

**Development Forecast:
The Fiscal Effects on Property Taxes and Occupational License Fees
and the Social Costs and Benefits of Urban Redevelopment in
Lexington – Fayette County, Kentucky[†]**



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Executive Summary

Real estate development has effects on the publicly recorded property valuation of a parcel. The extent of the relationship in Lexington – Fayette County demands further analysis. Redevelopment also has unintended social costs the public may be forced to bear. This study presents estimates of the fiscal impact a redevelopment project has on the local tax revenues. The study population used for analysis includes redevelopment projects completed within the last six years in the downtown Lexington area. The research attempts to formalize a relationship among the incremental change in the publicly recorded value, the cost of redevelopment, and the distance the project is from downtown to estimate new property tax revenues. Redevelopment costs and distance from downtown are regressed on the Fayette County Property Valuation Administrator property value change corresponding to redevelopment. Constants derived from previous research approximate the effect redevelopment has on occupational licenses fees. Combining the property tax and occupational license fee streams gives the total estimated incremental tax revenue. Lexington Fayette Urban County Government should examine each project using some sort of analytical tool, such as cost-benefit analysis. The new recurring revenue figures caused by redevelopment must first be used to offset public expenditures and the social costs of each project. If any funds still remain, the incremental revenue may be appropriated for funding other public projects and programs.

Issue Defined and Discussed

Recent years have seen new interest in the redevelopment of downtown Lexington. Several local and national developers have numerous project plans making their way through the various stages of the development process. For the most part, local government officials welcome and encourage the rejuvenation of Lexington's downtown.

Downtown redevelopment has impacts, both positive and negative, on the developers, local government, surrounding property, and community. Some aspects can be quantified and projected with reasonable certainty, while others, more qualitative in nature, must be recognized and considered when making public policy decisions. Examples of the quantifiable pieces in the downtown redevelopment policy arena include incremental changes in the property taxes and occupational license fees (income taxes) the Lexington – Fayette Urban County Government (“LFUCG”) receives and the cost of new public infrastructure to support the projects. Lower income families unable to afford rising housing costs, loss of community atmosphere and character, and increased pollution represent a few examples of the more qualitative externalities of downtown redevelopment. The range of both quantitative and qualitative examples is immense, too large to list exhaustively here.

This study presents estimates of the fiscal impact downtown redevelopment has on property taxes and occupational license fees. It also addresses the public decision-making process that requires consideration by policy makers of the positive and negative externalities of redevelopment. Downtown Lexington projects already constructed are used to generate data for a regression equation explaining the fiscal effects future projects will have on the local community from a tax revenue standpoint. The property tax portion of the calculations requires the

relationship between the change in the Fayette County Property Valuation Administrator office’s (“PVA”) assessment and the private cost to the developer of a particular project, known as the assessment ratio. As can be seen in equation 1, the assessment ratio is the difference in the PVA valuations before and after development, divided by the cost of redevelopment.

$$Assessment_Ratio = \frac{\Delta PVA_Assessment}{Development_Cost} \quad (1)$$

The cost of redevelopment and the distance from downtown Lexington are the two variables used to trend the assessment ratio.¹ Labor analyses of the downtown Lexington market completed by the University of Kentucky Center on Real Estate Studies (“UKCRES”) gives estimates of the typical number of employees per square foot of retail or office space used. These numbers can be applied to predict the fiscal effect of new jobs being created by redevelopment.

While the tax revenue forecasting piece of this research undoubtedly presents a positive light for downtown redevelopment because of the newly generated revenue, such a presentation merely portrays one piece of the spectrum of possible analysis. The first part of this study should not be the only component referenced by various interest groups and parties. Such an application would be a misuse of this research. Social costs inherently arise with each redevelopment project, so they must be taken into account. While tempting, private developers and the LFUCG must not solely focus on the revenue generation side of redevelopment and ignore social costs. Integrating both of these effects can be accounted for through the use of cost-benefit analysis. Proper public decision-making should be based on comprehensive cost-benefit analysis.

¹ Following the Lexington Downtown Development Authority, “downtown Lexington” is defined to be the intersection of Broadway and Main Street.

Literature Review

Over 71 percent of LFUCG's revenue comes from occupational license fees and property taxes (LFUCG 2004). By increasing the property values and adding jobs to the community, downtown redevelopment boosts local revenues. Along with newly generated tax revenue, the social benefits and costs of redevelopment must also be considered.

Property Value

Studies show that a parcel's property value increases directly with the amount of money spent on redevelopment, an underlying question of this study (Rosenthal 1994). This research estimates the relationship between PVA property valuations of redevelopment, redevelopment costs, and distance from downtown Lexington to a project. Based on these estimates, construction costs incurred by the developer when revitalizing a property and the distance from downtown to a project can be used to estimate the PVA assessment rate. The estimated change in assessed value can then be used to predict the incremental property tax revenue. Preferably, the PVA assessed value of a parcel would equal the market value. However, much variability exists in the assessment ratio between neighborhoods (Pearson 1979). Because of the narrow focus of this research – only analyzing projects within the downtown Lexington area – this variability is minimized.

Property value can also be explained by the theory of rent gradients. Rent gradient theory states the maximum rent a household is willing to pay for a location decreases with increasing distance from the center of downtown.² The PVA office should then be expected to assess properties closer to downtown at a higher valuation than similar properties located further away from downtown. Therefore, redevelopment projects constructed closer to downtown should have

² For a deeper discussion of rent gradients see Heilbrun's Urban Economics and Public Policy (1974) pg 106-111.

a higher assessment ratio than redevelopment projects completed on the fringe of the Lexington downtown area.

