

**A LONG-RUN FORECAST OF  
TAXABLE SALES FOR ORANGE COUNTY**

*Prepared for*  
**ORANGE COUNTY TRANSPORTATION AUTHORITY**

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# A Long-Run Forecast of Taxable Sales for Orange County

This study revises, updates and extends the results of a previous study completed in May 2022 that forecasted annual taxable sales in Orange County. This study provides a quarterly forecast for 2023Q1 to 2025Q2, and a yearly forecast from 2023 to 2041. Although Covid deaths and infections have decreased dramatically, the virus still has some residual impact on health and the economy. Hundreds of thousands of people have not rejoined the labor force due to the virus. Some because of immune deficiency disorder, others because of day-care-related issues. The counter measures that the Federal Reserve took during the pandemic to minimize its negative impact on the economy have resulted in a higher inflation rate. New measures are now undertaken to lower the inflation rate to an acceptable level.

## I. Recovery from the Pandemic

In January 2022 employment in Orange County finally exceeded the peak employment that occurred in February 2020 immediately before the beginning of the pandemic. In March 2023, payroll employment stood at 8,200 jobs above February 2020, the peak employment before the Covid recession. The economy has recuperated all the 272,300 jobs that were lost due to the pandemic. The unemployment rate now stands at 3.4 percent.

<b>ORANGE COUNTY EMPLOYMENT</b>		
	<b>PERCENT CHANGE February – May 2020</b>	<b>PERCENT CHANGE Feb 2020 – March 2023</b>
Total	-16.2%	0.5%
Leisure & Hospitality	-49.9%	-0.2%
Retail Trade	-20.0%	-0.1%
Construction	-6.3%	-1.1%
Manufacturing	-8.3%	-2.0%

As the table on the previous page shows, not all sectors of the economy have recuperated all the jobs lost during the pandemic. The Leisure and Hospitality sector which lost the most jobs is getting very close to the peak employment that was reached in February 2020.

The supply chain issues that plagued the world economies have been mostly resolved with the operations at the Los Angeles and the Long Beach ports going back to normal. After reaching a high of 9.1 percent, the consumer price index (not seasonally adjusted) went down to 5.0 percent in March 2023. On the housing front, home listings have continued to decline in 2022. This decline together with high mortgage rates led to a decrease in the number of homes sold and to higher home prices. The median single family home price in Orange County reached a peak of \$1,325,000 in April 2022, a 50 percent increase over the price that existed at the beginning of the pandemic.

The federal government's assistance programs have led to record savings by households. The saving rate, which reached 33.8 percent in April 2022, decreased to 4.6 percent in February 2023. Real consumption – consumption adjusted for inflation – increased 1.7 percent in the fourth quarter of 2022 compared to the fourth quarter of 2021, the lowest increase since the end of 2020. The low growth rate in saving is mostly due to higher prices and the substantial decrease in the amount of saving that households have accumulated that has accompanied elevated consumption.

## **II. Determining Factors**

Several factors are believed to impact taxable sales.

### **A. Population**

The fertility rate in the U.S. was 56 births per 1,000 women in 2020, about half what it was in the early 1960s. This in part explains the lower growth rate in the U.S. population in the last few decades. The Orange County population decreased from 3,163,851 in July 2021 to 3,149,004 in July 2022, a decline of 14,847 people. This follows a decrease of 23,338 the previous year. The decrease in the growth rate of the population started many years earlier. As

shown in the table below, the high growth rate of the last century is now in the past. Orange County’s population grew by only 5.6 percent between 2010 and 2020. This growth rate is expected to decrease in the coming decades. The upcoming slow growth in the population will have a substantial impact on the growth in employment, taxable sales, city and county tax revenue, residential development, and the broader real estate market. City and county governments will have to assess the impact on their jurisdictions and take the necessary steps to mitigate the consequences. Certainly, there will be some positive impact such as on pollution and traffic.

<b>ORANGE COUNTY POPULATION GROWTH RATE<sup>1</sup></b>		
<b>YEAR</b>	<b>PERCENT CHANGE</b>	<b>ACTUAL CHANGE</b>
1950-1960	228.8%	489,864
1960-1970	101.8%	716,461
1970-1980	36.1%	512,535
1980-1990	22.6%	437,010
1990-2000	20.1%	476,358
2000-2010	5.8%	163,943
2010-2020	5.6%	176,757

The table on the next page shows that the Orange County population growth rate has even turned negative in the last three years. Although the population growth rate is expected to be positive in 2023, the rate is expected to remain at a very low level in coming decades according to projections made by the California Department of Finance.<sup>2</sup> In comparison, population growth in the Inland Empire has been higher than Orange County’s as shown in the table on the next page. It is expected to drop over time but will continue to be over that of

(1) Bureau of the Census, April 1<sup>st</sup> data

(2) This is according to a custom run for the Anderson Center done by the California Department of Finance.

Orange County’s. The decline in the population growth rate will impact not only the number of jobs in each county, but taxable sales growth as well. It is also important to note that the proportion of people over the age of 65 will continue to increase in the coming years as the baby boomer generation grows older.

<b>POPULATION GROWTH RATE</b>		
<b>YEAR</b>	<b>ORANGE COUNTY</b>	<b>INLAND EMPIRE</b>
2018	0.17%	0.77%
2019	-0.07%	0.69%
2020	-0.13%	0.72%
2021	-0.73%	0.21%
2022	-0.47%	0.06%

**B. Impact of Population Growth on Employment**

While the Orange County population growth rate from 2019 to 2022 was negative, it is expected to turn positive starting 2023. There is no doubt that the decrease in the population is partly due to Covid deaths. The other reason is a large net population outflow to other parts of the state and to other states. The net population outflow stood at -30,524 in 2022. The population growth rate will continue to be low in the future compared to previous years. With a lower population growth rate, one wonders where Orange County is going to get additional workers to fill its need for employees to continue growing its economy at a healthy growth rate. Given the high cost of living in Orange County, particularly the high home prices and rents, it is not surprising that many employees are unable to afford to live in Orange County. Consequently, an increasing number of people work in Orange County and live in neighboring counties such as the Inland Empire and Los Angeles County. This has occurred in previous years and will continue to occur in the future possibly on a larger scale particularly that the population growth rate in Orange County is expected to be below that of the Inland Empire’s as mentioned earlier.

### **C. Saving and Consumption**

The three stimuli by the Trump and Biden administrations totaled \$5 trillion. It is estimated that this has allowed households to save \$2.3 trillion in 2020 and 2021 over and above what they would have saved assuming that consumption and saving continued to grow at the same rate that existed before the pandemic. This additional saving amount decreased to \$1.7 trillion by the middle of 2022. This indicates that households went on a spending spree in 2022 leading to a 12.13 percent increase in taxable sales in 2022 compared to 2021. The excess saving amount is below \$1 trillion now. This could still support an adequate increase in taxable sales at least in the first half of 2023.

## **III. Employment Projections**

Employment plays a critical role in forecasting taxable sales. That is why there is a need to forecast employment first. Our empirical findings suggest that growth in employment is explained by the real gross domestic product and the labor force participation rate.

### **A. Real Gross Domestic Product**

While it would be advantageous to include consumption in our forecasting equation, unfortunately long-term consumption projections are not available. Since there is a strong and statistically significant relationship between consumption and gross domestic product, we use gross domestic product as a proxy for consumption spending to explain the growth rate in employment.

Covid heavily impacted the growth rate of the real gross domestic product. Real GDP decreased by 2.77 percent in 2020 and rebounded by 5.95 percent in 2021 followed by 2.06 percent in 2022. The continued depletion of household savings due to increased consumption will lend less support to the economy in the second half of 2023. The federal funds rate that is determined by the Federal Reserve has reached a range of 5 - 5.25% as of May 2023. The banking debacle that followed the bankruptcy of Silicon Valley Bank is leading to tighter lending standards by banks. These events lead the researchers at the A. Gary Anderson Center for

Economic Research to expect a slowdown in the economy in 2023 as shown in the table below. We project that the real gross domestic product will increase by a meager 0.41 percent this year, with decreases in quarters 3 and 4 on a quarter-to-quarter basis. This is due mostly to the high interest rate policy that the Federal Reserve has been following since March 2022 in order to tame inflation. Projection of the growth rate in real gross domestic product for 2023 is derived from the forecasting model at the A. Gary Anderson Center for Economic Research. Further years' projections are based on projections by the Federal Reserve and our own research.

