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Joint Legislative Audit and Review Commission



**Review of Virginia's General Fund  
Revenue Forecasting Process**

JLARC Subcommittee Briefing

November 20, 2006



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# In This Presentation

- Background
- Performance of Virginia Forecasts
- Is There a Better Process?
- Enhancing Virginia's Process



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## Study Mandate

- In a July 24, 2006 letter, Delegate Callahan requested JLARC review Virginia's forecasting process
  - Verify role of advisory boards
  - Consider how greater legislative oversight can be achieved
  - Determine feasibility of General Assembly revenue forecasting unit
  - Report due November 2006
- Special report on sales tax errors, also requested by Del. Callahan, released August 23

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# Prior Reviews

- 1991 JLARC report found Department of Taxation's forecasting models basically sound:
  - "Although some error is inevitable, the revenue forecasts for FYs 1990-92 were unusually far off"
  - Recommended monthly revenue reports, including forecast accuracy (implemented). General Assembly also took action on revenue stabilization fund.
- 1998-99 Commission on the Commonwealth's Planning and Budget Process reviewed Virginia revenue forecasting
  - Concluded legislative revenue forecasting unit not appropriate at that time
  - Recommended JLARC be given resources to conduct fiscal impact reviews and report on State spending, major budget drivers

## Prior Reviews (continued)

- 2002 JLARC report reiterated findings:
  - Some forecasting error inevitable
  - Models and process still basically sound
  - Virginia has safeguards against revenue shortfalls
    - Revenue stabilization fund
    - Annual budget adjustments
- 2005 Government Performance Project gave Virginia an “A” for managing money (with only two other states)
  - GPP credited Virginia’s forecasting process as a strength, noting “fairly accurate estimates, except in 2004”
  - Both legislative and executive branches “have shown real interest in budget planning,” according to GPP

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## 2006 Review by Moody's/Economy.com Recommended Improvements

- Concluded that the revenue estimating process “is a sound one, generating forecasts that are relatively accurate given Virginia’s mix of tax instruments.”
- However, when compared to all states, Virginia was ranked in the group having the second largest forecasting errors
  - Virginia’s overall absolute percentage forecast error was 6.7%; 50-state average was 4.6%
- Study identifies three areas for improvement:
  - Continue analysis of alternative structures for individual revenue equations by Dept. of Taxation
  - Automate adjustments to the baseline forecast
  - Add a formal quantitative analysis of trend growth rates

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# Forecasting Process

- Governor, Secretary of Finance oversee process. Two groups participate annually:
  - Governor's Advisory Board of Economists (GABE – meets in October)
  - Governor's Advisory Council on Revenue Estimates (GACRE – meets in November)
- Statutes assign TAX to provide staff support
- 2003 statute added provision for July re-estimate if prior-year general fund collections fell below forecast by one percent or more

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## Advisory Boards Play Limited Roles

- Statutes direct GABE to “review economic assumptions and technical econometric methodology”
  - Current process solicits economists’ opinions on economic assumptions, but stops short of reviewing methodology or selecting revenue forecast
- GACRE statutorily directed to review “economic assumptions and the general economic climate” of the Commonwealth
  - Participants generally comment on assumptions and economic climate
- Legislative role continues to be very limited
  - “Minimal role” noted in 1991 and 1998 reports

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# Varying FY 2006 Forecasts

<b>Date</b>	<b>Source</b>	<b>Forecast (\$ millions)</b>
Nov. 2003	GACRE Notebook	\$12,779.70
Dec. 2003	2004 HB/SB 30	13,234.60
June 2004	2004 Chapter 4	13,093.40
Nov. 2004	GACRE Notebook	13,510.20
Dec. 2004	2005 HB/SB 1500	13,441.80
Feb. 2005	2005 Chapter 951	13,313.50
Nov. 2005	GACRE Notebook	13,948.80
Dec. 2005	2006 HB/SB 29	14,527.80
Feb. 2006	Mid-Session Update	14,704.90
June 2006	2006 Chapter 2	14,687.30
	Actual FY 2006 Revenues	14,843.30



# The Further Out the Forecast, the Greater the Error

<b>Forecast Horizon*</b>	<b>Error Rate (Absolute Mean)</b>	<b>Range of Errors (Lowest and Highest)</b>
3-Month	1.2%	-2.7% to 4.0%
6-Month	2.2%	-4.8% to 5.8%
14-Month	4.4%	-14.2% to 10.3%
18-Month	6.3%	-14.2% to 9.4%
26-Month	6.8%	-21.2% to 11.7%
30-Month	9.0%	-20.1% to 13.4%

\* The forecasts at 3, 14, and 26 month horizons occur approximately that many months prior to the end of the fiscal year being forecast due to different dates for passage of the respective Appropriation Acts. Forecasts at 6, 18, and 30 months are the December forecasts (appearing in the Budget Bills) that many months prior to the end of the fiscal year being forecast.

Source: JLARC staff analysis of 1981-2006 Appropriation Acts and Department of Taxation data.

# Private Sector Forecasting Faces Similar Challenges

## Private Sector Forecasting Performance (percent)

	July '04 Performance Forecast <sup>1</sup>	Actual Performance	Absolute Error	June '05 Performance Forecast <sup>2</sup>	Actual Performance	Absolute Error
GDP (Q1-Q3)	4.4%	3.9%	13%	3.6%	3.7%	3%
CPI (Nov)	2.9	3.5	17	2.8	3.5	20
Unemployment (Nov)	5.3	5.4	2	5.1	5.0	2