Occupational License Fee

Lexington, Kentucky has experienced positive population growth in recent years. Studies conducted on the downtown Lexington housing market indicate continued growth in downtown population. Roughly 30.2 percent of the net future downtown residents will be migrating from outside Lexington-Fayette County (Zimmerman 2004). These new dwellers would be additional payers of property taxes and occupational license fees. The other 69.8 percent of the future downtown migrants are already living in Lexington – Fayette County, paying taxes. The incremental effect these people will have on additional tax revenue generation is small and assumed here to be zero. When a citizen moves from one location within Lexington – Fayette County to another, assuming similar housing and employment, the individual's local tax liability will not change substantially.

Downtown Lexington employment analysis by UKCRES shows retail establishments tend to lease 250 square feet of space per employee and professional office companies use 200 square feet per employee. For residential, UKCRES estimates 2 residents per housing unit developed. This number can be justified for analysis. Residential redevelopments recently completed and those projects still within the design phase aim at meeting the more affluent market. Even if only one occupant resides in the unit, the probability of that person making twice the average income for Lexington-Fayette County is high, counterbalancing the effect of a smaller number of people eventually living in the residential structures. The UKCRES estimates a 10 percent vacancy rate for office space in downtown Lexington (Ambrose 2003). Residential

market analyses have shown a high demand for downtown housing, so complete usage for all units in a particular project is assumed here (Zimmerman 2004).³

Social Benefits and Costs

Other urban areas in the United States have seen noticeable positive and negative effects in how redevelopment influenced their community. Closer amenities to residential locations would be a positive externality. Roads in and around certain types of poorly designed redevelopment witnessing higher traffic densities would be considered a negative externality (Thibodeau 1990). Depending upon the intended outcome, higher property values subsequent to redevelopment could be seen as a benefit or a cost. Increased tax revenue would be a benefit. Nonetheless, rising property taxes could push lower income families out of their homes, forcing them to move to another locality with cheaper housing. If such a result is an intended consequence, redevelopment produces additional benefits. However, if simply enhancing the conditions of the current community demographic is the desired outcome, redevelopment produces costs in the form of negative externalities. Urban infill redevelopment serves as a solution to a series of urban related problems by reducing sprawl, saving open spaces, potentially reducing traffic congestion, increasing property tax and occupational license fee, and helping rejuvenate parts of the city that have depreciated. Furthermore, lower density development located further away from the center of downtown tends to have a higher public cost (Steinacker 2003).

Steinacker (2003) divides issues related to redevelopment into four categories: economic, environmental, political, and financing. The economic issue mainly consists of affordable

³ In the long-term, the vacancy rate of the downtown housing projects would be greater than zero. Because of the large demand, as studied by Zimmerman and exhibited by the market reaction to the initial new housing offerings, a zero vacancy for the new projects can be assumed.

housing, increases in public services, the time and money spent by legislators and city officials to rezone the city, and all the costs related to planning. The environmental problem entails increased pollution and contamination issues of abandoned industrial or commercial sites, which are often a target for infill development. The political implications refer to making sure downtown areas have a mix of social classes. The financing issue concerns the need for financing sources, grants, and tax breaks to ensure completion of a project.

A principle economic problem arising with infill redevelopment relates to the difficulty of producing affordable housing for low income families. Wishing to prevent sprawl of retirees and young professionals with no children to suburban areas, local governments often unintentionally encourage higher end housing to be built by the private developers. Supposedly, the demand for such housing in Lexington has greatly increased in recent years, and supply is just now beginning to try to catch up. New developments cause property values to increase with time, forcing housing costs up as well. According to Rosenthal, land will be redeveloped when its current value drops below the increase in value of a redeveloped parcel minus development costs. In Lexington, the remaining supply of lower cost housing will make way for the more profitable higher cost housing of redevelopment. Alternatively, land owners not interested in redeveloping will allow their property to naturally decay, yet charge higher rents because the supply of lower cost housing has dropped precipitously. Unsurprisingly, lower income families will see a larger part of their income being devoted to housing until a critical time when they decide to move to another part of town. Steps have been taken to ensure the housing cost problem does not become a local crisis. LFUCG, University of Kentucky, Samaritan Hospital, and Fannie Mae plan to offer financial support in the form of forgivable loans up to \$15,000 as a component of the "Live Where You Work" program (LDDA website). Lexington could require

developers to include affordable units in each housing project, but these limitations may decrease or even eliminate any incentive for the developers to build.

Urban redevelopment demands a higher concentration of services due to higher density in the downtown areas. Examples of those public services are trash removal, recreational facilities, police personnel, fire department personnel and equipment, sewer and water infrastructure, and more cleaning personnel for public places. Research has shown the costs – considering stable housing costs and local tax base – of managed development can save about 15 to 25 percent and 7 to 15 percent of the costs of local roads and sewers, respectively (Burchell 2003). Considering that the usual number of police officers is one per 1,000 citizens, four or five more on-duty law enforcement officers would need to be hired over the next five years to compensate the increased downtown population as projected by Zimmerman. Also, with the potential to accommodate 5,520 households in the next five years (Zimmerman 2004), downtown Lexington may need a new fire department in the near future.

The costs incurred with growth tend to be more equally distributed over the population than the benefits of growth. Expenditures for the revitalization of Lexington that do not reap positive returns have negative effects on people even beyond Fayette County (Burchell 2003). Because federal and state funds have been used to rejuvenate downtown Lexington, taxpayers from across the country have financially assisted LFUCG. Most of these taxpayers may never receive any of the benefit. More locally, some residents might experience a loss of property value if their houses are one day found immediately adjacent to new high-rise building (Thibodeau 1990). Finally, as more people move downtown, retail chains are likely to out-compete small family-owned local businesses. Urban redevelopment could have very negative effects on some, while as a whole the society benefits.

