INDIVIDUAL INCOME TAX
(CONSENSUS FORECASTING GROUP)

THOMAS JONES, PH.D.
DECEMBER 14, 2022

Office of State Budget Director

Individual Income Tax Receipts History
($ millions, nominal)

	IIT	% chg
FY18	4,603.6	4.8
FY19	4,544.7	-1.3
FY20	4,765.2	4.9
FY21	5,143.8	7.9
FY22	6,047.5	17.6
FY23Q1	1,368.9	8.4
Oct-22	535.4	23.6
Nov-22	409.8	0.2

Methodology

Withholding = f(KY Wages and Salaries)

      Range: 2001 Q1 to 2022 Q3

      Seasonally Adjusted

      First Differences

      AR(1)

Declarations = 3-yr moving average

Methodology cont.
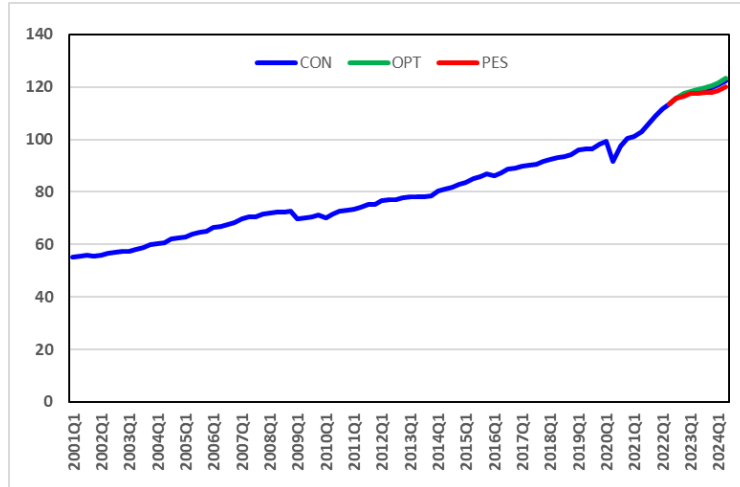
NetReturns:

      * Base FY22

      * Adjustment for wage inflation

Fiduciary = 3-yr moving average

Kentucky Wages and Salaries

($ billions, SAAR)

Withholding Forecasts

($ millions, nominal)

	CON	% chg	PES	% chg	OPT	% chg
FY20	4,276.0	3.2	4,276.0	3.2	4,276.0	3.2
FY21	4,530.2	5.9	4,530.2	5.9	4,530.2	5.9
FY22	5,031.1	11.1	5,031.1	11.1	5,031.1	11.1
FY23	5,241.0	4.2	5,226.0	3.9	5,255.0	4.5
FY24	5,395.2	2.9	5,330.6	2.0	5,425.8	3.3

Declarations Forecast
($ millions, nominal)

	DECL	% chg
FY20	523.7	-3.0
FY21	611.1	16.7
FY22	792.2	29.6
FY23	663.6	-16.2
FY24	689.0	3.8

Net Returns Forecast
($ millions, nominal)

	NETR	% chg
FY20	-35.6	-75.1
FY21	3.3	NA
FY22	222.2	6639.8
FY23	258.0	16.1
FY24	258.0	0.0

Fiduciary Forecast

($ millions, nominal)

	FID	% chg
FY20	1.1	-61.7
FY21	-0.8	NA
FY22	2.0	NA
FY23	-0.2	NA
FY24	0.3	NA

Individual Income Tax CON Forecast

($ millions, nominal)

	FY21	% chg	FY22	% chg	FY23	% chg	FY24	% chg
WITH	4,530.2	5.9	5,031.1	11.1	5,241.0	4.2	5,395.2	2.9
DECL	611.1	16.7	792.2	29.6	663.6	-16.2	689.0	3.8
NETR	3.3	NA	222.2	6,639.8	258.0	16.1	258.0	0.0
FID	-0.8	NA	2.0	NA	-0.2	-110.1	0.3	-250.0
TAX	0.0	NA	0.0	NA	-342.5	NA	-663.3	NA
IIT	5,143.8	7.9	6,047.5	17.6	5,819.9	-3.8	5,679.2	-2.4

Individual Income Tax PES Forecast

(\$ millions, nominal)

	FY21	% chg	FY22	% chg	FY23	% chg	FY24	% chg
WITH	4,530.2	5.9	5,031.1	11.1	5,226.0	3.9	5,330.6	2.0
DECL	611.1	16.7	792.2	29.6	663.6	-16.2	689.0	3.8
NETR	3.3	NA	222.2	6,639.8	258.0	16.1	258.0	0.0
FID	-0.8	NA	2.0	NA	-0.2	-110.1	0.3	-250.0
TAX	0.0	NA	0.0	NA	-342.5	NA	-663.3	NA
IIT	5,143.8	7.9	6,047.5	17.6	5,804.9	-4.0	5,614.6	-3.3

Individual Income Tax OPT Forecast

(\$ millions, nominal)

	FY21	% chg	FY22	% chg	FY23	% chg	FY24	% chg
WITH	4,530.2	5.9	5,031.1	11.1	5,255.0	4.5	5,425.8	3.3
DECL	611.1	16.7	792.2	29.6	663.6	-16.2	689.0	3.8
NETR	3.3	NA	222.2	6,639.8	258.0	16.1	258.0	0.0
FID	-0.8	NA	2.0	NA	-0.2	-110.1	0.3	-250.0
TAX	0.0	NA	0.0	NA	-342.5	NA	-663.3	NA
IIT	5,143.8	7.9	6,047.5	17.6	5,833.8	-3.5	5,709.8	-2.1

COAL SEVERANCE TAX
(CONSENSUS FORECASTING GROUP)