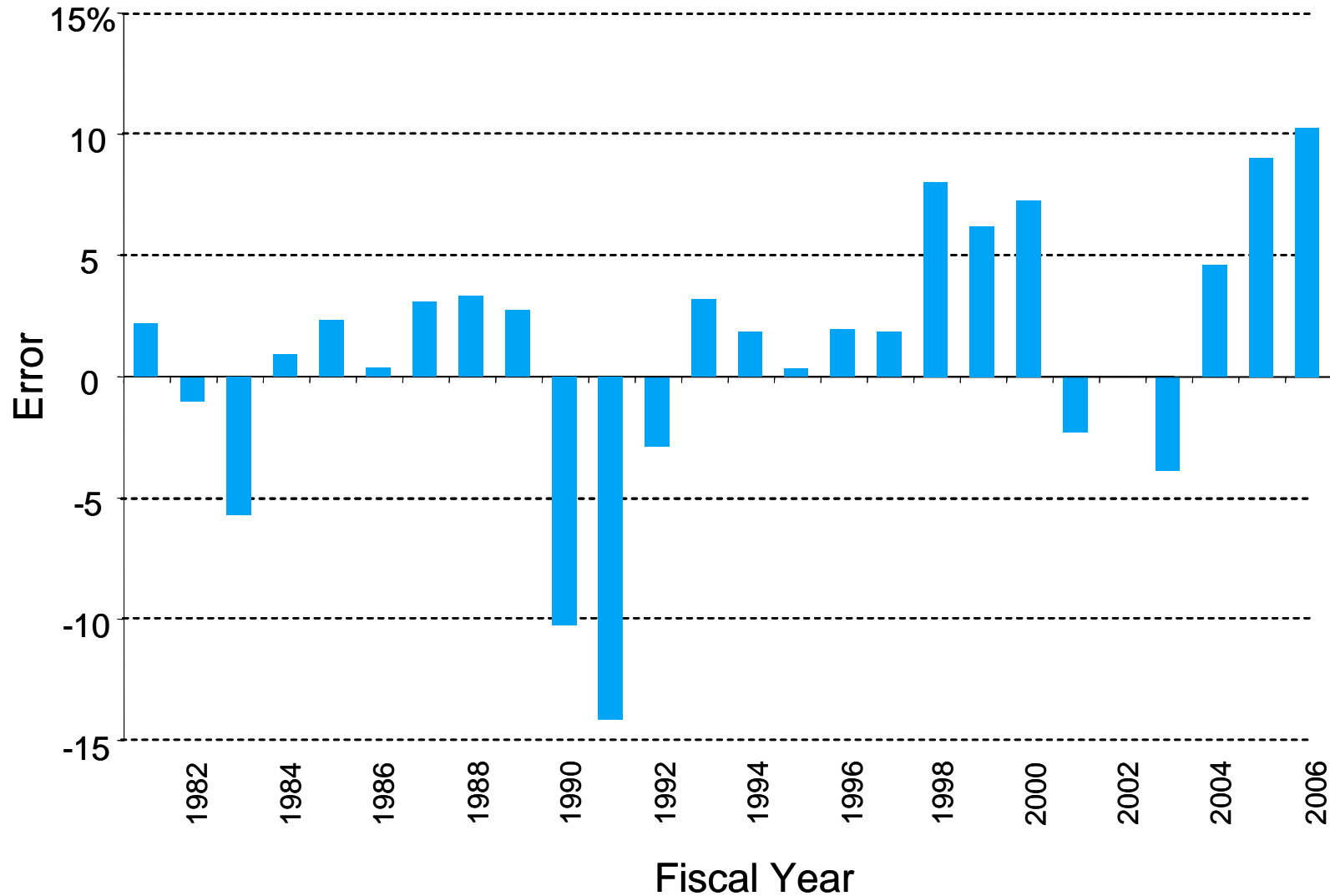
Source: Wall Street Journal, January 2005 and January 2006. 55 forecasters polled in each year.

<sup>1</sup> July 2004 forecast of 2004 indicators. Actual performance reported December 31, 2004.

<sup>2</sup> June 2005 forecast of 2005 indicators. Actual performance reported December 31, 2005.



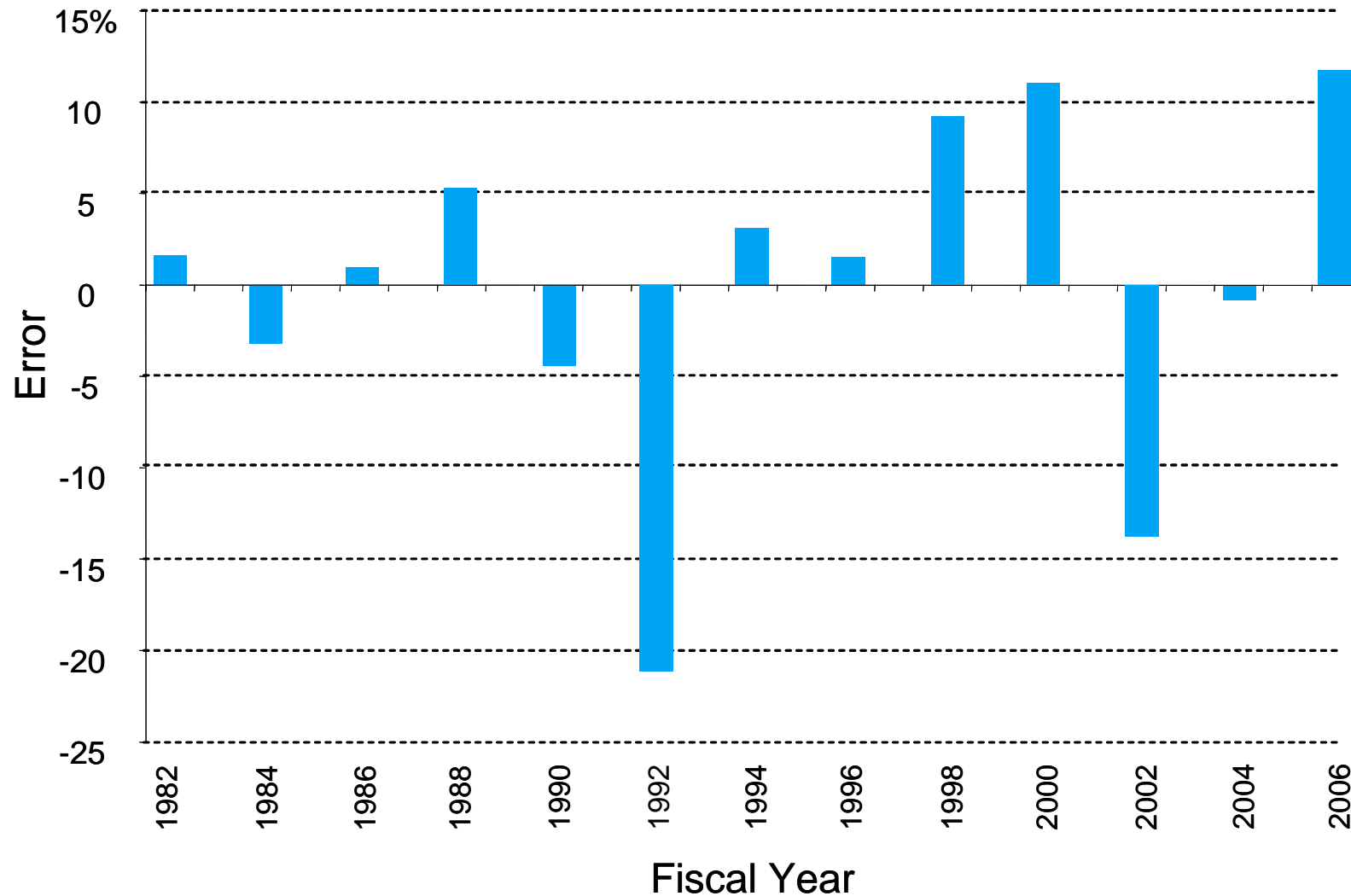
## Virginia 14-Month Forecast Error, 1981 -2006 (Average Absolute Error = 4.4%)



