



Indiana Fiscal Policy Institute Brief

REVENUE FORECASTING:
INDIANA'S METHOD AND THE RESULTS IT PRODUCES

By Sarah LeeAnn Smith

IFPI Fellow

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What works best for one state may not translate to other states; however, the states utilizing the five best practices are expected to produce the most reliable estimates. Indiana is recognized as one of only 15 states applying all five best practices (see Appendix 1).

Indiana's State Budget Agency provides information on its website explaining how the state's forecast is produced⁵ (see Appendix 2). First, the state's economic outlook is produced by the international consulting firm IHS Markit. Included in the outlook are forecasts for dozens of economic data points for Indiana (e.g. personal income and personal consumption). The revenue forecast, based on the economic forecast, then is prepared by the Revenue Forecast Technical Committee. The RFTC includes a fiscal analyst from each legislative caucus; a tax economist from a state university, appointed by the governor; and a member of the State Budget Agency. This is a consensus-type forecast representing both the executive and legislative branches and also includes input from experts outside of these government branches. Using this process, the RFTC selects statistical equations that are used to project major state revenue sources using the economic data provided by the consulting firm. McNichol concludes consensus-type forecasts promote fiscal discipline and foster a smooth transition to budget execution. A research article by John L. Mikesell and Justin M. Ross explores how consensus forecasts, like Indiana's, remove most political bias and provide for fiscally sustainable budgets.⁶ Bond ratings may also be influenced by the perceived rigor and accuracy of a revenue forecast.

Indiana publishes its revenue forecasts and related data on the State Budget Agency website. The meeting to reveal and explain the forecast is open to the public, offering transparency to the process. Revenue forecasts are published each December prior to the beginning of the legislative session and updated in April of odd-numbered years (budget session years) before approval and enactment of the final budget.

Methodology for determining forecasts and the complexity of forecasting models tie into other state-specific processes. Mikesell and Ross' paper explains how research has indicated more complex models do not necessarily contribute to reduced errors in forecasting. Some methods may also unintentionally allow for political bias in forecasting. Methodology, therefore, is an important variable contributing to forecast accuracy.

Mikesell and Ross further explain how Indiana's method "follows a standard pattern for creating the revenue forecast: a national economic forecast drives a state economic forecast. The state economic forecast then drives the forecast for individual state taxes, based on an econometrically derived relationship between elements of the state economy and each tax." Methodology is expected to be published along with the forecast that provides "step-by-step instructions for converting the macroeconomic forecasts into a revenue baseline for each major tax and for total general fund revenue." Each forecast considers changes in tax laws which may have an effect on revenues. Forecast updates evaluate the methodology and compare the original forecasted revenue with revenue collected to-date. When revenue forecasts are reissued, they reflect any new information gathered during this process.

Indiana has a fairly representative budget process compared with other states. Data provided by McNichol shows of the states surrounding Indiana, Kentucky is the only other one that has a consensus forecast and implements the five best practices. Mikesell and Ross report that Indiana is also recognized as having one of the most accurate forecasts in the nation.