THOMAS JONES, PH.D.
DECEMBER 14, 2022

Office of State Budget Director

Coal Receipts History
($ millions, nominal)

	COAL	% chg
FY18	89.6	-10.8
FY19	92.9	3.6
FY20	58.8	-36.7
FY21	56.1	-4.7
FY22	70.7	26.0
FY23Q1	22.1	72.2
Oct-22	8.4	32.2
Nov-22	8.4	52.6

Coal Severed Tons

(million tons)

	TONS	% chg
FY20	30.4	-28.4
FY21	20.4	-33.0
FY22	24.3	19.2
FY23Q1	8.6	37.9

Coal Prices

$ / ton

	CAP	NAP	IB	PRB	UB
10-28-22	182.10	185.80	186.50	17.15	41.80
11-04-22	182.10	185.80	186.50	17.15	41.80
11-11-22	182.10	185.80	186.50	17.15	41.80
11-18-22	187.70	191.50	186.50	17.10	41.65

Methodology

Coal Receipts = f(PPI Coal, West Texas Intermediate Price of Oil, Henry Hub Price of Natural Gas, US Personal Income)

* Range: 2001 Q1 to 2022 Q2
* All Seasonally-Adjusted Variables
* First Differences

Producer Price Index for Coal
(1982 = 1.00, SA)
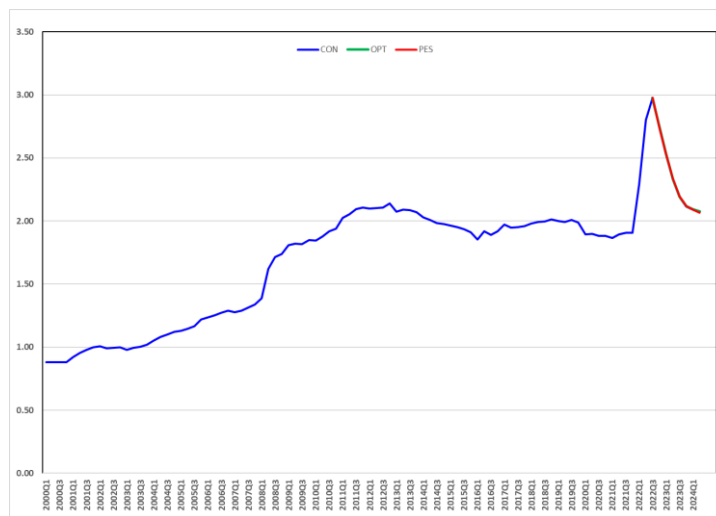
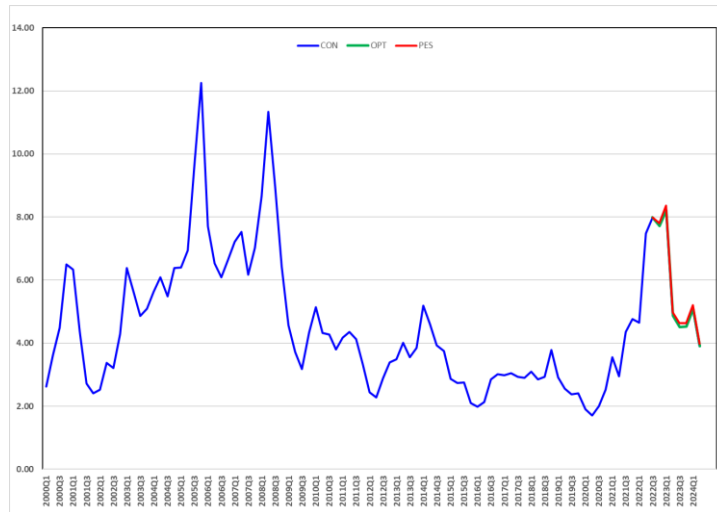# Price of West Texas Intermediate Oil

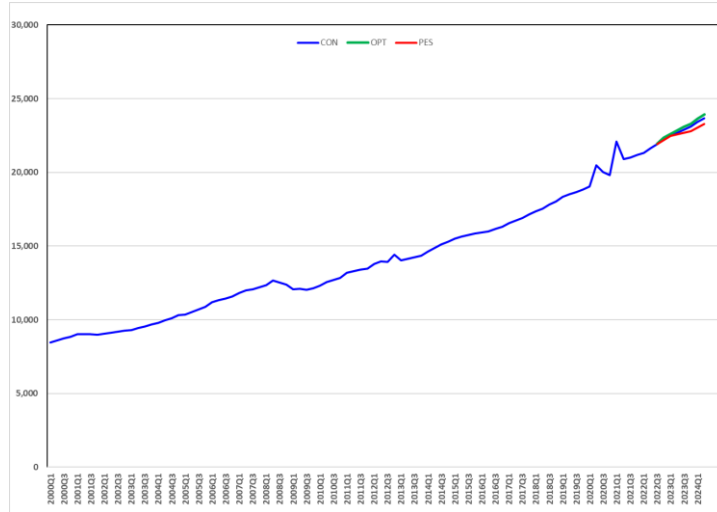($, nominal)
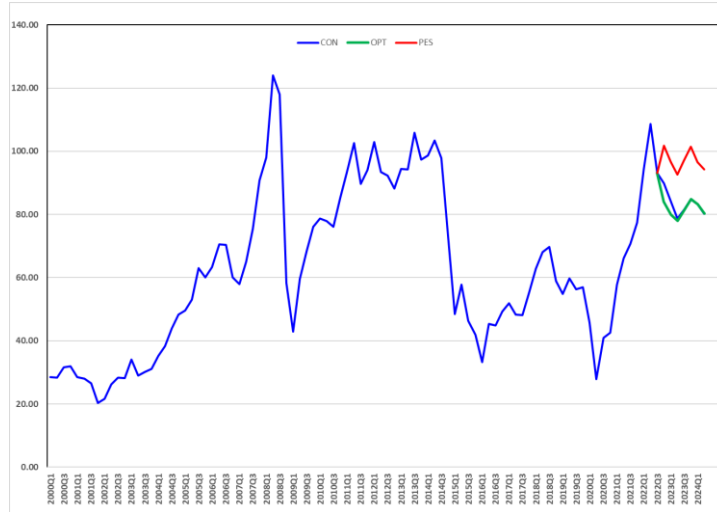
Henry Hub Price of Natural Gas