Source: JLARC staff analysis of forecasts from Appropriation Acts and actual collections.



## Virginia 26-Month Forecast Error, 1982 -2006 (Average Absolute Error = 6.8%)



Source: JLARC staff analysis of forecasts from Appropriation Acts and actual collections.



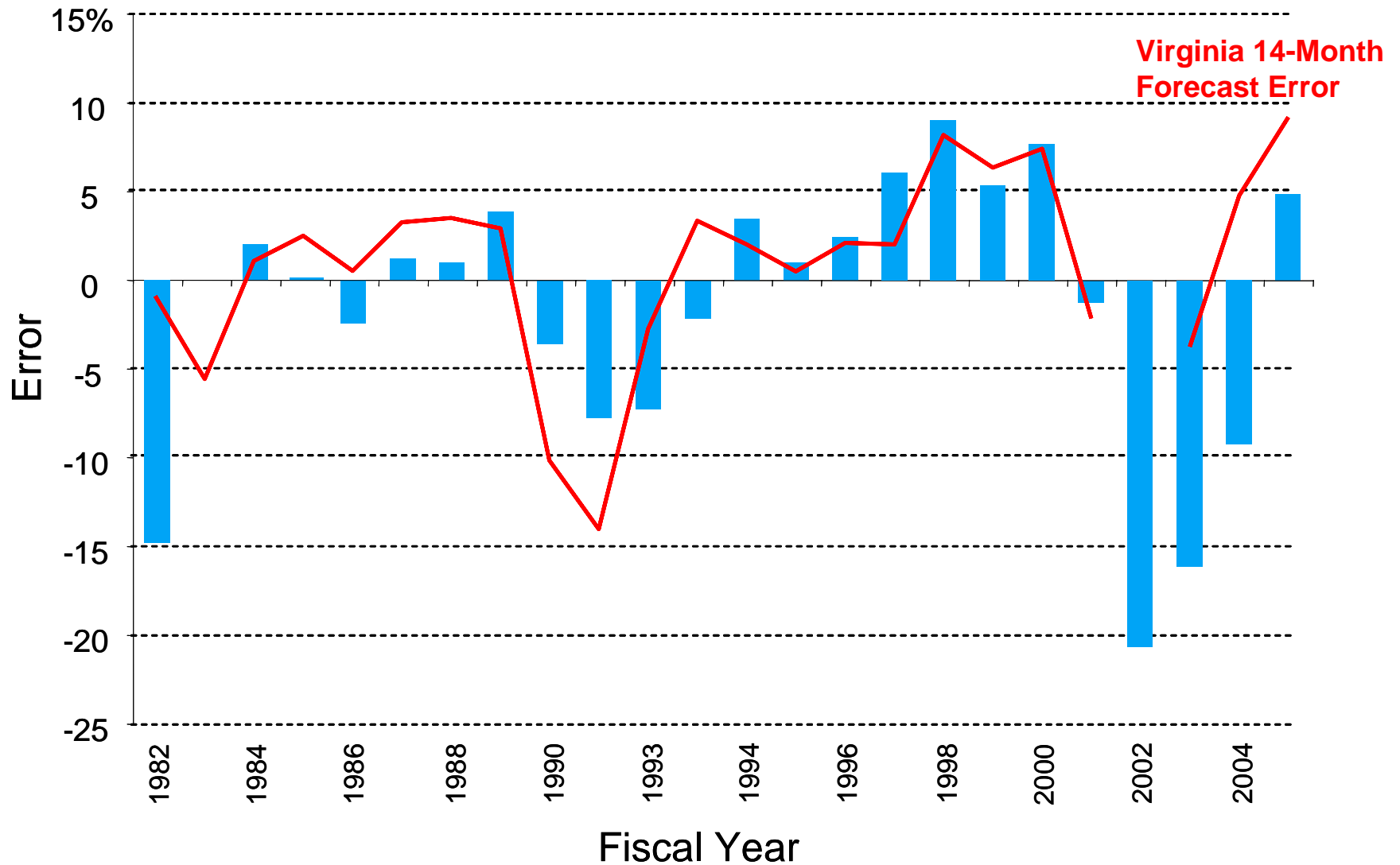
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## Virginia's One-Year Forecasts More Accurate Than Federal Government's

- Virginia's average absolute percent error is smaller than federal government's
- Virginia's FY 2005 forecast error was larger than federal government's for FY 2005
- Federal government had unusually large negative forecast errors for FYs 2002, 2003 and 2004; Virginia did not in FYs 2003 and 2004, but did for FY 2002

# CBO One-Year Forecast Error, 1982-2005

(Average Absolute Error = 5.8%)

