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Revenue Forecasting Practices: Accuracy, Transparency and Political Acceptance

Emily Franklin
Georgia State University

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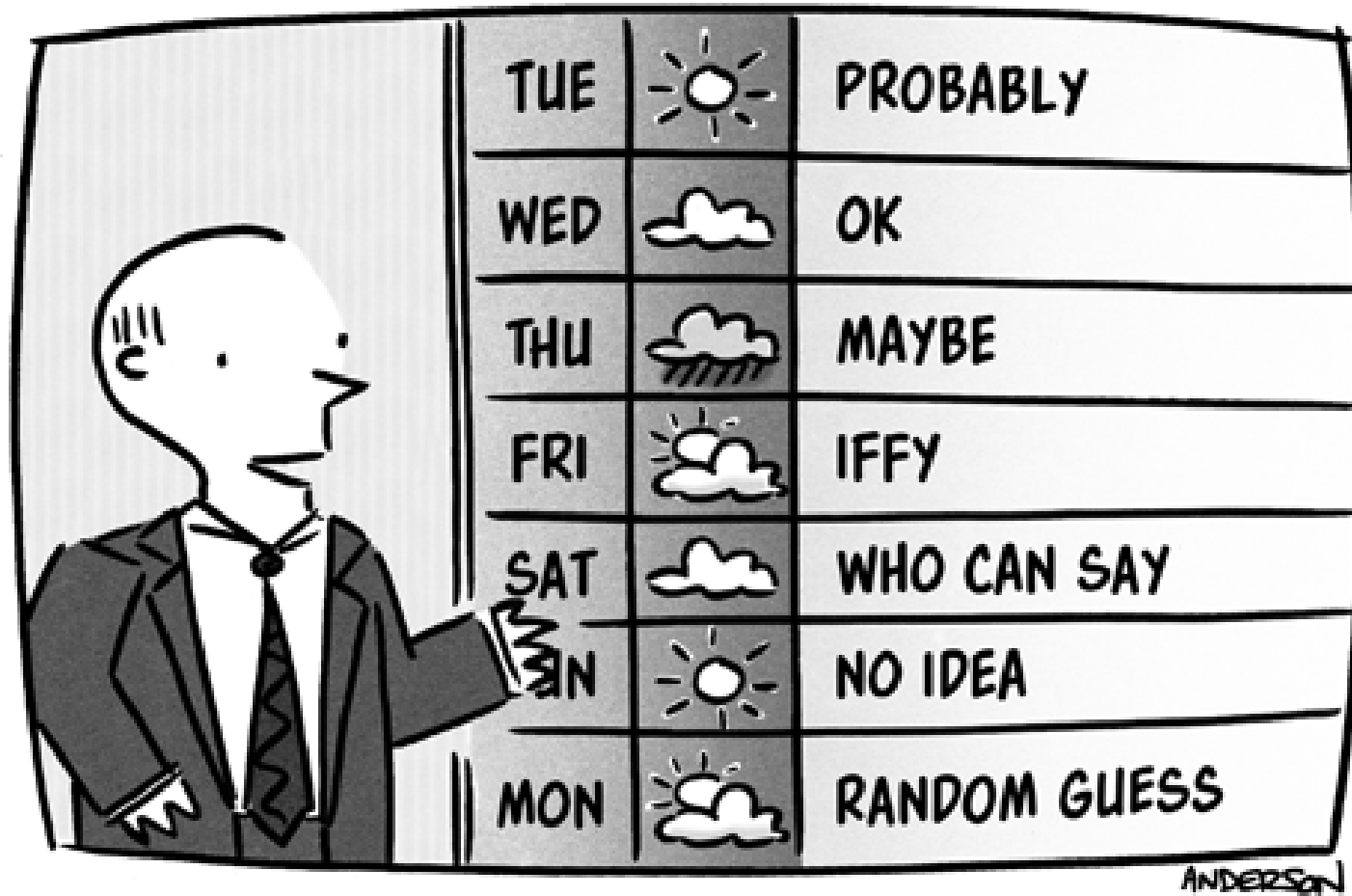
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September 28, 2017

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FINANCE

Emily Franklin
Center for State and Local Finance

Revenue Forecasting Practices: Accuracy, Transparency and Political Acceptance



"And now the 7-day forecast..."