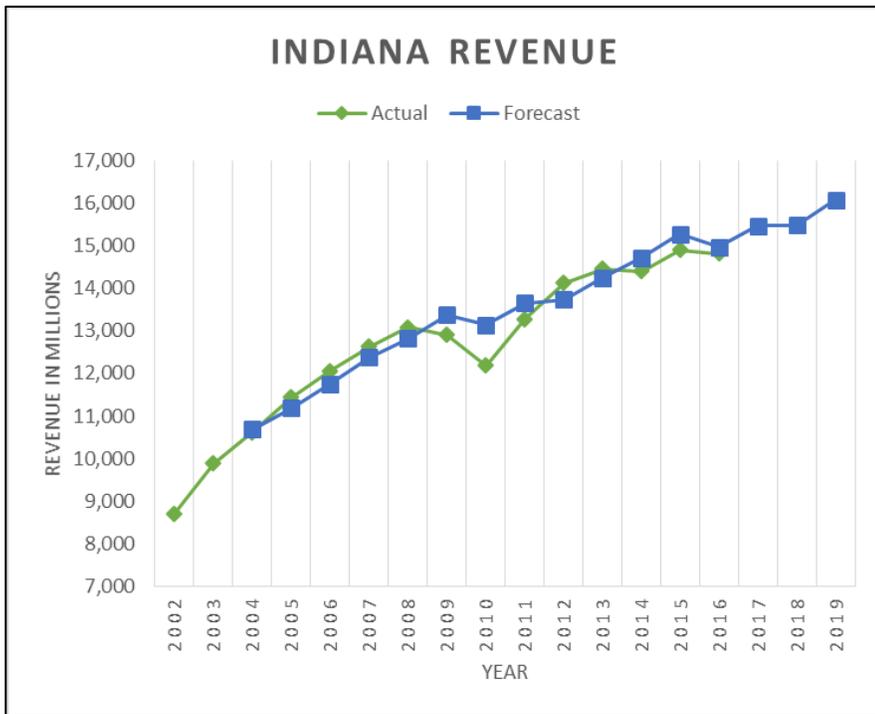
Forecasts are inherently prone to errors as exact revenue to be collected is unpredictable. The nature of the overall economy is influenced by every aspect of spending and revenue. As such, revenue forecasts are difficult to produce, especially when periods of dramatic economic recession or growth occur. Trends from previous years may not adequately express what is to come. New legislation, unstable economies, unemployment, and many other factors alter the actual revenues. Indiana has identified specific indicators that contribute to the difficulty in projecting revenue, including: taxable goods sales versus non-taxable services, wage and salary income, labor force trends, recessions, and housing starts.⁷

⁵ <http://www.in.gov/sba/2372.htm>

⁶ John L. Mikesell and Justin M. Ross, Indiana University, 2014, State Revenue Forecasts and Political Acceptance: The Value of Consensus Forecasting in the Budget Process

⁷ <http://www.in.gov/sba/2701.htm>

A stable economy leads to more accurate forecasts.⁸ However, taking bi-partisan contributions and employing best practices during the revenue forecast process help to guard against errors and allow for the production of a more accurate forecast.



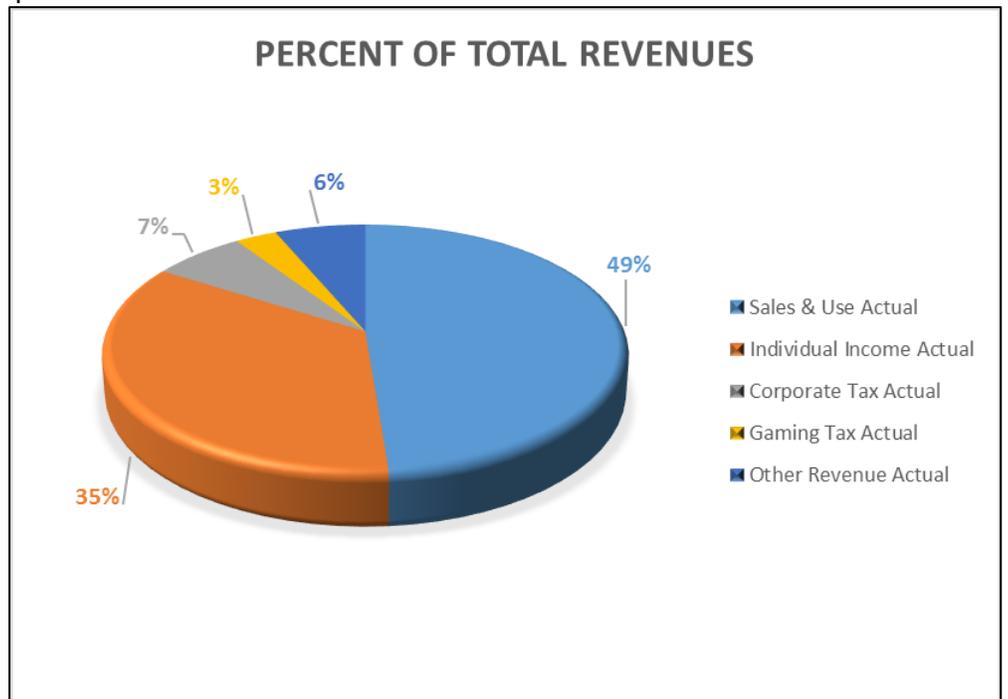
The revenue forecast's accuracy is critical because the General Assembly's final budget is determined by the amount of tax revenue anticipated over the next two fiscal years. A miss, especially one that overestimates tax revenue, will create difficulties for managing the budget.