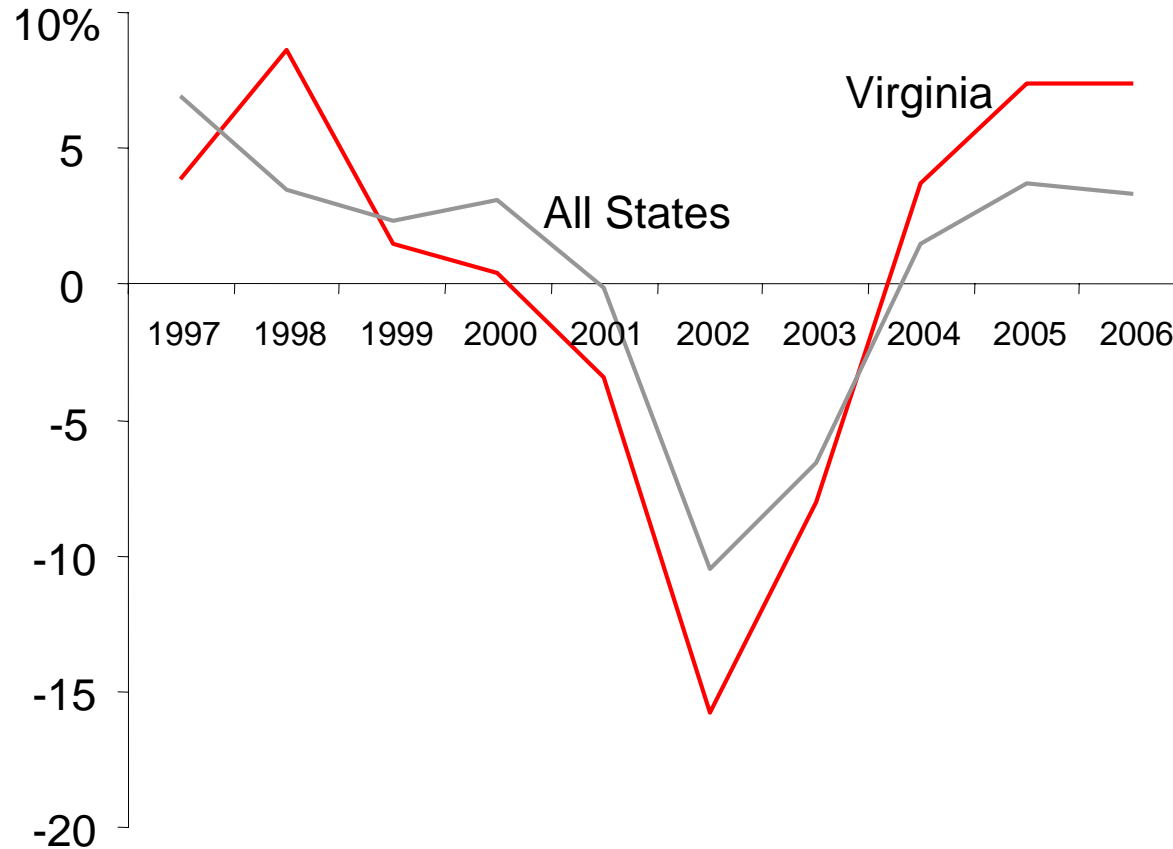


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# Cross-State Comparison

- National Association of State Budget Officers (NASBO) annually surveys all states
  - Compares projections used in adopting state budgets with “current estimates” of actual collections, for recently completed fiscal years
  - NASBO collects data on state forecasts for tax revenues from:
    - personal income
    - corporate income
    - sales
- NASBO survey results allow comparison of forecast accuracy of three major revenue sources across states

# Virginia's Forecast Error Exceeded 50-State Average Since 2001



Note: Forecasts of personal and corporate income taxes and sales taxes.

Source: NASBO. Negative percentage means actual revenue was less than forecasted revenue.

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# Virginia Ranked High Among the 50 States in Forecasting Error for Major Revenue Sources

- In terms of the absolute percent forecast error, Virginia ranked:
  - 9th highest in FY 2006
  - 16th highest in FY 2005
  - 4th highest in FY 2004
- Much of the error is attributed to:
  - Virginia's more complex economy
  - Corporate income tax revenues
  - Nonwithholding personal income tax revenues
- In contrast, sales and withholding personal income tax revenue forecasts have been relatively accurate

