

## **Economic growth and public debt: The case of Union County, North Carolina**

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### **ABSTRACT**

Local governments routinely struggle with how to provide citizens quality services while keeping tax rates manageable. This challenge is intensified in areas where population is growing most quickly and where neighboring localities are competing to attract newcomers. The need for added investment in infrastructure (schools, roads, water and sewer, etc.) forces municipalities to either take on large amounts of debt, significantly increase tax revenue, or both. Taking on debt saddles future generations with the burden of repayment. Increasing tax revenue can be accomplished by either attracting more industry to increase the tax base or by increasing tax rates, but either of these approaches tends to threaten the quality of life differentials that likely drove rapid growth. This creates an important and interesting dilemma. While the data and analyses presented in this paper are particular to Union County (and a set of other comparable, fast-growing counties in North Carolina), this case study can provide a valuable blueprint for better understanding how these issues may affect communities in general.

Keywords: Economic growth, public debt, quality of life, local government.

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## **INTRODUCTION**

Union County is located in the southern part of North Carolina, southeast of the city of Charlotte and Mecklenburg County. The eastern part of Union County is primarily rural and agricultural while the western part of the county is largely residential. The close proximity to Charlotte has resulted in high growth in the western section of the county. Union County's population grew by 64% from 1999 to 2009, far above the 19% growth rate for the state. The growth is a result of Charlotte commuters moving to Union County following the county's reputation for having a high quality-of-life environment, namely high quality public schools and low taxes. Growing pains have accompanied the success in the form of increased educational needs and increased government services and spending.

For Union County, residential property taxes are a major source of revenue. Keeping tax rates low has been attractive to the citizens, but the tradeoff has been additional borrowing. In the long run this can cause added stress on the county budget. Union County is not alone in facing this dilemma. The dichotomous goals of providing high quality services and low taxes are a tradeoff many counties face. This study addresses these issues faced by Union and other similar counties: Alamance, Cabarrus, Chatham, Durham, Gaston, Harnett, Iredell, Johnston and Lincoln.

The paper proceeds with a brief review of the literature on county tax structure and the role of taxes rates for population mobility. What follows is an analysis of the quality of life factors that compose a healthy county and the tax revenue required to achieve the level of service that citizens desire. The paper addresses what quality-of-life factors attract both residential and commercial entities to a county, and how these factors contribute to economic growth while at the same time strain the ability of local government to pay for these services. By focusing the research on Union County North Carolina, the paper analyzes specific revenue demands and forecasts both future debt obligations and future revenue needs. Finally, forecasts for potential industrial growth are developed by targeting areas where commercial expansion can provide needed revenues to maintain the service quality that residents desire. The paper concludes with a summary of county decisions.

## **LITERATURE REVIEW**

This case study of Union County's tax and debt structure highlights several fiscal issues. As background, the county's population growth was driven by growth in the city of Charlotte's job market. Mobile residents compared county services and taxes. Many were attracted by Union County's high-quality public schools and low property tax rates; they decided that the amenities and lower property taxes offset commuting costs.

Quality of life has been examined by many authors throughout the years. Quality can be measured by quantitative or qualitative factors. The Economist Intelligence Unit uses quality of life factors such as material wellbeing, health, political stability, family life and community life to compare quality of life across countries. Rapley (2003) reviews multiple quantitative and qualitative methods for measuring quality of life on a national scale. The review compares methodologies developed by multiple authors on constructing quality of life indices. When analyzing quality of life on a local scale, Nzaku and Bukenya (2005) find that factors such as schools, amenities and climate are important to a population.

In Union County, population growth spurred construction of more schools. Union County officials were tasked with deciding whether to finance construction through current taxes or debt. Variables in the choice of debt vs. taxes included current tax rates in neighboring counties. As Buettner (2001) predicts, Mecklenburg County has higher rates than surrounding counties.

Skidmore, Reese and Kang (2012) review different perspectives on property tax rates. In the benefit view, taxes are essentially a user fee for public services. Mobile residents look for the best tax rate/public service package. An increase in tax rates is not distortionary as long as residents perceive an increase in their service level. However, in the classical view, property taxes are capitalized into property values. An increase in tax rates will reduce property values, and will lead capital to migrate from high tax to low tax areas. Union County officials feared that a relative increase in tax rates would stymie future growth, so chose current debt (and future taxes). Officials continued public spending as a means to attract private development and improve the safety and amenities of the community.

One question is whether Union County has taken on such a large quantity of debt that it is no longer affordable. According to Hildreth and Miller (2002), debt affordability is determined by several variables, including economic diversification of the local government's tax base. Unfortunately for Union County, its property tax base is 85% residential. Local officials often work to diversify the tax base (Gill and Haurin, 2001), but Union has been unable to do so.

In a twist, this lack of diversification may have benefited Union County. When the housing market collapsed in the Great Recession, other aspects of the economy declined in response. The housing market impacts government tax revenue through five primary channels: the property tax, the real estate transfer tax, the sales tax revenues via sales of materials used in construction and renovation, the sales tax revenues via general wealth, and personal income tax revenues as affected by construction and real estate employment. Property tax revenue has been a relatively stable stream as changes in assessed value lag changes in market value, and as government officials raise tax rates to offset a decline in value. While property tax revenues have declined, the drop has been much milder than for sales and income taxes [Alm, Buschman and Sjoquist (2011) and Lutz, Molloy and Shan (2011)].