($, nominal)

US Personal Income
($ billions, AR)

Coal Forecasts
($ millions, nominal)

	FY22	% chg	FY23	% chg	FY24	% chg
CON	70.7	26.0	98.8	39.8	71.7	-27.5
PES	70.7	26.0	89.2	26.3	63.6	-28.8
OPT	70.7	26.0	88.9	25.8	58.2	-34.5

SALES TAX
CONSENSUS FORECASTING GROUP

Office of State Budget Director

GREG HARKENRIDER
DECEMBER 14, 2022

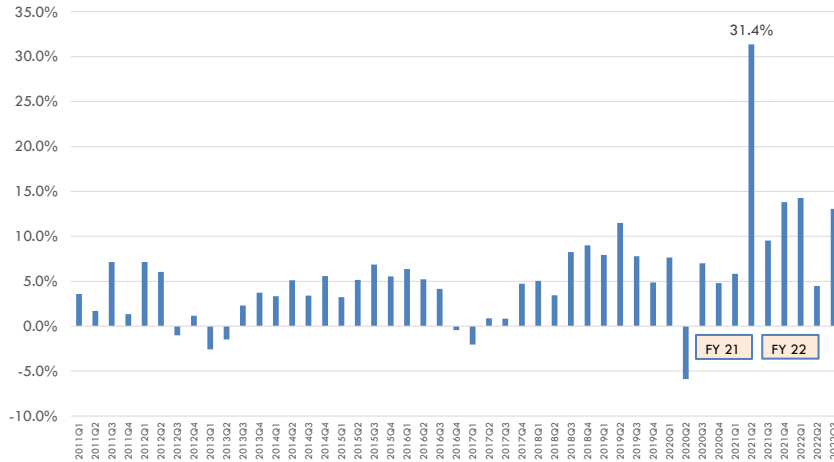# Sales Tax Growth Rates
(Percentage Change, Control Forecast in Red)
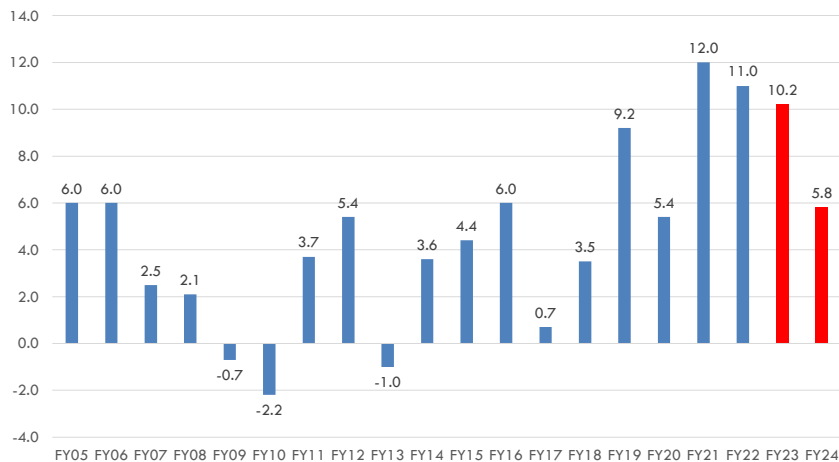
Historical Quarterly Sales Tax Growth

(Calendar year quarters, Percentage Changes)

FY2022 General Fund Revenues

(FY22 revenue totals, $ million)

|	FY22				
	Full Year		Official		
	Actual	% Chg	Estimate	$ Diff	% Diff
Individual Income	6,047.5	17.6	5,424.7	622.8	11.5
Sales & Use	5,062.9	11.0	4,950.7	112.2	2.3
Corp. Inc. & LLET	1,186.6	34.4	970.5	216.1	22.3
Property	723.9	3.0	679.2	44.7	6.6
Lottery	295.0	2.0	319.3	-24.3	-7.6
Cigarettes	324.5	-7.3	334.7	-10.2	-3.1
Coal Severance	70.7	26.0	64.1	6.6	10.2
Other	991.5	17.7	1,013.9	-22.4	-2.2
General Fund	**14,702.5**	**14.6**	**13,757.1**	**945.4**	**6.9**

Dilemma We are Facing

- ☐ Underestimated the sales tax for two consecutive years
- ☐ Continued composite forecasting for the sales tax
- ☐ Time series models have performed better in-sample, but …
- ☐ Is there a turning point coming, despite 12.8% growth in the first quarter?
- ☐ Structural models tend to do better during turning points vis-à-vis pure time series approaches