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## Study Question

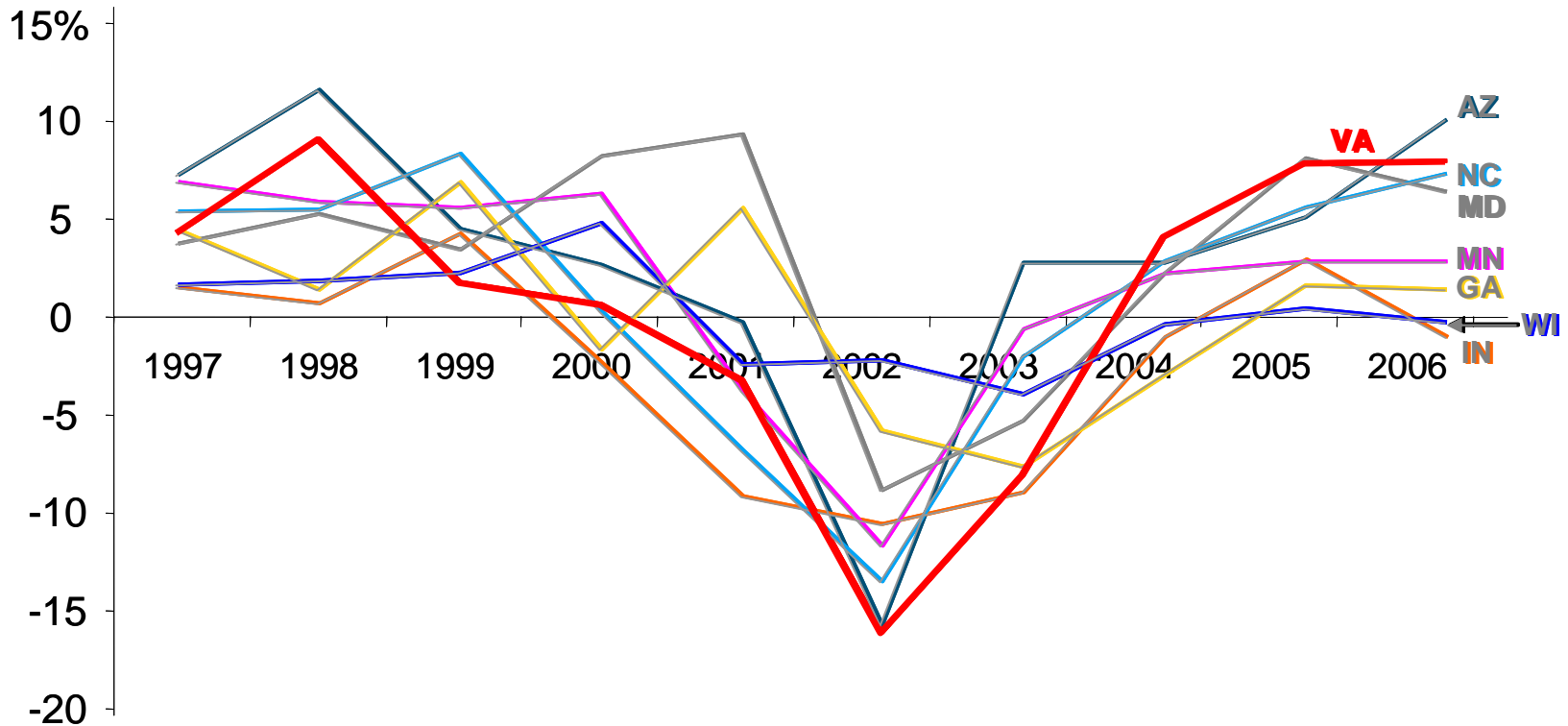
- Is there another type of forecasting process, with a different amount of legislative involvement, that consistently leads to more accurate forecasts?
- Objectives for improving process:
  - Forecast accuracy
  - Transparency
  - Acceptance

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## JLARC Staff Focused on States More Comparable to Virginia

- According to three criteria:
  - Economic growth similar to Virginia's over last 15 years (upper 25 states in terms of growth in gross state product, personal income, and employment)
  - Collected sales and income taxes, like Virginia
  - General Fund budgets at least half the size of Virginia's
- Seven states met criteria:
  - Arizona            -Maryland            -North Carolina
  - Georgia            -Minnesota            -Wisconsin
  - Indiana

# Virginia's Revenue Forecast Error Followed Similar Pattern as Seven Comparable States



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## Characteristics of Virginia's and Comparable States' Forecasts

- Overall patterns appear similar: Virginia's forecasts tended to be too high or too low in same years as other seven states
- Virginia's revenue forecasts were more accurate in some years and less accurate in others, compared to other seven states
- Wisconsin and Georgia tended to be closest to zero forecast error in last ten years, but their forecasting processes are very different
  - Wisconsin: separate legislative forecast
  - Georgia: exclusively executive branch process
- Accuracy may be driven by factors other than type of forecasting process

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## 5 Types of State Forecasting Processes

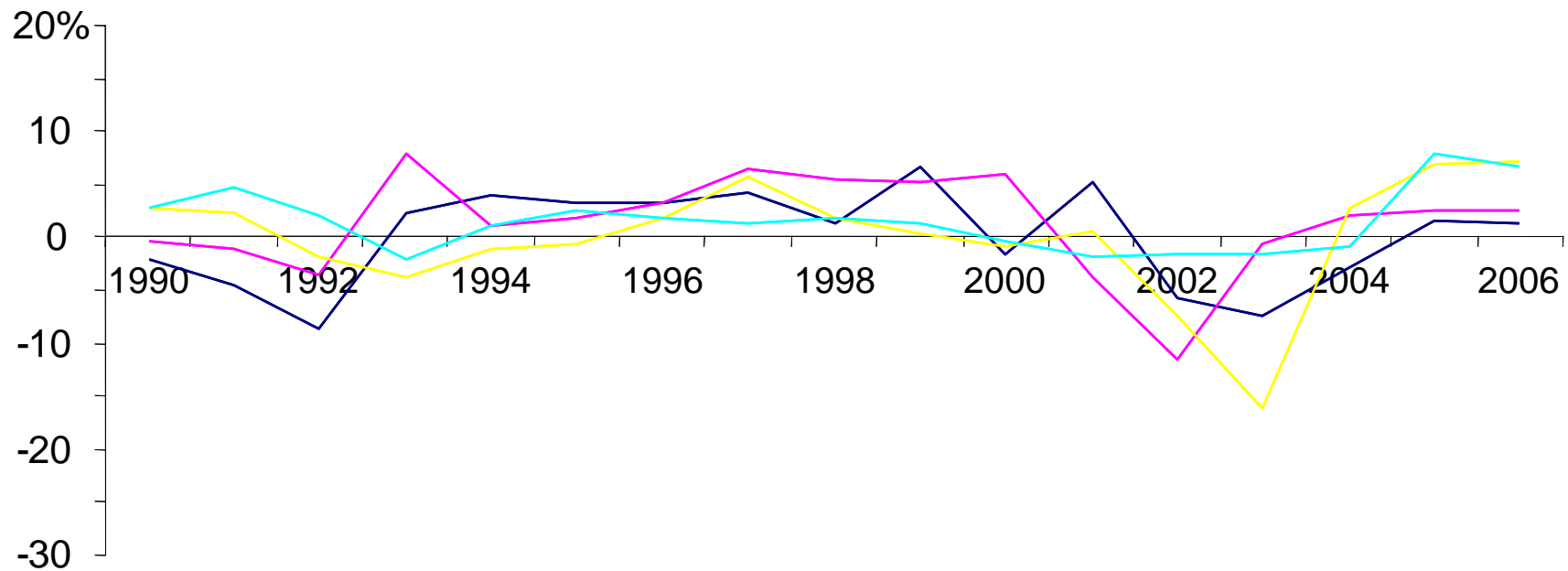
- Different states' processes can be grouped into five categories:
  - Exclusively executive
  - Executive, with legislative participation/review
  - Joint legislative and executive
  - Separate legislative
  - Independent

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## Type of Process: Exclusively Executive

- Revenue forecasts prepared exclusively by executive branch, with no legislative involvement. Five states use this process: AK, GA, MN, OK, WV.
- Advantages
  - No cost to legislature
  - Fewer steps and approval processes
  - Easier to control influence of outside factors or groups when determining estimates
- Disadvantages
  - Process less transparent, so acceptance of estimates can be problematic
    - Early buy-in by other groups not possible
    - Substantively excludes legislature from process
  - Perception that process gives Governor too much power and others too little

## Forecasting Error: Exclusively Executive Range: 7.9% (MN) to -16.2% (OK)



Note: Alaska excluded because error range (52.6% to -25.0%) exceeded the scale.