## **QUALITY-OF-LIFE FACTORS AND REGRESSION**

This study identified thirteen general quality-of-life factors as relevant in attracting both residential and commercial growth (see Table 1). These were designed to measure aspects that lead to higher quality of life, such as education, community life, health, and financial and economic well-being. The goal was to generate the relative position of the counties in each quality area. Overall, this presents a straightforward, yet comprehensive, overview of the counties' quality of life, focusing on factors which a county government may influence. Data was collected on each factor and counties were ranked from 1 (best) to 10 (worst). Ties were handled by taking average ranks (for example if there was a tie between the 4<sup>th</sup> and 5<sup>th</sup> ranked counties both were assigned a relative rank of 4.5).<sup>1</sup>

The factors were combined into a composite quality index for each county using a weighted average technique. The assigned weights were influenced by research in the allocation

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<sup>1</sup> Individual factor data available from authors.

of tax dollars and through general consensus of the research team and members of the local business community (see Table 1). Table 2 displays the individual factor ratings for each county and these overall weighted average Quality Indices.

A set of potential variables was identified from which a predictive model could be developed for any fast growing county's Quality Index. A total of 24 feasible variables were assessed, first individually and then collectively using an additive stepwise regression approach. Variables associated with counties' collection of taxes that were identified for possible inclusion in a linear regression model were Percent of Residential Property Tax, Per Capita Net Enterprise Funds, Per Capita Property Tax, Per Capita Sales Tax, Per Capita Sales and Service Funds, Per Capita Intergovernmental Funds, Per Capita Debt Proceeds, Per Capita Other Funds, Ratio of Residential to Commercial Tax, and Average Tax Revenue Collected Per Private Industry Establishment. Potential variables associated with the counties' expenditure of tax revenues included Per Capita Education, Per Capita Debt Service, Per Capita Human Services, Per Capita Government, Per Capita Public Safety, Per Capita Other, 5-Year Average Percent Change in Education Expenditures, 5-Year Average Percent Change in Debt Expenditures, 5-Year Average Percent Change in Human Services Expenditures, 5-Year Average Percent Change in Government Expenditures, 5-Year Average Percent Change in Public Safety Expenditures and 5-Year Average Percent Change in Total Expenditures. Two other potential variables were considered: Number of Interstates and Number of Private Industry Establishments. Regression results are presented in Table 3.

The recommended model follows:

$$\text{Quality Index} = 8.331 - 0.0053 (\text{Per Capita Education}) - 10.807(\text{Avg. \% Change in Govt. Expenditures}) + 0.0012 (\text{Per Capita Intergovernmental Funds})$$

To evaluate a fast growing North Carolina county, plug into the model that county's Per Capita Education Expenditures, 5-Year Average Percent Change in Government Expenditures and Intergovernmental Funds (federal and state dollars, much of which support programs for low income residents) to calculate an estimated Quality Index value for that county. The model estimates, with 68% confidence, that the county's actual Quality Index would fall within  $\pm 0.792$  of the predicted value. Furthermore, knowing any of the other potential variables for that county would not significantly improve the Quality Index estimate.

The coefficients in this model provide interpretive insight. The  $-0.0053$  coefficient of Per Capita Education Expenditures means that for every additional dollar per capita that a county allocates for Education the Quality Index decreases (and thus improves) by 0.0053. \$100 additional investment per capita in Education Per Capita would improve a county's Quality Index by a little more than half a point. The overall rank for Union County would be even better had the county not committed to a pattern of decreasing its average allocation of Government Expenditures. Since Intergovernmental funds are used to support many programs for low income families, increases in Intergovernmental funding may indicate a decrease in the overall wealth of the county, which results in a worse Quality Index. Union County has one of the lowest levels of Per Capita Intergovernmental Funding among the comparison counties.

## RESIDENTIAL TAX BASE & BREAKEVEN PROPERTY VALUE

In the previous analysis, spending is necessary to maintain quality. Property taxes, collected on both residential and commercial property, are an important source of revenue for counties. The counties studied derive 70% to nearly 90% of their real estate property tax revenue from private residences, with the exception of Durham County (62%). Ten year data indicate that Union County's residential base grew from 79% of the total to 85% from 1999 to 2009. The 2009 value of residential property in Union County was \$19.7 billion, up from \$4.5 billion in 1999.

Increasing the number of residential homes creates additional spending for education and other government services. Higher home values increase property tax receipts and low priced new homes can be an added burden to local budgets. The break-even value for residential property in Union County was estimated to be about \$251,000. The process follows Dorfman, whose 2004 study estimated the break even value for residential property at \$208,000. Union County fiscal data for the year ended June 30, 2009 was used. Three land-use categories were defined: residential, commercial and agricultural. The revenues and expenditures were allocated to the land use categories in a similar manner to Dorfman. For example, funds for culture/recreation and for the public schools were described as 100% residential. Debt service was included as expenditure. Federal and state funds received for education, public safety, human services, etc. were subtracted from the county expense data; the remaining expenses are those funded by county tax revenue (see Table 4).