Using data available on the State Budget Agency website, Indiana's revenue forecasts and actual revenue collected can be compared (see Appendix 3). Except for the years affected by the Great Recession, Indiana's forecast is quite accurate. In 2004, for instance, the forecast was within 0.68 percent of the actual revenue collected. The biggest miss, except for the recession, was 2.87 percent in 2011.

Revenue was underestimated six times between 2004 and 2016 and overestimated the remaining seven years. Underestimations averaged 2.16 percent difference, whereas overestimations averaged 2.92 percent. The Great Recession affected the forecast most from 2009-11. Removing the recession years' results in a 1.61 percent average difference for overestimated forecasts.

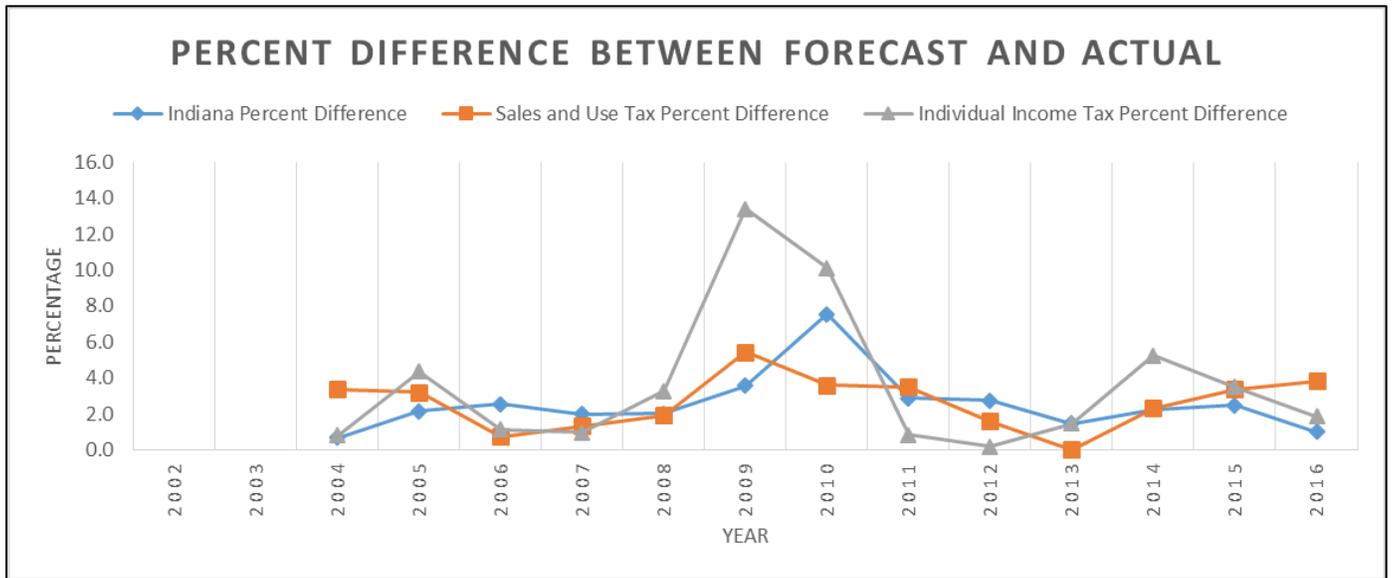
Take the recession out of the overall numbers and the average difference is a remarkably low 1.88 percent. While the forecast is more optimistic than actual revenue collected in some years, the close alignment of the data overall confirms the validity of the RFTC's approach.

Breaking revenue down into its various components allows for the individual analysis of sales and use tax, individual income tax, corporate tax, gaming tax,



⁸ Arturo Perez, NCSL Fiscal Affairs Program, State Revenue Forecasting: A Summary (Presentation to the NCSL Fiscal Leaders Seminar)

