# The Return of Inflation and Its Impact on Tax Revenues

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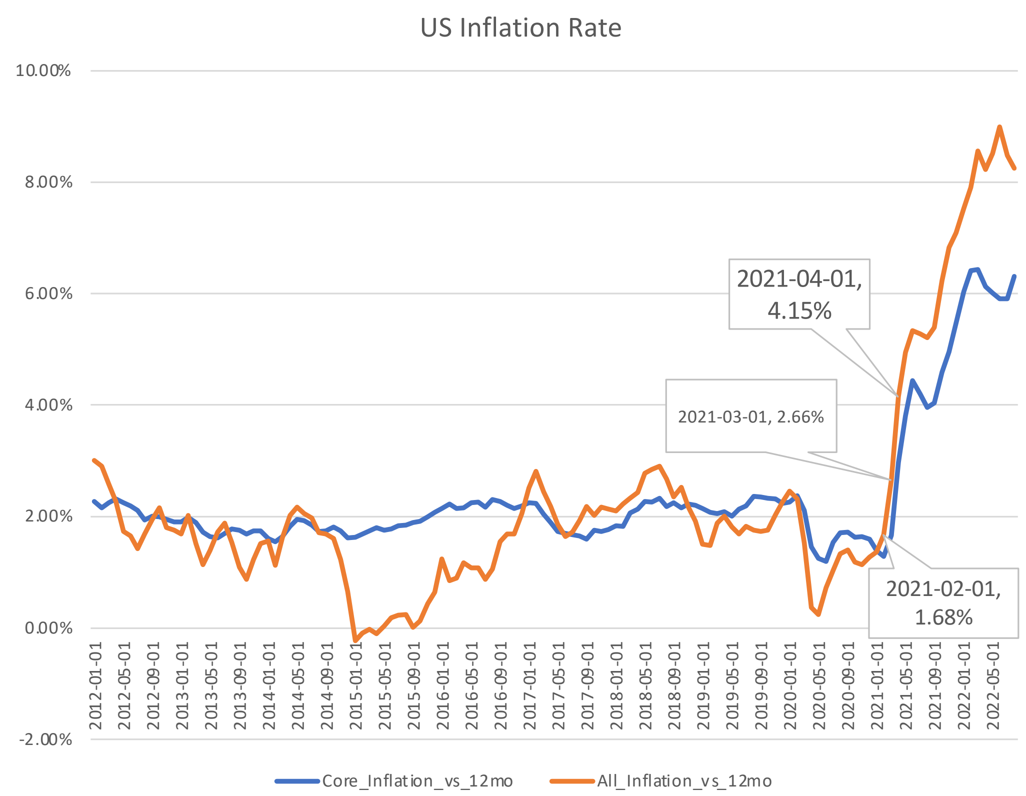
*The views and opinions expressed in this presentation are those of the speaker and do not necessarily reflect the views or positions of the Office of the Chief Financial Officer

# The Return of Inflation

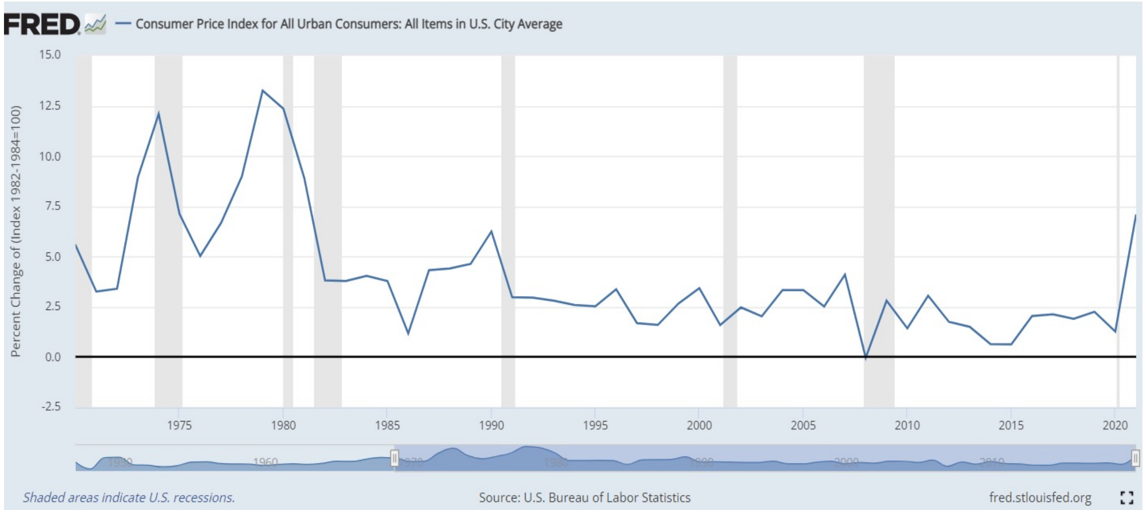
- Inflation have soared in the United States and across the globe since early 2021, reflecting multiple drivers, including both supply and demand shocks.
- Inflation started to break out in the spring of 2021 after the availability of covid vaccines and the relaxation of Covid restrictions.
- Multiple drivers, including both supply and demand factors, had joined forces to push inflation to forty year high
- Before the past two years, revenue forecasters have paid little attention to inflation in making their forecasts. The return of inflation has changed that.