Sales Tax Models December 2022

(Control Scenario, $ millions)
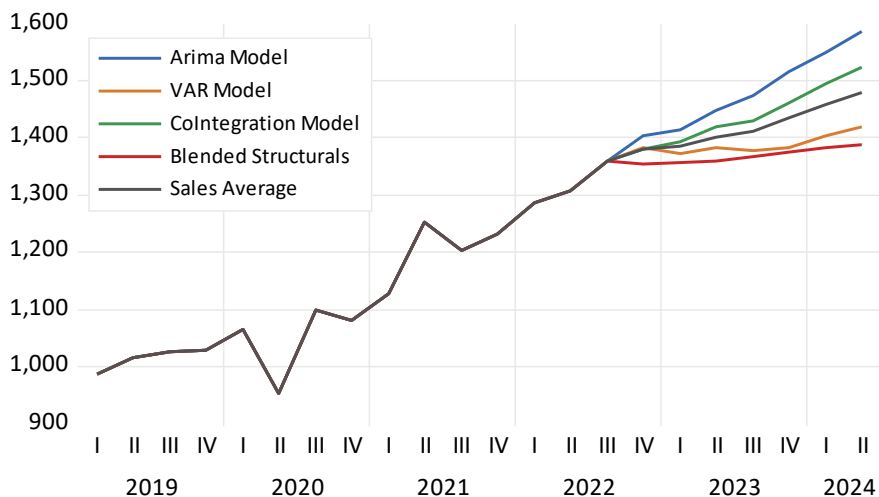
Model Specifications, Sales Tax

- Time Series for Estimation: 2010q1 to 2022q3
  - Have data back to 1990q1
  - Policy neutral time series, tax credits and law changes
- All models use seasonally-adjusted data
- Arima {AR (1,3); 1st difference; MA (1,4,5)}
- Cointegration (Sales and Withholding)
- VAR (Sales and KY Wages & Salaries), TXPGSL (State & Local Personal Taxes)
- Structural Models (SRTAFS_0 Nominal Retail Sales); (CDFHE_0 Consumer Spending Furniture and Durable Home); (DOMPURCH_0) Final Sales to Domestic Purchasers;

Consumer Spending –
Furnishings and Durable Household Equipment
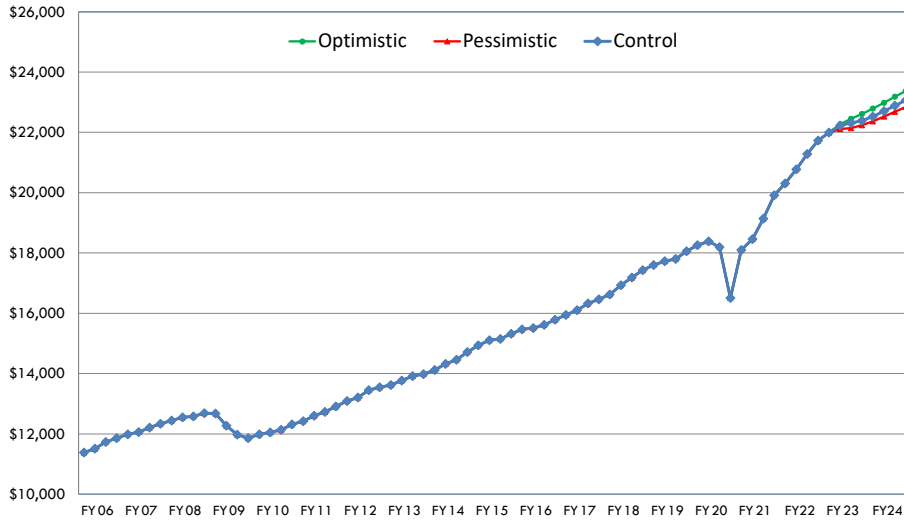### (Billions of Dollars, Annual Rate, BEA)
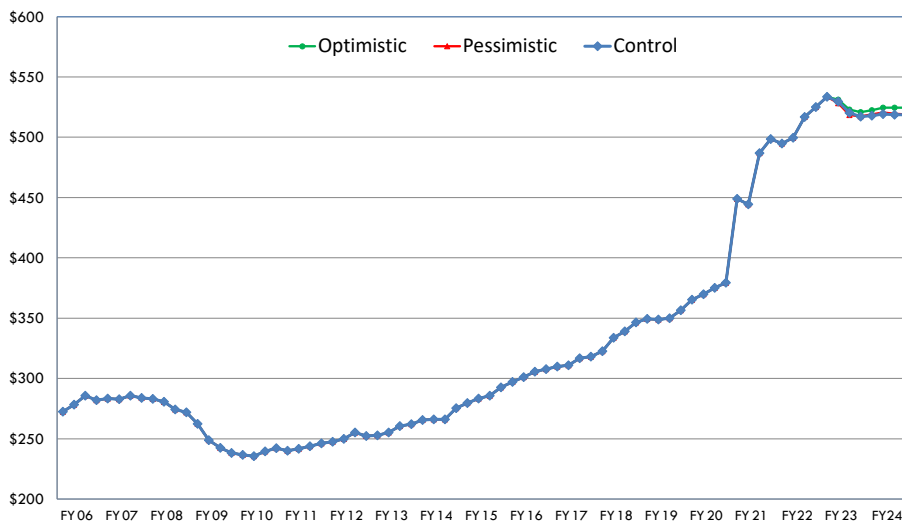
Private Sales to Private Domestic Purchasers
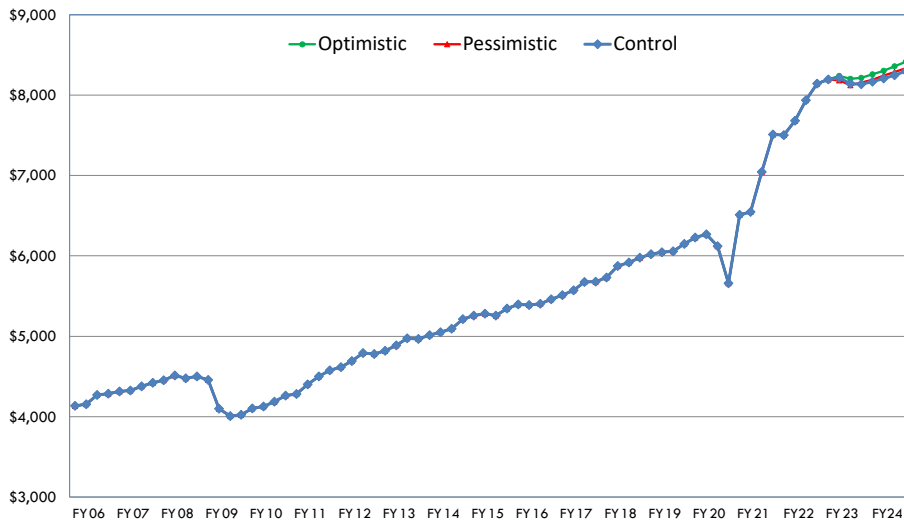## (Billions of Dollars, Annual Rate, BEA)
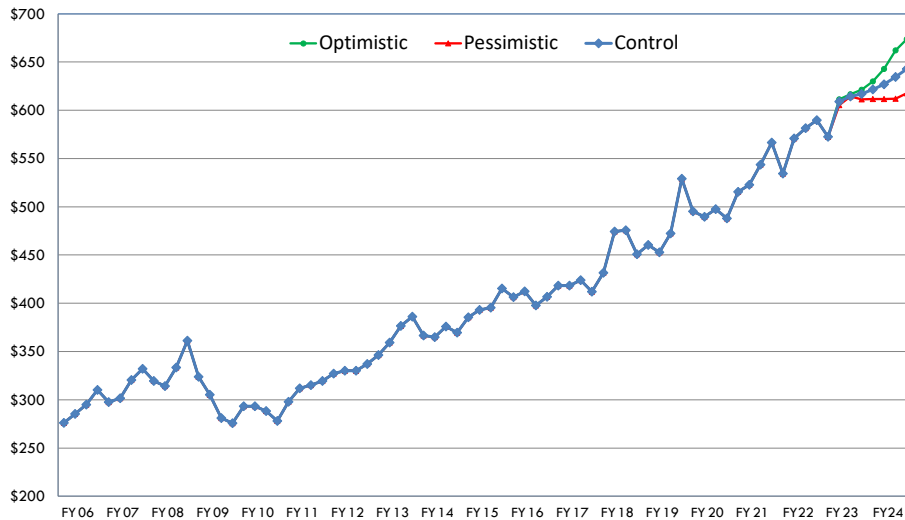
Retail Sales – Including Food Service
(Billions of Dollars, Annual Rate, BEA)

