, landowners, and local governments are all influenced by the public finance technique. To further explore the topic, empirical studies have been conducted across North America to analyze the effects of impact fees on housing prices, land values, and housing supply.

The Effect of Impact Fees on Housing Prices and Land Values

Delaney and Smith (1989a) examined the effect of a development impact fee on both new and existing housing prices in two studies conducted in Pinellas County, Florida. The first study focused on a \$1,150 impact fee imposed in 1974 and assessed against all new, single-family housing in Dunedin, Florida.³⁶ Annual constant-quality price indices were created for Dunedin and three other cities in Pinellas County for the period between 1971 and 1982. The cities of Clearwater, Largo, and St. Petersburg were selected because they did not impose an impact fee and were considered part of the same

³⁴ Turnbull, Geoffrey (2005).

³⁵ Singell and Lillydahl (1990).

³⁶ Delaney and Smith (1989a).

housing market. The indices were created by regressing the sale price of new housing units on several independent variables selected to represent physical characteristics, location, and neighborhood characteristics of the housing stock.³⁷ The estimated price of a constant-quality home in Dunedin was then compared with the estimated price in each of the other three cities. The sales price ratios were then regressed on a dummy variable representing the impact fee to determine if the fee resulted in a significant increase in the price of new housing in Dunedin.³⁸ The impact fee resulted in a statistically significant increase in housing prices in Dunedin compared to Clearwater and St. Petersburg in the period between 1973 and 1978. The regression coefficients reflected an estimated new housing price increase in Dunedin more than three times greater than the amount of the impact fee.³⁹

Delaney and Smith's findings are consistent with several aspects of economic theory. Inelastic demand in Dunedin's new housing market allowed impact fees to be passed forward to buyers of new homes in the short-run. The authors offer several possible reasons why the impact fee was not quickly capitalized throughout surrounding communities. Home buyers may have perceived an increase in infrastructure quality associated with the fee and capitalized the anticipated benefit into purchase prices. Imperfect information and transaction costs may have also prevented the impact fee from filtering through to other communities. The difference in new housing prices dissipated after 1978, suggesting the fee was eventually capitalized throughout the housing market as information gaps were corrected or infrastructure improvements failed to materialize.

³⁷ Id. Independent variables included conditioned living space in SF, Lot size in SF, and land cost per square foot.

³⁸ Id. at 51.

³⁹ Id.

Dunedin's housing price increase in the year before the impact fee was imposed also supports a dynamic view of urban land markets. The price increase may have resulted from homebuyers anticipating the imposition of the impact fee and increasing their demand for housing before the fee went into effect.

Delaney and Smith's (1989b) second study implemented a similar hedonic price model to examine the effect of Dunedin's impact fee on existing housing prices in both Dunedin and Clearwater.⁴⁰ In the period between 1973 and 1978, the study found Dunedin's estimated new housing price exceeded the city's existing housing price by \$2,633, which was more than twice the amount of the impact fee.⁴¹ Dunedin's existing housing price exceeded Clearwater's existing housing price by \$1,643.⁴² These results suggest the impact fee increased the cost of new housing in Dunedin relative to existing housing and increased the cost of existing housing in Dunedin relative to a comparable community without an impact fee.⁴³ Economic theory suggests impact fees should be capitalized into new and existing housing prices throughout the market. The authors once again suggest imperfect information may have prevented the impact fee from being fully capitalized into the price of existing housing. Delaney and Smith also note increased carrying costs associated with the impact fee may partially explain why the fee has a greater price effect on new housing.

Singell and Lillydahl (1990) examined the effect of an impact fee on new and existing housing prices in Loveland, Colorado.⁴⁴ The study regressed the log of home

⁴⁰ Delaney and Smith (1989b).

⁴¹ Id. at 9. The results were statistically significant at the .05 level.

⁴² Id. The results were statistically significant at the .05 level.

⁴³ Id. The authors note the capitalization of impact fees into the price of existing housing lagged that of new housing by at least one year.

⁴⁴ Singell and Lillydahl 1990.

values on the log of five independent variables selected to represent the physical characteristics of the housing stock. The interest rate, age of the house, a time trend, and an impact fee dummy variable were also included in the regression.⁴⁵ Their results show a \$1,182 increase in the impact fee resulted in a \$3,800 increase in the estimated price of new homes.⁴⁶ The authors conclude the burden of the impact fee is shifted to buyers of new homes and provide three explanations for the “over-shifting” of fees.⁴⁷ Developers could potentially be adding carrying costs associated with the fees or passing through other development costs. The price increase could also exceed the amount of the impact fee if builders improved the quality of new homes. The study found the impact fee increased existing home prices by \$7,000.⁴⁸ The increase in the price of existing homes was expected as “spill-over” benefits of improved infrastructure and reduced property tax rates were capitalized into the price.⁴⁹

An increase in the price of new and existing housing is expected after the imposition of an impact fee as infrastructure benefits are capitalized throughout the housing market. However, the large difference in the price increase between new and existing housing found in Singell and Lillydahl’s study was not anticipated. Ihlanfeldt and Shaughnessy (2004) attempt to improve upon existing models by removing limitations generating results inconsistent with economic theory⁵⁰ Their study estimating the effect of impact fees on single-family homes and undeveloped land prices in Dade County, FL. Constant-quality indices were created for new and existing housing,

⁴⁵ Id. at 89.