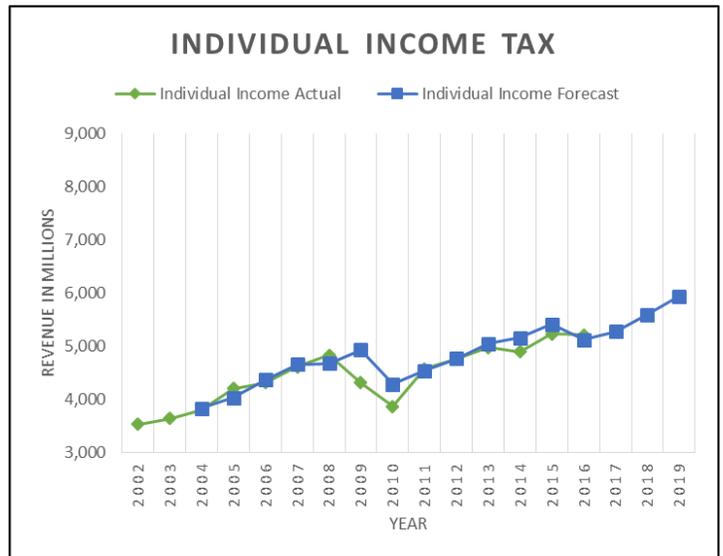
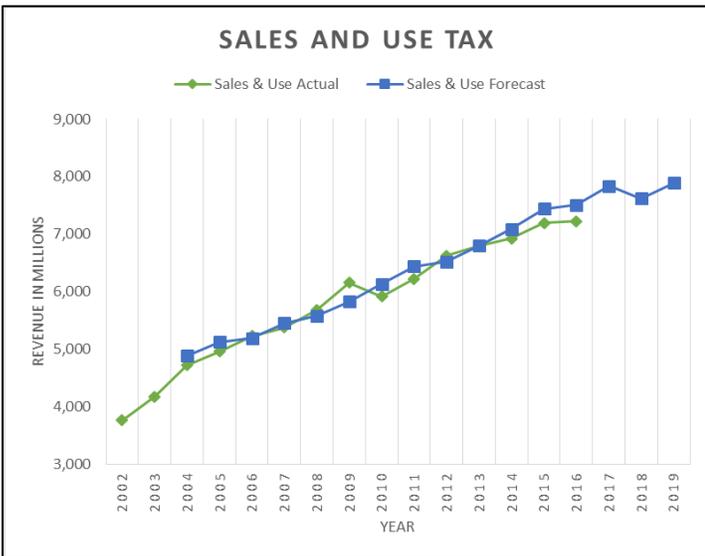
and other tax revenue compared to the revenue collected. Notable differences in the Great Recession years are explained to a larger extent when viewing the sales and use tax and individual income tax separately due to their outsized effect on overall revenue. A greater disparity is seen in the forecast compared with the actual revenue



for the individual income tax – likely due to the unexpected increase in unemployment during that time.

Sales and use tax revenue increased more than individual income tax, and is anticipated to more than double between 2002 and 2019. A pair of increases in the sales and use tax rate from 2002-04 and 2008-09 accelerated income in this segment. Additional growth in sales and use tax could be realized by taxing additional services and collecting taxes on internet sales.

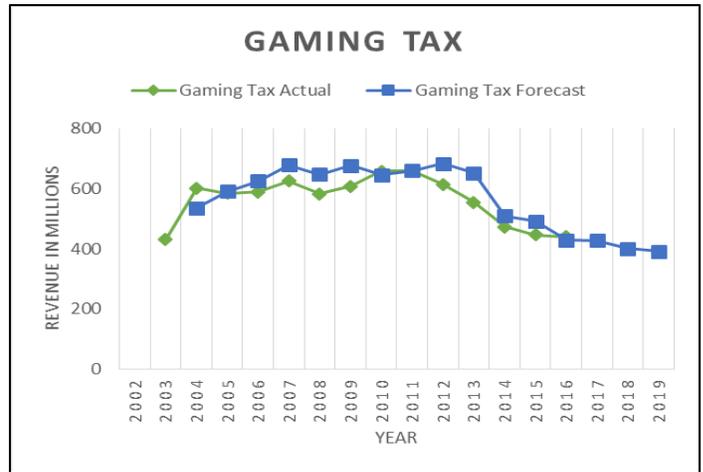
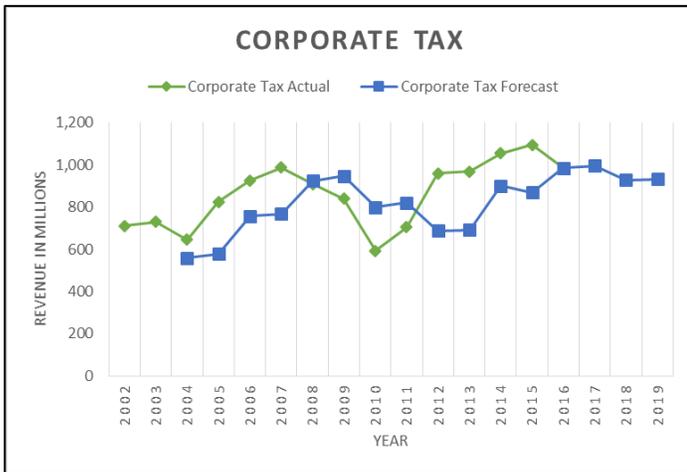
Sales and use tax was forecasted, on average, within a 2.64 percent difference of actual revenue. Indiana saw the greatest gap in 2009 with an underestimation of 5.45 percent difference. The closest forecast occurred in 2013 with a 0.01 percent overestimation.