<b>REAL GROSS DOMESTIC PRODUCT QUARTER TO QUARTER PERCENT CHANGE, ANNUALIZED</b>	
<b>YEAR</b>	<b>PERCENT</b>
2022Q4	2.57%
2023Q1	1.04%
2023Q2	0.52%
2023Q3	-5.24%
2024Q4	-1.80%

**B. Consumer Price Index**

The Consumer Price Index is a measure of the average price paid by urban consumers for a market basket of consumer goods and services. It is used in this study to compute real taxable sales, which are taxable sales adjusted for inflation. The Consumer Price Index is expected to decrease from 7.99 percent in 2022 to 4.34 percent in 2023.

Longer-run projection of the increase in the Consumer Price Index is 2.30 percent.



<b>CONSUMER PRICE INDEX</b>	
<b>YEAR</b>	<b>ANNUAL % CHANGE</b>
2022	7.99%
2023	4.34%
2024	2.89%

### **C. Labor Force Participation Rate**

The long-run nature of this forecast study limits the type of variables that can be used in forecasting taxable sales. One might hypothesize that both the population and the labor force participation rate would be significant variables in explaining employment. Although as a general principle one would expect employment to increase as the population increases, the number of employed workers is cyclical and varies substantially over the business cycle. Demographics also impact employment such as the aging of the population and the proportion of people in each age cohort who seek employment. As a result, it is the labor force participation rate that is the relevant variable in explaining employment.

The labor force participation rate in Orange County declined from 64.9 in 2010, to 61.0 in 2020 as shown in the table on the next page. The rate decreased further in 2021 to 60.2 and rebounded in 2022 to 61.1. Projections of the U.S. labor force participation rate over the 2023-2033 period were made by the Congressional Budget Office. Orange County's percentage change in the labor force participation rate is assumed to be equal to that of the U.S. over that period since county level labor force participation rate projections are not available. The U.S. growth rate was applied to compute the Orange County labor force participation rate. The rate beyond 2033 is assumed to be equal to the 2033 value.

<b>OC LABOR FORCE PARTICIPATION RATE</b>	
<b>YEAR</b>	<b>RATE</b>
2010	64.9
2015	63.1
2020	61.0
2025	60.9
2030	60.4

**D. Employment Equation**

The percentage change in the real gross domestic product (PRGDP) and the percentage change in the labor force participation rate (PLFPR) are the two explanatory variables of the percentage change in employment (PNT0). The regression equation for employment is a quarterly CORC-adjusted percentage change equation using the two explanatory variables. (The percentage changes are year-to-year percentage changes, i.e. one quarter over the same quarter of the previous year.) The results of the regression equation are presented on page 14 of this report.

The table on the next page presents the forecast of payroll job growth over the 2023-2027 period. The growth rate in employment in 2023 will be on the low side because we are projecting a slowdown in the economy in the second half of the year due to the tight monetary policy that is followed by the Federal Reserve. While the federal funds rate stood at 0.08 percent in January 2022, it is now at 5.08 percent, a 5 percentage points increase. Additionally, the money supply decreased by 2.7 percent in the first quarter of this year, but it increased by 10.3 percent in the first quarter of 2022. Future employment growth rates are expected to be low due to the expected low population growth rate. The longer-run projections of Orange County payroll employment are shown on page 18 of this report.

<b>ORANGE COUNTY PAYROLL EMPLOYMENT</b>	
<b>YEAR</b>	<b>ANNUAL % CHANGE</b>
2023	1.19%
2024	1.15%
2025	2.04%
2026	2.01%
2027	1.90%

#### **IV. Taxable Sales Forecasts**

The regression equation for taxable sales is a quarterly CORC-adjusted percentage change equation. The percentage change in real taxable sales (PRSTO) is a function of the percentage change in employment (PNT0)<sup>3</sup>. Although one would expect that gross domestic product would enter as an explanatory variable in the taxable sales equation, this variable has already been taken into account since it is included in the employment equation. The results of the regression equation are presented on page 15. These results clearly indicate the significance of the explanatory variable included in the regression equation. The equation is estimated over a sample period that includes the fourth quarter of 2022 which is the last quarter for which taxable sales data are available. The Appendix contains the sources of the data used in estimating this equation as well as other variables used in this study.

Real taxable sales forecasts are converted to nominal forecasts using a projection of the Consumer Price Index (CPI) referenced earlier. The forecasts can be found on page 19 of this report.

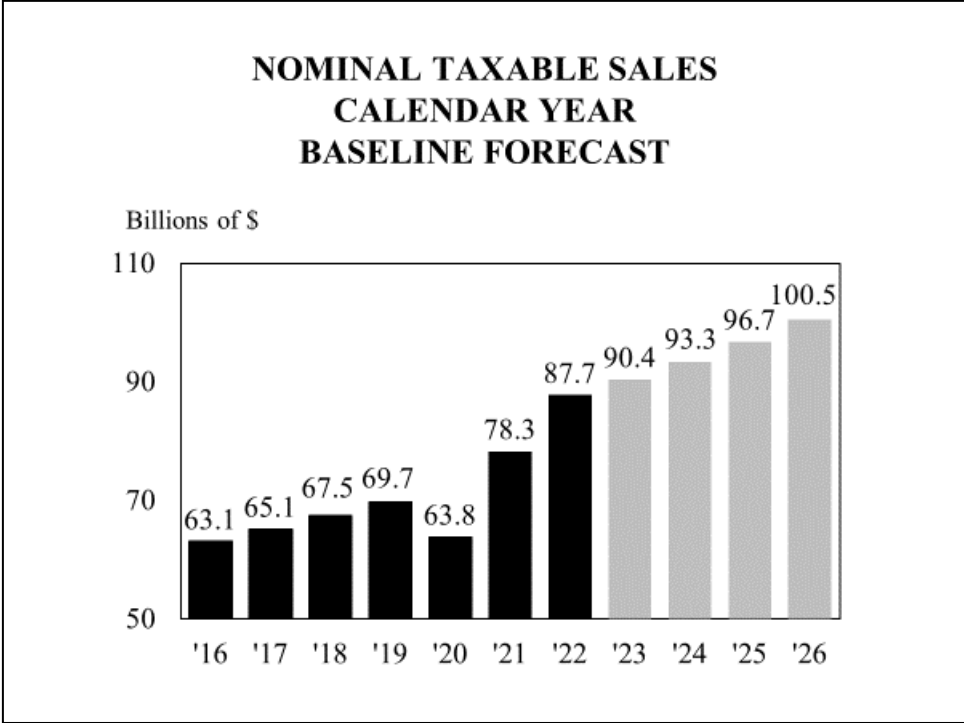
The table on the next page presents calendar year forecast of year-to-year percentage change in Orange County's nominal (not adjusted for inflation) taxable sales over the 2022-2026 period (2022 is an actual percentage).

(3) Dummy variables are also included in the regression in order to account for anomalies from the Covid recession.

<b>NOMINAL TAXABLE SALES CALENDAR YEAR BASELINE FORECAST</b>	
<b>YEAR</b>	<b>ANNUAL % CHANGE</b>
2022	12.13%
2023	3.01%
2024	3.21%
2025	3.69%
2026	3.92%

The increase in taxable sales of 22.59 percent in 2021 was followed by an increase of 12.13 percent in 2022. This high increase was due to the high amount of savings that households were still holding and the high level of consumer prices. The decline in the growth rate of taxable sales in 2023 is due to the expected slowdown in the economy resulting in lower employment and lower consumption.

Nominal values of taxable sales are presented in the chart on the next page. The data from 2016 to 2022 represent actual values, while the rest of the data are forecasted values.



The Orange County taxable sales projections (ASTO), derived from the model, represent a baseline (most-likely) forecast. Optimistic (ASTOO) and pessimistic (ASTOP) forecasts of taxable sales in Orange County are projected by adding and subtracting one standard error of the regression equation to the baseline forecast. The quarterly baseline, optimistic and pessimistic forecasts of taxable sales are shown on page 23, and the annual baseline, optimistic and pessimistic forecasts are shown on page 24.

Additionally, the fiscal year baseline, optimistic and pessimistic, nominal and real (adjusted for inflation) taxable sales forecasts over the 2005-2041 period are presented on pages 26 and 27 of this report.