# High and Low Inflation Regimes

- **The Low Inflation Regime**: For most of the past 30 years, inflation had remained subdued and averaged about 2.4% annually.
- **The High Inflation Regime**: The United States experienced high inflation in the 70s and early 80s. Inflation averages at about 6.9% during this period.
- Revenue during recessions does not have to decline during high inflation regime, as shown in the table.
- Total Tax Revenue in DC during the 1974, 1980 and 1982 recessions rosed by 9%.
- Total tax revenue during the 1991, 2002, and 2008 recessions declined by 4.9%.
- Implication for 2023 revenue forecast: How high will inflation be?

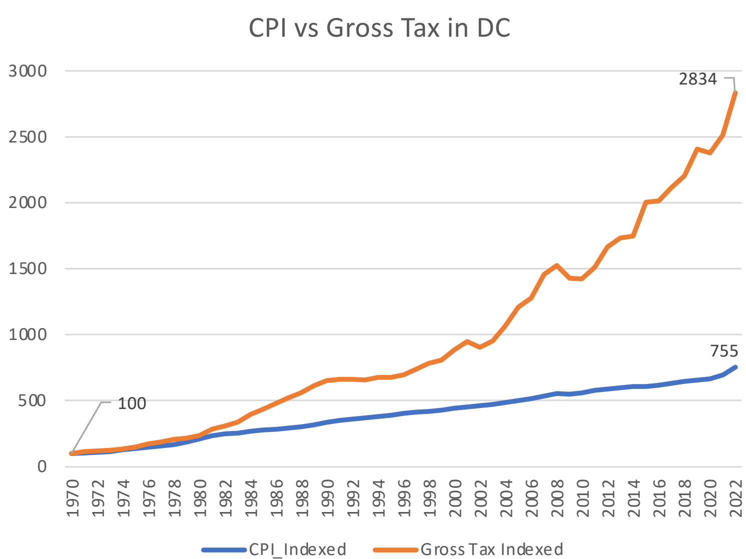
| | Inflation Regimes | All Taxes | IIT | Sales |
|---|---|---|---|---|
| Revenue growth | 1970-1990 | 9.89% | 10.87% | 9.71% |
| | 1991-2019 | 4.73% | 4.83% | 4.52% |
| Revenue Growth in Recession | 1970-1990 | 8.99% | 7.66% | 6.90% |
| | 1991-2019 | -4.86% | -7.23% | -4.31% |

