

Brown County Financial Decision and Support Model

PREPARED FOR
BROWN COUNTY REDEVELOPMENT COMMISSION
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Background

INDIANA SCHOOL OF PUBLIC AND ENVIRONMENTAL AFFAIRS GRADUATES



- Course project for Seminar in Revenue Theory & Administration Spring 2018
- Previous students produced the Brown County Redevelopment Analysis during Fall 2017.
- Further analysis to consider after the first report
 - Revenue forecast model of revenue from property and local income tax to support County Financial Decision and Support Model
 - County level data to support its decision-making process and to improve tax policy

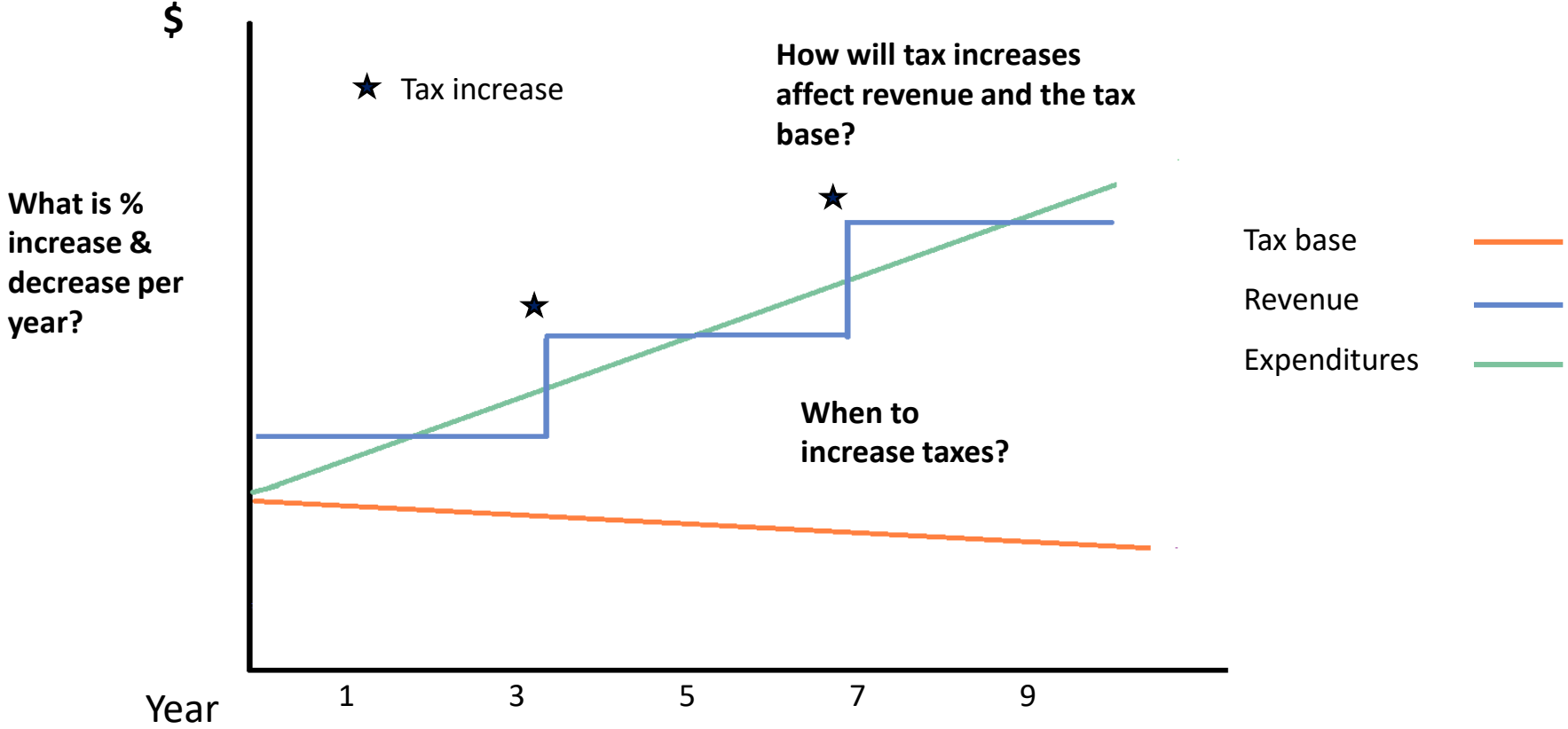
The purpose of this paper is to provide the first step in building Brown County's Financial Decision and Support Model.