**V. Comparison**

Our forecast of taxable sales for fiscal year 2022 was 17.2 percent. At 19.9 percent, the actual percentage increase turned out to be very close. So our argument last year that higher prices and the high level of household savings will keep taxable sales at a high level came out to be true. Forecasting is still tough these days because we are still dealing with the remnants of a

recession caused by a virus. Our forecast for 2023 is lower than the forecast made last year because we anticipate a slowdown in the second half of this year as we explained earlier. The long-run forecast is very close to the forecast made last year.

The forecast of fiscal year percentage change in taxable sales made last May (PASTOF2022) together with the forecast developed this May (PASTOF2023) are presented on page 29.

## Definition of Variables

STO:	Total quarterly taxable sales, actual and baseline forecast
STOO:	Total quarterly taxable sales, optimistic forecast
STOP:	Total quarterly taxable sales, pessimistic forecast
ASTO:	Total annual (calendar year) taxable sales, actual and baseline forecast
ASTOO:	Total annual (calendar year) taxable sales, optimistic forecast
ASTOP:	Total annual (calendar year) taxable sales, pessimistic forecast
ARSTO:	Total annual (calendar year) real taxable sales, actual and baseline forecast
ARSTOO:	Total annual (calendar year) real taxable sales, optimistic forecast
ARSTOP:	Total annual (calendar year) real taxable sales, pessimistic forecast
ASTOF:	Total annual (fiscal year) taxable sales, actual and baseline forecast
ASTOOF:	Total annual (fiscal year) taxable sales, optimistic forecast
ASTOPF:	Total annual (fiscal year) taxable sales, pessimistic forecast
ARSTOF:	Total annual (fiscal year) real taxable sales, actual and baseline forecast
ARSTOOF:	Total annual (fiscal year) real taxable sales, optimistic forecast
ARSTOPF:	Total annual (fiscal year) real taxable sales, pessimistic forecast
ACPI:	Annual average of the consumer price index, actual and forecast
ALFPR:	Annual Orange County labor force participation rate
AOCPOP:	Annual Orange County population
RGDP:	Real gross domestic product

For any of the above variables, the letter P preceding the name of the variable indicates the year over year percentage change in that variable.

All taxable sales and real taxable sales are in millions of dollars.

LS // Dependent Variable is PNT0

Method: ARMA Maximum Likelihood (BFGS)

SMPL range: 1991Q1 – 2023Q1

Number of observations: 129

Convergence achieved after 6 iterations

Coefficient covariance computed using outer product of gradients

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT	PROB.
C	-0.252232	0.465840	-0.541456	0.5892
PRGDP	0.836531	0.036936	22.64798	0.0000
PLFPR	0.989541	0.091458	10.81967	0.0000
AR(1)	0.782967	0.056537	13.84870	0.0000
SIGMASQ	1.289818	0.132187	9.757503	0.0000
R-squared	0.894927	Mean dependent var		1.163058
Adjusted R-squared	0.891537	S.D. dependent var		3.517292
S.E. of regression	1.158373	Akaike info criterion		3.177258
Sum squared resid	166.3866	Schwarz criterion		3.288103
Log likelihood	-199.9331	Hannan-Quinn criter.		3.222297
F-statistic	264.0327	Durbin-Watson stat		1.787402
Prob(F-statistic)	0.000000			
Inverted AR Roots	0.78			



LS // Dependent Variable is PRSTO

Method: ARMA Maximum Likelihood (BFGS)