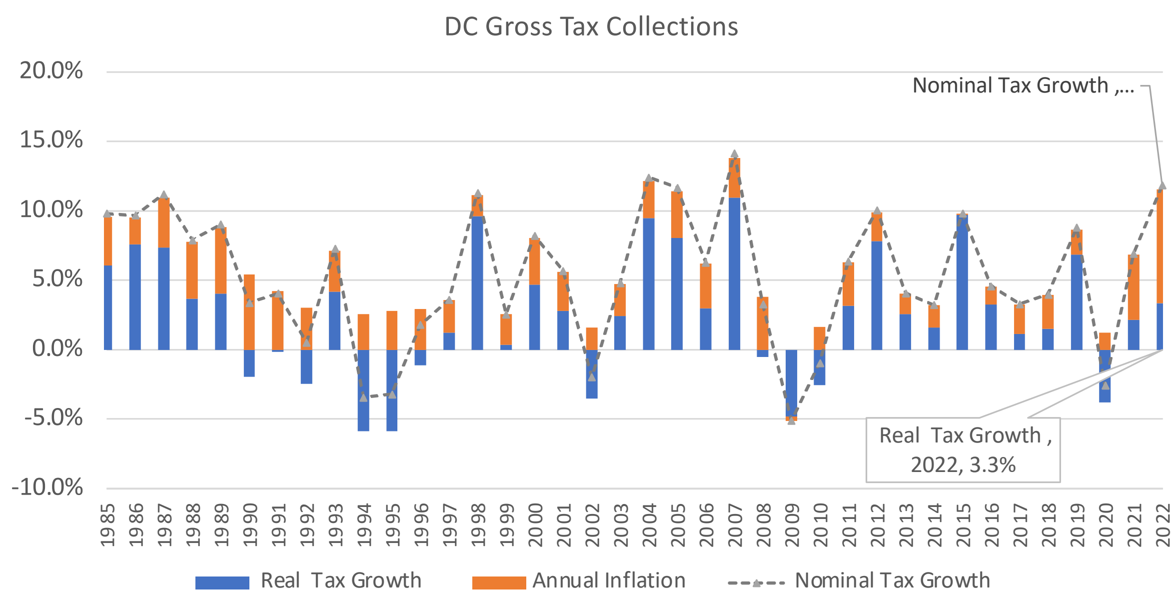



Data source: Federal Reserve Bank of St. Louis

# Real vs. Nominal Revenue Growth

- I decomposed the nominal growth in tax collections into real growth vs inflation components.
- For DC gross tax collections, I use CPI for all urban consumers (CPI-U) to deflate the nominal tax revenue to real tax revenue collections.
- DC gross taxes grows at an annual rate of 6.8% over the last 52 years, while real revenue (the blue bars) grows at an average of 2.6%. (real growth includes tax rates increase, bracket creeping, tax progressiveness etc)
- For the same period, CPI-U averages at 4.0%.
- 8.2% of the 11.5% nominal revenue growth in 2022 is from Inflation. Real growth accounts for only about 3.3%, slightly above historical average.