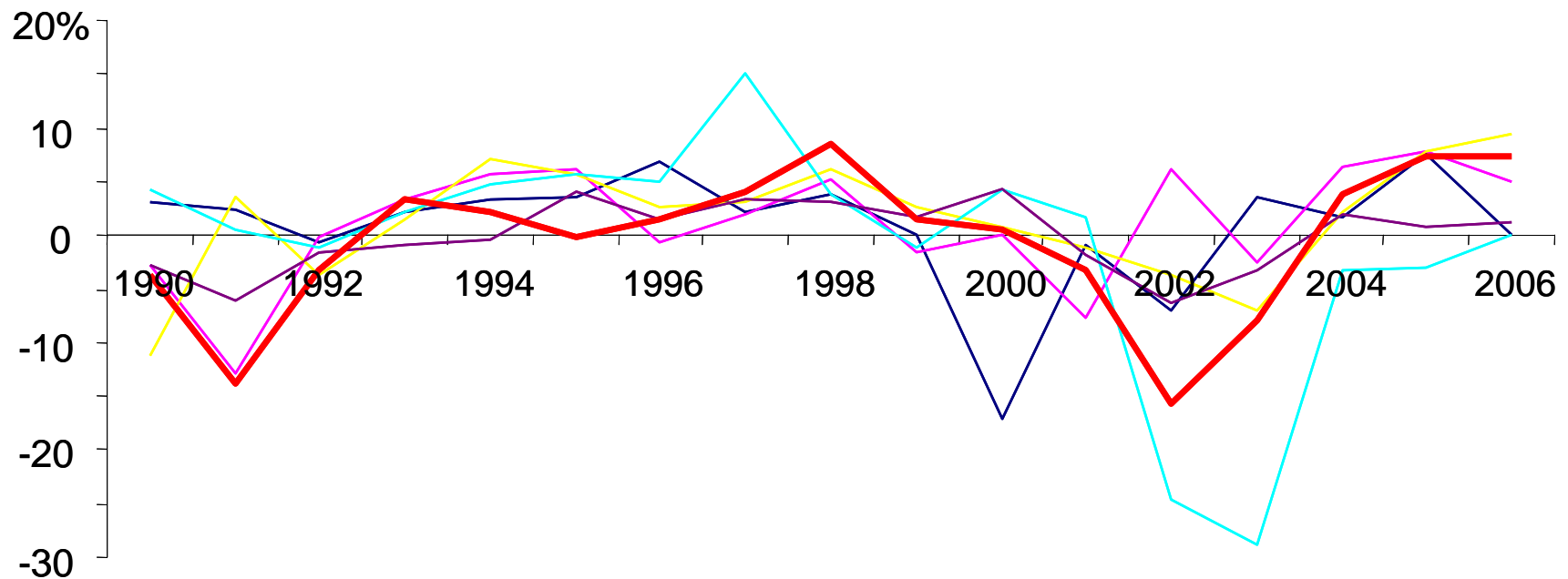
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## Type of Process: Executive, With Legislative Participation/Review

- Executive branch has principal responsibility for preparing forecast. Legislative branch reviews it, through membership on advisory committees or with assistance from legislative fiscal staff, but does not develop its own forecast. Six states use this process: AR, DE, ND, OR, PA, VA.
  
- Advantages
  - Relatively less costly to legislature
  - Provides legislative input with minimal disruption
  
- Disadvantages
  - Stops short of producing legislative forecast
  - Legislators may still feel they lack sufficient participation, so acceptance may remain problematic

## Forecasting Error: Executive, With Legislative Participation

Range: 15.1% (OR) to -28.9% (OR)



— = Virginia; range is 8.6% to -15.8%

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## Type of Process: Joint Legislative and Executive

- Both branches jointly arrive at official forecast. Separate legislative and executive forecasts may be considered before recommending a single forecast. 22 states use this process: FL, IN, IA, KS, KY, LA, MD, ME, MA, MI, MS, MO, NE, NM, NY, NC, RI, TN, UT, VT, WA, WY.
- Advantages:
  - Provides relatively more legislative input
  - More transparent, especially when forecasting meetings are public
  - Shared resources reduces need for duplication