Three main questions

- **What is happening?** Trends in revenue, expenditures, and economic factors
- **What will happen?** Forecasting future revenue based on current trends
- **How will financial decisions affect the future?** Estimating the effects tax policy and the economy will have on future revenue and tax base

Trends and forecasts of Brown County's **property tax** and **local income tax (LIT)**

Financial Decision & Support Model



Trends in revenue and economic factors define the county's financial situation

Community Vitality Indicators

- Assessed Value
- Per Capita Income
- Population Growth

Revenue

- Certified Distributions (Local Income Tax)
- Certified Levy (Property Tax)

Considerations

- Time-series data allows for comparison across years and variables
- Multiple sources of data at the local, state and federal level
- Timeliness: collection and cleaning of data takes time and expertise
- Relationship between economic factors, revenue

Assessed value represents market value of property and the base for property taxes

Brown County's Net Assessed Value (NAV)

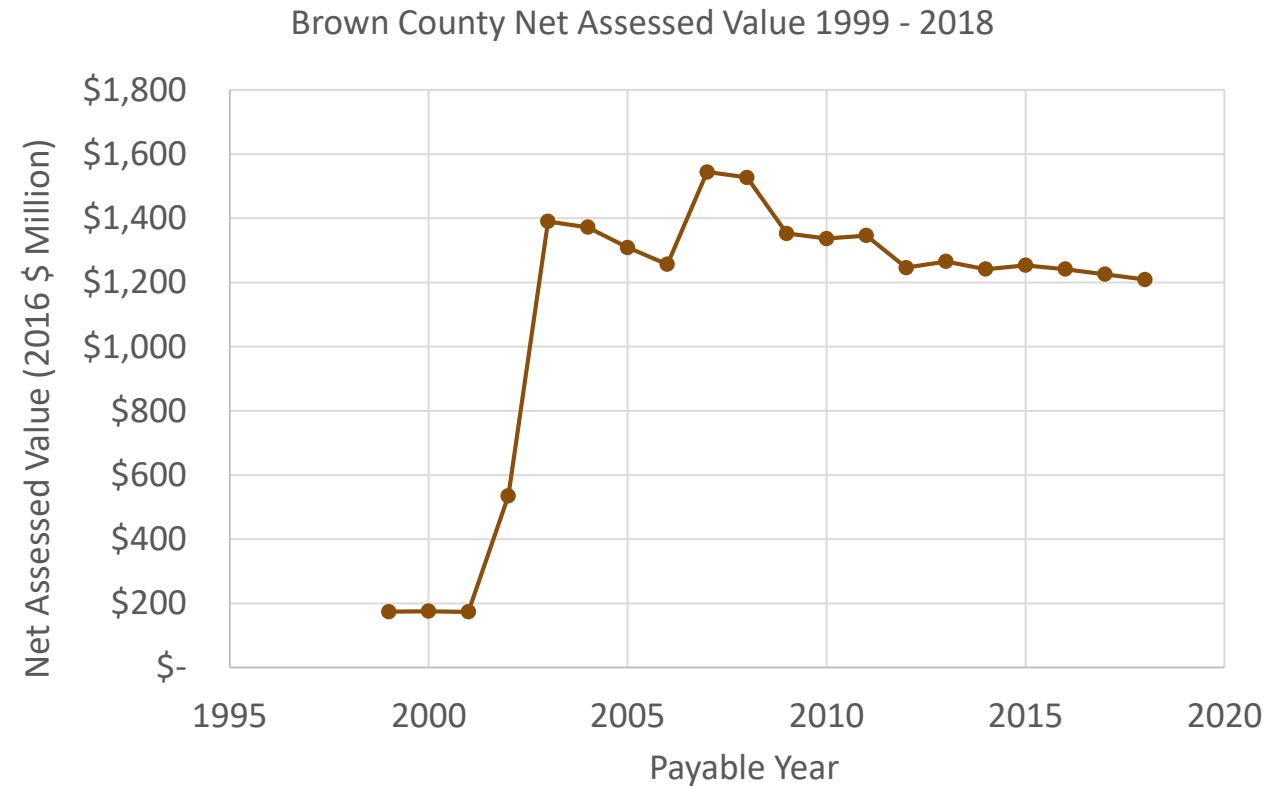
- 2001 - \$125 million (nominal \$)
- 2003 - \$1 billion (nominal \$)