Why is revenue forecasting important?

- In a balanced budget environment, the revenue estimate constrains expenditures
- Accuracy is difficult to achieve
- A key element of fiscal discipline is that political actors accept and abide by the revenue estimate
- Theoretically, transparency keeps forecasters accountable for accurate and politically acceptable forecasts

Literature Review

- Accuracy
 - Academic literature supports combining forecasts and using independent experts to increase accuracy in forecasts
 - The verdict is still out on consensus forecasting
 - Survey data show some states adopt consensus forecasts to increase accuracy*
- Transparency
 - Government Finance Officers' Association (GFOA) and others recommend disclosing the macroeconomic trends (GDP, inflation, etc.) that underpin the forecast
- Political Acceptance
 - A number of authors recommend consensus forecasting to reduce political contention
 - 28 states have adopted consensus forecasting

* Qiao, Yuhua. Use of Consensus Revenue Forecasting in U.S. State Governments. In *Government Budget Forecasting: Theory and Practice*. ed. Jinping Sun and Thomas D. Lynch. 142: 393-413. Boca Raton, FL: CRC Press.

Research Questions

- What are the forecasting processes used in the states?
- How accurate are the revenue forecasts?
- How transparent are states in supporting their forecast methodology?
- Is there any obvious relationship between the forecasting process, accuracy, transparency, and political acceptance?
- What does the contextual detail around revenue forecasting practices tell us about assessing forecasting accuracy, transparency, and political acceptance?

Methods

- Volcker Alliance data on revenue forecasting processes, revenue growth projection rationales, and midyear budget adjustments
 - Includes rich contextual detail on forecasting practices for five states (GA, NC, SC, MD and VA)
- Additional research
 - National Association of Budget Officers (NASBO) *Fiscal Survey of the States* data: used to calculate forecasting error

Forecasting Processes

- Three types of forecasting processes: separate, executive and consensus
- Forecasting processes (especially consensus forecasts) vary widely
- **In North Carolina**, the lead executive and legislative economists get together to informally agree on an estimate
- **In Virginia**, there are two groups, a staff group that looks at methodology and a political group that reviews the forecast and overall economic climate
- **In Florida**, there are a series of conferences around estimating different elements of the expenditure and revenue forecasts

Accuracy

Accuracy of Consensus States

All States

Mean Absolute Percent Error = 4%

Median Absolute Percent Error = 2.5%

Consensus States

Mean Absolute Percent Error = 3.6%

Median Absolute Percent Error = 2.5%

*FY17 numbers are based on estimated actuals.

**FY17 midyear adjustment data not included because FY17 was ongoing at time of data collection.

Table 1. Did the state need to make a meaningful midyear budget adjustment?

State	FY15 Percent Error	FY15 Midyear Adjustment?	FY16 Percent Error	FY16 Midyear Adjustment?	FY17 Percent Error	State Percent Error	State Absolute Percent Error
CONSENSUS							
Connecticut	-1.0%	Yes	-2.3%	Yes	0.1%	-1.1%	1.1%
Delaware	0.2%		0.2%		-2.5%	-0.7%	0.9%
Florida	1.4%		-0.6%		0.5%	0.4%	0.8%
Hawaii	5.7%		4.0%		-2.2%	2.5%	4.0%
Indiana	0.3%		-1.0%		-2.0%	-0.9%	1.1%
Iowa	-0.4%		-3.7%		-3.5%	-2.6%	2.6%
Kansas	-0.8%	Yes	-8.6%	Yes	-8.6%	-6.0%	6.0%
Kentucky	1.3%		2.8%		0.0%	1.3%	1.3%
Louisiana	-3.0%	Yes	-8.6%	Yes	0.0%	-3.9%	3.9%
Maine	2.5%		1.3%		2.3%	2.0%	2.0%
Maryland	-0.4%	Yes	-0.8%	No	-2.5%	-1.2%	1.2%
Massachusetts	0.3%	Yes	-0.4%	No	0.9%	0.3%	0.6%
Michigan	3.7%	Yes	1.3%	No	0.4%	1.8%	1.8%
Mississippi	1.4%	No	0.7%	Yes	3.2%	1.8%	1.8%
Missouri	1.4%		1.3%		-3.0%	-0.1%	1.9%
Nebraska	2.0%	No	-3.9%	Yes	-3.1%	-1.7%	3.0%
Nevada	-1.7%	Yes	4.9%	No	4.5%	2.6%	3.7%
New Mexico	-0.1%	No	-10.4%	Yes	-7.9%	-6.1%	6.1%
New York	7.3%		2.0%		-1.5%	2.6%	3.6%
North Carolina	2.1%		2.2%		-0.3%	1.4%	1.5%
Rhode Island	4.1%		3.3%		1.2%	2.8%	2.8%
South Carolina	4.3%		3.1%		0.0%	2.5%	2.5%
Tennessee	4.0%		7.0%		4.3%	5.1%	5.1%
Utah	7.3%		2.4%		0.0%	3.2%	3.2%
Vermont	-0.3%	Yes	0.4%	Yes	-0.2%	0.0%	0.3%
Virginia	-4.9%	Yes	0.9%	No	-2.7%	-2.2%	2.8%
Washington	2.7%		3.2%		2.5%	2.8%	2.8%
Wyoming	-17.0%		-77.1%		-2.9%	-32.3%	32.3%
Mean	0.8%		-2.7%		-0.8%	-0.9%	3.6%
Median	1.3%		0.8%		-0.1%	0.4%	2.5%