The amount of county spending for residential purposes was totaled; approximately 92.6% of Union County spending goes toward residential property owners, in large part through public school spending. 2008/09 enrollment in Union County Public Schools was 38,554 students, 85 percent higher than in 1998/99. Large increases in enrollment brought higher expenses not only for operations but for construction.

Once residential-based spending was totaled, tax revenues received from residential sources other than real estate were subtracted. The remaining residential-purposed expenditure was estimated and divided by the number of properties. To cover expenses generated, it is estimated residential property would need a tax value of around \$251,000 at the current property tax rate of 0.665 per \$100. For comparison, the average residential property in Union County is valued at approximately \$212,000. Results are shown in Table 4.

The Union County average home value is below breakeven value, and the gap is magnified by the fact that residential property comprises 85% of the property tax base. This is problematic for the county when it comes to generating sufficient revenues. When counties are unwilling to collect enough tax revenue to cover expenditures, borrowing the difference becomes necessary.

## DEBT

An analysis of the debt accumulated by Union County and comparison counties over the past six years is presented in Table 5. Of the counties studied, Union had the highest level of general obligation debt at \$472 million (Panel A). Johnston County has the second highest amount with \$341 million in general obligation debt. Union County debt grew at a 5 five-year compounded rate of 26%. The only other county with higher debt growth was Iredell County, but its overall debt outstanding was only \$54 million. Looking at general obligation debt per capita (Panel B), Union County had the highest amount \$2,472, with Johnston County second at

\$2,093. The 5 year growth in general obligation debt per capita for Union County was 19%. Iredell again had higher growth at 26%, but the amount per capita was only \$351.

Debt service cost is shown in Table 6. Union County had the highest debt service cost of all the comparison counties (Panel A). The cost was \$58 million, with a five year growth rate of 19%. Debt service per capita for Union County was the highest of all the counties at \$303 (Panel B). The growth rate was 13%.

A further analysis of debt service cost is shown in Tables 7 and 8. Table 7 displays county expenditures by function. Debt service has grown from 12% of total expenditures to 17% of total expenditures over the study period. It is the second largest expenditure after education funding. Table 8 shows Union County revenue by source. Revenues are totaled both including and excluding debt proceeds. When using total revenues, debt service cost represents 17% of the revenues. When revenues are totaled excluding debt proceeds, debt service grows to 22% of total revenue.

Table 9 shows property tax rates for the counties in this study. The tax rate for Union County is in the mid-range for the counties in the study. Union County had the highest compound growth over the study period at 4.64%; however, the tax rates did decline from 2008 to 2009 from .7111 to .6650. An overall reduction in tax rates was also evident in other counties in the study. Considering the current tax rate of .6650 per \$100 of property value, it is unlikely that Union County will be able to continue raising tax rates at the same rate as in the past.

## **REVENUE AND EXPENDITURE FORECASTING**

Union County has steadily increased property tax rates; however, the accumulation of debt indicates that revenues have not kept up with expenditures. Figure 1 displays Union County revenues, excluding debt proceeds, from 2004-2009. Debt proceeds are not a recurring source of revenue, so this study is forecasting revenues excluding any borrowed funds. A trend line is fit through the historical data and can be used for forecasting future revenue, assuming revenue grows at the same rate in the future. Moderate variation from the trend line should be anticipated when using it for forecasting.

The trend line formula is:  $Y = 25,894,150X + 123,298,470$  with  $R^2 = .95$ . Setting  $X = 11$  years gives a revenue forecast for 2014 equal to \$408,134,120. Assuming that 50% of revenues are raised from property taxes (based off current proportions), the needed revenue from property tax is \$204,067,060. (Note: This assumes Union County can raise the remaining 50% from other sources of recurring revenue.)

Table 10 shows tax forecasts under different sets of assumptions that generate the needed level of forecasted property tax revenue (\$204,067,060). The analysis looks at scenarios where property tax is raised from both residential and commercial property in different proportions from 90% residential down to 60% residential. The current proportion is 85% residential.

The number of households in Union County is forecasted at 75,000, 85,000 and 95,000. The current number of households is 78,826, according to Union County tax scrolls. Mean home values are estimated from a low of \$180,000 to a high of \$240,000. The actual mean home value is \$212,132 according to the Union County tax scrolls and the median home value is \$179,351, according to the Economic Development Information System (EDIS).

The minimum home value in the forecast (\$180,000) is close to the current median home price and reflects a worst case scenario where revaluation reduces mean home values. The maximum home value (\$240,000) is chosen to be above the estimated breakeven mean home

value. In addition, the mean home value for this analysis represents tax value, which may differ from market value.

Under most scenarios where the tax base remains 80-90% residential, the tax rate is higher than projected using linear tax forecasting (.8850 per \$100 of value). As the proportion of property tax raised is shifted from residential to commercial, the property tax rate can grow at a much lower rate than if the county continues to maintain an 80-90% residential base. It is also important to note that increasing the number (and/or value) of households helps moderate the tax rate; however, adding 20,000 homes may end up increasing educational and other government service expenditures more than is suggested by the linear model.