NAV = 100% of market value of property

Time series data for NAV was constructed from Indiana's Tax Handbook, adjusted for inflation

Average Growth 2010-2018

- Nominal \$ = 0.58%
- 2016 \$ = -1.21%



Source: Department of Local Government and Indiana Tax Handbook

Per capita income as an indicator of economic health

Per Capita Income (2016 \$)

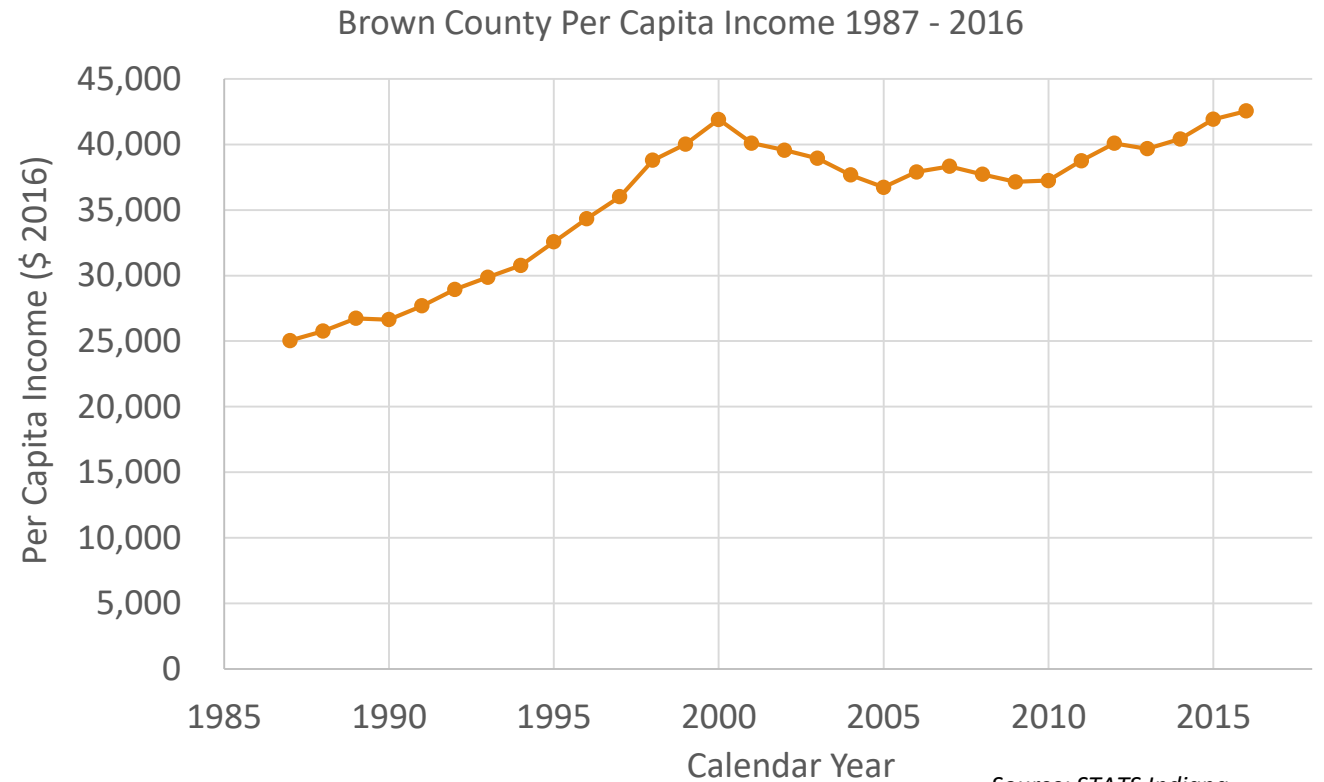