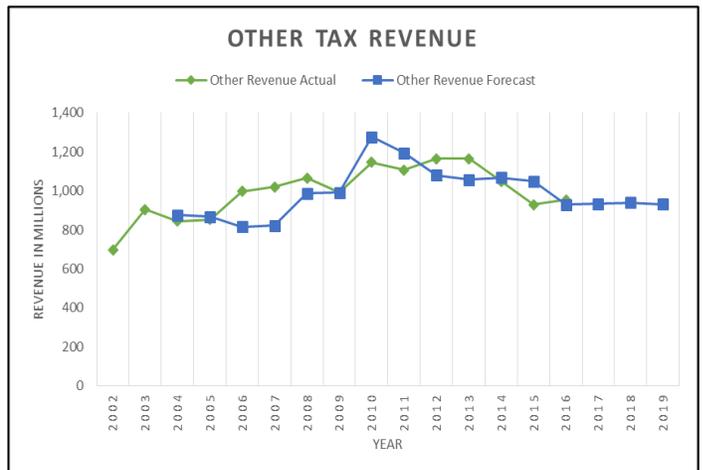
Individual income tax revenues exist in a smaller range of overall growth from 2002-19. Between 2017 and 2019, individual income tax revenue is forecasted to increase steadily, on par with the post-recession rate trend. The combined revenue forecast follows the increasing trend overall and shows influences from both sales and use tax and individual income tax.

Individual income tax contributed to the revenue forecast inconsistencies created by the Great Recession with overestimations of 13.4 percent in 2009 and 10.13 percent in 2010. The smallest difference occurred in 2012 with an overestimation of only 0.17 percent difference.

The remaining tax revenues contribute on a much smaller level. Corporate tax; gaming tax, including riverboat wagering and racino wagering; and other tax revenues are a lesser share of overall revenue, are much more



volatile, and seemingly lack influence over total revenue trends and variation between total revenue forecast and actuals. The volatility is shown in the extremes between actual and forecasted revenue, especially in the corporate tax. The results ranged from a 0.07 percent overestimation in 2016 to a 35.12 underestimation in 2005. The gaming tax forecast was as close at 0.06 percent in 2011 and as distant as 16.1 percent in 2013. The range was even greater for the “other” category of revenue. The forecast missed by just 1.64 percent in 2005 and by a 21.5 percent just two years later.



Some of the disparity among these tax categories’ forecasted vs. actual revenue is due to unpredictable changes in economic climate. Other differences are due to policy changes. Changes in how a tax is collected, increases or decreases in the tax, or the data used to track the tax all account for some of the inconsistencies seen in the charts.

Still the accuracy of Indiana’s revenue forecast is remarkable given the uncertainty involved in projecting revenue. With only a few exceptions influenced by the recession, the forecast has provided the General Assembly with an effective starting point for budget preparation and passage. The forecast update due April 12 is eagerly anticipated because it will determine how much tax revenue lawmakers will appropriate and it will initiate the beginning of the budget-making end-game.