Politically, the local government and private developers must cooperate to ensure a prosperous redevelopment environment. As an example, the potential liability, increased risk, and probable reduction in profits of brownfields scares developers from pursuing projects in such areas (De Sousa 2000). Various government programs increase incentives to conduct brownfield redevelopments by reducing liability to developers. Often, brownfield projects require time commitments twice those of a Greenfield project. The supplementary legal services to cover property review, discussion with the government, and communication with the eventual buyer can cost a multiple of a typical project.

At times a private developer may petition for public assistance in finalizing a project. The requests can include, but are not limited to, paving new sidewalks around the site, burying all nearby utility lines, or tax incentives. Clearly, the responsibilities of each side – property rights – need to be determined. Coase argues that so long as property rights are explicitly defined from the beginning, when two parties negotiate they will reach an efficient equilibrium. Private developers and city leaders collaborating on who will pay for various portions of a project that can be classified as public expenditures is a positive sign. Assuming negligible transaction costs, if the property rights of both sides are unambiguously understood from the beginning, an efficient outcome that benefits the entire community can be reached.

Research Design

Property Valuation

The research population included downtown Lexington redevelopment projects completed within the last six years. Such projects have similar construction costs, demand for downtown housing, supply of downtown employment, and governmental administrative

conditions.⁴ Redevelopment represents demolition-rebuild, major restoration, and in-fill development type construction. The Lexington Downtown Development Authority (“DDA”) has defined a boundary for the Lexington downtown area. Only projects completed within the confines of that section of Fayette County are included in the analysis. Previous research, as mentioned above, shows a relationship between property market values, cost of redevelopment, and distance from the center of downtown. Required information for the property value aspect includes the date of redevelopment, cost of redevelopment, pre-development PVA assessment, post-redevelopment PVA assessment, and distance from downtown.

The DDA’s office records residential development activity in the downtown area. All local developers recently completing a downtown redevelopment project received a survey, requesting the parcel location, square feet of development, cost to developer for the redevelopment, and completion date (See Appendix A). All solicited developers responded to the survey. The assessment ratio, as given in equation 1, used the value before construction began and the year after project completion according to PVA records. LFUCG’s Arc View GIS gave the distance in feet from the center of downtown to the project parcel.

Parcels already have a value assessed to them by the PVA office. This research investigates the incremental change in property value because of redevelopment. Therefore, the incremental assessment ratio must be calculated. The incremental assessment ratio regression equation is

$$IAR = \alpha(DCost) + \beta(Dist) + \varepsilon \quad (2)$$

⁴ Data on projects completed before this time window would require adjustments to relate to the current data.

where

IAR = Incremental Assessment Ratio (%) $Dist$ = Distance from downtown (ft.)
 $DCost$ = Redevelopment costs (\$) α, β = Coefficients
 ε = Constant term

Redevelopment costs and distance from downtown have unknown effects on the incremental assessment ratio.

Confidence interval analysis on the incremental assessment ratio further illustrates the relationship between location from downtown, development cost, and PVA property valuation changes. The average redevelopment cost and average distance from downtown constitute the first inputs. To show the confidence interval, $DCost$ increases and decreases one standard deviation while holding $Dist$ constant. $Dist$ then increases and decreases one standard deviation while holding $DCost$ constant at its average.

To apply this model to a specific project in downtown Lexington, the incremental assessment ratio must first be calculated. The incremental assessment ratio, as presented in equation 2, requires $DCost$ and $Dist$ for the project. The product of the incremental assessment ratio and the redevelopment costs gives the expected amount by which the PVA assessment should increase. Multiplying the expected PVA assessment increase by the local tax rate equals the incremental property tax revenue from the redevelopment. Most of the downtown area pays an \$8.37 / \$1,000 in assessed value property tax (Lexington PVA 2004).

Potential data collecting problems exist on two fronts. First, only 14 downtown redevelopment projects have been completed and reassessed over the last six years. Therefore, the population size of this study is small. While over a dozen redevelopments are being constructed as of this writing, those projects cannot contribute towards the study sample, because the PVA has not reassessed their value. Second, a few of the private developers have not been

willing to release their development cost data for use in this study. When developers wish to keep their costs confidential, two remedies exist: (a) commission the opinion of an experienced developer on an estimated cost or (b) impute an estimated cost per square foot from the observed costs for similar developments. All data points in this particular study estimated costs through the use of the second method approximation.

Occupational License Fee

The occupational license fee model design uses the work of previous studies by UKCRES and Zimmerman / Volk Associates, Inc. UKCRES and Zimmerman give constants that can be used as multiplier for the number of residential units, square feet of office space, and square feet of retail space. These multipliers, when assembled together, create one formula that encapsulates the effects of residential units, office space, and retail space developed.

Recall that over 30 percent of the net new downtown residents will be migrating from outside Lexington-Fayette County. Citizens already living and working in Lexington – Fayette County already pay taxes and are assumed here to have no new incremental tax revenue generation by moving to downtown. Each residential unit houses two average income workers. Retail establishments rent 250 square feet per employee while firms typically hire one employee for every 200 square feet of professional office space. Arranging these constants as necessary, the final equation is

$$TRev = New * (2 * HUnits + 0.9 * (SFOS / 200) + SFRS / 250) * AvgI * TRate \quad (3)$$

where

<p><i>TRev</i> = Occupational fee revenue forecast <i>New</i> = New employees to Lexington <i>HUnits</i> = Number of residential units in project</p>	<p><i>AvgI</i> = Average income of Lexington <i>TRate</i> = Occupational license fee rate <i>SFRS</i> = Square feet of retail space in project <i>SFOS</i> = Square feet of office space in project</p>
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This equation may over- or under-estimate occupational license fee revenues. Furthermore, the housing, employment, and income densities of new projects could either be higher or lower than the norm. Equation 3 assumes that residents of housing units are not also the employees of the new office and retail spaces. If the residents of a mixed-use project also worked within the same project, the model would inflate the potential tax revenue generated. The tax revenue produced from a particular redevelopment project could then estimate greater or less than the model above. Finally, the results found from using these multipliers cannot be easily confirmed. Doing so would require knowing the individual incomes of all the tenants and employees of the redeveloped projects. This question would be an area of further research.