⁴⁶ Id.

⁴⁷ Id. at 89.

⁴⁸ Id. at 90.

⁴⁹ Id.

⁵⁰ Ihlanfeldt and Shaughnessy (2004).

as well as undeveloped residential land, using both hedonic price and repeat-sales models.⁵¹ The price indices were then regressed on impact fees and a set of control variables representing the metropolitan housing market.⁵² The results of the hedonic model show each additional dollar of impact fees increases the estimated new home price by \$1.64 and the estimated existing home price by \$1.68.⁵³ The similar price increase in new and existing homes is consistent with economic theory, in which price increases are capitalized throughout the housing market.

The study also found the impact fee resulted in a reduction in undeveloped land values by approximately 8%.⁵⁴ Economic theory suggests undeveloped land prices need not fall when the capitalized benefits of new infrastructure exceed the impact fee. The authors explain the decrease in land values as a function of developer uncertainty at the time the land was purchased. If developers anticipated future impact fees to increase, current land bids would decrease in light of the uncertainty. This reflects the dynamic nature of the land market.

Ihlanfeldt and Shaughnessy's empirical research examining the effect of impact fees on residential land values furthered previous work conducted by Skaburskis and Qadeer, which analyzed the price of developed lots in suburban Toronto between 1977

⁵¹ Id. at 649. Hedonic and repeat-sales models were estimated for existing housing. However, only a hedonic model was estimated for new housing and only a repeat sale model was estimated for vacant land. The hedonic model includes independent variables representing structural, neighborhood, and locational characteristics of the house. Distance from employment centers and the time period of the sale were also included in the analysis.

⁵² Id. at 651. A stock flow model of the housing market is used for the second stage of the analysis.

⁵³ Id. at 656. The results of the existing housing OLS regression analysis are statistically significant at the .05 level and are nearly identical to the results of the repeat sales model, which shows a price increase of \$1.67 for each dollar of impact fees. The results of the new housing regression are significant at the .01 level.

⁵⁴ Id. at 657.

and 1986.⁵⁵ The study regressed the sale price of vacant lots against development impact fees, location factors, and various development costs. The results show a \$1.00 increase in development fees increased vacant lot prices by \$1.88. The authors explain the short-run price increase resulted from reduced supply of developed lots created by the impact fee. When a population growth premium was included in the regression analysis the price increase fell to \$1.23 for each \$1.00 increase in impact fees. The effect of impact fees was less substantial in rapidly growing communities because price increases associated with increased demand quickly covered the cost of the fee. Despite the short-run price increase in lot values, Skaburskis and Qadeer anticipated a long-run decline in the value of undeveloped land as anticipated impact fees are capitalized into undeveloped land bid.

Two recent studies have expanded the empirical analysis of impact fees and their effect on housing prices, developed lots and undeveloped land values. Mathur, Waddell and Blanco (2004) examined the effect of impact fees on the cost of housing at various price points.⁵⁶ Three housing price indices were created, the first model reflecting all new homes in the market, the second lower-quality homes, and the third reflecting higher-quality homes. After regressing the indices on the impact fee dummy variable, each \$1 increase in impact fees resulted in a \$1.66 increase in the mean price of homes, a \$.63 increase in lower-quality homes, and a \$3.58 increase in higher-quality home prices.⁵⁷ The authors explain the large increase in the price of higher-quality homes

⁵⁵ Skaburskis, Andrejs, and Mohammad Qadeer, 1992. An Empirical Estimation of the Price Effects of Development Impact Fees, *Urban Studies*, v 29, n 5, pp 653-667.

⁵⁶ Mathur, Shishir, Paul Waddell, and Hilda Blanco, 2004. The Effect of Impact Fees on the Price of New Single-Family Housing, *Urban Studies*, v 41, n 7, pp 1303-1312.

⁵⁷ Id. at 1308. The mean price for all new homes was \$246,000, lower-quality homes \$166,000, and higher-quality homes \$291,000.

occurred because the benefit created by the infrastructure was greater than the amount of the impact fee.⁵⁸ The small price increase in lower-quality housing is explained by elasticity of supply or demand in the affordable housing sub-market.⁵⁹

Evans-Cowley, Forgey and Rutherford (2005) analyzed developed lots and undeveloped land values in 43 communities throughout Texas.⁶⁰ Their regression analysis found only 31% of impact fees were capitalized into developed lot values, suggesting owners of developed lots can only pass on a portion of the fee to lot purchasers. The study also found impact fees resulted in a 4.7% decrease in undeveloped land prices. Based on the results, the authors conclude some of the cost of impact fees accrues to landowners throughout the community.