Accuracy of Executive States

Table 1. Did the state need to make a meaningful midyear budget adjustment?

State	FY15 Percent Error	FY15 Midyear Adjustment?	FY16 Percent Error	FY16 Midyear Adjustment?	FY17 Percent Error	State Percent Error	State Absolute Percent Error
EXECUTIVE							
Alaska	-50.1%	Yes	-43.2%	Yes	13.9%	-26.5%	35.7%
Arkansas	0.2%		3.4%		0.0%	1.2%	1.2%
Georgia	3.5%	Yes	6.9%	Yes	1.7%	4.0%	4.0%
Minnesota	3.6%	No	1.2%	Yes	-0.8%	1.4%	1.9%
North Dakota	2.1%	No	-31.3%	Yes	-0.5%	-9.9%	11.3%
Oklahoma	-2.0%	Yes	-9.1%	Yes	-5.5%	-5.5%	5.5%
Oregon	2.4%		-2.1%		0.9%	0.4%	1.8%
Texas	4.9%		-5.9%		-4.6%	-1.9%	5.1%
West Virginia	-1.4%	Yes	-4.6%	Yes	0.0%	-2.0%	2.0%
Mean	-4.1%		-9.4%		0.6%	-4.3%	7.6%
Median	2.1%		-4.6%		0.0%	-1.9%	4.0%

*FY17 numbers are based on estimated actuals
 **FY17 midyear adjustment data not included because FY17 was ongoing at time of data collection

All States

Mean Absolute Percent Error = 4%
 Median Absolute Percent Error = 2.5%

Executive States

Mean Absolute Percent Error = **7.6%**
 Median Absolute Percent Error = **4%**

Accuracy of Separate States

All States

Mean Absolute Percent Error = 4%
Median Absolute Percent Error = 2.5%

Separate States

Mean Absolute Percent Error = 2.3%
Median Absolute Percent Error = 2.1%

Table 1. Did the state need to make a meaningful midyear budget adjustment?							
State	FY15 Percent Error	FY15 Midyear Adjustment?	FY16 Percent Error	FY16 Midyear Adjustment?	FY17 Percent Error	State Percent Error	State Absolute Percent Error
SEPARATE							
Alabama	-0.2%		-0.7%		0.3%	-0.2%	0.4%
Arizona	2.1%		6.7%		1.1%	3.3%	3.3%
California	6.0%		0.4%		-1.3%	1.7%	2.6%
Colorado	2.1%	No	-2.8%	Yes	0.9%	0.0%	1.9%
Idaho	3.2%		2.0%		1.1%	2.1%	2.1%
Illinois	-0.4%	Yes	N/A	Yes	-1.6%	-0.7%	0.7%
Montana	2.9%	No	-6.7%	Yes	-5.8%	-3.2%	5.1%
New Hampshire	-2.2%		6.4%		4.8%	3.0%	4.5%
New Jersey	1.7%	Yes	-2.1%	No	-0.7%	-0.4%	1.5%
Ohio	2.3%		-2.6%		-2.9%	-1.1%	2.6%
Pennsylvania	5.6%	No	N/A	Yes	-5.0%	0.2%	3.6%
South Dakota	-0.8%		0.3%		-1.7%	-0.7%	0.9%
Wisconsin	-1.2%	Yes	-0.7%	No	-1.0%	-1.0%	1.0%
Mean	1.6%		0.0%		-0.9%	0.2%	2.3%
Median	2.1%		-0.7%		-1.0%	-0.2%	2.1%
TOTAL							
Mean	0.1%		-3.2%		-0.6%	-1.2%	4.0%
Median	1.4%		0.2%		-0.2%	0.0%	2.5%