Analysis

Property Valuation

The assessment ratio values in the data set comprise the histogram seen in Figure 1 below. Figure 1 shows that a majority of the assessment ratios fall between 55 and 65 percent. Despite some variability, the results show a concentration of assessment ratios slightly higher when compared to Pearson's average of 47.8 percent for Norfolk, Virginia.

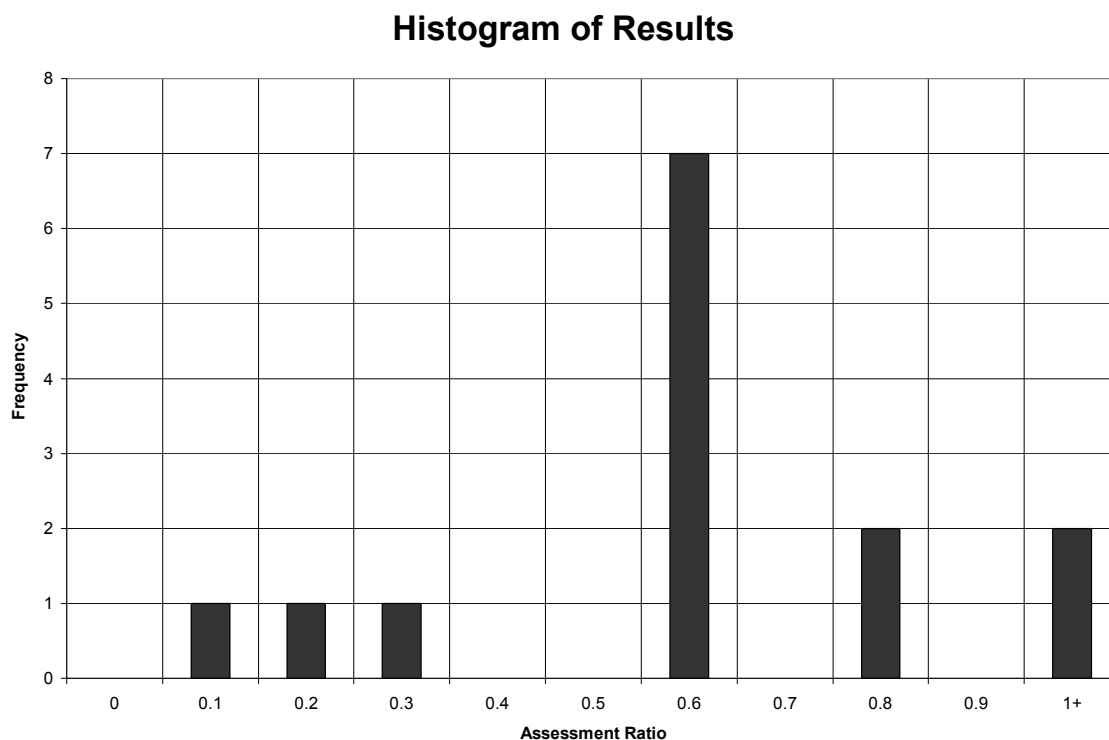


Figure 1: Histogram of Assessment Ratios

The linearly transformed, regressed equation on the data is

$$IAR = 2.06 - 9.5e^{-8}(DCost) - 0.00076(Dist) \quad (4)$$

where

IAR = Incremental Assessment Ratio (%) $Dist$ = Distance from downtown (ft.)
 $DCost$ = Redevelopment costs (\$)

The incremental assessment ratio is inversely related to the redevelopment costs and distance from downtown. When $DCost$ and $Dist$ are zero, or close to zero, the incremental assessment ratio equals 2.06. As $DCost$ and $Dist$ increase, however, the incremental assessment ratio decreases. The incremental assessment ratio decreases 0.095 percent for every \$1,000,000 of redevelopment costs on a particular project. Likewise, IAR decreases 0.38 percent for every 500 feet a redevelopment is located from the center of downtown. Both coefficients and the intercept are statistically significant at the 0.05 level.

Testing the model developed in equation 4 with the original data set shows its accuracy with real world examples and the regressed equations fit with the data that created it. Table 1 lists the results of the model's *IAR* along with the actual assessment ratios.

Actual Incremental Assessment Ratio	Calculated Incremental Assessment Ratio
27.86%	20.02%
56.94%	87.03%
56.94%	82.10%
56.94%	77.92%
56.94%	72.98%
59.79%	63.22%
74.02%	59.04%
75.66%	56.76%
55.03%	53.34%
55.03%	49.82%
97.35%	46.12%
10.00%	63.50%
28.36%	41.08%
174.20%	118.22%

Table 1: Actual Incremental Assessment Ratio Versus Calculated Incremental Assessment Ratio

The effect of redevelopment cost and distance from downtown can be illustrated by entering a series of values for one of the variables while the other remains constant. An example of such can be seen in Figures 2 and 3. Figure 2 depicts the change in assessment ratio when varying distances from downtown with redevelopment costs constant at \$189,000.⁵ Small changes in distance have a substantial effect on the assessment ratio.

⁵ \$189,000 is the median for the *DCost* data set.