Impact Fees and Housing Supply

The economic literature acknowledges impact fees can increase the price of housing by increasing demand and by restricting supply. Impact fees increase development costs, thereby reducing the supply of new housing. Development fees can also increase demand for new housing within a municipality by reducing property taxes and providing needed infrastructure. Skidmore and Peddle's (1998) research isolates these factors to determine the effect impact fees have on the delivery of new housing units.⁶¹ Their study modeled the number of new homes constructed in DuPage County,

⁵⁸ Id. at 1311. The authors also suggest the increase in higher-quality housing prices could have resulted from additional developer costs associated with processing time or other development exactions present in the community.

⁵⁹ Id. The authors propose greater elasticity in the lower-quality sub-market may lead developers or consumers to shift to multi-family housing.

⁶⁰ Evans-Cowley, Jennifer S., Fred A. Forgey, and Ronald Rutherford, 2005. The Effect of Development Impact Fees on Land Values, *Growth and Change*, v 36 n 1, pp 100-112.

⁶¹ Skidmore and Peddle (1998).

Illinois between 1977 and 1992 as a function of municipal attributes and impact fees.⁶² Their results found property tax reductions associated with impact fees increased the rate of residential development by 4%. However, increased costs reduced the supply of residential development by 29%. The authors conclude the net effect of impact fees can reduce the rate of new residential development by approximately 25%.⁶³

Mayer and Somerville (2000) also examined the impact of land use regulations on new housing supply.⁶⁴ Their study focused on both impact fees and regulations which increase the amount of time necessary to develop land. Forty-four metro areas throughout the United States were examined between 1985 and 1996.⁶⁵ The study found heavily regulated communities may have as many as 45% fewer new residential construction starts than less regulated markets. While these results suggest government regulations clearly impact the development of new housing, the study found impact fees had little effect on the level of new residential construction. Mayer and Somerville found regulations influencing the timing of new development proved to be more detrimental to the delivery of new housing units. These results suggest regulatory uncertainty may be more detrimental to housing production than regulatory costs.

The Economic Consequences of an Impact Fee

Economic theory and existing empirical research provide a great deal of guidance as to the expected outcome of an impact fee. Impact fees often increase the cost of new housing in an amount greater than the fee. Therefore, new home buyers may absorb a

⁶² Id. at 1.

⁶³ Id. at 7.

⁶⁴ Mayer, Christopher J., and C. Turiel Somerville, 2000. Land Use Regulation and New Construction, *Regional Science and Urban Economics*, v 30 i 6, pp 639-662.

⁶⁵ Id. at 640.

large portion of the cost increase associated with an impact fee. Existing residents are likely to experience capital gains as property tax savings and benefits of improved infrastructure are capitalized into existing home values. A reduction in new housing supply may also put upward pressure on existing home prices. Local governments experience windfall economic gains as increasing home prices expand the property tax base. While economic theory suggests the effect of impact fees on undeveloped land values is ambiguous, empirical work shows land values are likely to fall as a result of developer uncertainty regarding the cost of impact fees in the future.

IV. Evolving APFO Structures

The potential economic consequences of an APFO justify many of the concerns brought forth by social policy advocates. Empirical evidence demonstrates an APFO can potentially increase housing prices throughout a market and reduce the availability of affordable units.⁶⁶ An APFO may also encourage urban sprawl if mobile developers build in more remote locations after finding market conditions will not allow impact fees to be passed on to homebuyers or landowners. Finally, the possibility of windfall economic gains for existing residents and local governments, coupled with losses for landowners, questions the fairness of this growth management strategy. Although APFOs in their most basic form influence only the timing of new development, a number of communities have structured APFOs to address these social issues.

Communities have structured APFO regulations in a number of ways to increase their utility and create a more complete growth management tool. The number of

⁶⁶ All of the empirical studies in the literature review examining housing prices found impact fees increase the cost of housing units. The studies do not address APFOs, but the findings are useful because impact fees are a common finance technique included in concurrency regulations.

services included in the ordinance often varies across communities. The established level of service standard and type of development effected by the APFO may also vary. Concurrency regulation may strictly prohibit development until necessary infrastructure is developed or provide exceptions to prevent APFOs from interfering with other smart growth objectives. Additionally, the source of funding for infrastructure improvements may change from community to community. The flexibility of these factors depicts how APFO regulations have evolved to accomplish a number of objectives in the city and regional planning framework.