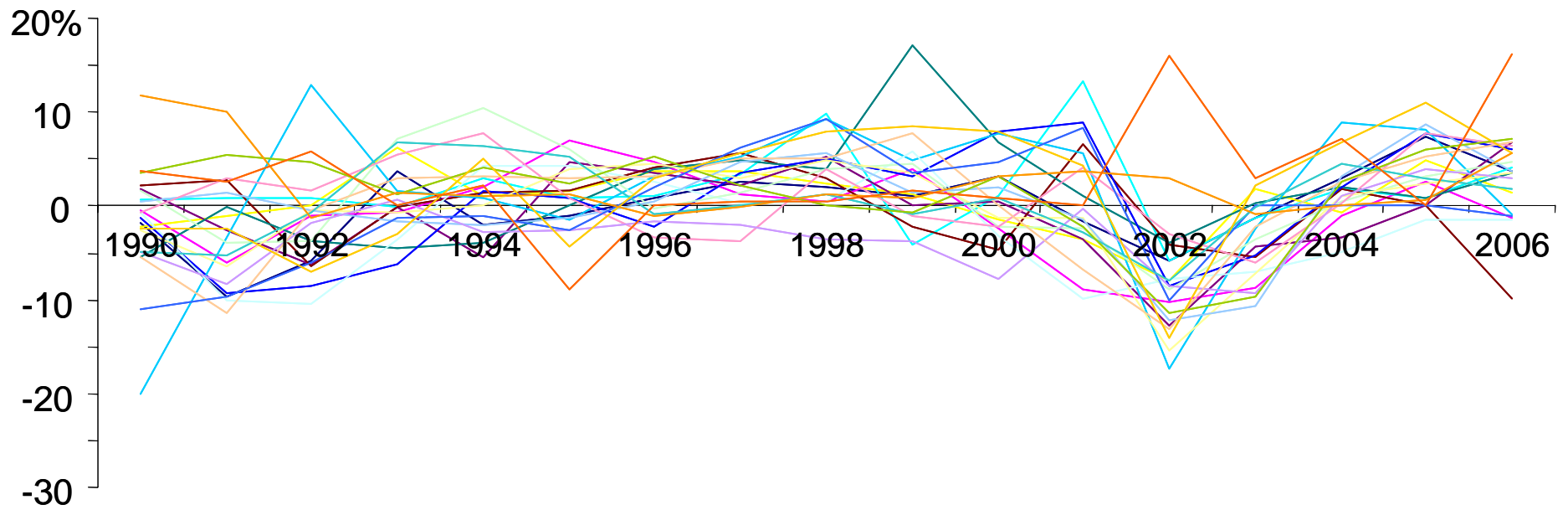
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## Type of Process: Joint Legislative and Executive (continued)

### ■ Disadvantages:

- Not feasible in states where executive branch is unwilling to share data and responsibilities – requires openness of both branches
- Staffing legislative forecasting unit takes time and is more costly
- Requires statutory guidelines and timetables to avoid problems that may cause process to become more politicized

Forecasting Error: Joint Legislative and Executive  
Range: 17.1% (ME) to -19.9% (MA)



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## Type of Process: Separate Legislative Forecast

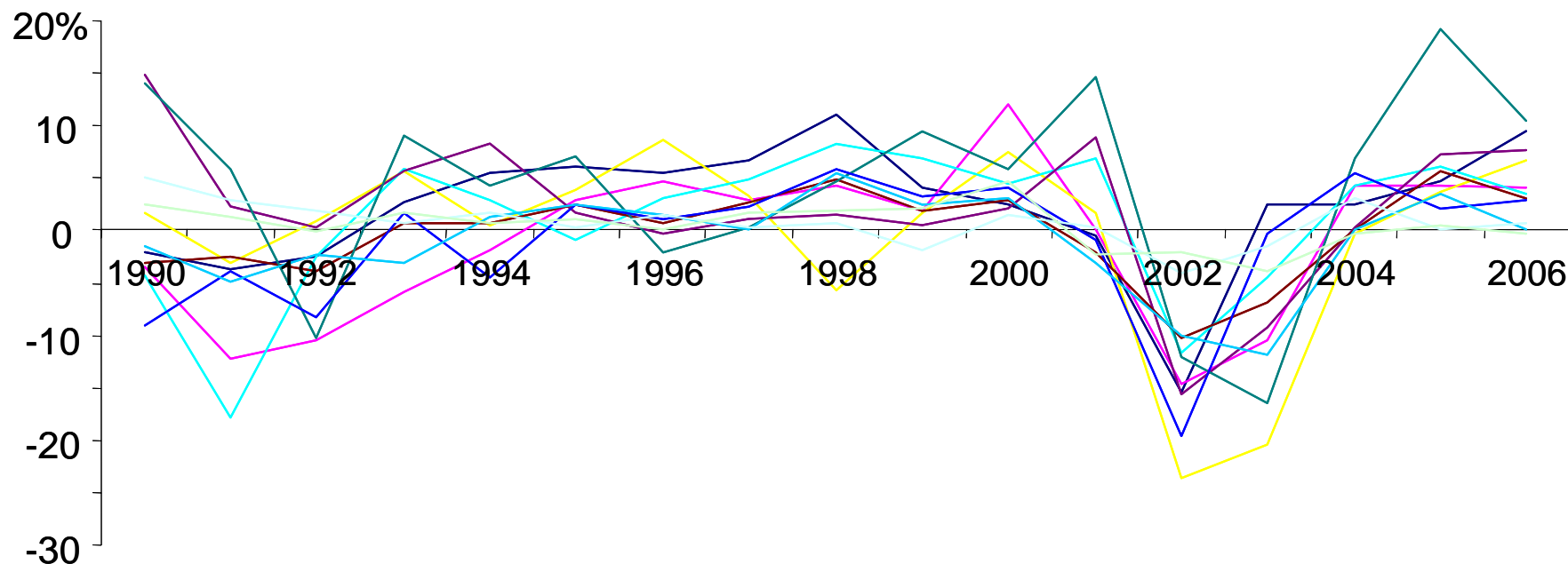
- Legislature prepares its own forecast, independent of executive, but separate forecasts are not submitted to consensus group for resolution of differences. Final forecast is negotiated and eventually agreed upon as part of legislative process. 13 states use this method: AL, AZ, CA, CO, CT, ID, IL, MT, NH, NJ, OH, SD, WI.
- Advantages:
  - Provides legislature with alternative to executive branch forecasts
  - May enhance accuracy because alternative may provide checks on executive branch projections

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## Type of Process: Separate Legislative Forecast (continued)

- Disadvantages:
  - Having a legislative forecast may politicize process
  - May delay appropriation process if there is a debate over whose forecast to use
  - More costly to legislature in terms of time and funding
  - No guarantee of enhanced accuracy, given other states' experience

## Forecasting Error: Separate Legislative Range: 19.2% (MT) to -20.4% (CO)



Note: New Hampshire excluded because error range (33.3% to -39.8%) exceeded the scale.