Figure 1 also displays Union County expenditures from 2004-2009. A trend line is fit through the historical data and can be used for forecasting future expenditures, assuming expenditures grow at the same rate in the future. The trend line formula is:  $Y = 35,724,363X + 173,819,982$  with  $R^2 = .74$ . Setting  $X = 11$  gives an expenditure forecast for 2014 equal to \$566,787,975. Expenditures do not grow as smoothly as revenue; therefore, the trend line fit is not as accurate for expenditures as for revenues. Education expense is the biggest cause of sudden changes in expenditures. Since education spending is volatile, it may cause the actual expenditures to be higher or lower than forecast.

If Union County is trying to achieve a balanced budget, revenue raised needs to be equal to expenditures. Assuming that 50% of revenues are raised from property taxes (based off historical data), the needed revenue from property tax is \$283,393,988.

Table 10 also shows the tax level necessary to raise enough revenue to cover half of the total forecasted expenditures in 2014 (\$283,393,988). Under the current proportion of 80-90% residential and moderate growth in home value, taxes would need to double or triple from the current rate of .6650 per \$100 of home value by 2014. These estimates are well above the linear forecast of .8850. The mean home value would need to increase above \$240,000 to keep taxes within the linear forecast. Even diversifying the tax base to include more commercial property (60-70% residential) does not keep taxes within the linear forecast, except at mean home values above \$210,000.

## **INDUSTRIAL IMPACT ANALYSIS**

The preceding analysis established factors that contribute to a high quality county, and the financial impact of borrowing to achieve and maintain the quality. Countywide economic development is an essential component of the overall health of any region. The analysis that follows demonstrates what Union County could expect from industrial expansion of existing industries or attracting new industries to the county. Additionally, with industrial expansion comes an increase in the tax base for the county both in direct business taxation, and in indirect taxation through an increase in the labor force and an increase in the spillover business expansion.

The modeling of industrial change for Union County presented here, utilizes a basic input-output (IO) analysis (IMPLAN is the modeling software). This model is used to estimate economic change based on the premise that production in a county is comprised of inextricably linked firms that interact with each other (Shaffer, et al., 2004), and these firms all draw on labor resources that are often within the county. The data presented here models the impact of an exogenous shock to employment (and the subsequent output expansion) when several key industries in Union County undergo an increase in their workforce. This industrial expansion provides business leaders and policymakers with a clearer understanding of the economic impact

to the county when key industries change by the entrance of new firms or growth within existing firms.

Six existing industries are targeted in this IO analysis for expansion within Union County. These six industrial segments represent areas of potential growth for the county both in the expansion of existing firms and in locating new firms to the area. The six industries consist of four in the manufacturing sector (Advanced Metals, Aerospace, Medical Products, and Building Products), and two in the retail and business services sectors (Retail E-Commerce and Data Center/Support Services). Each of these industries provide an opportunity for economic growth within the county due to existing firms in each segment, which means, in part, the presence of a trained workforce to support expansion.

Panel A of Table 11 displays the summary results of the IO analysis for each of the six industries; the dollar impact results from expansion by 100 workers in each industry. The total output values are presented along with the total impact on employment and labor income. The table is ranked by industry in order of largest to smallest total economic impact. For example, growing the Advanced Metals industry by 100 workers yields a total effect on the county of approximately \$139 million in increased output and a total of 267 jobs. With those new jobs total labor income would increase by \$17.7 million.

The table further breaks down the economic impact of the six industry model into the three separate effects that comprise the economic impact: direct, indirect, and induced. Again, this labor force growth could occur by the expanding existing firms or by attracting new firms to the county. When adding the indirect and induced effects on employment, the 100 worker increase in Advanced Metals sector generates an additional 167 jobs within the county (for a total employment gain of 267 workers). In addition to the growth in employment and output, Table 11 also displays the labor income that is expected from the increase in the workforce from each economic effect. These effects are displayed for each of the six industries targeted.

Certain industries contribute a much larger economic impact within the county than other industries. In particular, the effect of increased manufacturing activity provides a much larger economic contribution than growth in the retail and business services industries. Yet, these effects only represent the contribution to economic output and employment within the county, which may not be the only variables to consider when targeting industries for expansion.

Panel B of Table 11 displays the tax implications for the expansion represented above. The tax data estimate the total state and local tax impact when each of the same six industries mentioned above expand by 100 workers. These figures include the tax proceeds expected when accounting for all the direct, indirect, and induced effects. The first column represents indirect business taxes which consist of taxes on sales, property, and production, but it excludes employer contributions for social insurance and taxes on income. The household tax data represents the income and property tax data for all the jobs created in each industrial segment. This data only includes the tax revenue represented by those workers who live in the county. Finally, the corporation tax data represents state and local taxes on corporate profits.

Commercial investment within the county creates economic opportunities beyond the specific industry or market segment, and not all industrial growth causes the same economic effects.



## CONCLUSIONS

Union County has strong quality-of-life characteristics, including good schools and low crime. Quality, however, came at a great cost. Expenditures, specifically for education and general government, were a driving determinant of quality.