SMPL range: 1991Q1 – 2022Q4

Number of observations: 128

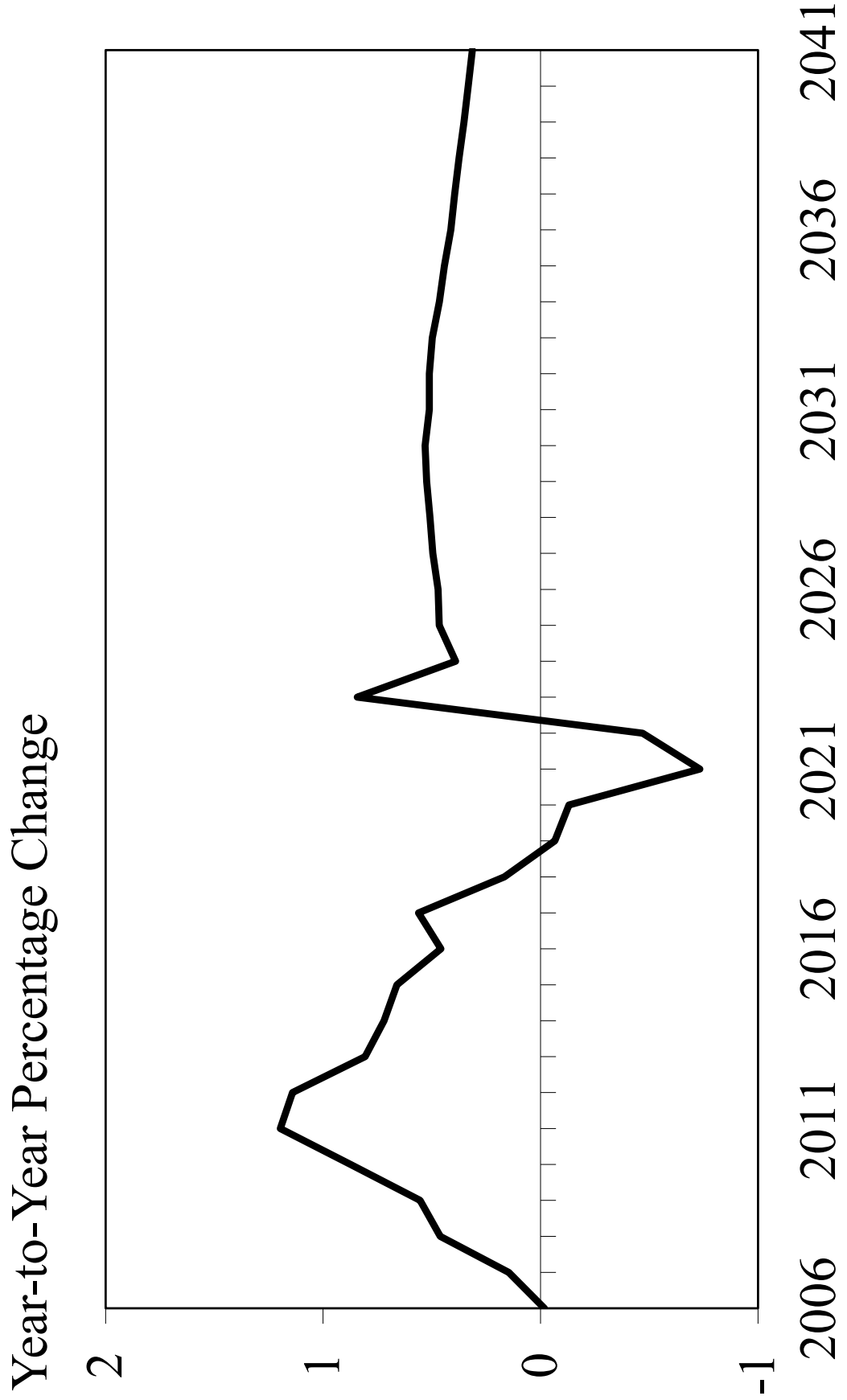
Convergence achieved after 7 iterations

Coefficient covariance computed using outer product of gradients

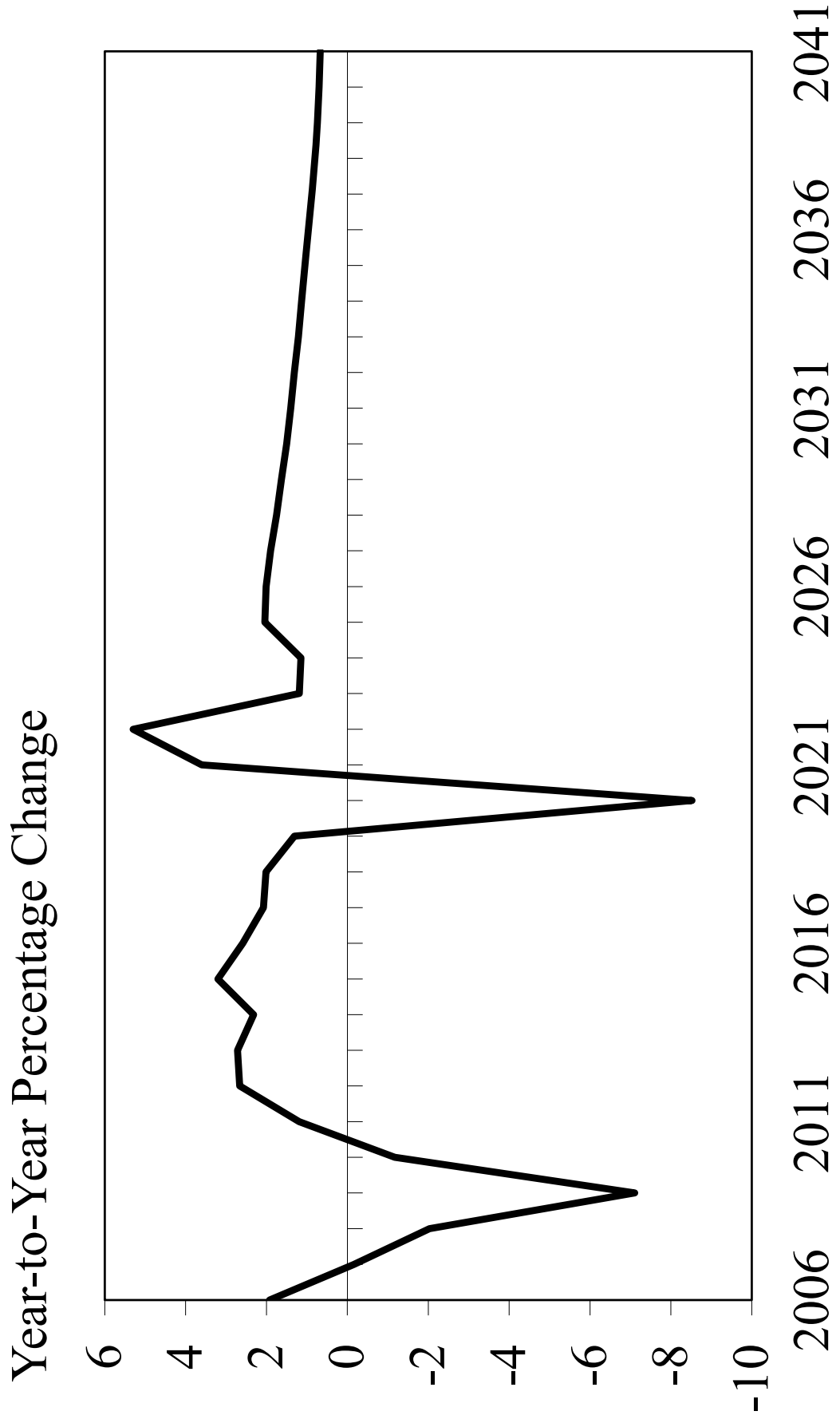
VARIABLE	COEFFICIENT	STD. ERROR	T-STAT	PROB.
C	-0.437573	0.889229	-0.492081	0.6236
PNT0	1.039998	0.106526	9.762813	0.0000
DUM2	-6.954577	1.117054	-6.225819	0.0000
DUM5	9.189054	2.489561	3.691034	0.0003
DUM6	19.34170	1.921445	10.06623	0.0000
AR(1)	0.789145	0.054002	14.61315	0.0000
SIGMASQ	5.406388	0.685189	7.890364	0.0000
R-squared	0.877293	Mean dependent var		1.299462
Adjusted R-squared	0.871208	S.D. dependent var		6.663795
S.E. of regression	2.391475	Akaike info criterion		4.642449
Sum squared resid	692.0177	Schwarz criterion		4.798420
Log likelihood	-290.1168	Hannan-Quinn criter.		4.705821
F-statistic	144.1811	Durbin-Watson stat		1.975659
Prob(F-statistic)	0.000000			
Inverted AR Roots	0.79			

	ACPI	PACPI	AOCPOP	PAOCPOP	ALFPR
2005	195.27	3.37	2,956,847	0.30	70.24
2006	201.56	3.22	2,956,334	-0.02	70.60
2007	207.34	2.87	2,960,659	0.15	70.37
2008	215.25	3.81	2,974,321	0.46	69.94
2009	214.56	-0.32	2,990,805	0.55	67.91
2010	218.08	1.64	3,016,922	0.87	64.87
2011	224.92	3.14	3,053,035	1.20	64.22
2012	229.59	2.07	3,087,846	1.14	63.91
2013	232.95	1.47	3,112,757	0.81	63.27
2014	236.72	1.62	3,135,170	0.72	62.93
2015	237.01	0.12	3,155,895	0.66	63.11
2016	240.01	1.27	3,170,359	0.46	63.15
2017	245.12	2.13	3,188,158	0.56	62.96
2018	251.10	2.44	3,193,464	0.17	63.11
2019	255.65	1.81	3,191,365	-0.07	62.99
2020	258.85	1.25	3,187,189	-0.13	60.99
2021	270.97	4.68	3,163,851	-0.73	60.23
2022	292.62	7.99	3,149,004	-0.47	61.06
2023	305.31	4.34	3,175,535	0.84	61.01
2024	314.13	2.89	3,187,943	0.39	60.96
2025	320.98	2.18	3,202,810	0.47	60.85
2026	327.55	2.05	3,217,904	0.47	60.76
2027	334.33	2.07	3,233,853	0.50	60.67
2028	341.65	2.19	3,250,304	0.51	60.59
2029	349.33	2.25	3,267,340	0.52	60.51
2030	357.28	2.28	3,284,698	0.53	60.41
2031	365.38	2.27	3,301,514	0.51	60.30
2032	373.68	2.27	3,318,399	0.51	60.19
2033	382.23	2.29	3,334,936	0.50	60.10
2034	391.00	2.30	3,350,456	0.47	60.10
2035	400.00	2.30	3,365,279	0.44	60.10
2036	409.25	2.31	3,379,173	0.41	60.10
2037	418.63	2.29	3,392,530	0.40	60.10
2038	428.25	2.30	3,405,250	0.37	60.10
2039	438.10	2.30	3,417,257	0.35	60.10
2040	448.17	2.30	3,428,632	0.33	60.10
2041	458.50	2.30	3,439,397	0.31	60.10