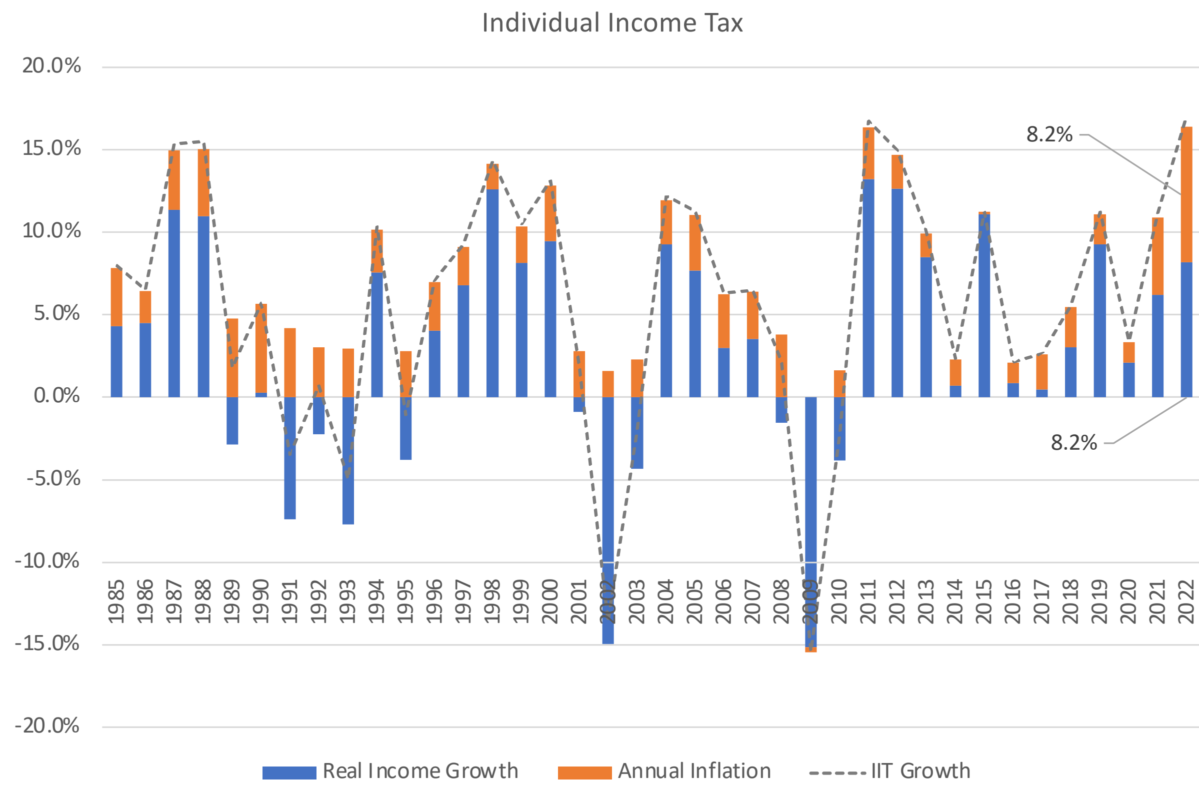



* 2023 and 2023 revenues and inflation numbers are estimates

# Real vs. Nominal Revenue Growth

- Nominal growth in IIT is decomposed into real growth vs inflation components.
- For DC individual income tax collections, I use CPI for all urban consumers (CPI-U) to deflate the nominal tax revenue to real tax revenue collections.
- DC individual income tax revenue grows at an annual average of 5.9% over the last 37 years, while real income tax revenue (the blue bars) grows at an average of 3.1%.
- For the same period, CPI-U averages at 2.8%.

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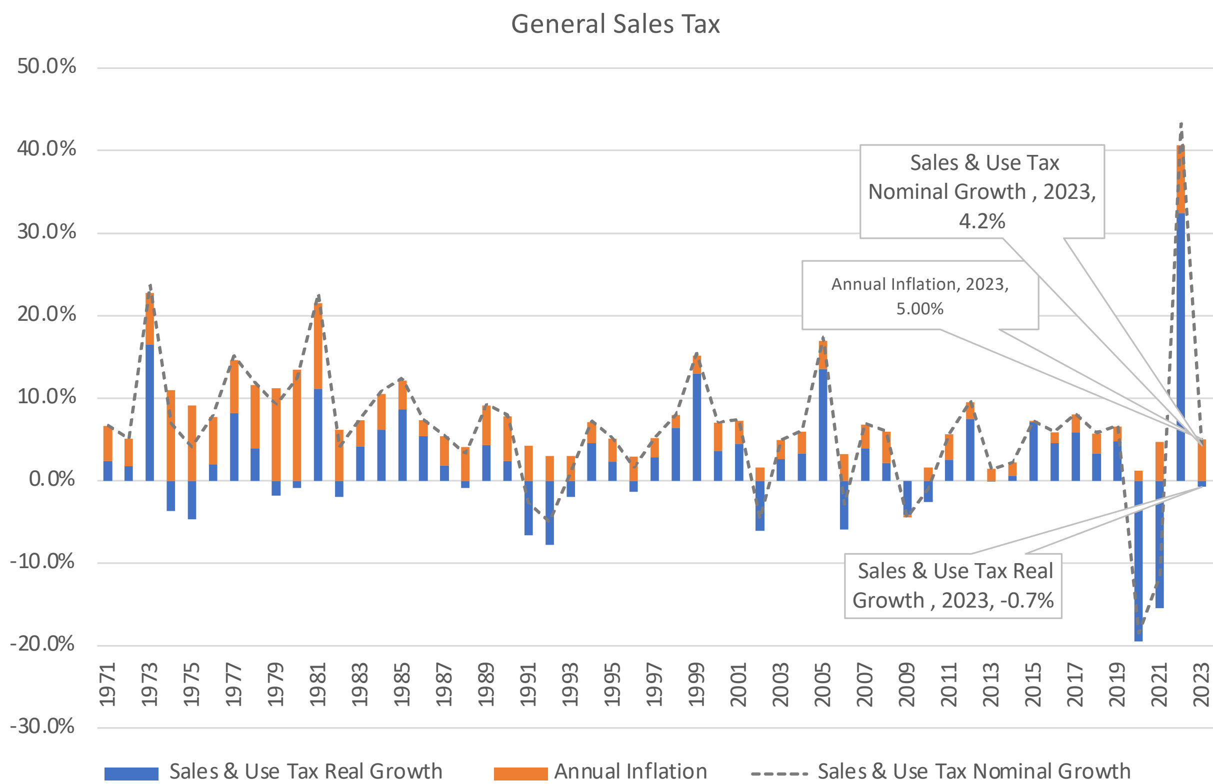
# Real vs. Nominal Revenue Growth