State & Local Government Personal Tax Receipts
(Billions of Dollars, Annual Rate, BEA)

Notes concerning C-O-P scenarios

- Given the similarities between the structural variables in the control, optimistic, and pessimistic scenarios, the range between estimates is relatively small

- As such, the difference between Optimistic and Pessimistic scenarios should not be considered the upper and lower range for the sales tax estimate

- Did not use add factors per se to adjust the scenarios to be more reflective of the best and worst outcomes

- Time series models are somewhat incapable of producing differences between scenarios, so the weight on the ARIMA model was adjusted to generate Opt and Pess scenarios

Sales Tax Projections
(Millions $)

Fiscal Year	Control	Optimistic	Pessimistic
FY 2022	$5,062.9 11.0%	$5,062.9 11.0%	$5,062.9 11.0%
FY 2023	$5,580.7 10.2%	$5,689.4 12.4%	$5,538.6 9.4%
FY 2024	$5,906.2 5.8%	$6,059.3 6.5%	$5,801.6 4.7%

Sales Tax Forecast Needs for FY23
Percent Change

	Estimate FY23	YTD	Needs Dec-June
Control	10.2%	11.3%	9.5%
Optimistic	12.4%	11.3%	13.1%
Pessimistic	9.4%	11.3%	8.1%

MAJOR BUSINESS TAXES FORECAST
(CONSENSUS FORECASTING GROUP)

GENE ZAPARANICK-BROWN

DECEMBER 14, 2022

Office of State Budget Director

Major Business Taxes– Actual v. Estimate
Millions $

	Actual	Estimate	Diff ($)	Diff (%)
FY22	$1,186.6	$970.5	$216.1	22.3
FY21	882.8	547.5	335.3	61.3
FY20	639.2	488.4	150.8	30.9

Business Taxes Receipts History
Millions $ & Percent Change

Major Business Taxes Forecast
Millions $

	FY22		FY23		FY24	
	Actual	%Chg	Estimate	%Chg	Estimate	%Chg
Control	$1,186.6	34.4	$1,257.6	6.0	$1,271.1	1.1
Optimistic	1,186.6	34.4	1,279.0	7.8	1,298.3	1.5
Pessimistic	1,186.6	34.4	1,252.1	5.5	1,269.2	1.4

Difference From Official

Control			$347.9		$307.4	
Optimistic			369.3		334.6	
Pessimistic			342.4		305.5	

FY23 Estimate and Needs

Million $

	Model Estimate	Pct Change from FY22	YTD Receipts	Model Needs	Adjustment	Forecast Needs
Control	$1,382.6	16.5%	9.8%	19.2%	-$125.0	4.5%
Optimistic	1,404.0	18.3%	9.8%	21.7%	-125.0	7.0%
Pessimistic	1,377.1	16.1%	9.8%	18.6%	-125.0	3.8%