# Population



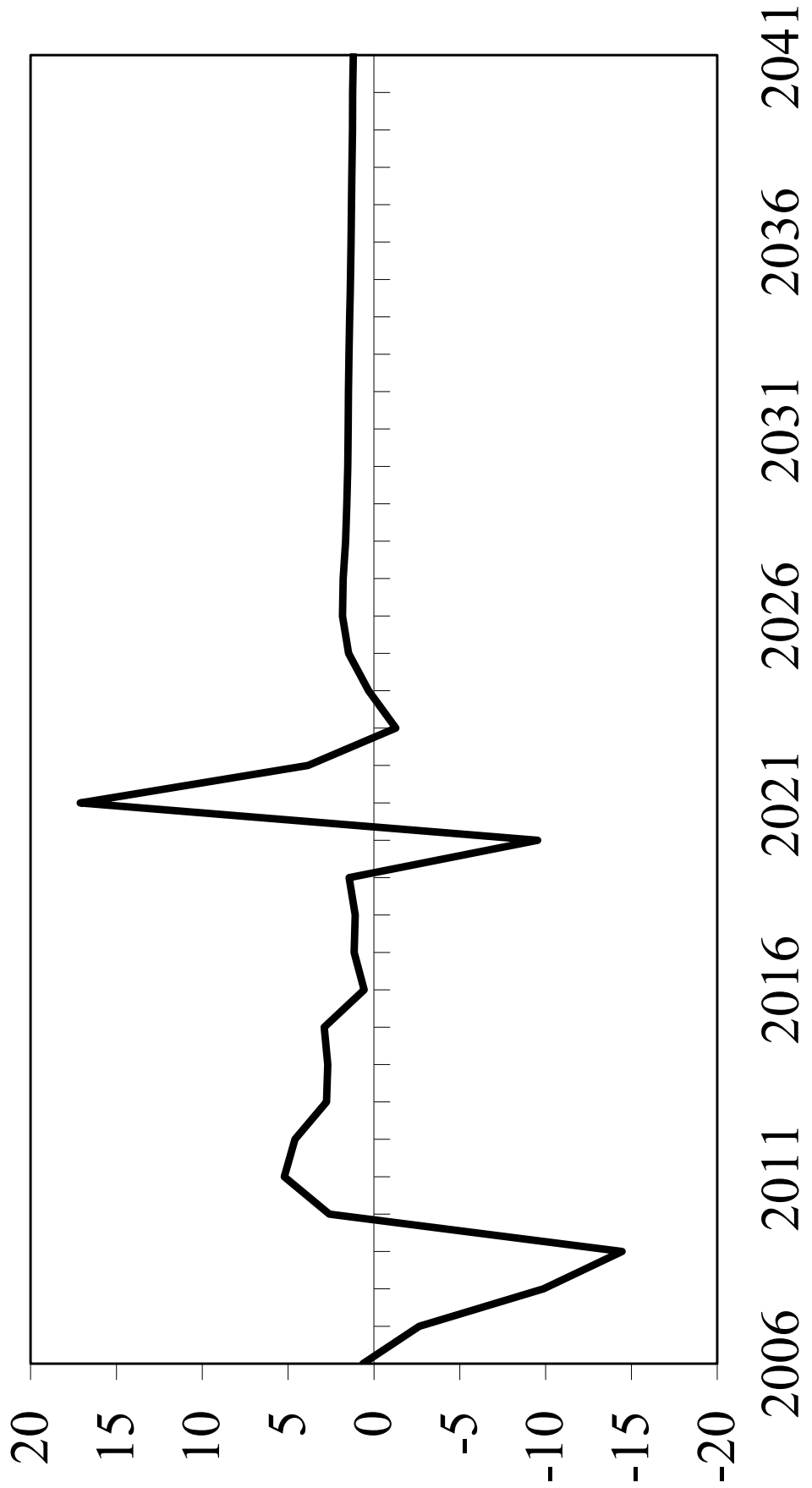
# Employment



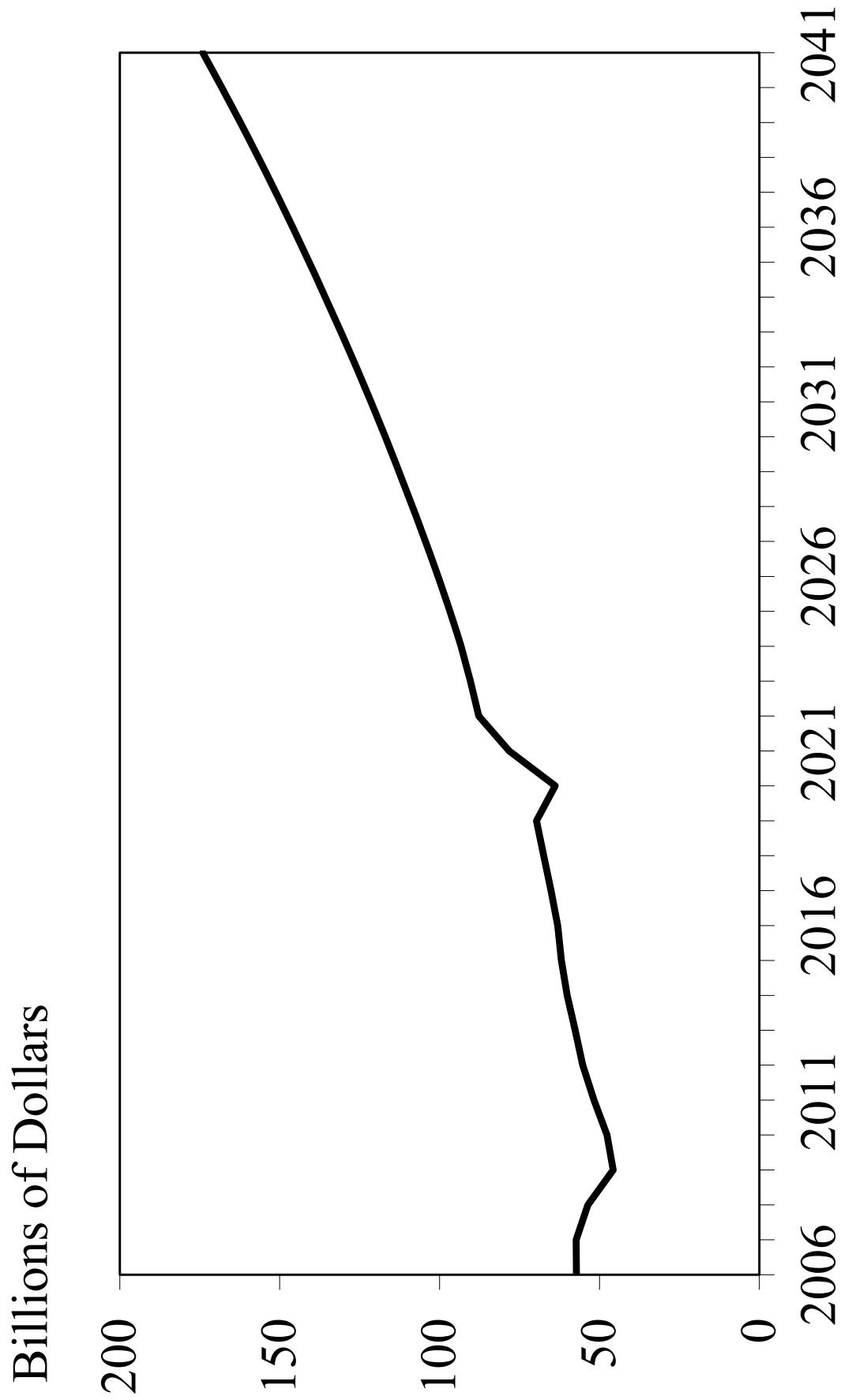
	ASTO	PASTO	ARSTO	PARSTO
2005	55,063.25	6.54	28,199.00	3.07
2006	57,202.75	3.89	28,380.24	0.64
2007	57,293.47	0.16	27,632.06	-2.64
2008	53,606.83	-6.43	24,903.96	-9.87
2009	45,712.79	-14.73	21,304.90	-14.45
2010	47,667.18	4.28	21,858.04	2.60
2011	51,731.14	8.53	22,999.49	5.22
2012	55,230.61	6.76	24,056.60	4.60
2013	57,591.22	4.27	24,722.38	2.77
2014	60,097.13	4.35	25,387.97	2.69
2015	61,916.22	3.03	26,124.44	2.90
2016	63,058.76	1.85	26,273.94	0.57
2017	65,148.06	3.31	26,577.75	1.16
2018	67,468.62	3.56	26,869.22	1.10
2019	69,688.98	3.29	27,259.26	1.45
2020	63,833.52	-8.40	24,660.43	-9.53
2021	78,253.94	22.59	28,878.92	17.11
2022	87,746.06	12.13	29,986.86	3.84
2023	90,390.48	3.01	29,606.37	-1.27
2024	93,291.30	3.21	29,698.78	0.31
2025	96,734.26	3.69	30,137.63	1.48
2026	100,523.54	3.92	30,689.52	1.83
2027	104,444.17	3.90	31,240.31	1.79
2028	108,501.39	3.88	31,758.05	1.66
2029	112,694.61	3.86	32,260.68	1.58
2030	117,022.15	3.84	32,754.08	1.53
2031	121,475.27	3.81	33,246.74	1.50
2032	126,078.82	3.79	33,740.24	1.48
2033	130,839.11	3.78	34,230.91	1.45
2034	135,736.03	3.74	34,715.10	1.41
2035	140,767.41	3.71	35,191.85	1.37
2036	145,933.98	3.67	35,658.88	1.33
2037	151,251.67	3.64	36,130.59	1.32
2038	156,705.20	3.61	36,591.99	1.28
2039	162,319.50	3.58	37,050.79	1.25
2040	168,114.84	3.57	37,510.98	1.24
2041	174,053.93	3.53	37,961.60	1.20