Appendix 1:

State Use of Best Practices

Current Use of Best Revenue Forecasting Practices							
State	Forecast Type	Consensus Forecast	Forecasting Body Includes Non-government Experts	Forecast and Assumptions Are Published and Made Easily Available Online	Forecast Developed With Open Meetings or Notes Made Public	Forecasts for Upcoming Year Revisited During Budget Session	Score
Alabama	Separate	—	■	—	—	—	■ □ □ □ □
Alaska	Executive	—	■	■	—	■	■ ■ ■ □ □
Arizona	Separate	—	■	■	■	■	■ ■ ■ ■ □
Arkansas	Executive	—	—	■	—	—	■ □ □ □ □
California	Separate	—	■	■	—	■	■ ■ ■ □ □
Colorado	Separate	—	■	■	—	■	■ ■ ■ □ □
Connecticut	Consensus	■	—	■	■	■	■ ■ ■ ■ □
Delaware	Consensus	■	■	■	■	■	■ ■ ■ ■ ■
District of Columbia	Executive	—	■	■	—	■	■ ■ ■ □ □
Florida	Consensus	■	—	■	■	■	■ ■ ■ ■ □
Georgia	Executive	—	■	—	—	—	■ □ □ □ □
Hawaii	Consensus	■	■	■	■	■	■ ■ ■ ■ ■
Idaho	Separate	—	■	■	■	—	■ ■ ■ □ □
Illinois	Separate	—	■	■	—	■	■ ■ ■ □ □
Indiana	Consensus	■	■	■	■	■	■ ■ ■ ■ ■
Iowa	Consensus	■	■	■	■	■	■ ■ ■ ■ ■
Kansas	Consensus	■	■	■	■	■	■ ■ ■ ■ ■
Kentucky	Consensus	■	■	■	■	■	■ ■ ■ ■ ■
Louisiana	Consensus	■	■	■	■	■	■ ■ ■ ■ ■
Maine	Consensus	■	■	■	■	■	■ ■ ■ ■ ■
Maryland	Consensus	■	—	■	■	■	■ ■ ■ ■ □
Massachusetts	Consensus	■	■	■	■	■	■ ■ ■ ■ ■
Michigan	Consensus	■	—	■	■	■	■ ■ ■ ■ □
Minnesota	Executive	—	■	■	—	■	■ ■ ■ □ □
Mississippi	Consensus	■	■	■	■	■	■ ■ ■ ■ ■
Missouri	Consensus	■	■	■	—	—	■ ■ ■ □ □
Montana	Separate	—	■	■	■	—	■ ■ ■ □ □
Nebraska	Consensus	■	■	—	■	■	■ ■ ■ ■ □
Nevada	Consensus	■	■	■	■	■	■ ■ ■ ■ ■
New Hampshire	Separate	—	■	—	—	—	■ □ □ □ □
New Jersey	Separate	—	—	■	—	■	■ ■ □ □ □
New Mexico	Consensus	■	—	■	■	■	■ ■ ■ ■ □
New York*	Consensus	■	—	■	■	■	■ ■ ■ ■ □
North Carolina	Consensus	■	—	■	—	■	■ ■ ■ □ □