Paying for quality has been problematic for the county. Residential properties comprise 85% of the property tax base and the average home value is well below the breakeven value necessary to pay for services. Union County relied on borrowed money to pay for quality-of-life expenses during the boom years.

The Great Recession abruptly curtailed population growth, new home construction and school construction. The county reduced education spending from a high of \$217 million in 2007 to \$91 million in 2011 (see Table 12). Education spending has been reduced from 55.8% of total expenditures in 2007 to 32.5% in 2011. The education spending cut was coupled with a reduction in borrowing, as seen in Panel C. Debt proceeds declined from \$224 million in 2008 to \$0 in 2011, reducing county revenue from \$486 million to \$265 million in 2011.

While county officials have reduced new borrowing, debt service is still increasing (\$64 million) and is the second largest county expenditure after education spending. Debt service is also increasing as a percent of revenue. Currently 24% of revenue goes toward debt service.

Property tax revenue increased to \$155 million; however, the scheduled 2012 property revaluation was cancelled and moved to 2015. Also, the county commissioners voted in June 2012 to reduce the property tax rate in FY 2012-13 to \$.6600 per \$100 from previous \$.6650, with an additional \$.005 reduction in FY 2013-14. The tax cut was adopted due to \$54 million the county received from the sale of the local hospital to a private healthcare system (UC Board of Commissioner Minutes 2012). Further, Union County announced in January 2013 that \$21 million of the money received from the sale of the hospital would be used to cancel interest rate swap contracts the county had entered into prior to the financial crisis of 2008 (Bell 2013).

Overall, property taxes provide over 50% of county revenue. The percentage of residential to commercial property has remained unchanged at 85%. If property values are not adjusting until 2015 and the property tax rate is lower, the future revenues of the county will struggle to grow. Any revival of new home construction will put pressure on the budget unless the new homes are above the breakeven value. Union County had the opportunity to increase revenue with the 2012 revaluation by maintaining existing property tax rates. The decisions to delay the revaluation and reduce tax rates could hurt the future financial strength of the county. Encouraging new commercial and industrial development could help grow revenues. Cutting spending, primarily education spending, helps the short term budget, but could impact the overall quality of the county. Union County will continue to face budgetary issues into the future and it could constrain the growth of the county for many years.

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Table 1: Quality Factors and Weight in Index

Factor	Measure	Weight
Public Schools	Performance Score, Graduation Rate and Average SAT	0.30
Debt	Average Debt Service Per Capita, Average General Obligation Debt Per Capita, and Moody's Debt Rating	0.20
Public Safety	Crime Index	0.15
Unemployment	Unemployment Rate	0.05
Property Tax	Property Tax Rate	0.05
Visitor Spending	Annual Visitor Spending in County	0.05
Wastewater Capacity	Water/sewer Expansion Moratorium	0.05
Income Per Household	Mean Income Per Household	0.03
Hospital	Optimal Care Score, Outcomes and Consumer Assessment	0.03
Libraries and Parks	Number of Libraries and Park Acreage	0.03
Jobs Per Household	Jobs Per Household	0.02
Hourly Salary	Weighted Average Hourly Wage	0.02
Transportation	Number of Interstates and Number of Controlled-access Highways	0.02

Table 2: Quality Index and Ranking by Factor

County	Quality Index	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13
Alamance	5.385	7	1	8	7	3	6	3.5	9	9	3	4	6.5	3.5
Cabarrus	4.650	4.5	7	3	6	4	2	3.5	5	1.5	7	2	4	7.5
Chatham	3.760	4.5	2	1	1	5	10	8.5	1	7	1.5	5	6.5	6
Durham	6.065	8	5	10	2	7	1	3.5	2	4	8	1	1	1.5
Gaston	6.990	9.5	3.5	9	8.5	10	3	8.5	6	1.5	1.5	6	5	5
Harnett	7.840	9.5	6	7	5	8	8	8.5	10	10	4.5	9	10	7.5
Iredell	3.580	1.5	3.5	5	8.5	1	4	3.5	7	6	9	3	2	3.5
Johnston	5.235	3	8.5	4	3	9	5	3.5	4	8	10	8	8	1.5
Lincoln	7.055	6	10	6	10	2	9	3.5	8	5	6	10	9	9
Union	4.440	1.5	8.5	2	4	6	7	8.5	3	3	4.5	7	3	10

Table 3: Stepwise Regression Estimates to Predict County Quality Index

	(1)	(2)	(3)
Intercept	7.9000	8.4939	8.3313
	(0.0000)	(0.0000)	(0.0000)
Education	-0.0043	-0.0050	-0.0053
	(0.0283)	(0.0083)	(0.0040)
% change in General Government Expenditures		-8.9402	-10.8072
		(0.0693)	(0.0259)
Intergovernmental Receipts			0.0012
			(0.1027)
Adjusted R square	0.4055	0.5898	0.7040
Standard Error	1.1225	0.9325	0.7920
Significance F	0.0283	0.0183	0.0155
Observations	10	10	10
<i>Note: p values are in parentheses.</i>			