*FY17 numbers are based on estimated actuals

**FY17 midyear adjustment data not included because FY17 was ongoing at time of data collection

Accuracy Results

- Average forecast error (4%) is slightly bigger than 3.3% error rate reported in other research*
- There does not appear to be a relationship between accuracy and consensus forecasts for the time period studied (FY15, FY16, and FY17)
- However, the wide variation in how the forecast is used makes it difficult to assess accuracy
- The revenue forecast is not always the same as what the state anticipates it will receive in revenues
- We found several examples where forecast appeared to be used as a policy lever

*Boyd, Donald J. and Lucy Dadayan. 2014. State Tax Revenue Forecasting Accuracy. Rockefeller Institute.

Example of Policy-Influenced Forecast

- “Given that Governor Nathan Deal has publicly committed to rebuilding Georgia’s revenue shortfall reserves to over \$2 billion before he leaves office and given this pre-commitment of part of the reserve to K-12 education, by extension, the state’s revenue estimates must reflect an **implicit policy choice to low-ball the revenue estimates** which then allows the state to both recoup the funds allocated through the K-12 reserve and also to rebuild the overall Revenue Shortfall Reserve.
- In sum, the revenue estimate is not a formal estimate in the sense of showing methodology and actual projections of anticipated revenues; **instead, the revenue estimate proposed in the Governor’s Budget Report reflects the amount that the Governor wants to spend.**”

Georgia appears to low-ball its estimate to rebuild its Rainy Day Fund

*Georgia Question 4 Response, Georgia State University, Volcker Alliance’s 2016-2017 “Truth and Integrity in Government Finance” (Report forthcoming)

Virginia FY15/FY16 Biennium Budget

	First Year	Second Year	Total
Unreserved Balance, June 30, 2014	\$478,643,378	\$0	\$478,643,378
	\$40,843,378		\$40,843,378
Additions to Balance	\$147,375,013	\$800,000	\$148,175,013
	\$303,725,013		\$304,525,013
Official Revenue Estimates	\$17,721,905,909	\$18,448,628,910	\$36,170,534,819
	\$16,874,405,909	\$17,317,328,910	\$34,191,734,819
Revenue Stabilization Fund	\$470,000,000	\$235,000,000	\$705,000,000
Transfers	\$616,168,307	\$524,066,980	\$1,140,235,287
	\$588,118,307	\$555,066,980	\$1,143,185,287
Total General Fund Resources Available for Appropriation	\$18,964,092,607	\$18,973,495,890	\$37,937,588,497
	\$18,277,092,607	\$18,108,195,890	\$36,385,288,497