Assessment Ratio with Redevelopment Costs Constant at \$189,000

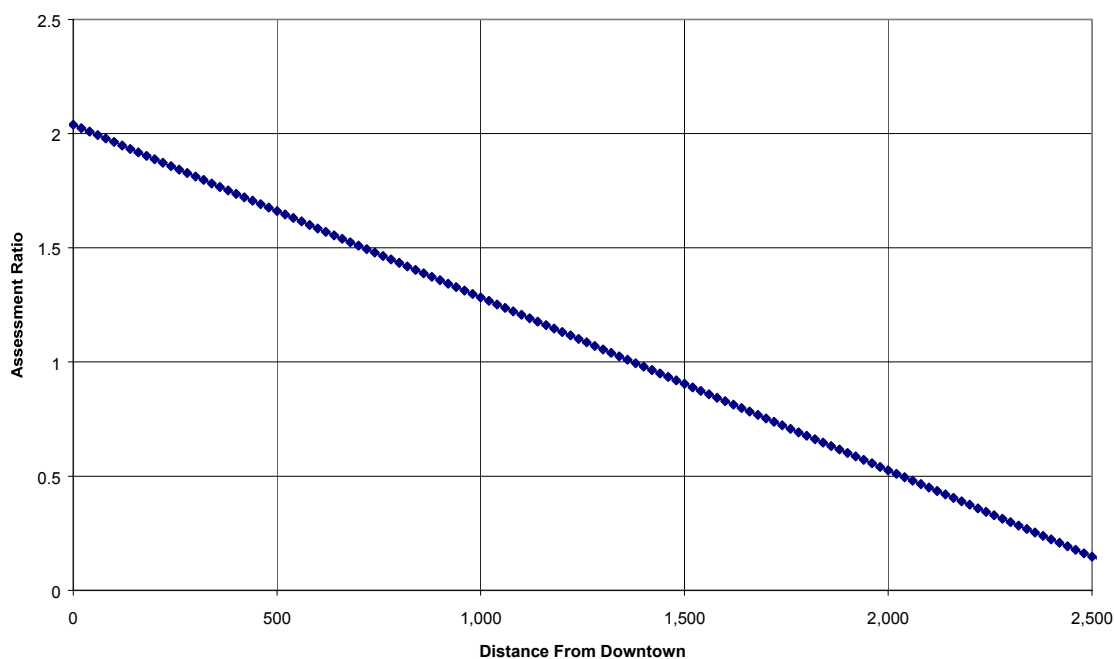


Figure 2: Assessment Ratio with Distance Varying and Redevelopment Costs Held Constant at \$189,000

Figure 3 depicts change in the assessment ratio while holding distance constant at 2,000 feet and varying the cost of development.⁶ Between cost of redevelopment and distance from downtown, distance from downtown is more inelastic. The wider range with which the assessment ratio fluctuates when distance varies verifies this assertion.

⁶ 2,000 feet is the median for the *Dist* data set.

Assessment Ratio With Constant Distance of 2,000 Ft.

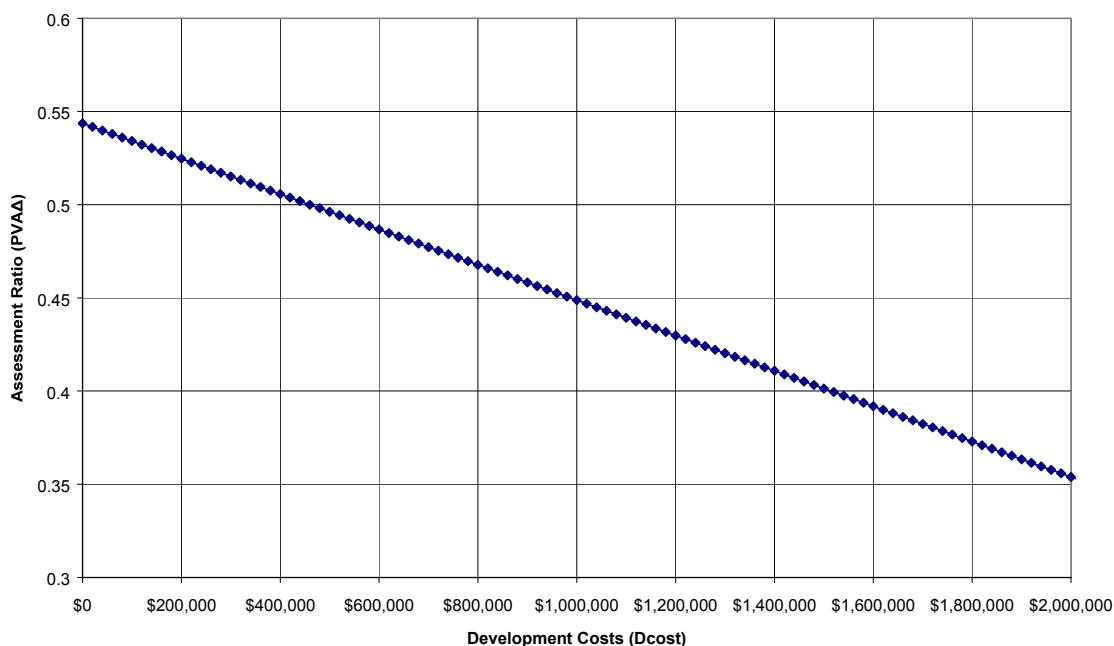


Figure 3: Assessment Ratio with Redevelopment Costs Varying and Distance from Downtown Held Constant at 2,000 Feet

Confidence interval calculations further demonstrate the relationship among the incremental assessment ratio, cost of redevelopment, and distance from downtown. Initially, average and standard deviation of the *DCost* and *Dist* data set are computed. As can be seen in Table 1, *Dist* is held constant at its average of 1,813 feet while *DCost* is varied among its average and one standard deviation above and below its average. The same method follows in Table 2 where *DCost* is held at its average of \$233,884 while *Dist* is varied among its average and one standard deviation above and below its average. Because the standard deviation for redevelopment cost exceeded the average, a negative value is observed when subtracting one standard deviation from the average. Such a value cannot exist, so that redevelopment cost is adjusted to zero, as can be seen in Table 1.