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## Type of Process: Independent

- Independent individual or group (such as Board of Economists) prepares forecast. Governor and Legislature may appoint, but group makes independent decision. Four states use this process: HI, NV, SC, TX.
- Advantages:
  - May utilize expertise of “outside” economists
  - Less costly to legislature, compared to establishment of legislative forecasting unit
  - Provides a way to limit political influence on forecast

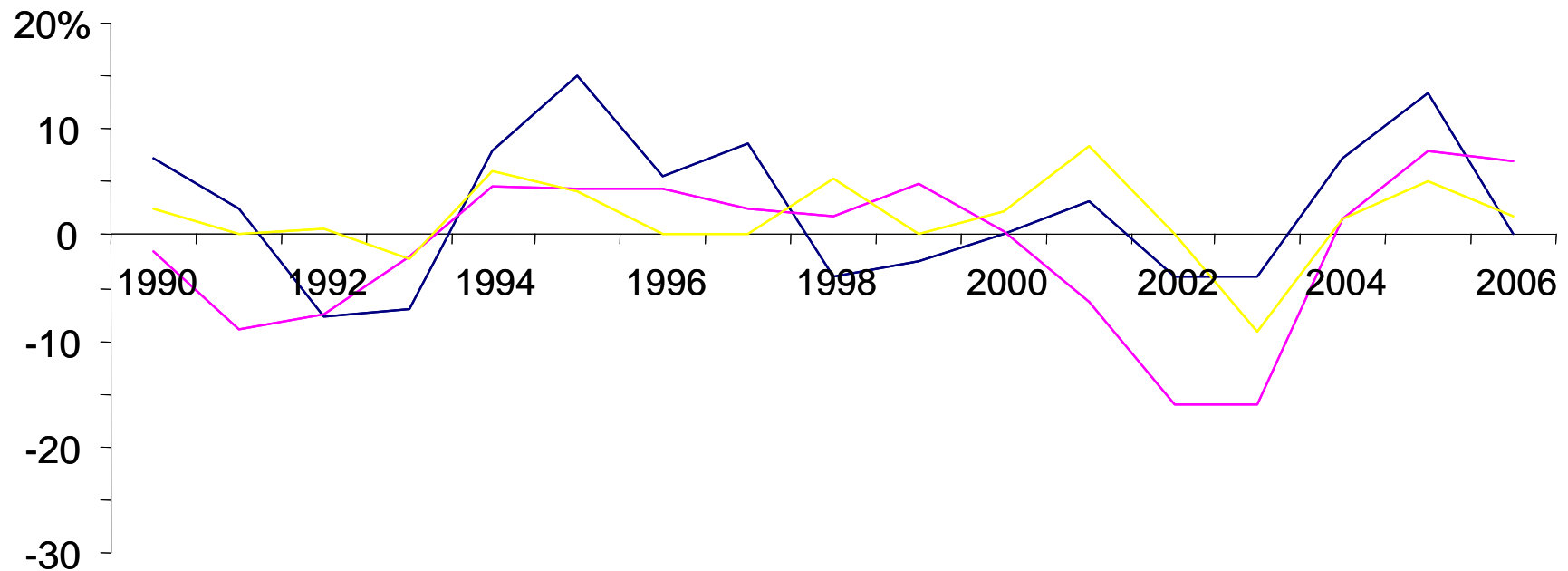
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## Type of Process: Independent (continued)

- Disadvantages:

- Forecasts may not have greater acceptance than those generated exclusively by executive branch
- No guarantee forecasts are more accurate, given experience of other states

Forecasting Error: Independent  
Range: 15.1% (NV) to -16.0% (SC)



Note: Hawaii excluded because error range (10.6% to -39.1%) exceeded the scale.



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# JLARC Staff Contacted 8 States With Different Forecasting Processes

- States selected based on:
  - Revenue forecasting process category
  - Comparable tax base
  - Forecast accuracy
  - Geographic proximity to Virginia
- The selected states were:
  - Exclusively executive: Georgia
  - Executive, with legislative participation/review: Pennsylvania
  - Joint legislative and executive: Indiana, Maryland, North Carolina
  - Separate legislative: Ohio, Wisconsin
  - Independent: South Carolina



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## Staff in Other States Reported Intentional Under-Estimation

Georgia (exclusively executive)

Iowa (joint legislative and executive)

Maryland (joint legislative and executive)

North Carolina (joint legislative and executive)

South Carolina (independent)

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# Considerations for Increasing Legislative Involvement

	Exclusively Executive	Executive, w/ Legislative Participation	Joint Legislative & Executive	Separate Legislative	Independent
Amend the Code?	✓	~	✓	✓	✓
Extent of Legislative Involvement		~	✓	✓	
Level of Technical Sophistication			✓	✓	~
Staffing Requirement			✓	✓	
Organizational Location of Forecasting Effort			✓	✓	
Outside Review of Forecast		~	✓		✓
Frequency of Forecast	✓		✓	✓	✓
Time Horizon of Forecast	✓		✓	✓	✓
Acquisition of Forecasting Data	✓		✓	✓	✓
Access to Tax Collections Data			✓	✓	✓
Who Participates in Consensus Group		~	✓	✓	
Cost / Funding	✓		✓	✓	✓

✓ = Decision Required    ~ = Optional

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# Greater Transparency and Acceptance of Forecasting Process May Be Achieved Without Legislative Forecasting Unit

- A subcommittee of GABE should hold an additional, prior meeting to focus on technical review of the assumptions, equations, and models that underlie general fund revenue forecast
  - Should result in report to GABE
  - Legislative staff should be invited to attend
  - Similar to current “technical review committee” used in inmate forecasting process
- Subcommittee should consider at least one additional competing forecast of general fund revenues developed with a different methodology and by an agency other than TAX (such as Department of Planning and Budget)
- GABE should recommend one forecast of general fund revenues for consideration by GACRE

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## Additional Recommendations to Enhance Transparency and Acceptance

- Judgmental adjustments and changes in tax policy that affect the forecast should be identified and documented
- TAX should make materials (including assumptions and statistical details) provided to GABE and GACRE publicly available after the Governor submits the budget

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## For Further Consideration

- Greater legislative participation may require more resources: staffing, data access, etc.
- Should JLARC staff continue to review forecasting with a Phase 2?
  - Contact more states
  - Identify additional actions to enhance accuracy, transparency, acceptance
  - Develop cost estimates for changing process

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## For More Information

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Copies of these slides are available on our website.

