

Institute for Public Policy and Business Research
University of Kansas

PROJECTIONS OF LOCAL SALES TAXES
IN DOUGLAS COUNTY, 1990-1993

- I. Projections of the One-Half Percent City Tax
- II. Projections of a Proposed One Percent Countywide
Sales Tax

by

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INTRODUCTION

Time series regression has been used as a statistical technique to forecast revenues of the one-half percent sales tax collections levied by the City of Lawrence and of a proposed one percent countywide sales tax. Time series regression is based on a given set of historical data (e.g. sales tax collections) and implies the computation of the best-fitting curve (least square line) which is trended into the future.

The reliability of the forecast series in this report is given within a 95 percent confidence interval. This means that one can be 95 percent confident that the projected values will lie within an interval specified for each forecast series individually (see notes in Tables 1,3 and 5). While forecasts based on a regression model are fairly reliable one or two years ahead, they become less accurate in the distant future. This is why the forecasting period has been restricted to four years.

I. Projections of the One-Half Percent Local Sales Tax

Levied by the City of Lawrence

The forecast of the one-half percent local sales tax collections by the City of Lawrence is based on 15 observations, i.e. historical data of actual collections for FY 1975 through FY 1989.

Table 1: Projections of One-Half Percent Local Sales Tax Collections
City of Lawrence

		<u>Annual Change</u>
FY 1990	\$2,753,253	4.9%
FY 1991	\$2,915,836	5.9%
FY 1992	\$3,066,922	5.2%
FY 1993	\$3,227,751	5.2%

NOTE: The projected figures should vary by no more than plus or minus \$67,611 from actual revenues at the 95% confidence level.

Source: Institute for Public Policy and Business Research, December 1989.

Table 2: Local Sales Tax Collections for FY 1975-1989
City of Lawrence

<u>FY</u>	<u>Collections</u>	<u>Annual Change</u>
1975	\$ 754,119	
1976	907,567	20.35%
1977	1,026,814	13.14%
1978	1,119,504	9.03%
1979	1,297,680	15.92%
1980	1,373,222	5.82%
1981	1,508,250	9.83%
1982	1,598,421	5.98%
1983	1,750,372	9.51%
1984	1,930,888	10.31%
1985	2,040,610	5.68%
1986	2,186,875	7.17%
1987	2,294,431	4.92%
1988	2,433,061	6.04%
1989	2,623,910	7.84%

NOTE: Collections represent one-half of all taxable sales subject to local sales tax in Lawrence.

Source: Kansas Department of Revenue.

II. Projections of a Proposed One Percent Countywide Sales Tax

Revenues from a proposed countywide sales tax are forecast for the State's fiscal years and for calendar years separately, since the County's budgetary matters are based on calendar years. The forecast by State's fiscal years uses historical data starting in FY 1980, whereas the calendar-year forecast is restricted to a more limited database starting in Calendar 1984.

Both forecasts use a 15 percent upward adjustment to the state sales tax collections for Douglas County as an estimator for missing historical data on a countywide local sales tax (see technical note below). Thus, the reliability of the forecast is affected by the use of estimators as well as by the standard error of the regression which measures the size of the prediction errors, specified through the confidence intervals for each forecast.

Table 3: Nominal and Real One-Percent Local Sales Tax Collections and Two-Year Forecast for Douglas County, Calendar 1984-1991

<u>Calendar Year</u>	<u>Current Dollars</u>	<u>Percent Change Current Dollars</u>	<u>Real Dollars</u>	<u>Percent Change Real Dollars</u>
1984	\$3,970,125		3,821,102	
1985	\$4,391,294	10.61%	4,081,128	6.81%
1986	\$4,533,875	3.25%	4,136,748	1.36%
1987	\$4,903,523	8.15%	4,316,481	4.34%
1988	\$5,107,913	4.17%	4,315,939	-0.01%
* 1989	\$5,346,787	4.68%	4,325,879	0.23%
** 1990	\$5,574,661	4.26%	4,364,660	0.90%
** 1991	\$5,794,235	3.94%	4,365,393	0.20%

* Preliminary ** Forecasted

Note: The confidence interval is +/- \$112,602 at the 95% confidence level.
Data reflect a 15 percent adjustment of state sales tax collections.

Source: Institute for Public Policy and Business Research, December 1989.