- 2000 – \$41,909
- 2016 – \$42,554

Inference from trend

- Causes for growth
- Economic events

Brown County Personal Income¹

Year	Average Annual Growth Rate %
2007 – 2016	0.904
2010 – 2016	1.640



Source: STATS Indiana

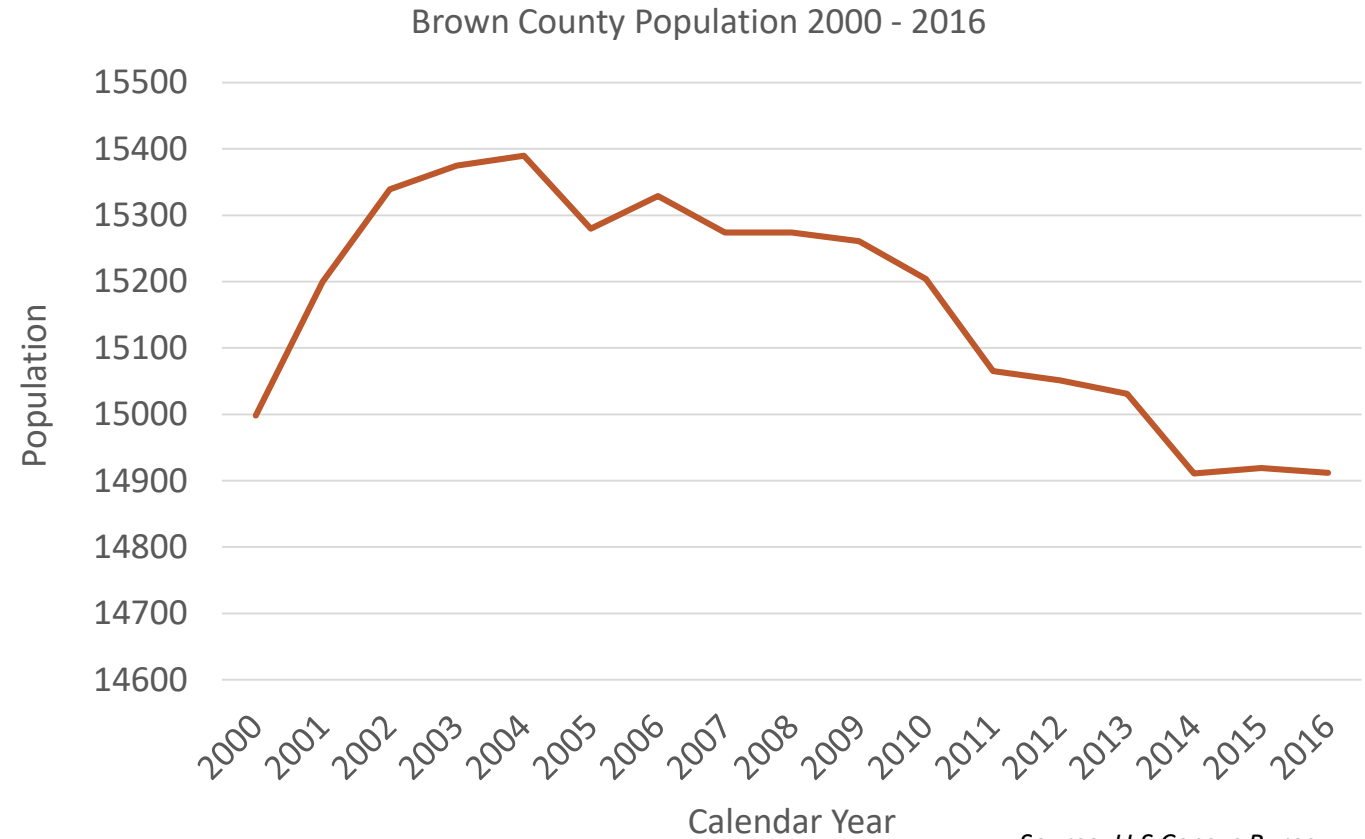
¹ Personal income was first converted into 2016 dollars before average growth rates were calculated.