Table 4: Breakeven Analysis Data

Net spending, adjusted for intergovernmental revenues	\$186,471,643
Estimated expenditures for residential uses (~92.6%)	\$172,665,902
Estimated spending per residence funded by real estate taxes	\$1,666
Estimated break-even value at property tax rate of 0.665	\$ 250,579
Total value of taxable residential properties	\$16,721,517,689
Number of residential properties	78,826
Average tax value of residential properties	\$212,132
Number of public school children	38,554
Average number of public school children per residence	0.49

Table 5: Panel A- Total General Obligation Debt (in millions)

	Growth Rate	2009	2008	2007	2006	2005	2004
Union	26%	472.425	433.050	314.592	258.819	259.469	148.367
Alamance	10%	69.110	73.410	77.745	59.390	40.460	43.545
Cabarrus	18%	119.835	126.895	133.980	91.845	97.805	52.495
Chatham	-11%	11.585	13.375	15.200	17.065	18.945	20.850
Durham	2%	259.646	275.570	247.445	265.660	221.945	239.020
Gaston	8%	152.195	161.875	145.910	96.075	98.305	104.100
Harnett	N/A	0.000	0.000	0.000	0.000	0.000	0.000
Iredell	29%	54.110	57.310	54.960	57.910	13.780	14.980
Johnston	13%	340.645	273.695	232.485	204.890	177.845	185.550
Lincoln	10%	95.660	82.410	88.755	95.165	72.210	59.785

Panel B - General Obligation Debt Per Capita

	Growth Rate	2009	2008	2007	2006	2005	2004
Union	19%	2,472	2,375	1,828	1,604	1,709	1,025
Alamance	8%	473	513	556	429	295	319
Cabarrus	14%	703	772	852	611	667	366
Chatham	-13%	190	226	263	304	344	388
Durham	0%	997	1,082	1,003	1,097	929	1,012
Gaston	6%	743	805	740	496	512	544
Harnett	N/A	0	0	0	0	0	0
Iredell	26%	351	381	378	414	101	112
Johnston	9%	2,093	1,740	1,534	1,400	1,258	1,361
Lincoln	8%	1,283	1,132	1,245	1,369	1,061	887

Table 6: Panel A – Debt Service (in millions)

	Growth Rate	2009	2008	2007	2006	2005	2004
Union	19%	57.965	50.100	35.778	31.043	24.802	23.914
Alamance	11%	9.770	9.636	9.344	7.830	6.281	5.926
Cabarrus	12%	35.440	30.822	24.603	24.910	21.696	19.829
Chatham	8%	5.795	4.265	3.493	2.820	3.088	4.032
Durham	8%	44.973	41.891	42.732	39.109	37.499	30.608
Gaston	7%	22.237	23.294	19.005	17.642	15.927	15.651
Harnett	-100%	0.000	17.383	13.717	12.016	11.594	17.622
Iredell	36%	44.742	19.465	15.591	11.523	11.718	9.630
Johnston	10%	36.660	33.885	31.112	29.246	26.025	23.074
Lincoln	7%	15.559	15.594	14.741	12.712	10.935	10.935

Panel B – Debt Service Per Capita

	Growth Rate	2009	2008	2007	2006	2005	2004
Union	13%	303	275	208	192	163	165
Alamance	9%	67	67	67	57	46	43
Cabarrus	9%	208	187	157	166	148	138
Chatham	5%	95	72	61	50	56	75
Durham	6%	173	164	173	161	157	130
Gaston	6%	108	116	96	91	83	82
Harnett	-100%	0	163	132	118	116	180
Iredell	32%	290	129	107	82	86	72
Johnston	6%	225	215	205	200	184	169
Lincoln	5%	209	214	207	183	161	162

Table 7: Union County Expenditures (in millions)

	2009	2008	2007	2006	2005	2004
Education	161.343	189.942	216.904	104.628	103.637	70.070
	46.8%	52.1%	55.8%	39.7%	44.1%	35.5%
Debt Service	57.965	50.100	35.778	31.043	24.802	23.914
	16.8%	13.7%	9.2%	11.8%	10.6%	12.1%
Human Services	36.958	38.591	37.129	33.403	31.016	28.587
	10.7%	10.6%	9.6%	12.7%	13.2%	14.5%
General Government	14.119	15.081	15.499	13.681	17.543	19.334
	4.1%	4.1%	4.0%	5.2%	7.5%	9.8%
Public Safety	37.597	34.869	32.350	28.830	26.784	23.667
	10.9%	9.6%	8.3%	10.9%	11.4%	12.0%
Other	36.709	35.826	50.744	51.846	31.059	31.786
	10.6%	9.8%	13.1%	19.7%	13.2%	16.1%
Total	344.691	364.410	388.403	263.431	234.840	197.357
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 8: Panel A – Revenues by Source (in millions)

	2009	2008	2007	2006	2005	2004
Property Taxes	148.422	123.953	102.203	82.560	71.292	57.671
Other Taxes	5.913	6.553	7.507	6.232	5.446	4.331
Sales Tax	31.273	37.305	36.863	28.532	24.851	21.822
Sales & Services	37.658	46.009	51.187	47.626	36.230	30.796
Intergovernmental	28.795	26.880	24.649	19.905	18.107	16.934
Debt Proceeds	78.765	224.215	94.423	0.000	0.000	0.306
Other Miscellaneous	10.102	21.067	20.602	17.380	14.758	12.156
Total Revenue	340.929	485.983	337.432	202.234	170.684	144.016
Total Revenue Less Debt Proceeds	262.164	261.768	243.009	202.234	170.684	143.710