Services Included in an APFO

The number of public services included in an APFO regulation varies greatly across communities. Some ordinances provide for a single public service, while others cover a wide range of services and infrastructure types. The disparity can be observed by examining various APFO regulations enacted in the state of Maryland. Somerset County's ordinance requires concurrency only for roads. Alternatively, Montgomery County requires concurrency for schools, roads, water, sewer, emergency services, and health care clinics.⁶⁷ The distinction is notable because communities including a greater number of public services in their APFO regulation are more likely to require regulatory delays or development fees. Communities can reduce negative economic externalities by limiting the number of services included in the ordinance or ensuring an effective public finance plan is in place to develop the identified services.

⁶⁷ Maryland Association of Counties, APFO Survey, March 2005.

Level of Service Standards and Type of Development

The level of service (LOS) a community deems appropriate for different types of public services naturally varies between municipalities. LOS standards are often uniform within a municipality, but some communities vary the LOS by geographic location. The APFO enacted in Davidson, North Carolina applies a tiered system, in which three LOS standards are implemented for urban, suburban and rural areas of the jurisdiction.⁶⁸ Changing the required LOS can encourage or discourage growth in particular geographic areas, giving a community greater control over the location of development and the ability to prevent leapfrog development patterns. Structuring APFO regulations in this way increases their flexibility and helps prevent interference with other community objectives.

APFO regulations may also apply differently to residential and commercial development. A large number of communities apply concurrency regulations only to residential development. The distinction is based on an assumption that tax revenues generated by residential development do not cover the cost of infrastructure stress created by new residents. On the other hand, Cabarrus County, North Carolina and Queen Anne's County, Maryland apply concurrency regulations to commercial development if the project places demand on infrastructure similar to residential units.⁶⁹ Including commercial development in an APFO regulation may help prevent accusations that concurrency regulations are merely an attempt to prevent new residential development or to exclude affordable housing.⁷⁰ Unfortunately, many communities are unwilling to

⁶⁸ White and Paster at 773. Town of Davidson, Davidson Planning Ordinance, 18.0 Adequate Public Facilities Ordinance, 2003, p. 7.

⁶⁹ White and Paster at 773. Maryland Association of Counties, APFO Study, March 2005.

⁷⁰ Pelham at 980.

extend the regulations to commercial properties for fear of undermining economic development efforts.

Smart Growth and Concurrency Waivers

A community may be willing to waive the concurrency requirement to encourage development satisfying other public objectives. The APFO implemented in Hillsborough County, Florida specifically provides a concurrency waiver for infill development and pedestrian-oriented projects.⁷¹ Other APFOs utilize complex point systems in which proposed projects receive points for satisfying community objectives such as infill development and provision of affordable housing.⁷² These points are accumulated and used to offset concurrency requirements. Such provisions further enhance the flexibility of APFOs.

Funding Infrastructure Improvements

Developing an efficient APFO regulation requires a community to consider how funds will be generated to pay for necessary infrastructure improvements. Impact fees are a common public finance method used to fund concurrency. However, research suggests these fees may generate negative externalities for landowners or provide windfall gains to owners of existing homes. Problems occur when communities enact APFO regulations as an impulsive reaction to growth without any established plan for increasing public service capacity.⁷³ The lack of funds for new infrastructure can result

⁷¹ White at 774.

⁷² Id.

⁷³ Pelham at 978. Pelham cites several cities in California that implemented APFOs to slow growth, resulting in an extended development moratorium.

in extended development delays. Regardless of how a community decides to finance concurrency, a capital budgeting plan should be in place before the enactment of an APFO.

V. Conclusions

Adequate public facilities ordinances provide rapidly growing communities with a management strategy capable of limiting the pace of residential development. However, existing literature supports many of the economic and social concerns identified by opponents of APFOs. Concurrency regulations imposing temporary development moratoria or voluntary impact fees may produce a number of externalities. APFOs can potentially increase the cost of housing, reduce undeveloped land values, encourage development in more remote locations, and provide existing residents and local governments with windfall economic gains. The characteristics of the housing market and the structure of the APFO determine the extent of these effects. Several communities have developed creative APFO structures to reduce these impacts and achieve individual planning objectives.

Economic theory and existing empirical research show that impact fees often increase the cost of new housing in an amount greater than the fee. Therefore, new home buyers may absorb a large portion of the cost increase associated with an impact fee. Existing residents are likely to experience capital gains as property tax savings and benefits of improved infrastructure are capitalized into existing home values. A reduction in new housing supply may also put upward pressure on existing home prices. Local governments experience windfall economic gains as increasing home prices

expand the property tax base. While economic theory suggests the effect of impact fees on undeveloped land values is ambiguous, empirical work shows land values are likely to fall as a result of developer uncertainty regarding the cost of impact fees in the future.

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