Brown County declining population due to an aging population and net migration

Population estimates for 2011-2016 based on 2010 Census and American Community Survey

Fewer residents imply decreasing number of employees and property owners in the county

Demographic information to accompany population statistics



Source: U.S Census Bureau

Certified Distributions – Local Income Tax Revenue

Local Income Tax Trend

Distributions to county for all taxing units

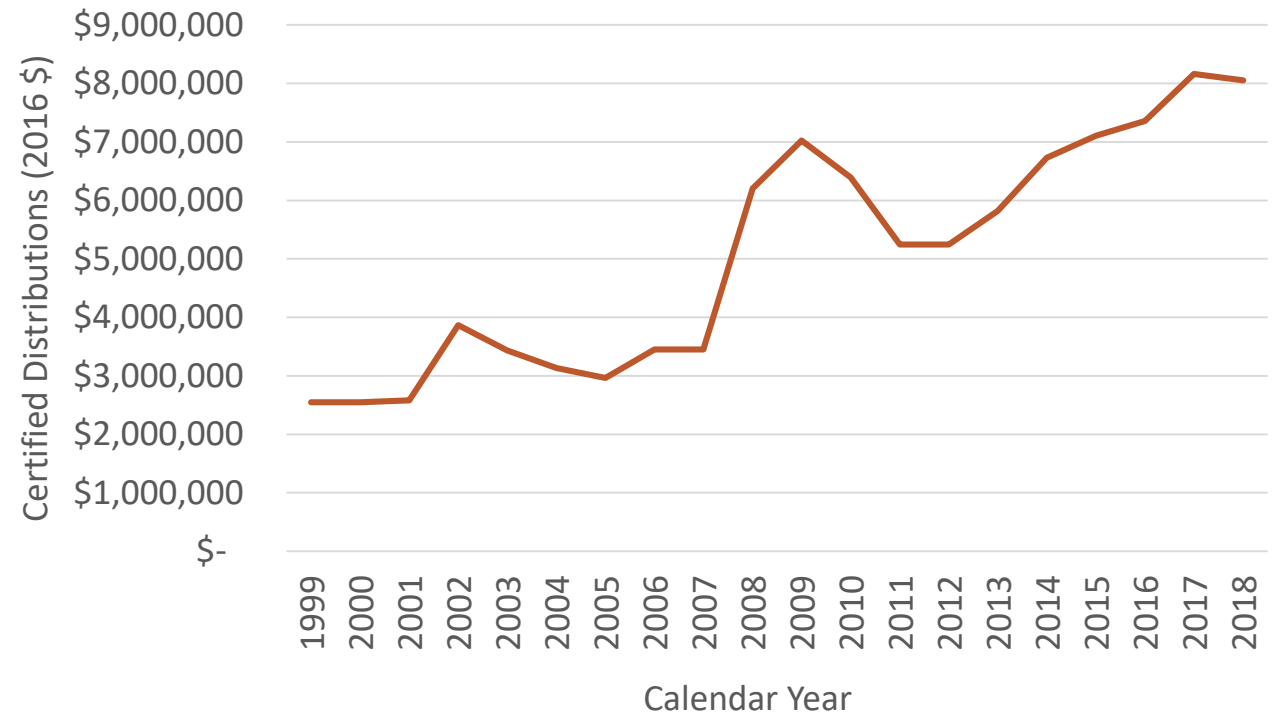
Time-series of shares for each taxing unit requires intensive data gathering

Increase growth reflects increases in the tax rate
2010 – 2018 average rate 0.78%

Brown County Tax Rate

Year	Tax Rate
1999 - 2007	1.250%
2008 – 2014	2.200%
2015 - 2016	2.396%
2017 - present	2.523%