Incremental Assessment Ratio <i>IAR</i>	Redevelopment Costs <i>DCost</i>	Distance From Downtown (feet) <i>Dist</i>
68.21%	\$0	1,813
65.99%	\$233,884	1,813
62.94%	\$554,518	1,813

Table 2: Assessment Ratio Holding Distance From Downtown Constant and Adjusting Redevelopment Costs One Standard Deviation

The results presented in Table 1 show how the assessment ratio changes only modestly when redevelopment costs vary by one standard deviation above and below the average. By contrast, a one standard deviation change in distance from downtown has a much larger affect on the incremental assessment ratio.

Incremental Assessment Ratio <i>IAR</i>	Redevelopment Costs <i>DCost</i>	Distance From Downtown (feet) <i>Dist</i>
90.38%	\$233,884	1,492
65.99%	\$233,884	1,813
41.59%	\$233,884	2,134

Table 3: Assessment Ratio Holding Redevelopment Costs Constant and Adjusting Distance from Downtown One Standard Deviation

Additional analysis provides alternative estimators of *DCost* and *Dist* for *IAR*. Each combination of redevelopment costs and distance from downtown with a concave up, concave down, or linear shape – a total of nine regressions – explores the other potential relationships between independent and dependent variable. Only those equations with coefficients statistically significant to 0.05 are plotted.

Figure 4 contains a scatter plot of the four estimated equations that pass the above requirements. Because the scatter plot of the original data encompasses a wide numerical range, the estimated equations are difficult to interpret. Figure 5 removes the two principle outlying points from the plotted area, giving a clearer illustration of the differences in the estimated

equations. Because of the narrow range of the data no one particular equation fits the scatter plot data markedly better than the other equations.

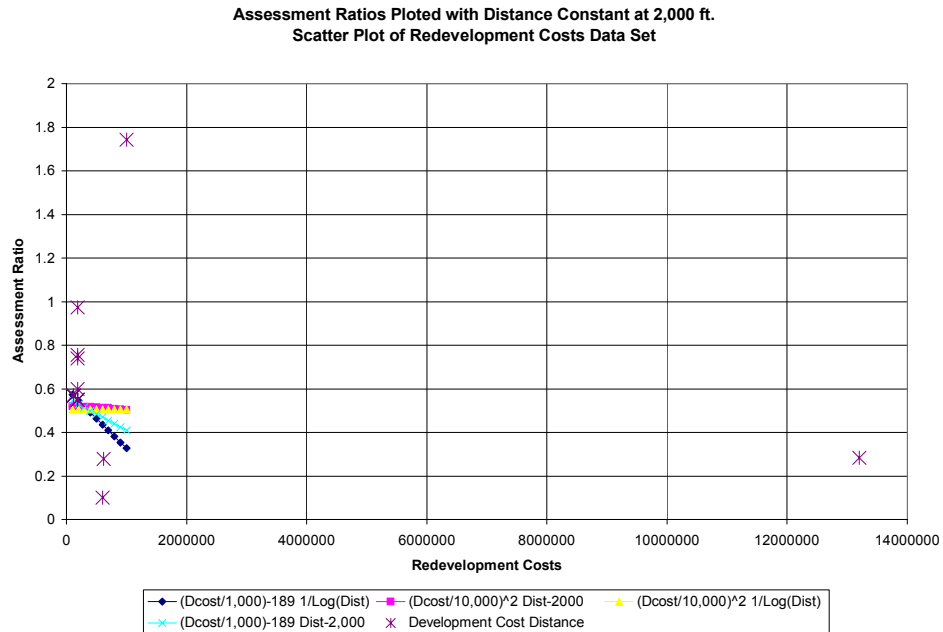


Figure 4: Assessment Ratios with Distance Constant at 2,000 ft. Scatter Plot of Redevelopment Costs Data Set

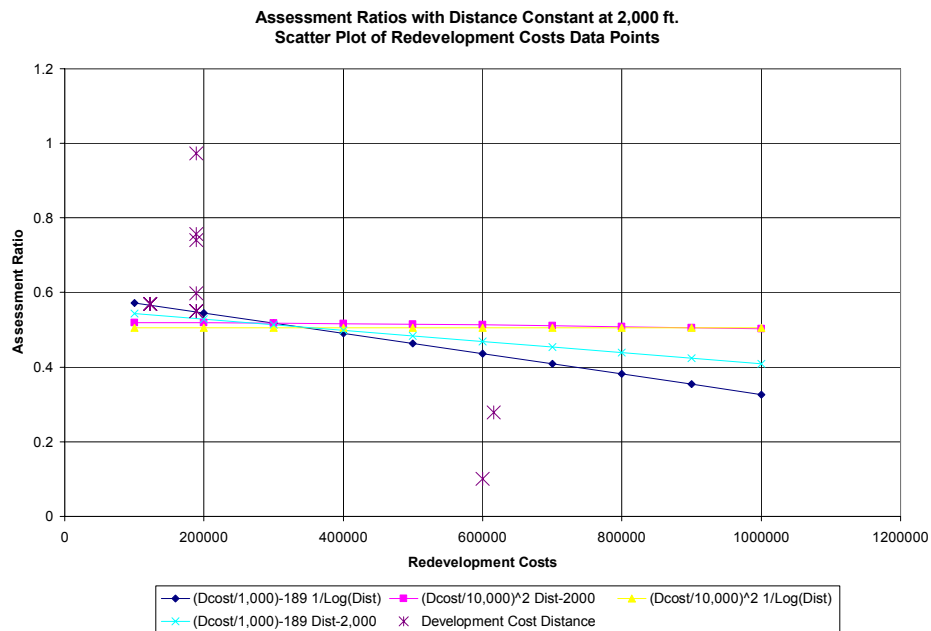


Figure 5: Assessment Ratios with Distance Constant at 2,000 ft. Scatter Plot of Redevelopment Costs Data Points