# Calendar Year Real Taxable Sales

Year-to-Year Percentage Change

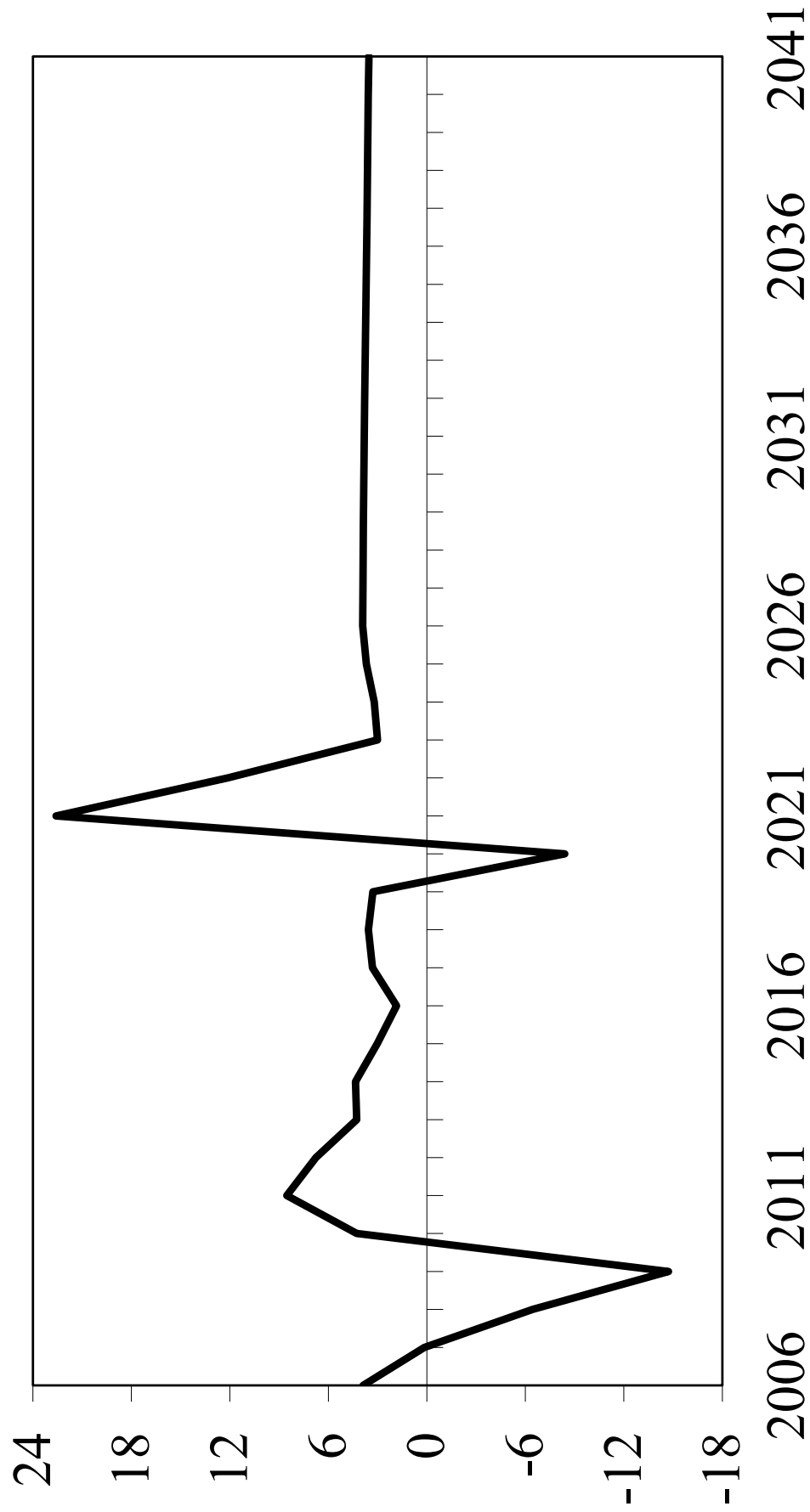


# Calendar Year Taxable Sales



# Calendar Year Taxable Sales

Year-to-Year Percentage Change

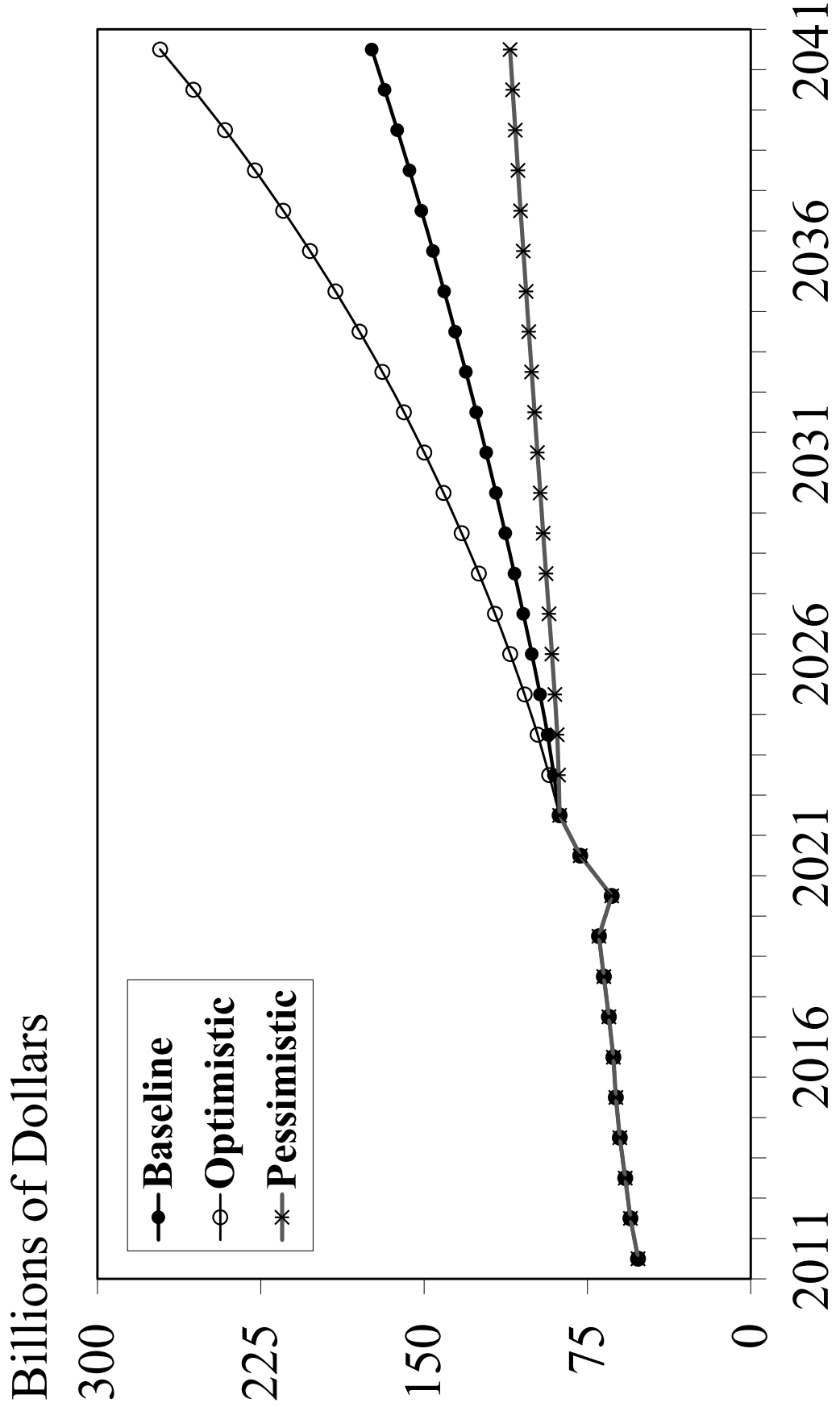




	STO	STOO	STOP
2015Q1	14,167.79	14,167.79	14,167.79
2015Q2	15,535.45	15,535.45	15,535.45
2015Q3	15,652.46	15,652.46	15,652.46
2015Q4	16,560.51	16,560.51	16,560.51
2016Q1	14,592.05	14,592.05	14,592.05
2016Q2	15,680.84	15,680.84	15,680.84
2016Q3	15,953.02	15,953.02	15,953.02
2016Q4	16,832.86	16,832.86	16,832.86
2017Q1	14,932.66	14,932.66	14,932.66
2017Q2	16,397.88	16,397.88	16,397.88
2017Q3	16,385.98	16,385.98	16,385.98
2017Q4	17,431.54	17,431.54	17,431.54
2018Q1	15,583.72	15,583.72	15,583.72
2018Q2	16,691.29	16,691.29	16,691.29
2018Q3	16,893.05	16,893.05	16,893.05
2018Q4	18,300.56	18,300.56	18,300.56
2019Q1	15,818.90	15,818.90	15,818.90
2019Q2	17,577.73	17,577.73	17,577.73
2019Q3	17,365.76	17,365.76	17,365.76
2019Q4	18,926.58	18,926.58	18,926.58
2020Q1	15,332.43	15,332.43	15,332.43
2020Q2	13,730.41	13,730.41	13,730.41
2020Q3	16,513.42	16,513.42	16,513.42
2020Q4	18,257.25	18,257.25	18,257.25
2021Q1	16,442.11	16,442.11	16,442.11
2021Q2	19,588.32	19,588.32	19,588.32
2021Q3	20,277.95	20,277.95	20,277.95
2021Q4	21,945.56	21,945.56	21,945.56
2022Q1	20,205.91	20,205.91	20,205.91
2022Q2	22,470.59	22,470.59	22,470.59
2022Q3	21,965.00	21,965.00	21,965.00
2022Q4	23,104.55	23,104.55	23,104.55
2023Q1	21,478.88	21,989.89	20,967.88
2023Q2	23,288.52	23,848.75	22,728.29
2023Q3	22,518.52	23,063.61	21,973.43
2023Q4	23,104.55	23,676.73	22,532.38
2024Q1	21,777.44	22,838.90	20,741.24
2024Q2	22,857.68	23,995.22	21,747.75