Virginia used an inaccurate revenue forecast to access the Rainy Day Fund

The state was able to access \$705 million to help build the budget

Transparency

Transparency of Consensus States

All States

Mean Absolute Percent Error = 4%

Median Absolute Percent Error = 2.5%

Consensus States

Mean Absolute Percent Error = 3.6%

Median Absolute Percent Error = 2.5%

*FY17 numbers are based on estimated actuals

State	FY15 Percent Error	FY15 Reasonable Rationale?	FY16 Percent Error	FY16 Reasonable Rationale?	FY17 Percent Error	FY17 Reasonable Rationale?	State Percent Error	State Absolute Percent Error
CONSENSUS								
Connecticut	-1.0%		-2.3%		0.1%		-1.1%	1.1%
Delaware	0.2%		0.2%		-2.5%		-0.7%	0.9%
Florida	1.4%		-0.6%		0.5%		0.4%	0.8%
Hawaii	5.7%		4.0%		-2.2%		2.5%	4.0%
Indiana	0.3%		-1.0%		-2.0%		-0.9%	1.1%
Iowa	-0.4%	No	-3.7%	No	-3.5%	No	-2.6%	2.6%
Kansas	-0.8%	No	-8.6%	No	-8.6%	No	-6.0%	6.0%
Kentucky	1.3%		2.8%		0.0%		1.3%	1.3%
Louisiana	-3.0%		-8.6%		0.0%		-3.9%	3.9%
Maine	2.5%		1.3%		2.3%		2.0%	2.0%
Maryland	-0.4%		-0.8%		-2.5%		-1.2%	1.2%
Massachusetts	0.3%		-0.4%		0.9%		0.3%	0.6%
Michigan	3.7%		1.3%		0.4%		1.8%	1.8%
Mississippi	1.4%		0.7%		3.2%		1.8%	1.8%
Missouri	1.4%	No	1.3%	No	-3.0%	No	-0.1%	1.9%
Nebraska	2.0%		-3.9%		-3.1%		-1.7%	3.0%
Nevada	-1.7%		4.9%		4.5%		2.6%	3.7%
New Mexico	-0.1%		-10.4%		-7.9%		-6.1%	6.1%
New York	7.3%		2.0%		-1.5%		2.6%	3.6%
North Carolina	2.1%		2.2%		-0.3%		1.4%	1.5%
Rhode Island	4.1%		3.3%		1.2%		2.8%	2.8%
South Carolina	4.3%		3.1%		0.0%		2.5%	2.5%
Tennessee	4.0%		7.0%		4.3%		5.1%	5.1%
Utah	7.3%		2.4%		0.0%		3.2%	3.2%
Vermont	-0.3%		0.4%		-0.2%		0.0%	0.3%
Virginia	-4.9%	No	0.9%	Yes	-2.7%	Yes	-2.2%	2.8%
Washington	2.7%		3.2%		2.5%		2.8%	2.8%
Wyoming	-17.0%		-77.1%		-2.9%		-32.3%	32.3%
Mean	0.8%		-2.7%		-0.8%		-0.9%	3.6%
Median	1.3%		0.8%		-0.1%		0.4%	2.5%

Transparency of Executive States

Table 2. Did the state have a reasonable rationale for revenue growth projections?

State	FY15 Percent Error	FY15 Reasonable Rationale?	FY16 Percent Error	FY16 Reasonable Rationale?	FY17 Percent Error	FY17 Reasonable Rationale?	State Percent Error	State Absolute Percent Error
EXECUTIVE								
Alaska	-50.1%		-43.2%		13.9%		-26.5%	35.7%
Arkansas	0.2%		3.4%		0.0%		1.2%	1.2%
Georgia	3.5%	No	6.9%	No	1.7%	No	4.0%	4.0%
Minnesota	3.6%		1.2%		-0.8%		1.4%	1.9%
North Dakota	2.1%		-31.3%		-0.5%		-9.9%	11.3%
Oklahoma	-2.0%		-9.1%		-5.5%		-5.5%	5.5%
Oregon	2.4%		-2.1%		0.9%		0.4%	1.8%
Texas	4.9%		-5.9%		-4.6%		-1.9%	5.1%
West Virginia	-1.4%		-4.6%		0.0%		-2.0%	2.0%
Mean	-4.1%		-9.4%		0.6%		-4.3%	7.6%
Median	2.1%		-4.6%		0.0%		-1.9%	4.0%