Panel B – Debt Service Percentage

Debt Service as Percent of Total Revenue	17.0%	10.3%	10.6%	15.3%	14.5%	16.6%
Debt Service as Percent of Total Revenue Less Debt Proceeds	22.1%	19.1%	14.7%	15.3%	14.5%	16.6%

Table 9: County Tax Rates

	Compounded Growth	2009	2008	2007	2006	2005	2004
Union	4.64%	0.6650	0.7111	0.6367	0.5600	0.5250	0.5300
Alamance	2.21%	0.5800	0.5800	0.5750	0.5625	0.5100	0.5200
Cabarrus	2.38%	0.6300	0.6300	0.6289	0.6300	0.5300	0.5600
Chatham	0.20%	0.6530	0.6170	0.5970	0.5970	0.6464	0.6464
Durham	-1.48%	0.7081	0.8340	0.8090	0.8090	0.7900	0.7630
Gaston	-1.33%	0.8350	0.8400	0.8800	0.8930	0.8930	0.8930
Harnett	0.00%	0.7350	0.7350	0.7350	0.7350	0.7350	0.7350
Iredell	0.46%	0.4450	0.4450	0.4650	0.4350	0.4350	0.4350
Johnston	0.00%	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800
Lincoln	-1.67%	0.5700	0.6100	0.6100	0.6100	0.6200	0.6200

Figure 1: Historical Union County Revenue and Expenditures

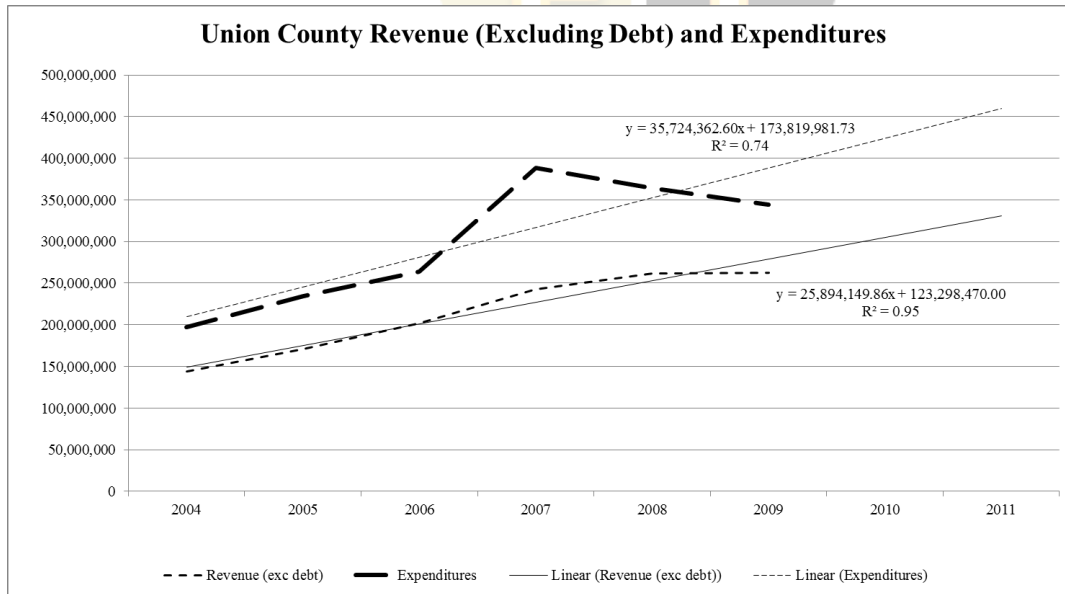




Table 10: Property Tax Forecasting

Projected Revenue Model  
 $Y = 25,894,150X + 123,298,470$   $R^2 = .95$

Projected Expenditure Model  
 $Y = 35,724,363X + 173,819,982$   $R^2 = .74$

Forecast of property tax rate to collect \$204,067,060 in 2014 (50% of projected revenue)

Forecast of property tax rate to collect \$283,393,988 in 2014 (50% of projected expenditure)

		Mean Home Value			Mean Home Value		
		180,000	210,000	240,000	180,000	210,000	240,000
90% Residential Number Of Households	75,000	1.3604	1.1661	1.0203	1.8893	1.6194	1.4170
	85,000	1.2004	1.0289	0.9003	1.6670	1.4289	1.2503
	95,000	1.0740	0.9206	0.8055	1.4915	1.2785	1.1187
80% Residential	75,000	1.2093	1.0365	0.9070	1.6794	1.4395	1.2595
	85,000	1.0670	0.9146	0.8003	1.4818	1.2701	1.1113
	95,000	0.9547	0.8183	0.7160	1.3258	1.1364	0.9944
70% Residential	75,000	1.0581	0.9070	0.7936	1.4695	1.2595	1.1021
	85,000	0.9336	0.8003	0.7002	1.2966	1.1113	0.9724
	95,000	0.8354	0.7160	0.6265	1.1601	0.9944	0.8701
60% Residential	75,000	0.9070	0.7774	0.6802	1.2595	1.0796	0.9446
	85,000	0.8003	0.6859	0.6002	1.1113	0.9526	0.8335
	95,000	0.7160	0.6137	0.5370	0.9944	0.8523	0.7458