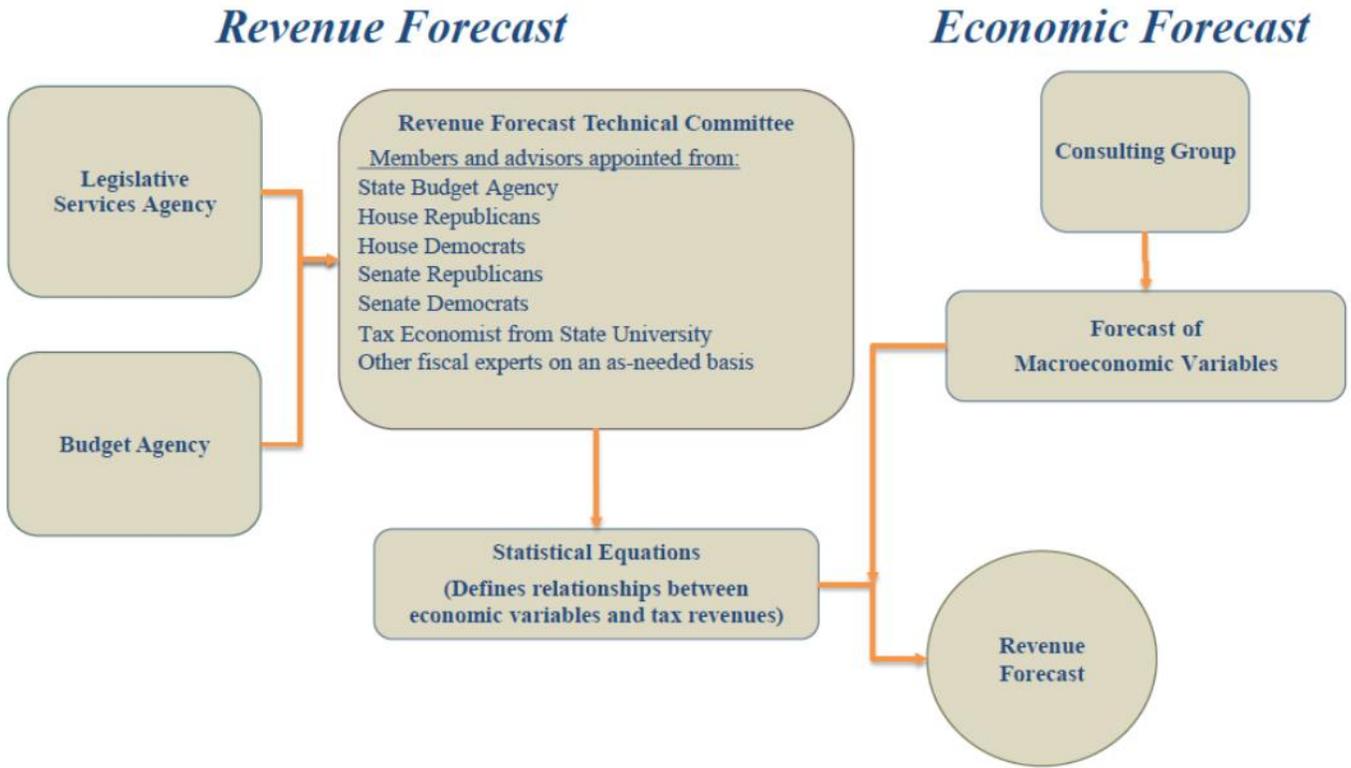
Appendix 1 Continued

Current Use of Best Revenue Forecasting Practices							
State	Forecast Type	Consensus Forecast	Forecasting Body Includes Non-government Experts	Forecast and Assumptions Are Published and Made Easily Available Online	Forecast Developed With Open Meetings or Notes Made Public	Forecasts for Upcoming Year Revisited During Budget Session	Score
North Dakota	Executive	—	■	—	—	■	■ ■ □ □ □ □
Ohio	Separate	—	■	■	—	—	■ ■ □ □ □ □
Oklahoma	Executive	—	■	—	■	■	■ ■ ■ □ □ □
Oregon	Executive	—	■	■	■	■	■ ■ ■ ■ □ □
Pennsylvania	Separate	—	—	■	—	■	■ ■ □ □ □ □
Rhode Island	Consensus	■	■	■	■	■	■ ■ ■ ■ ■ ■
South Carolina	Consensus	■	—	■	—	■	■ ■ ■ □ □ □
South Dakota	Separate	—	■	■	■	—	■ ■ ■ □ □ □
Tennessee	Consensus	■	■	■	■	■	■ ■ ■ ■ ■ ■
Texas	Executive	—	—	■	—	—	■ □ □ □ □ □
Utah	Consensus	■	■	■	■	■	■ ■ ■ ■ ■ ■
Vermont	Consensus	■	■	■	■	■	■ ■ ■ ■ ■ ■
Virginia	Consensus	■	■	■	—	■	■ ■ ■ ■ □ □
Washington	Consensus	■	—	■	■	■	■ ■ ■ ■ □ □
West Virginia	Executive	—	—	■	■	—	■ ■ □ □ □ □
Wisconsin	Separate	—	—	■	—	■	■ ■ □ □ □ □
Wyoming	Consensus	■	■	■	—	■	■ ■ ■ ■ □ □
Count		28	36	45	30	40	

Source: Table 7 from NASBO's "Budget Processes in the States" (2008) and CBPP review of published state revenue forecasting processes. Note: Descriptions of the processes are on the next page. *New York's consensus estimate is agreed on after the executive budget is prepared.