2024Q3	23,603.91	24,741.83	22,492.77
2024Q4	25,052.27	26,252.52	23,880.04
2025Q1	23,118.93	24,804.30	21,511.67
2025Q2	23,872.56	25,646.79	22,182.08
2025Q3	24,064.19	25,828.45	22,382.15
2025Q4	25,678.57	27,550.01	23,893.81

	ASTO	ASTOO	ASTOP
2005	55,063.25	55,063.25	55,063.25
2006	57,202.75	57,202.75	57,202.75
2007	57,293.47	57,293.47	57,293.47
2008	53,606.83	53,606.83	53,606.83
2009	45,712.79	45,712.79	45,712.79
2010	47,667.18	47,667.18	47,667.18
2011	51,731.14	51,731.14	51,731.14
2012	55,230.61	55,230.61	55,230.61
2013	57,591.22	57,591.22	57,591.22
2014	60,097.13	60,097.13	60,097.13
2015	61,916.22	61,916.22	61,916.22
2016	63,058.76	63,058.76	63,058.76
2017	65,148.06	65,148.06	65,148.06
2018	67,468.62	67,468.62	67,468.62
2019	69,688.98	69,688.98	69,688.98
2020	63,833.52	63,833.52	63,833.52
2021	78,253.94	78,253.94	78,253.94
2022	87,746.06	87,746.06	87,746.06
2023	90,390.48	92,578.98	88,201.98
2024	93,291.30	97,828.46	88,861.81
2025	96,734.26	103,829.54	89,969.71
2026	100,523.54	110,430.42	91,298.55
2027	104,444.17	117,432.63	92,631.14
2028	108,501.39	124,863.64	93,966.19
2029	112,694.61	132,741.69	95,300.54
2030	117,022.15	141,085.38	96,629.46
2031	121,475.27	149,904.14	97,943.68
2032	126,078.82	159,250.66	99,260.45
2033	130,839.11	169,158.22	100,580.53
2034	135,736.03	179,626.71	101,884.90
2035	140,767.41	190,678.63	103,169.43
2036	145,933.98	202,341.81	104,432.13
2037	151,251.67	214,663.79	105,683.33
2038	156,705.20	227,654.18	106,908.95
2039	162,319.50	241,379.03	108,124.08
2040	168,114.84	255,901.14	109,339.78
2041	174,053.93	271,201.14	110,527.91

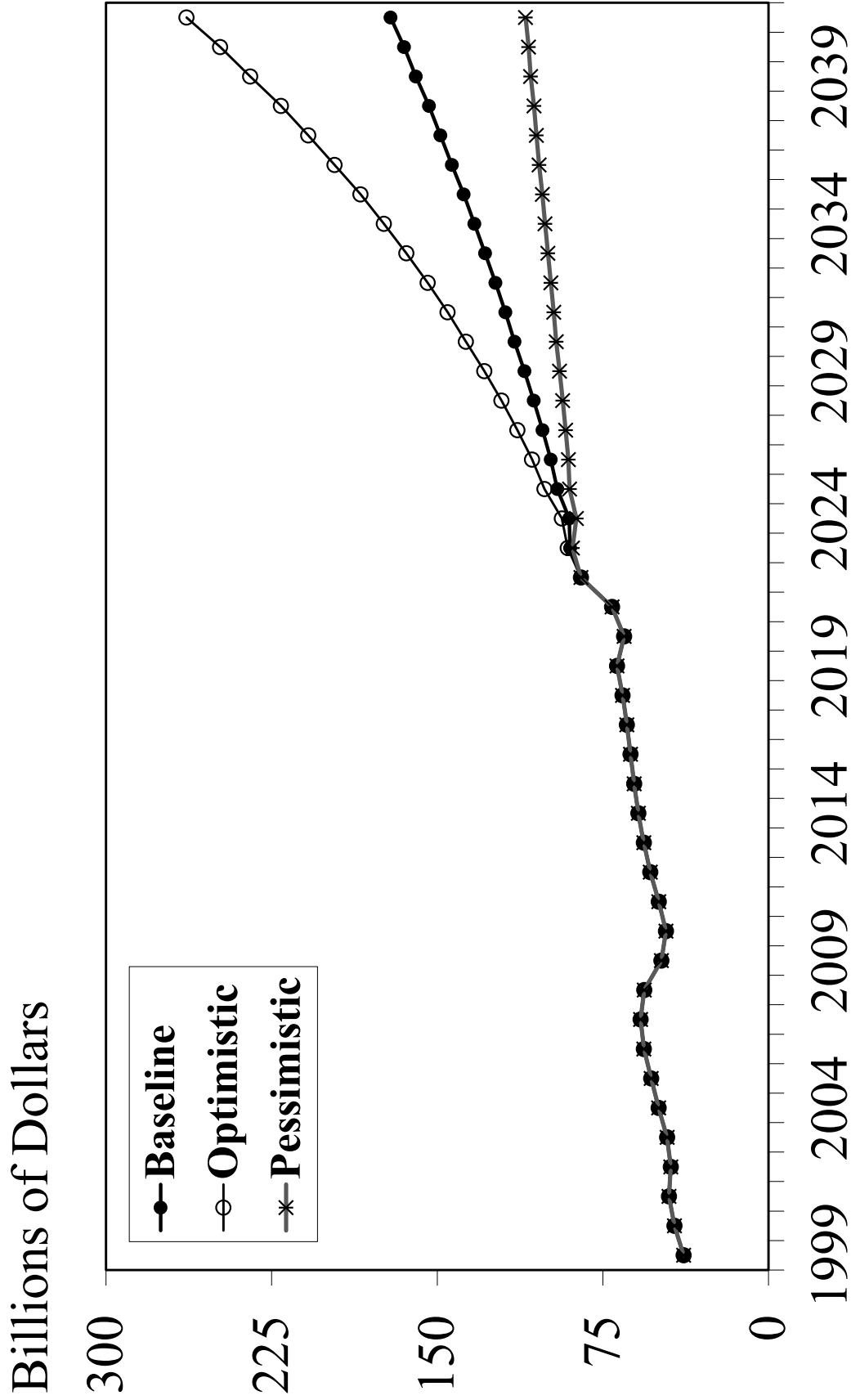
# Calendar Year Taxable Sales Forecast (Baseline, Optimistic, Pessimistic)