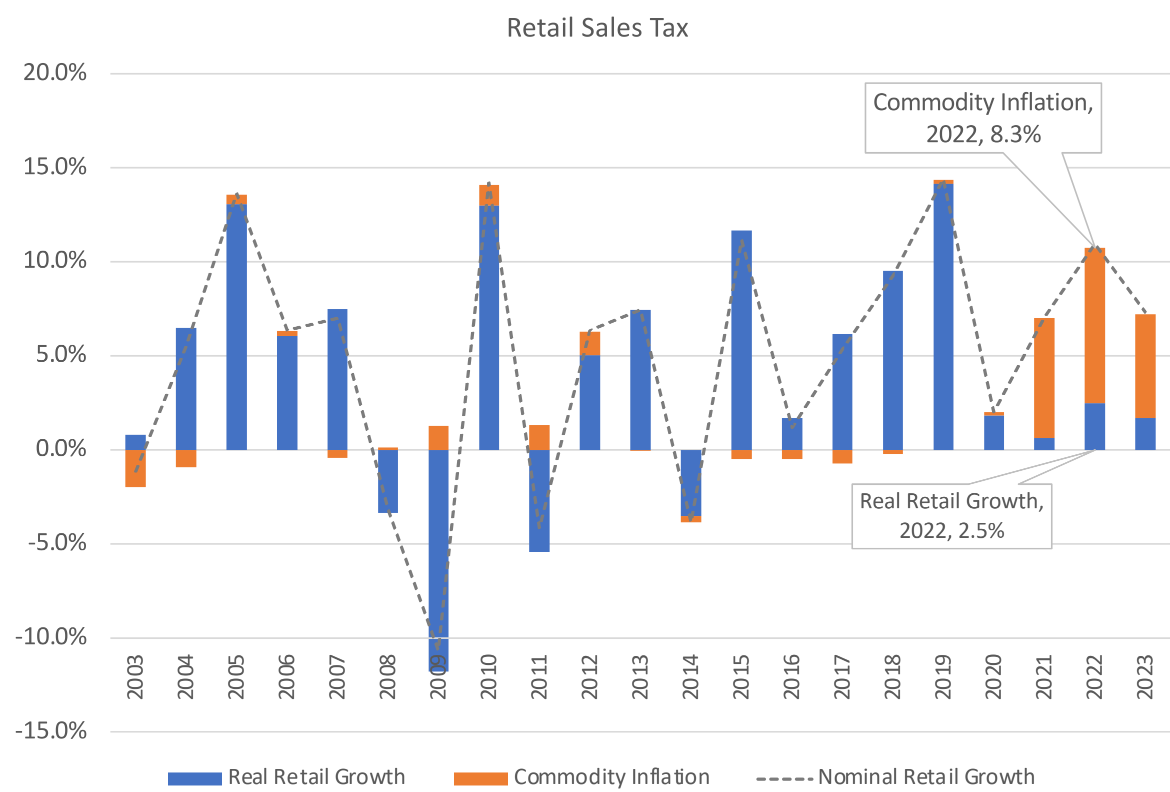
- Nominal growth in General Sales and Use Tax (S&U)is decomposed into real growth vs inflation components.
- I use CPI for all urban consumers (CPI-U) to deflate the nominal S&U tax revenue to real tax revenue collections.
- DC S&U tax revenue grows at an annual average of 6.5% over the last 53 years, while real revenue (the blue bars) grows at an average of 2.5% (the blue bars).
- For the same period, CPI-U averages at 4.0%.