Figure 6 demonstrates the effects of distance from downtown when redevelopment costs are held constant at \$189,000. In addition to scatter plotting the original distance from downtown data, Figure 6 includes the various estimated equations.

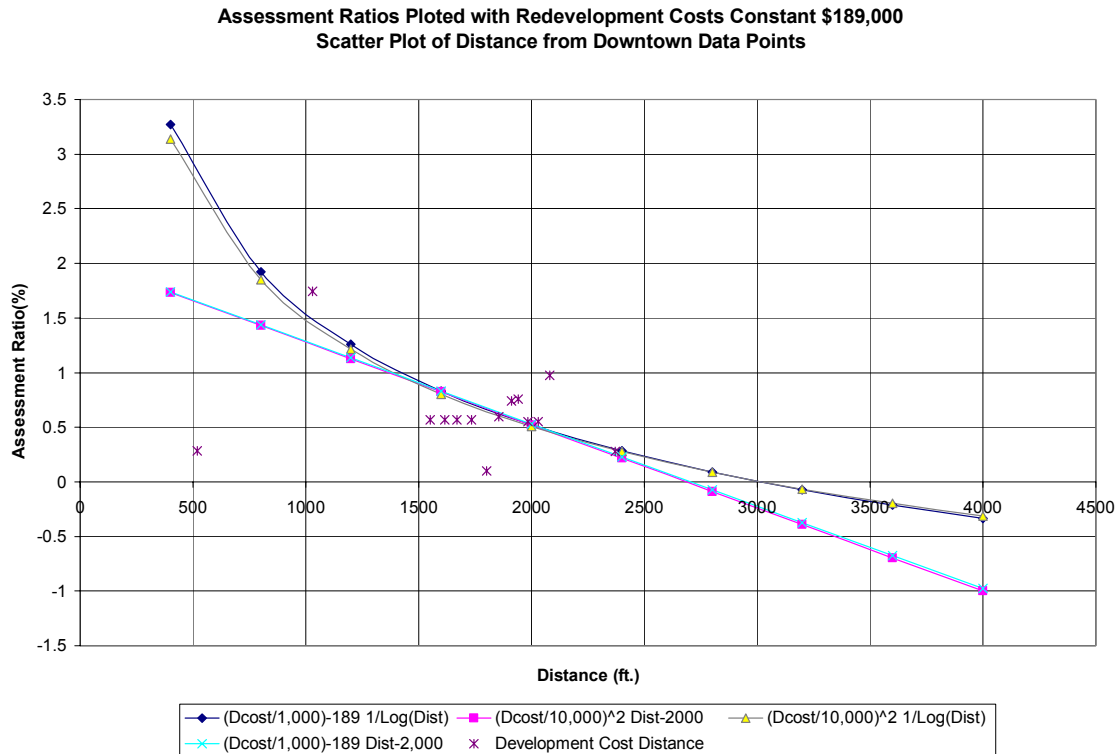


Figure 6: Assessment Ratios Plotted with Redevelopment Costs Constant at \$189,000. Scatter Plot of Distance from Downtown Data Points.

The product of the assessment ratio and the redevelopment costs give the estimated increase in the publicly recorded value of the property. Further multiplying the increase in a property's value by the distract tax rate provides the incremental property tax revenue LFUCG can expect to receive. Equation 5 below describes the calculation.

$$PRev = AR * (DCost / 1,000) * PRate \quad (5)$$

where

PRev = Property Tax Revenue Forecast
AR = Assessment Ratio

DCost = Redevelopment Cost
PRate = Property Tax Rate

Occupational License Fee

From above, equation 3 combines several constants as given by Ambrose.

$$TRev = New * (2 * HUnits + 0.9 * (SFOS / 200) + SFRS / 250) * AvgI * TRate \quad (3)$$

The multipliers calculate the number of employees created in Lexington – Fayette County with each project. The portion of equation 3 in parentheses finds the number of new average income workers created at each project. That number multiplied by the average income and occupational license fee rate gives the increase in occupational license fee tax revenue. The occupational license fee rate for Lexington-Fayette County, *TRate*, is 2.25% of income. The average income for Lexington-Fayette County, *AvgI*, is \$63,664 a year (TransWestern 2003). Recall, Ambrose assumes each residential unit has the equivalent of two workers residing within its walls, so *HUnits* is multiplied by two. The 0.9 multiplied by the SFOS and SFRS terms takes a 90 percent vacancy rate into account for built space not actively used.

Revenue Forecast

The results from the property tax revenue estimates joined with the occupational license fee projections complete the revenue forecasting model. Combining equations 4 and 5 gives the estimated recurring property tax revenue. Equation 3 approximates the recurring occupational license fee revenue. Adding the two recurring revenues presents a forecasted amount of money the LFUCG should expect to receive. The combined equation is

$$TRev = New * (2 * HUnits + 0.9 * (SFOS / 200) + SFRS / 250) * AvgI * TRate \\ + [0.5257 - 0.000095(DCost / 1,000 - 189) - 0.00076(Dist - 2,000)] * DCost / 1,000 * PRate \quad (7)$$

Assuming the incremental cash flow to be perpetual, the present value for the new incremental taxes provides information useful in comparing the results to other cost analysis. These costs include the present value of public sector redevelopment expenditures and social costs.