Quarterly Major Business Tax Collections

US Corporate Profits Forecast
Billions $

43

Control — Optimistic — Pessimistic

US Corporate Profits Forecast
Billions $

44

November 2021 — November 2022

Major Business Taxes Forecast
Millions $

	FY22		FY23		FY24	
	Actual	%Chg	Estimate	%Chg	Estimate	%Chg
Control	$1,186.6	34.4	$1,257.6	6.0	$1,271.1	1.1
Optimistic	1,186.6	34.4	1,279.0	7.8	1,298.3	1.5
Pessimistic	1,186.6	34.4	1,252.1	5.5	1,269.2	1.4
Difference From Official						
Control			$347.9		$307.4	
Optimistic			369.3		334.6	
Pessimistic			342.4		305.5	

PROPERTY TAX FORECAST
(CONSENSUS FORECASTING GROUP)

GENE ZAPARANICK-BROWN

DECEMBER 14, 2022

Office of State Budget Director

Property Tax– Actual v. Estimate, FY22

($ millions)

	Actual	Estimate	Diff ($)	Diff (%)
REAL	325.3	330.5	-5.2	-1.6%
TANGIBLE	124.4	128.7	-4.3	-3.3%
MOTOR VEHICLE	179.2	130.2	49.0	37.6%
DELINQUENT	6.2	6.5	-0.3	-4.6%
OM TANGIBLE	11.2	10.5	0.7	6.7%
PUBLIC SERVICE	74.6	70.5	4.1	5.8%
OTHER	2.9	2.3	0.6	26.1%
TOTAL PROPERTY	**723.8**	**679.2**	**44.6**	**6.6%**

Property Tax Revenue Compared to Previous Years
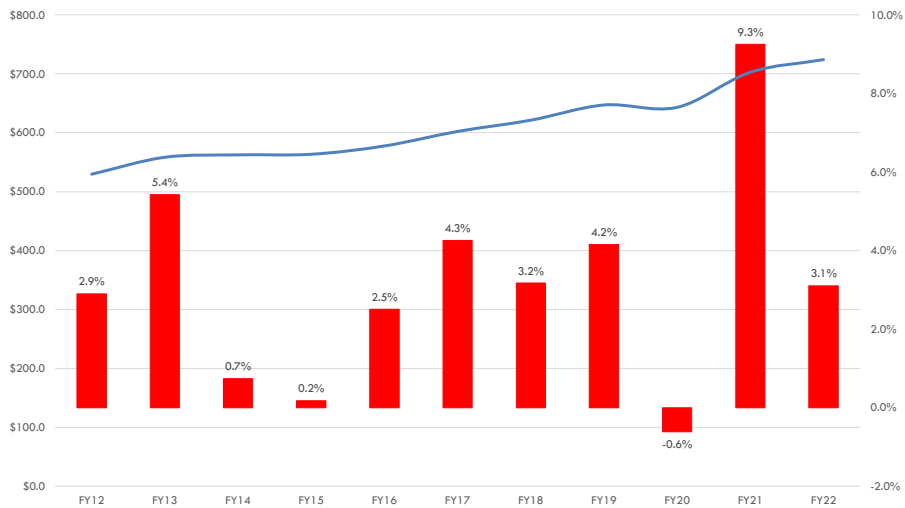
Changes to Property Tax Estimates, FY23

($ millions)

	Official	Estimate	Diff ($)
REAL	344.1	336.7	-7.4
TANGIBLE	132.7	127.8	-4.9
MOTOR VEHICLE	109.9	197.1	87.2
DELINQUENT	6.0	7.1	1.1
OM TANGIBLE	9.0	10.5	1.5
PUBLIC SERVICE	71.0	77.2	6.2
OTHER	2.2	3.0	0.8
TOTAL PROPERTY	**674.9**	**759.4**	**84.5**

Changes to Property Tax Estimates, FY24

($ millions)

	Official	Estimate	Diff ($)
REAL	357.9	348.5	-9.4
TANGIBLE	135.4	129.9	-5.5
MOTOR VEHICLE	85.7	207.9	122.2
DELINQUENT	6.0	7.3	1.3
OM TANGIBLE	8.0	10.5	2.5
PUBLIC SERVICE	72.5	77.5	5.0
OTHER	2.1	3.0	0.9
TOTAL PROPERTY	**667.6**	**784.6**	**117.0**

Property Tax Forecast, FY23-24
($ millions)

	FY22		FY23		FY24	
	Actual	%Chg	Estimate	%Chg	Estimate	%Chg
REAL	325.3	2.5	336.7	3.5	348.5	3.5
TANGIBLE	124.4	(0.7)	127.8	2.7	129.9	1.6
MOTOR VEHICLE	179.2	7.8	197.1	10.0	207.9	5.5
DELINQUENT	6.2	(16.6)	7.1	15.1	7.3	2.8
OM TANGIBLE	11.3	6.2	10.5	(6.7)	10.5	0.0
PUBLIC SERVICE	74.6	2.3	77.2	3.4	77.5	0.4
OTHER	2.9	11.9	3.0	3.1	3.0	0.0
TOTAL PROPERTY	**723.9**	**3.1**	**759.4**	**4.9**	**784.6**	**3.3**

CIGARETTE TAX
CONSENSUS FORECASTING GROUP

GREG HARKENRIDER

DECEMBER 14, 2022

Office of State Budget Director

Cigarette Trends

- □ FY20 cigarette tax revenue was 0.4% higher than FY19 on a tax rate-neutral basis
- □ FY21 cigarette tax revenue was 1.4% lower than FY20
- □ FY22 cigarette stamp receipts were down 7.3%
- □ Prices are rising / discounts abating on many cigarette brands
- □ Monthly growth rates have been quite volatile, as several large wholesalers dominate the market
- □ Not a monthly return, so payments for stamps can be irregular

Cigarette Tax Forecast
(Millions $)