* 2023 and 2023 revenues and inflation numbers are estimates

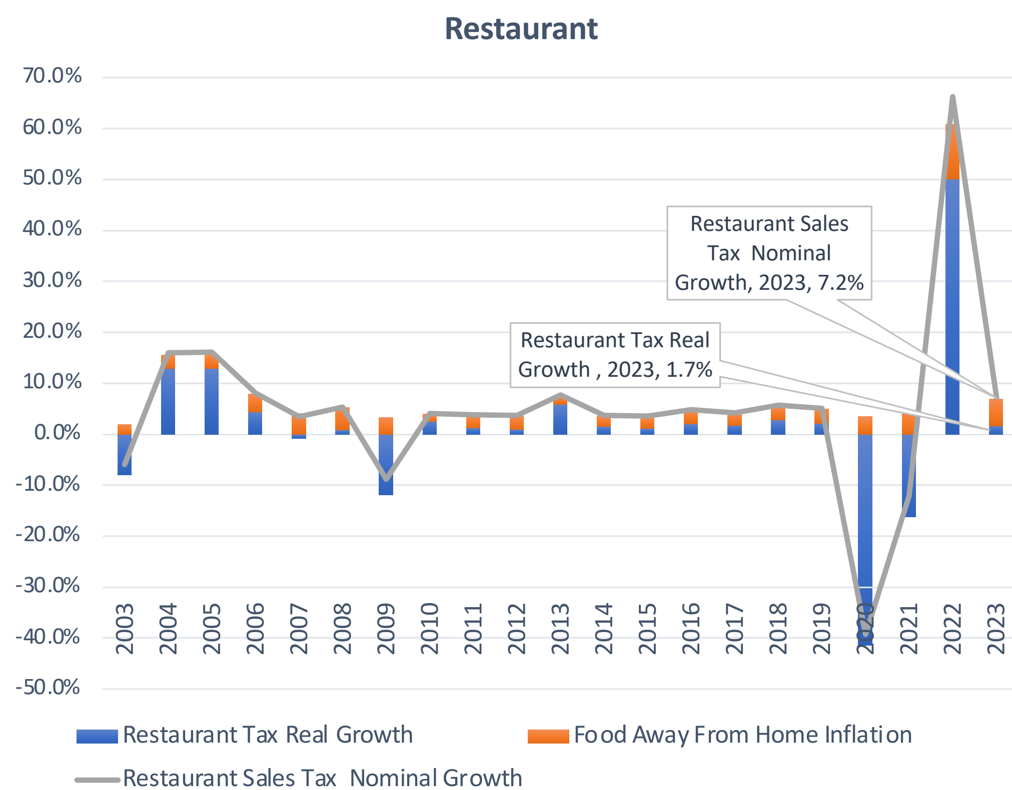
# Real vs. Nominal Revenue Growth

- Nominal growth in Retail Sales and Use Tax (S&U)is decomposed into real growth vs inflation components.
- I use CPI for Commodities ex. Food and Energy to deflate the  nominal retail S&U tax revenue to real tax revenue collections.
- DC retail S&U tax revenue grows at an annual average of 5.1% over the last 20 years, while real revenue (the blue bars) grows at an average of 4.1% (the blue bars).
- For the same period, CPI for Commodities ex. Food and Energy averages at 1.0%, which is low compared to the headline inflation of 2.6% for the last 20 years.
- 8.3% of the 11.2% of nominal retail sales tax growth is from inflation.



# Real vs. Nominal Revenue Growth

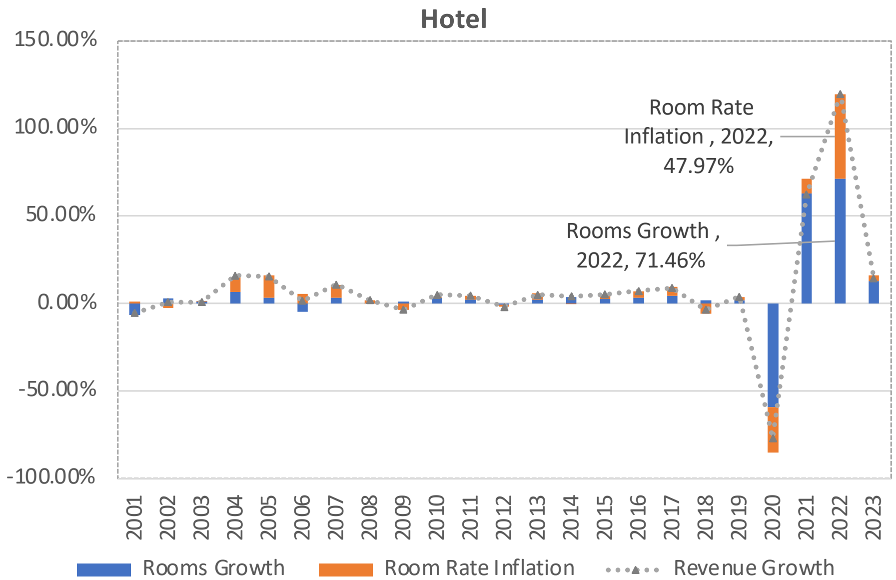
- Nominal growth in Restaurant Sales Tax (S&U)is decomposed into real growth vs inflation components.
- I use CPI for Food Way from Home to deflate the  nominal Restaurant sales tax revenue to real tax revenue collections.
- DC retail Restaurant sales tax revenue grows at an annual average of 4.9% over the last 20 years, while real revenue (the blue bars) grows at an average of 1.5% (the blue bars).
- For the same period, CPI for Food Way from Home averages at 3.4.