	ASTOF	ASTOOF	ASTOPF	PASTOF	PASTOOF	PASTOPF
2005	53,100.98	53,100.98	53,100.98	6.72	6.72	6.72
2006	56,395.57	56,395.57	56,395.57	6.20	6.20	6.20
2007	57,900.06	57,900.06	57,900.06	2.67	2.67	2.67
2008	56,233.64	56,233.64	56,233.64	-2.88	-2.88	-2.88
2009	48,509.43	48,509.43	48,509.43	-13.74	-13.74	-13.74
2010	46,424.42	46,424.42	46,424.42	-4.30	-4.30	-4.30
2011	49,691.58	49,691.58	49,691.58	7.04	7.04	7.04
2012	53,502.93	53,502.93	53,502.93	7.67	7.67	7.67
2013	56,402.04	56,402.04	56,402.04	5.42	5.42	5.42
2014	58,894.49	58,894.49	58,894.49	4.42	4.42	4.42
2015	60,801.03	60,801.03	60,801.03	3.24	3.24	3.24
2016	62,485.86	62,485.86	62,485.86	2.77	2.77	2.77
2017	64,116.42	64,116.42	64,116.42	2.61	2.61	2.61
2018	66,092.52	66,092.52	66,092.52	3.08	3.08	3.08
2019	68,590.24	68,590.24	68,590.24	3.78	3.78	3.78
2020	65,355.19	65,355.19	65,355.19	-4.72	-4.72	-4.72
2021	70,801.10	70,801.10	70,801.10	8.33	8.33	8.33
2022	84,900.01	84,900.01	84,900.01	19.91	19.91	19.91
2023	89,836.96	90,908.20	88,765.72	5.82	7.08	4.55
2024	90,258.20	93,574.45	86,994.80	0.47	2.93	-2.00
2025	95,647.67	101,445.43	90,066.57	5.97	8.41	3.53
2026	98,587.33	107,050.43	90,626.27	3.07	5.53	0.62
2027	102,308.79	113,701.81	91,837.31	3.77	6.21	1.34
2028	106,302.20	120,913.31	93,181.98	3.90	6.34	1.46
2029	110,519.01	128,663.32	94,602.17	3.97	6.41	1.52
2030	115,002.07	137,031.05	96,124.42	4.06	6.50	1.61
2031	119,149.48	145,326.22	97,238.71	3.61	6.05	1.16
2032	123,640.60	154,356.00	98,527.33	3.77	6.21	1.33
2033	128,351.27	164,010.12	99,872.73	3.81	6.25	1.37
2034	133,162.18	174,167.51	101,174.42	3.75	6.19	1.30
2035	138,038.58	184,802.23	102,406.75	3.66	6.11	1.22
2036	143,401.45	196,502.26	103,880.38	3.89	6.33	1.44
2037	148,594.12	208,427.42	105,099.30	3.62	6.07	1.17
2038	153,757.43	220,766.29	106,181.38	3.47	5.92	1.03
2039	159,714.54	234,722.33	107,696.64	3.87	6.32	1.43
2040	165,047.85	248,304.64	108,657.27	3.34	5.79	0.89
2041	171,129.72	263,528.41	110,003.25	3.68	6.13	1.24

	ARSTOF	ARSTOOF	ARSTOPF	PARSTOF	PARSTOOF	PARSTOPF
2005	27,699.45	27,699.45	27,699.45	3.61	3.61	3.61
2006	28,350.86	28,350.86	28,350.86	2.35	2.35	2.35
2007	28,371.61	28,371.61	28,371.61	0.07	0.07	0.07
2008	26,575.85	26,575.85	26,575.85	-6.33	-6.33	-6.33
2009	22,581.20	22,581.20	22,581.20	-15.03	-15.03	-15.03
2010	21,417.89	21,417.89	21,417.89	-5.15	-5.15	-5.15
2011	22,477.86	22,477.86	22,477.86	4.95	4.95	4.95
2012	23,512.35	23,512.35	23,512.35	4.60	4.60	4.60
2013	24,376.07	24,376.07	24,376.07	3.67	3.67	3.67
2014	25,063.66	25,063.66	25,063.66	2.82	2.82	2.82
2015	25,687.43	25,687.43	25,687.43	2.49	2.49	2.49
2016	26,227.39	26,227.39	26,227.39	2.10	2.10	2.10
2017	26,423.33	26,423.33	26,423.33	0.75	0.75	0.75
2018	26,639.59	26,639.59	26,639.59	0.82	0.82	0.82
2019	27,083.27	27,083.27	27,083.27	1.67	1.67	1.67
2020	25,401.31	25,401.31	25,401.31	-6.21	-6.21	-6.21
2021	26,892.26	26,892.26	26,892.26	5.87	5.87	5.87
2022	30,104.87	30,104.87	30,104.87	11.95	11.95	11.95
2023	29,961.33	30,315.20	29,607.46	-0.48	0.70	-1.65
2024	29,103.74	30,170.47	28,053.94	-2.86	-0.48	-5.25
2025	30,117.87	31,941.42	28,362.36	3.48	5.87	1.10
2026	30,402.64	33,010.55	27,949.29	0.95	3.35	-1.46
2027	30,921.20	34,362.47	27,758.08	1.71	4.10	-0.68
2028	31,458.50	35,780.10	27,577.62	1.74	4.13	-0.65
2029	31,994.20	37,244.33	27,388.29	1.70	4.09	-0.69
2030	32,554.03	38,787.26	27,212.14	1.75	4.14	-0.64
2031	32,978.78	40,221.43	26,916.04	1.30	3.70	-1.09
2032	33,462.49	41,772.62	26,667.57	1.47	3.86	-0.92
2033	33,963.36	43,396.20	26,429.42	1.50	3.89	-0.89
2034	34,445.83	45,049.82	26,173.21	1.42	3.81	-0.97
2035	34,906.36	46,728.42	25,897.85	1.34	3.73	-1.05
2036	35,444.55	48,566.07	25,677.97	1.54	3.93	-0.85
2037	35,902.38	50,355.48	25,395.21	1.29	3.68	-1.10
2038	36,316.44	52,139.91	25,081.07	1.15	3.54	-1.24
2039	36,872.04	54,184.77	24,864.83	1.53	3.92	-0.86
2040	37,249.75	56,036.15	24,524.66	1.02	3.42	-1.37
2041	37,753.32	58,133.60	24,269.79	1.35	3.74	-1.04

# Fiscal Year Taxable Sales Forecast (Baseline, Optimistic, Pessimistic)



	PASTOF2022	PASTOF2023
2023	7.96	5.82
2024	2.96	0.47
2025	4.85	5.97
2026	3.63	3.07
2027	4.28	3.77
2028	3.47	3.90
2029	4.06	3.97
2030	3.72	4.06
2031	3.75	3.61
2032	4.19	3.77
2033	3.87	3.81
2034	3.83	3.75
2035	3.89	3.66
2036	3.80	3.89
2037	3.75	3.62
2038	3.79	3.47
2039	3.77	3.87
2040	3.81	3.34
2041	3.84	3.68

## **Disclaimer**

*This report is prepared by Raymond Sfeir and James Doti (Consultants). Consultants who are affiliated with the Chapman University, Argyros School of Business and Economics, shall conduct their business as an Independent Contractor and nothing contained herein shall be construed to create involvement of the Chapman University or of the Argyros School of Business and Economics between the Client and Consultants. Chapman University's Argyros School of Business and Economics shall not be liable to the Client, or to anyone who may claim any right due to Consultants' relationship with the Client, for any acts or omissions in the performance of said services on the part of the Consultants or on the part of the agents or employees of the Consultants.*



# Appendix

## Sources of Data

- **Consumer Price Index** — "The Consumer Price Index," U.S. Department of Labor, Bureau of Labor Statistics. Projections made by the A. Gary Anderson Center for Economic Research.
- **Orange County Payroll Employment** — Employment Development Department, Labor Market Information Division, State of California. Projections made by the A. Gary Anderson Center for Economic Research.
- **Orange County Taxable Sales** — "Taxable Sales in California (Sales and Use Tax)," California Department of Tax and Fee Administration.
- **Orange County Population** — California Department of Finance. Population projections also made by the California Department of Finance.
- **Orange County Labor Force Participation Rate** — California Department of Finance. Labor force participation rate projections are modeled after the U.S. labor force participation rate projections.
- **U.S. Real Gross Domestic Product** — U.S. Department of Commerce, Bureau of Economic Analysis. Projections made by the Congressional Budget Office, the Federal Reserve, and the A. Gary Anderson Center for Economic Research.
- **Inland Empire Population** — California Department of Finance.