Table 11: Six Industry Economic Impact

	Impact Type	Employment	Labor Income (in millions)	Output (in millions)
Advanced Metals	Direct Effect	100.0	\$10.223	\$113.515
	Indirect Effect	121.5	\$6.120	\$20.252
	Induced Effect	45.7	\$1.428	\$5.372
	<i>Total Effect</i>	267.2	\$17.771	\$139.139
Aerospace	Direct Effect	100.0	\$12.278	\$108.677
	Indirect Effect	48.0	\$2.466	\$6.715
	Induced Effect	41.2	\$1.287	\$4.841
	<i>Total Effect</i>	189.2	\$16.031	\$120.233
Medical Products	Direct Effect	100.0	\$7.718	\$28.216
	Indirect Effect	24.5	\$1.112	\$3.415
	Induced Effect	24.7	\$0.771	\$2.898
	<i>Total Effect</i>	149.1	\$9.601	\$34.528
Building Products	Direct Effect	100.0	\$5.074	\$17.461
	Indirect Effect	13.8	\$0.669	\$2.111
	Induced Effect	16.0	\$0.501	\$1.884
	<i>Total Effect</i>	129.8	\$6.245	\$21.456
E-Commerce Retail	Direct Effect	100.0	\$1.422	\$7.086
	Indirect Effect	5.8	\$0.217	\$0.721
	Induced Effect	4.6	\$0.144	\$0.542
	<i>Total Effect</i>	110.4	\$1.783	\$8.349
Data Center	Direct Effect	100.0	\$2.371	\$5.611
	Indirect Effect	7.5	\$0.279	\$0.784
	Induced Effect	7.5	\$0.233	\$0.877
	<i>Total Effect</i>	115.0	\$2.884	\$7.272

Panel B: Six Industry State and Local Tax Impact

	Indirect Business Tax	Households Tax	Corporation Tax
Advanced Metals	\$2,344,537	\$617,221	\$362,269
Aerospace	\$869,508	\$556,711	\$283,892
Medical Products	\$496,904	\$333,224	\$109,544
Building Products	\$318,176	\$216,658	\$48,946
E-Commerce Retail	\$961,655	\$62,336	\$89,880
Data Center	\$153,136	\$100,882	\$34,254

Table 12: Union County Current Data

Panel A - Expenditures (in millions and as % of total)	2011	2010	2009	2008	2007	2006
Education	90.568	104.855	161.343	189.942	216.904	104.628
	32.50%	36.20%	46.80%	52.10%	55.80%	39.70%
Debt Service	64.439	60.487	57.965	50.1	35.778	31.043
	23.10%	20.90%	16.80%	13.70%	9.20%	11.80%
Human Services	37.222	35.259	36.958	38.591	37.129	33.403
	13.30%	12.20%	10.70%	10.60%	9.60%	12.70%
General Government	12.517	10.126	14.119	15.081	15.499	13.681
	4.50%	3.50%	4.10%	4.10%	4.00%	5.20%
Public Safety	38.092	40.531	37.597	34.869	32.35	28.83
	13.60%	14.00%	10.90%	9.60%	8.30%	10.90%
Other	36.23	38.692	37.026	36.036	50.744	51.846
	13.00%	13.30%	10.70%	9.90%	13.10%	19.70%
Total	279.068	289.949	345.007	364.619	388.403	263.431
	100%	100%	100%	100%	100%	100%
Panel B: Revenue (in \$millions)	2011	2010	2009	2008	2007	2006
Property Taxes	155.409	152.598	148.422	123.953	102.203	82.56
Other Taxes	6.748	6.233	5.913	6.553	7.507	6.232
Sales Tax	23.352	23.516	31.273	37.305	36.863	28.532
Sales & Services	40.612	39.285	37.658	46.009	51.187	47.626
Intergovernmental	32.121	31.472	28.795	26.88	24.649	19.905
Debt Proceeds	0	20	78.765	224.215	94.423	0
Other Miscellaneous	6.524	6.958	10.102	21.067	20.602	17.38
Total Revenue	264.764	280.062	340.929	485.983	337.432	202.234
Total Revenue Less Debt Proceeds	264.764	260.062	262.164	261.768	243.009	202.234
Panel C: General Obligation (GO) Debt and Debt Service	2011	2010	2009	2008	2007	2006
GO Debt (in millions)	427.18	450.29	472.43	433.05	314.59	258.82
GO Debt Per Capita	2,109	2,294	2,472	2,375	1,828	1,604
Debt Service as a % of Total Revenue	24.30%	21.60%	17.00%	10.30%	10.60%	15.30%
Debt Service as a % of Revenue Less Debt Proceeds	24.30%	23.30%	22.10%	19.10%	14.70%	15.30%