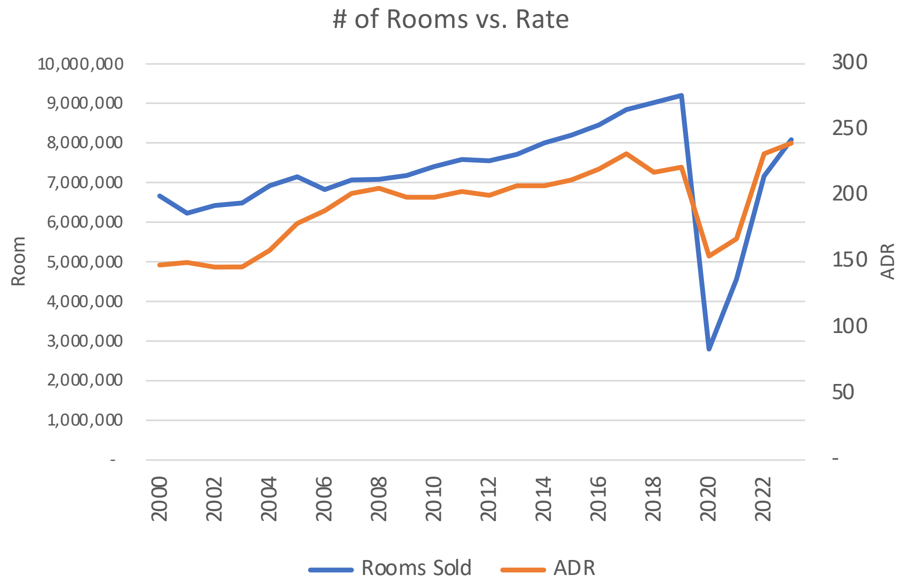



* 2023 and 2023 revenues and inflation numbers are estimates

# Real vs. Nominal Revenue Growth

- Data from Smith Travel (number of room nights and daily rates are used)
- Number of rooms grows at 1.8%, room rate Grows at 2.3%, and hotel revenue grows at 4.1% before the pandemic.
- While hotel average daily rate (ADR) has surpassed the pre-pandemic high in 2022, the number of rooms sold in 2022 is still projected to be about 88% of pre-pandemic high (2019).
- Hotel Revenue in 2nd half of 2022 reached similar level of 2nd half of 2019 due to strong room price inflation.



# The Implication for Revenue Estimation

1. Inflation creates money illusion; Expenditure side of the budget may eventually catch up.
2. Recession outcomes in a high inflation environment is different from a low inflation environment.
3. Inflation is high during recessions of 1970-1990 period while Inflation is low in recessions of 1991-2019.
4. Nominal revenue may not decline or may show only modest declines.
5. Inflation projection for 2023 and 2024 is a key factor in our revenue estimation
6. What would the next recession look like? Would it look like 1991 or the 1982 recession?

| | Inflation Regimes | All Taxes | IIT | Sales | Inflation |
|---|---|---|---|---|---|
| Average Growth | 1970-1990 | 9.89% | 10.87% | 9.71% | 6.3 |
| | 1991-2019 | 4.73% | 4.83% | 4.52% | 2.3 |
| Average Growth in **Recession** | 1970-1990 | 8.99% | 7.66% | 6.90% | 8.9 |
| | 1991-2019 | -4.86% | -7.23% | -4.31% | 1.8 |

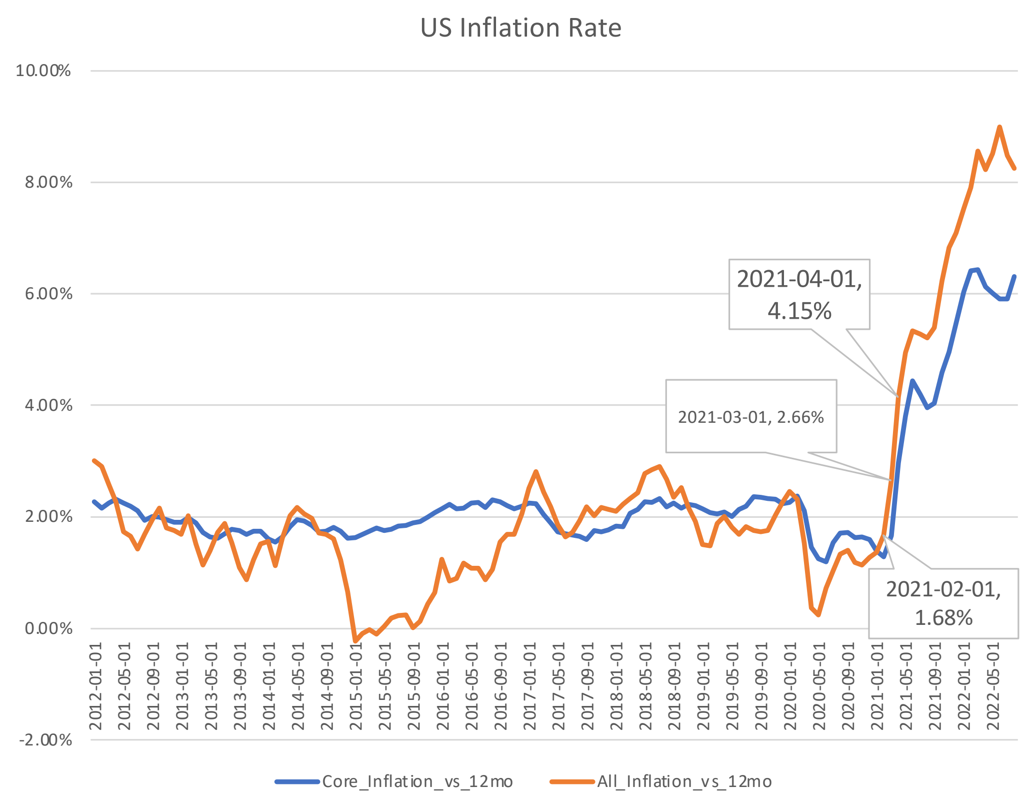
| **Recession Outcomes:** | | | | | |
|---|---|---|---|---|---|
| Revenue type | | Year of Maximum Decline | Year of Recovery | Years to Recover | % Decline |
| PROPERTY | Real Property | | | | |
| | Personal Property | 2010 | 2019 | 9 | -25% |
| | Public Space Rental | 2008 | 2009 | 1 | -14.10% |
| SALES & EXCISE | General Sales | 2009 | 2011 | 2 | -5.36% |
| INCOME | Individual Income | | | | |
| | Withholding | 2009 | 2010 | 1 | -3.40% |
| | Non-Withholding | 2009 | 2011 | 2 | -69.60% |
| | Corporate Franchise | 2002 | 2003 | 1 | -39% |
| | U.B. Franchise | 2009 | 2011 | 2 | -5% |
| OTHER TAX | Estate | 2003 | 2005 | 2 | -76.20% |
| NONTAX | Licenses & Permits | 2020 | 2021 | 1 | -15% |