*FY17 numbers are based on estimated actuals

All States

Mean Absolute Percent Error = 4%

Median Absolute Percent Error = 2.5%

Executive States

Mean Absolute Percent Error = 7.6%

Median Absolute Percent Error = 4%

Transparency of Separate States

All States

Mean Absolute
Percent Error = 4%

Median Absolute
Percent Error = 2.5%

Separate States

Mean Absolute
Percent Error = 2.3%

Median Absolute
Percent Error = 2.1%

*FY17 numbers are
based on estimated
actuals

State	FY15 Percent Error	FY15 Reasonable Rationale?	FY16 Percent Error	FY16 Reasonable Rationale?	FY17 Percent Error	FY17 Reasonable Rationale?	State Percent Error	State Absolute Percent Error
SEPARATE								
Alabama	-0.2%	No	-0.7%	No	0.3%	No	-0.2%	0.4%
Arizona	2.1%		6.7%		1.1%		3.3%	3.3%
California	6.0%		0.4%		-1.3%		1.7%	2.6%
Colorado	2.1%		-2.8%		0.9%		0.0%	1.9%
Idaho	3.2%		2.0%		1.1%		2.1%	2.1%
Illinois	-0.4%	Yes	N/A	No	-1.6%	No	-0.7%	0.7%
Montana	2.9%		-6.7%		-5.8%		-3.2%	5.1%
New Hampshire	-2.2%		6.4%		4.8%		3.0%	4.5%
New Jersey	1.7%		-2.1%		-0.7%		-0.4%	1.5%
Ohio	2.3%		-2.6%		-2.9%		-1.1%	2.6%
Pennsylvania	5.6%		N/A		-5.0%		0.2%	3.6%
South Dakota	-0.8%		0.3%		-1.7%		-0.7%	0.9%
Wisconsin	-1.2%		-0.7%		-1.0%		-1.0%	1.0%
Mean	1.6%		0.0%		-0.9%		0.2%	2.3%
Median	2.1%		-0.7%		-1.0%		-0.2%	2.1%

Transparency Results

- Most states include macroeconomic trends in their forecasting documents in a general way
- *There does not appear to be a relationship between transparency in the forecast and accuracy for the time period studied*

For example:

- **Alabama** does not disclose macroeconomic trends used at all, but had a **0.4%** mean absolute percent error
- **Hawaii** describes macroeconomic trends – earned a **4%** mean absolute percent error overall

Arkansas Assumptions

	ECONOMIC ASSUMPTIONS			FY 2017			FY 2018			FY 2019		
U.S. GDP	U.S. GDP Nominal (Billion \$)	18,970.9	696.8	3.8	19,882.6	911.8	4.8	20,785.9	903.3	4.5		
	U.S. GDP Real (Billions 2009\$ Chain-Weight)	16,847.0	333.6	2.0	17,263.1	416.1	2.5	17,684.2	421.2	2.4		
	U.S. GDP Deflator (Chain-Wt, 2009=100)	112.6	1.9	1.8	115.2	2.6	2.3	117.5	2.4	2.1		
	U.S. CPI Price Index (1984=100)	243.1	4.8	2.0	248.4	5.3	2.2	253.5	5.2	2.1		
Consumer Price Index	OIL - Avg. Dom. Crude to Refinery (\$ per barrel)	50.2	8.1	19.3	52.9	2.7	5.4	56.6	3.8	7.1		
	AR. Net General Revenue (Million \$)	5,941.8	-74.0	-1.2	6,170.0	228.2	3.8	6,372.3	202.3	3.3		
	AR. Net GR % of Non-Farm Personal Income	5.0	-0.3	-4.9	5.0	0.0	-0.8	4.9	-0.1	-1.8		
	AR. Non-Farm Personal Income (Million \$)	118,704.2	4,374.8	3.8	124,304.5	5,600.2	4.7	130,696.7	6,392.2	5.1		
	AR. Wage & Salary Disbursements (Million \$)	56,206.3	2,460.4	4.6	59,094.3	2,888.0	5.1	62,213.8	3,119.5	5.3		
	AR. Non-Farm Proprietor Income (Million \$)	7,437.7	316.1	4.4	7,852.1	414.4	5.6	8,184.1	332.0	4.2		
	AR. Per Capita Income (\$)	39,977.7	1,181.6	3.0	41,587.9	1,610.2	4.0	43,491.4	1,903.6	4.6		
	AR. GDP Nominal (Million \$)	125,061.0	4,214.0	3.5	130,651.3	5,590.3	4.5	136,173.5	5,522.2	4.2		
	AR. Employment Total Payroll (Thousands)	1,234.2	12.7	1.0	1,250.5	16.3	1.3	1,262.8	12.3	1.0		
	AR. Employment Private Sector (Thousands)	1,020.8	12.5	1.2	1,037.5	16.7	1.6	1,048.6	11.1	1.1		
	AR. Employment Manufacturing (Thousands)	153.3	-1.0	-0.7	154.5	1.3	0.8	156.5	2.0	1.3		
	AR. New Car/Light Truck registrations (Thous.)	142.8	3.0	2.2	139.7	-3.1	-2.2	138.6	-1.1	-0.8		
Arkansas Personal Income	AR. Retail Sales (Million \$)	41,590.1	1,570.7	3.9	43,139.6	1,549.5	3.7	45,157.6	2,018.0	4.7		