REVENUES OF A ONE-PERCENT SALES TAX

Douglas County

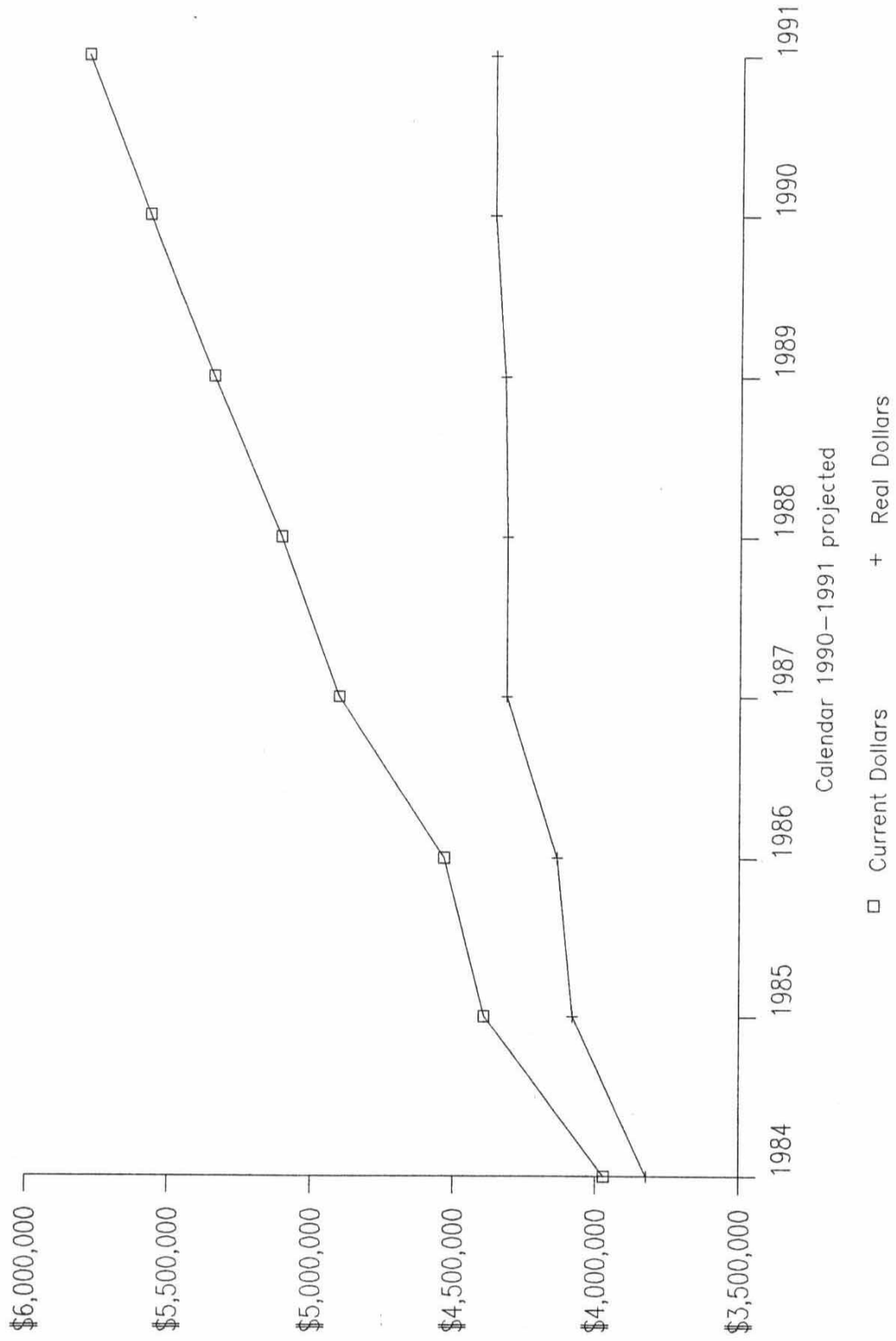


Table 4: Projections of a Proposed One Percent Countywide Sales Tax
FY 1990-1991

<u>State Fiscal Year</u>		<u>Annual Change</u>
1990	\$5,608,336	5.8%
1991	\$5,949,881	6.1%
1992	\$6,300,385	5.9%
1993	\$6,678,200	6.0%

NOTE: The projected figures should vary by no more than plus or minus \$71,499 from actual future revenues at 95% confidence level.

Source: Institute for Public Policy and Business Research, December 1989.

Table 5: Estimators for a One Percent Countywide Sales Tax

<u>FY</u>	<u>Collections</u>	<u>Annual Change</u>
1980	\$3,047,808	
1981	3,310,016	8.60%
1982	3,428,873	3.59%
1983	3,671,263	7.07%
1984	3,970,125	8.14%
1985	4,166,489	4.95%
1986	4,518,144	8.44%
1987	4,650,710	2.93%
1988	4,986,750	7.23%
1989	5,300,721	6.30%

NOTE: Figures represent one percent of Douglas County state sales tax collections increased by 15 Percent for Adjustment.

Source: Calculated from data by the Kansas Department of Revenue.

Technical Note: There are two ways to obtain historical data for a forecast of sales tax revenues from a one-percent countywide sales tax:

1. Use of State Sales Tax with a 15% Adjustment.

The lack of historical data on which to base the forecast of a proposed countywide sales tax required the use of estimators. Such estimators were obtained through the adjusted state sales tax collections for Douglas County, for which historical data are available and could be prorated to one percent collections. A 15 percent upward adjustment to the state sales tax collections, as suggested by the League of Kansas Municipalities¹, produces a fairly good approximation which to base countywide sales tax projections. The adjustment reflects the difference in application of the state and local sales tax (see attached diagram).

2. Use of Local Taxes Levied by the Cities of Lawrence, Eudora and Baldwin.

Since a countywide sales tax is identical in application to the local one-half percent sales taxes imposed by the City of Lawrence in 1971 and by the City of Baldwin and Eudora in 1982, the combined collections of the three cities, prorated to a one percent level, could also be used as an approximation for missing historical data. However, there were some drawbacks to this approach: 1) Lecompton and the unincorporated area of Douglas County do not levy a local sales tax which would lead to an underestimation of countywide sales tax revenues; 2) the limited number of observations for Baldwin and Eudora, which started their full collections for FY 1984, would not have allowed the forecast to go out more than one or two years; and 3) the data was only available for the State's fiscal years, not for calendar years.

¹Levying a Local Sales Tax, League of Kansas Municipalities, May 15, 1986.

Diagram to Illustrate Sales-Tax Applications
for State and Local Taxes

State Sales Tax

For FY 1980-1989 additionally applied to:
New and used manufacturing machinery and equipment.
New farm machinery and equipment.

Local Sales Tax

Both taxes apply to:
All taxable retail sales.

Additionally applies to:
Utility services (electricity, water, telephone).
Residential fuel sources (coal, natural gas, LP-gas,
propane gas).