Brown County Local Income Tax Revenue 1999 - 2018



Source: Indiana Tax Handbook

Certified Levy – Property Tax Revenue

Property Tax Trends

Certified Levy = Property Tax Collected

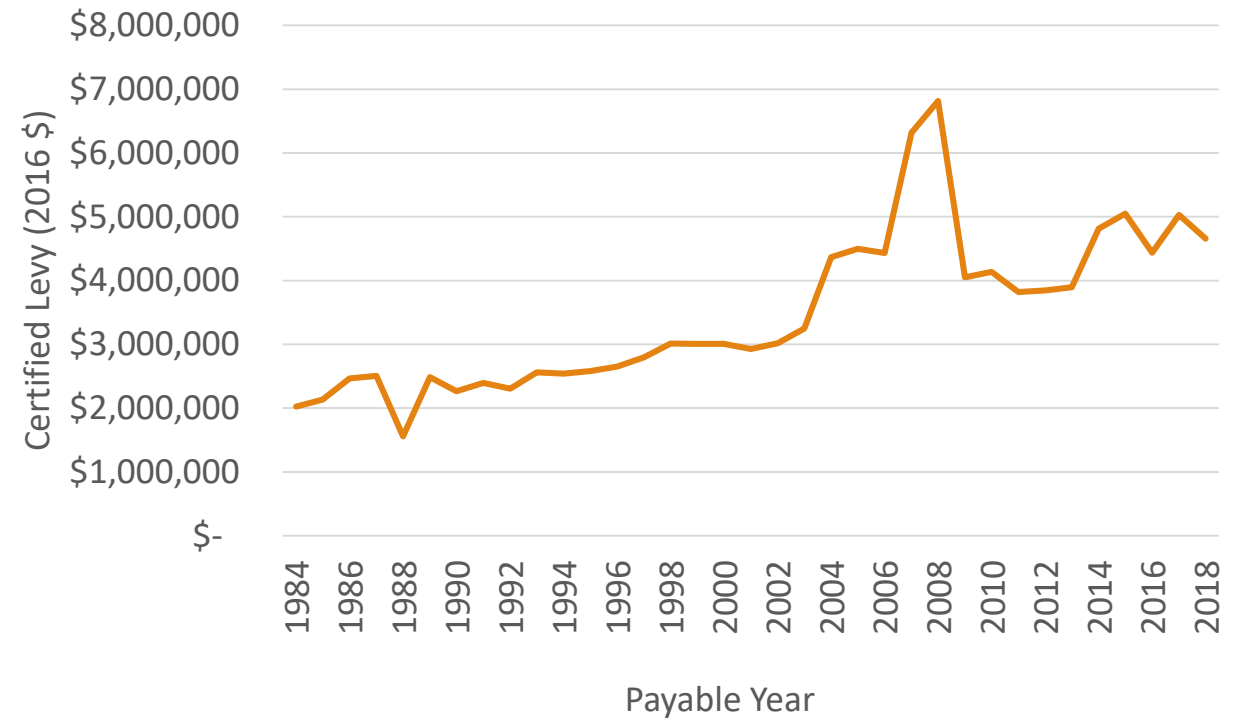
Expenditures and levy closely linked

Trends in expenditures and levy at fund level

Average % Change 2010 - 2018

Certified Levy	2.09%
Certified Budget	4.36%
Net Assessed Value	-1.21%

Brown County Certified Levy 1984 - 2018



Source: Department of Local Government Finance

Using data trends to forecast future values

Considerations

- Data availability
- Scope of forecast
- Technical expertise
- Accuracy

Purpose

- Budget process
- Justification for financial decisions
- Revenue and expenditures

Forecasting Techniques

Judgement/Expert

Extrapolative/Trend

Causal: Deterministic/Econometric

Forecasting Techniques – Judgement/Expert

Method – requires deep knowledge of and experience with the community, revenue source, and the budgeting process

Advantages – Simple, no data requirements, least expensive of methods

Limitations – inaccuracy, short-term projections, subjective, no explanatory value

Forecasting Techniques – Extrapolative/Trend

Method – incremental, quantitative approach; uses historical data to predict future values

Advantages – little cost, limited data requirements, straightforward

Limitations – account for influencing factors, volatile revenue sources, “turning points”

Forecasting Techniques – Deterministic/Econometric

Method – identifying causal relationships using economic principles and statistical techniques

Advantages – “what if questions”, economic impact, mathematical relationships between revenue and economic factors, test assumptions through statistical models

Limitations – significant information costs, technical expertise required to develop forecasting equations

Structural characteristics of local income tax and property tax

Local Income Tax

- Complex structure of four taxes with different rates and purposes
- Simplified in 2016 as Local Income Tax
- 2-year delay between when income is earned and when tax is received

Tax Base

- Indiana adjusted gross income
- Residents of Brown County

Tax Rate

- Property tax relief
- Expenditure

Property Tax

- 2003 change in assessment process to reflect 100% of market value
- Circuit breaker caps on property tax liability

Tax Base

- Net assessed value of real and personal property

Tax Rate

- Rate is a function of the budget process
- Determined at the fund level

A trend forecasting technique provides an easy to adapt method for predicting changes in revenue and tax base.