Appendix 2:

Revenue Forecast Process



John L. Mikesell and Justin M. Ross, Indiana University, 2014, State Revenue Forecasts and Political Acceptance: The Value of Consensus Forecasting in the Budget Process

**Appendix 3:
Revenue Data**

	Indiana Actual	Indiana Forecast	Indiana Percent Difference	Sales & Use Actual	Sales & Use Forecast	Sales and Use Tax Percent Difference	Individual Income Actual	Individual Income Forecast	Individual Income Tax Percent Difference	Corporate Tax Actual	Corporate Tax Forecast	Gaming Tax Actual	Gaming Tax Forecast	Other Revenue Actual	Other Revenue Forecast
2002	8708.8			3761.4			3540.8			709.4				697.2	
2003	9880.1			4172.4			3644.2			729.2		430.7		903.6	
2004	10619.9	10692.5	0.68	4721.0	4883.0	3.38	3807.9	3839.2	0.82	644.7	558.8	601.5	537.0	844.8	874.5
2005	11436.5	11192.3	2.16	4960.4	5122.1	3.21	4213.2	4033.0	4.37	824.8	578.4	584.7	591.3	853.4	867.5
2006	12060.7	11757.4	2.55	5226.3	5187.3	0.75	4322.4	4371.4	1.13	925.4	757.4	589.9	626.1	996.6	815.2
2007	12626.2	12378.3	1.98	5379.1	5451.1	1.33	4615.6	4659.9	0.96	987.1	767.5	625.3	678.8	1019.1	821.0
2008	13082.2	12817.6	2.04	5686.0	5577.5	1.93	4837.5	4681.4	3.28	909.5	924.3	582.9	647.3	1066.3	987.1
2009	12906.2	13377.0	3.58	6153.3	5827.1	5.45	4313.8	4933.6	13.40	839.0	947.1	608.2	677.9	992.0	991.3
2010	12186.7	13143.6	7.56	5914.7	6131.7	3.60	3875.6	4289.3	10.13	592.2	800.0	658.9	645.8	1145.4	1276.8
2011	13274.2	13660.3	2.87	6217.5	6438.4	3.49	4585.6	4547.2	0.84	704.8	819.3	660.3	660.7	1106.0	1194.7
2012	14125.1	13741.4	2.75	6621.8	6517.7	1.58	4765.5	4773.5	0.17	958.8	686.5	614.1	684.2	1164.9	1079.5
2013	14462.1	14249.4	1.48	6795.8	6796.2	0.01	4977.5	5051.2	1.47	968.4	692.1	554.6	651.8	1165.8	1058.1
2014	14402.2	14728.2	2.24	6925.9	7088.4	2.32	4898.8	5162.7	5.25	1054.4	900.3	474.0	509.4	1049.1	1067.5
2015	14898.4	15271.8	2.48	7194.8	7442.1	3.38	5233.0	5419.3	3.50	1093.7	869.3	446.7	492.4	930.1	1048.6
2016	14819.5	14971.1	1.02	7222.6	7504.7	3.83	5218.2	5121.8	1.86	984.0	984.7	440.9	430.1	953.8	929.8
2017		15478.3			7839.6			5283.1			994.4		427.5		933.7
2018		15480.8			7618.0			5596.3			926.7		401.0		938.7
2019		16087.0			7889.7			5942.0			932.8		391.4		931.0
Avg. % Diff			2.57			2.64			3.63						
Overestimation			2.92			2.73			4.09						
Underestimation			2.16			2.43			2.59						
Over W/O 09-11			1.61			2.49			1.90						

About the Author

Sarah LeeAnn Smith is a Fort Wayne native studying at IUPUI. She holds a B.S. in Criminal Justice with minors in Forensic and Investigative Science, Legal Studies, and Spanish. Sarah is currently pursuing a Master of Public Affairs with a concentration in Criminal Justice and anticipates a May 2017 graduation. Sarah comes to IFPI with academic and drug policy research experience and state legislative policy experience.

About the Indiana Fiscal Policy Institute

The Indiana Fiscal Policy Institute (IFPI), formed in 1987, is a private, non-profit government research organization. The IFPI's mission is to enhance the effectiveness and accountability of state and local government through the education of public sector, business and labor leaders on significant fiscal policy questions, and the consequences of state and local decisions. The IFPI makes a significant contribution to the important, on-going debate over the appropriate role of government. The IFPI does not lobby and does not support or oppose candidates for public office. Instead it relies on objective research evidence as the basis for assessing sound state fiscal policy.

Contact

John Ketzenberger
President
Indiana Fiscal Policy Institute
One American Square, Suite 150
Indianapolis, IN 46282
Phone: 317-366-2431
www.indianafiscal.org