Fiscal Year	Control
FY 2022	$324.5 -7.3%
FY 2023	$303.8 -6.4%
FY 2024	$291.4 -4.1%

KENTUCKY LOTTERY
CONSENSUS FORECASTING GROUP

GREG HARKENRIDER

DECEMBER 14, 2022

Office of State Budget Director

Historical Lottery Dividends

- Historical Dividend Performance
  - FY20 -- $271.4 million General Fund
  - FY21 -- $347.1 total
    - $289.1 million deposited into the General Fund
    - $58.0 million deposited into Trust and Agency Account (per House Bill 192)
  - FY22 -- $347.3 total
    - $295.0 million deposited into the General Fund
    - $52.3 million deposited into Trust and Agency Account (per House Bill 1)
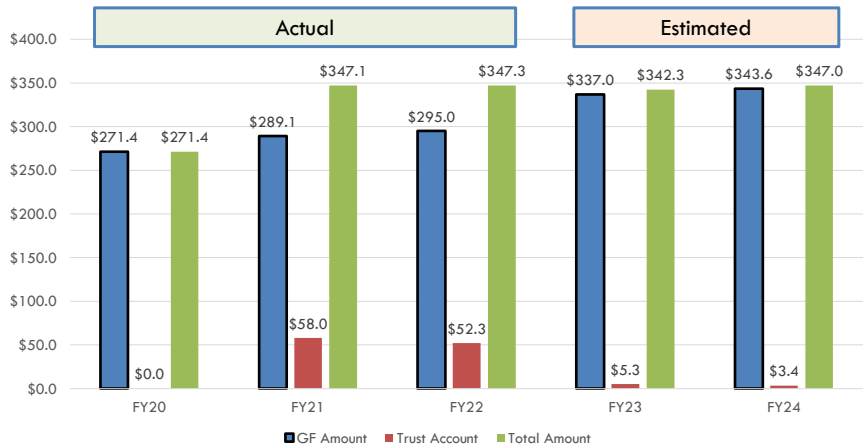
Lottery Trends in FY23

- ☐ Shift in the mix of ticket sales through October
  - ❑ iLottery instant play games showing continued growth
    - ▪ Instant play sales through October are up 73.4%, or $45.0 million, from the same period in FY22
    - ▪ Instant play games have a higher percentage payout to players than any other lottery product
  - ❑ Scratch-off game sales are running 4.0% behind FY22
  - ❑ Draw Games are up 2.0%, aided by large Mega Millions and Powerball jackpots
- ☐ Distribution of sales through October:
  - ❑ Instant Tickets – 52.3% actual versus 57.7% budgeted
  - ❑ Draw Games – 29.6% actual versus 27.1% budgeted
  - ❑ iLottery – 18.1% actual versus 15.2% budgeted

Kentucky Lottery Dividend Payments

	Actual				Estimated	
	FY20	FY21	FY22	FY23	FY24	
GF Amount	$271.4	$289.1	$295.0	$337.0	$343.6	
Trust Account	$0.0	$58.0	$52.3	$5.3	$3.4	
Total Amount	$271.4	$347.1	$347.3	$342.3	$347.0	

# Explanation of Lottery Forecast

- Budget Bill Language:
  - If lottery receipts received by the Commonwealth, excluding any unclaimed prize money received, exceed
    - $292,000,000 in fiscal year 2022;
    - $333,974,700 in fiscal year 2023;
    - or $340,574,700 in fiscal year 2024
  - Then the first $3,000,000 of excess funds in each fiscal year shall be transferred to the Kentucky Higher Education Assistance Authority and appropriated in accordance with KRS 154A.130(4)(b)
  - Any additional excess shall be transferred to a trust and agency account and shall not be expended or appropriated without the express authority of the General Assembly.

Kentucky General Fund Lottery Forecast
($ millions)

FY2023	FY2024
$337.0	$343.6
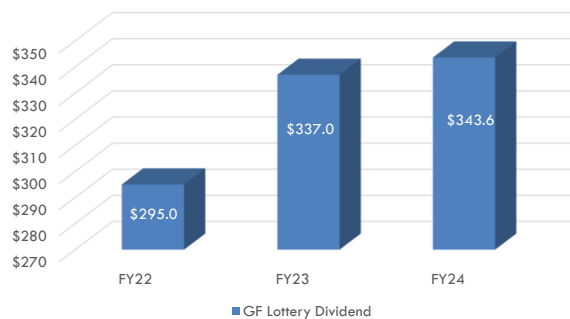
MISCELLANEOUS "OTHER" TAXES
(CONSENSUS FORECASTING GROUP)

GREG HARKENRIDER

DECEMBER 14, 2022

Office of State Budget Director

Changes to Other Taxes Since December 2021
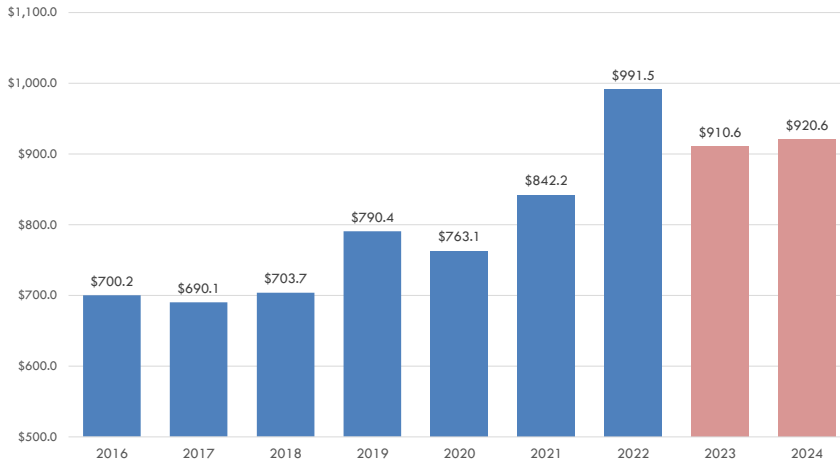
- □ Re-evaluated every account to adjust for FY22 actual receipts and YTD FY23 receipts
- □ Positive upgrades to:
  - ▫ Income on investments
  - ▫ Pari-mutuel
  - ▫ Insurance premiums
  - ▫ Natural gas severance/Oil production
  - ▫ Beer, wine, spirits wholesale taxes
  - ▫ Inheritance tax
- □ Minor downgrades to:
  - ▫ Beer, wine, and spirits consumption taxes
  - ▫ Telecommunications taxes