Florida Assumptions

NEW CONSTRUCTION

Estimates of new construction linked to Ad Valorem Tax estimate

	HS	RES		NRES	INDEX	
		NHS	TOT		RES	NRES
2001	10,083,127,719	9,054,924,561	19,138,052,280	8,000,444,059	0.75	1.16
2002	11,066,007,675	10,159,274,618	21,225,282,293	8,059,301,975	0.83	1.17
2003	13,576,308,317	11,988,648,390	25,564,956,707	6,897,989,514	1.00	1.00
2004	14,943,768,089	12,938,545,100	27,882,313,189	6,410,269,849	1.09	0.93
2005	17,114,557,824	18,162,103,629	35,276,661,453	6,668,978,051	1.38	0.97
2006	21,361,551,567	27,683,996,680	49,045,548,247	7,716,614,432	1.92	1.12
2007	19,566,621,443	39,029,269,625	58,595,891,068	7,919,223,465	2.29	1.15
2008	13,211,569,831	29,278,085,095	42,489,654,926	10,908,424,491	1.66	1.58
2009	7,213,242,351	16,138,130,288	23,351,372,639	12,302,872,178	0.91	1.78
2010	4,596,249,770	6,708,716,593	11,304,966,363	12,112,811,708	0.44	1.76
2011	4,105,722,733	4,397,367,531	8,503,090,264	7,007,444,164	0.33	1.02
2012	4,154,683,410	4,554,168,564	8,708,851,974	4,786,787,122	0.34	0.69
2013	5,256,044,129	4,405,092,445	9,661,136,574	5,404,007,197	0.38	0.78
2014	7,503,864,505	6,772,904,393	14,276,768,898	5,992,895,236	0.56	0.87
2015	8,962,353,134	9,431,139,634	18,393,492,768	9,485,718,845	0.72	1.38
2016	10,863,406,777	12,652,760,553	23,516,167,330	9,877,207,409	0.92	1.43
2017	11,780,391,165	15,864,341,100	27,644,732,265	11,934,025,877	1.08	1.73
2018			32,636,393,358	11,383,792,734	1.28	1.65
2019			34,422,188,701	11,620,131,170	1.35	1.68
2020			36,132,485,383	11,694,808,774	1.41	1.70
2021			38,382,483,383	11,943,367,741	1.50	1.73
2022			41,006,053,834	12,412,280,577	1.60	1.80
2023			43,687,996,517	12,929,896,064	1.71	1.87

Virginia Calculation

Individual Income Tax - Withholding

Equation to calculate predicted value of withholding tax receipts

$$\text{diffya(with)} = 0.00616 * \text{diffya(ywstran)} + 39.7988$$

(3.58883) (2.67087)

Sum Sq	120278	Std Err	52.8883	LHS Mean	87.4778
R Sq	02216	R Bar Sq	0.1673	F 3, 43	4.0815
D.W.(1)	2.1104	D.W.(4)	1.9792		

Quarterly data for 47 periods from 2005Q1 to 2016Q3

Past Income

diffya with ywstran

Year-over-year difference function
Withholding tax receipts
Virginia income from wages and salaries and transfer payments

Political Acceptance

Political Acceptance

- For the five states we looked at in depth (GA, SC, NC, VA and MD), we tracked the forecast through the budget process and various documents produced
 - Executive and legislature both built budgets off of revenue forecast; no unexpected changes.
- Review of question responses by other staff on Volcker Alliance project – no one observed contention around the forecast

Political Acceptance (continued)

- Could be that consensus forecast was adopted to reduce contention around the forecast; could be that years we looked at were not particularly contentious
- However, no evidence that revenue estimate was disputed during FY15, FY16 and FY17.

Conclusions

- Most states have a consensus forecast, but these processes vary widely
- The relationship between consensus forecasts and accuracy and transparency is difficult to determine
- Forecasts sometimes do not truly reflect what the state anticipates receiving in revenues
- Researchers should be aware that forecasts exist within institutional frameworks that can affect their accuracy