The first three lines in Table 3 show the fiscal effect redevelopment already has had on LFUCG tax revenues because the data comes from real projects. The bottom three lines present a fictitious redevelopment project showing the expected incremental tax revenue the project should produce. Cost and distance vary to explain the effect redevelopment cost and distance from downtown have on the assessment ratio and ultimately the new incremental tax revenue. The distance point, in particular, is outside the original data set range, so its calculations rely upon extrapolated findings. All six examples include the present value of the incremental revenue at different discount rates.

PV(3%)	PV(5%)	PV(7%)	New Incremental Tax Revenue	Housing Units	Sq Ft Office (ft^2)	Sq Ft Retail (ft^2)	Redevelopment Cost (\$)	Distance (ft)
\$150,408	\$90,245	\$64,461	\$3,461	4	0	0	\$616,000	2,370
\$84,954	\$50,972	\$36,409	\$1,730	2	0	0	\$122,500	1,650
\$276,084	\$165,651	\$118,322	\$7,787	9	0	0	\$111,111	2,000
\$277,700.00	\$166,620.00	\$119,014.29	\$8,331	4.5	0	813	\$812,500	2,000
(\$134,066.67)	(\$80,440.00)	(\$57,457.14)	(\$4,022)	4.5	0	813	\$812,500	4,390
\$358,166.67	\$214,900.00	\$153,500.00	\$10,745	4.5	0	813	\$1,783,438	2,000

Table 4: Example Calculations Using Equation 7 with Real Downtown Redevelopment Projects

Conclusions

The property value portion of the revenue forecasting model depends heavily upon the location of the property, as can be seen in Tables 1, 2, and 3. Locations closer to downtown Lexington have a higher incremental assessment ratio, and thus a higher percentage of

redevelopment costs being converted to PVA recorded property value. The rent gradient theory backs up this assertion.

The small data set gives way for high coefficient error. The data set only included points along a very narrow portion of the potential redevelopment costs and distance from downtown data range, as illustrated in Tables 1, 2, and 3 and Figures 4, 5, and 6. More data may help to provide a greater understanding of the incremental assessment ratio properties. Currently, the narrow range of the data set limits the scope of which property tax revenue analysis can be conducted. Tax revenue results derived from distances beyond 2,250 feet and less than 1,500 require extrapolation and therefore are not as reliable as distances between 1,500 and 2,250 feet. The curve as given in equation 7, while being accurate for values inside the range of the data set, cannot be extrapolated with projects having high redevelopment costs or distances outside of the 1,500 to 2,250 feet range. Future studies may show the assessment ratio “leveling off” as distance approaches zero and 5,000 feet, the edge of the downtown area. The regression equation can be reassessed and the coefficients adjusted as more projects are completed. Furthermore, the University of Kentucky, as a second point of reference, may need to be considered in the distance calculations. As projects move further away from downtown their value may indeed decrease. However, further analysis may prove that projects south of downtown with a closer proximity to the university have a higher value than those further away from the campus.

The data set for redevelopment costs has one point twenty fold and another point ten fold the size of the remaining figures. These two data pieces caused the large standard deviation on the redevelopment cost values. Again, with more completed projects, the standard deviations of the data becomes smaller and the assessment ratio equation more valid.

Further study may also be conducted on the residential and employment multipliers given by Ambrose. Multipliers specific to the current downtown Lexington market ensures more validity for the occupational license fee results. This research has applications beyond simply aiding this study but a wide variety of Lexington real estate questions.

A disciplined approach to reading the research above requires a full consideration of both benefits and costs. Whether a private developer desires public assistance with his project, city councilman wishing to fund one of his programs, or fireman requesting a raise in annual pay, the revenue forecasting element of this research could be misused by only showing great amounts of new tax dollars flowing to LFUCG. Rarely do redevelopment projects not cost the public some tangible expense or social cost. Denser traffic, more police and fire units, increased pollution, impact on local businesses, enhanced water and sewer systems, and many other potential costs have the effect of reducing the fiscal impact from enhanced revenue. Obviously, the redevelopment projects cause some of these social problems, so LFUCG would be wise to use the incremental revenue to offset these new costs.

Revenue forecasting by itself is meaningless unless accompanied by a decision-making tool, such as benefit-cost analysis, to determine whether an allocation of money for a specific project makes sense from the public viewpoint. As said before, revenue forecasting encompasses only one piece in the spectrum of public analysis that must be conducted to fully understand the fiscal and social benefits and costs of a project. For a complete understanding of the benefits and costs of a real estate redevelopment project, a series of studies on different aspects of the local community rolled up into one comprehensive cost-benefit analysis should provide adequate information. If and only if the benefits of redevelopment exceed the costs can funding of other projects be considered. Public decision making requires revenue generated from redevelopment

first offset any and all public and social costs due to redevelopment. Other public programs and projects should receive the incremental tax revenue from downtown redevelopment only if a surplus of funds remains after covering the public and social costs. This protocol requires financial and political discipline but helps ensure a fiscally solvent future.

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Appendix A – Developer Survey

Downtown Lexington developers were sent the following survey.

Name	Parcel Street Name and Number	Sq Ft of Redevelopment	Cost of Redevelopment	Phone #	# of Housing Units	# of Jobs Created	Date of Redevelopment
	101 Main Street	0/000	\$ 0/000		2	0	Jan-04
	102 Main Street	10,000	\$1,000,000		3	4	Jul-03