"Other" Receipts Forecast
(Millions $)

63

Year	Value
2016	$700.2
2017	$690.1
2018	$703.7
2019	$790.4
2020	$763.1
2021	$842.2
2022	$991.5
2023	$910.6
2024	$920.6

"Other" Differences from Official
(Millions $)

64

	Value
FY 2022	-$22.6 (Actual)
FY 2023	$91.9
FY 2024	$68.5 (Estimated)
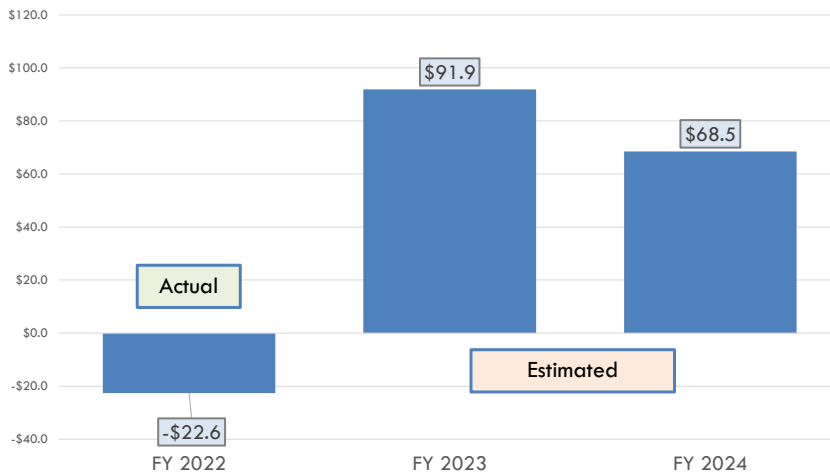
GENERAL FUND REMARKS
(CONSENSUS FORECASTING GROUP)

GREG HARKENRIDER

DECEMBER 14, 2022

Office of State Budget Director

FY23 Implied Variation Among Scenarios
(FY 23 Differences Control, Optimistic, Pessimistic)

FY 2023 Difference Among Forecast Scenarios

	Control		Optimistic		Pessimistic	
	Estimate	% Change	Estimate	% Change	Estimate	% Change
Individual Income	5,819.9	-3.8	5,833.8	-3.5	5,804.9	-4.0
Sales & Use	5,580.7	10.2	5,689.4	12.4	5,538.6	9.4
Corp. Inc. & LLET	1,257.6	6.0	1,279.0	7.8	1,252.1	5.5
Property	759.4	4.9	759.4	4.9	759.4	4.9
Lottery	337.0	14.2	337.0	14.2	337.0	14.2
Cigarettes	303.8	-6.4	303.8	-6.4	303.8	-6.4
Coal Severance	98.8	35.3	88.9	33.8	89.2	26.3
Other	910.6	-8.2	910.6	-8.2	910.6	-8.2
Total General Fund	**$ 15,067.8**	**2.5**	**$ 15,201.9**	**3.4**	**$ 14,995.6**	**2.0**

FY24 Implied Variation Among Scenarios

(FY 24 Differences Control, Optimistic, Pessimistic)

FY 2024 Difference Among Forecast Scenarios

	Control		Optimistic		Pessimistic	
	Estimate	% Change	Estimate	% Change	Estimate	% Change
Individual Income	5,679.2	-2.4	5,709.8	-2.1	5,614.6	-3.3
Sales & Use	5,906.2	5.8	6,059.3	6.5	5,801.6	4.7
Corp. Inc. & LLET	1,271.1	1.1	1,298.3	1.5	1,269.2	1.4
Property	784.6	3.3	784.6	3.3	784.6	3.3
Lottery	343.6	2.0	343.6	2.0	343.6	2.0
Cigarettes	291.4	-4.1	291.4	-4.1	291.4	-4.1
Coal Severance	71.7	-27.4	58.2	-34.5	63.6	-28.8
Other	920.6	1.1	920.6	1.1	920.6	1.1
Total General Fund	**$ 15,268.4**	**1.3**	**$ 15,465.8**	**1.7**	**$ 15,089.2**	**0.6**

General Fund Forecast Needs for FY23

Percent Change

	FY23 Estimate		YTD	Needs
	$ million	% Change	July-November	Dec-June
Control	$ 15,067.8	2.5%	6.4%	0.1%
Optimistic	$ 15,201.9	3.4%	6.4%	1.5%
Pessimistic	$ 14,995.6	2.0%	6.4%	-0.7%

Quarterly GF Revenue Growth Rates Since FY19

(Percentage Growth)

	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2	Qtr3	Qtr4	FY23 Q1
	FY 19				FY 20				FY 21				FY 22				

Values: 4.5, 2.9, 4.6, 8.3, 1.1, 4.1, 6.4, -4.4, 5.8, 5.3, 6.7, 24.8, 20.0, 12.3, 9.0, 16.9, 3.8