Forecasted Values

- Predicted values based on 3 year moving averages
- Prediction for 2020 and 2021 based on predicted values for 2019 and 2020
- Provides baseline for comparison to actual values and newer models

Year	Assessed Value	Certified Distribution
2019	1,209,201,032	8,055,896
2020	1,203,672,356	8,046,674
2021	1,205,549,418	8,049,713

Measures of Error

- Statistical measures of average difference between observed and predicted values
- Comparison between assumptions made to calculate moving averages

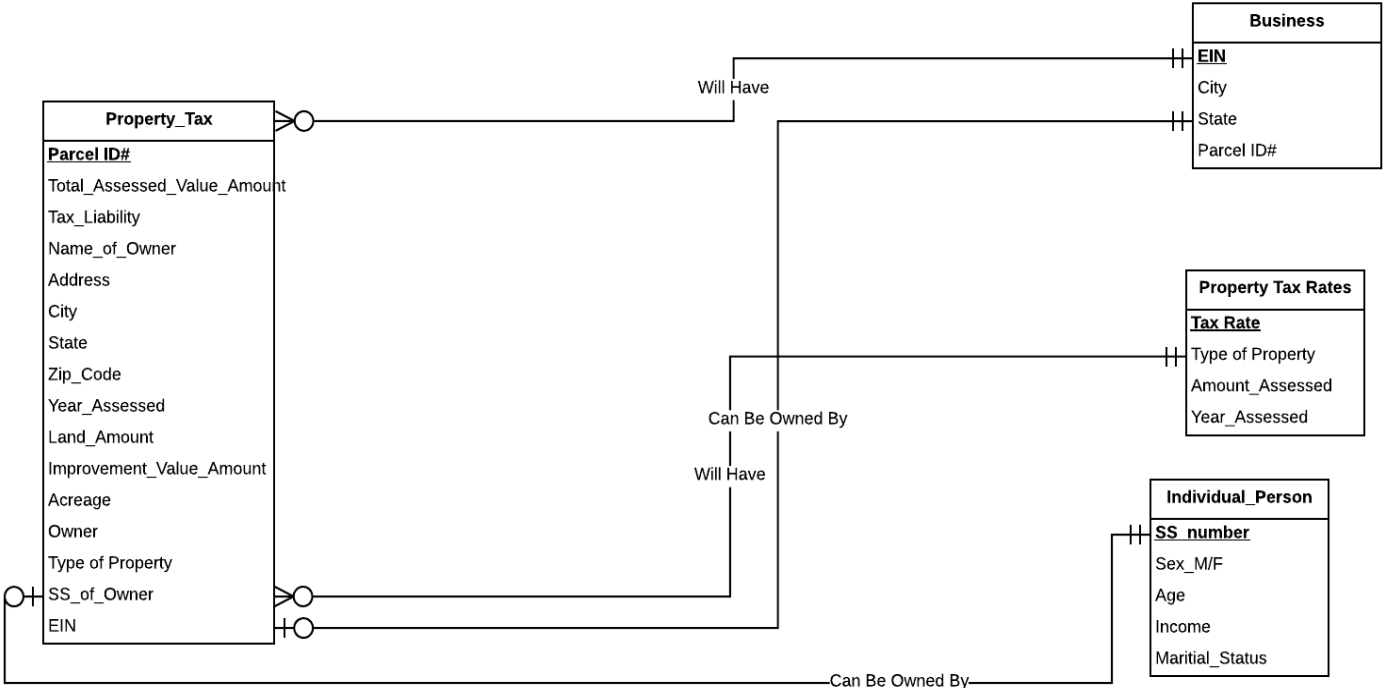
Measure	Certified Distribution	Assessed Value
MAD	206,601	33,568,482
MAPE	3.97%	2.39%
MSE	122E9	2.585E15

Database – Entity Relationship Diagram

Brown County currently faces many data challenges to forecast trends at the county-level.

Having an internal county level database offers many advantages for Brown County to improve speed, time and storage capability needed to manage financial data

We designed an entity relationship diagram model (ERD) to track revenue from property and income tax of residents and business in Brown County.



Recommendations

- ❖ We recommend Brown County identifies the relationships between revenue, expenditures, and economic factors to improve data management.
- ❖ We recommend the use of trend forecasting to predict future trends in revenue sources. Furthermore, analysis of revenue and expenditure trends should be at the fund level.
- ❖ We recommend BCRDC to further inquire about how to manage data at the county-level using a database management application system to conduct inquiries and generate reports of revenue and expenditure data to support the County Financial and Decision Support Model.

Questions?