# Cause of Inflation

Inflation rates have soared in the United States and across the globe since early 2021, reflecting multiple drivers, including both supply and demand factors:

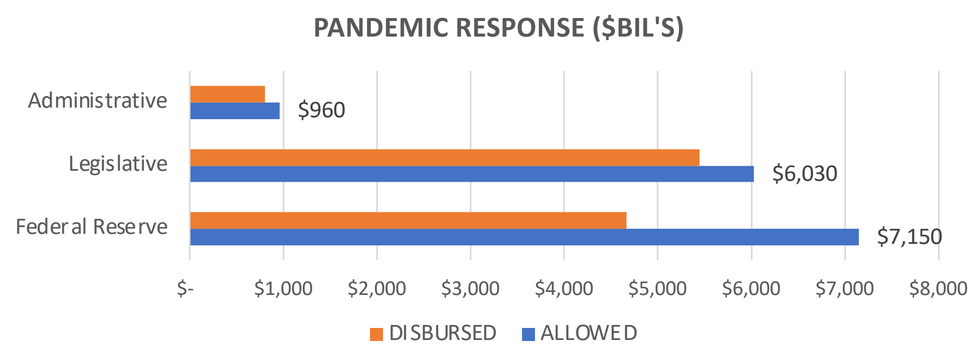
**Negative Supply Factors**: COVID lockdowns, Supply chain bottlenecks, Decline in labor force participation, Commodity price increases, etc

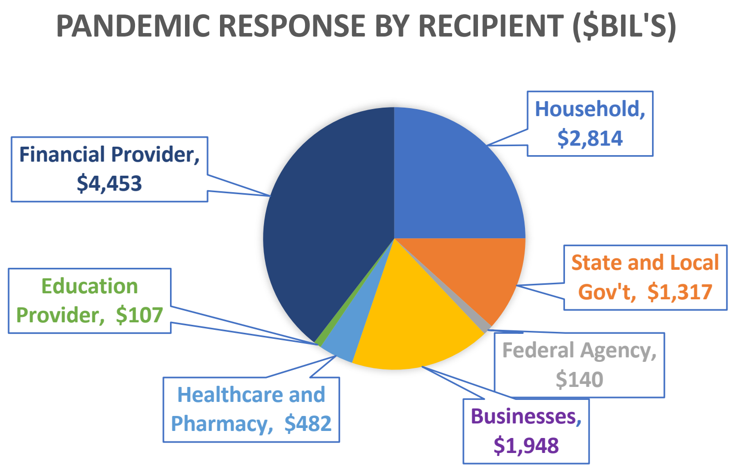
**Positive Demand Factors**: Rebounding demand after Covid restrictions, Pandemic fiscal response totaling $7 trillion, Federal Reserve loose monetary policy



# Positive Demand Shocks

- In response to the COVID-19 pandemic and economic crisis, policymakers have approved trillions of dollars of fiscal and monetary support, including
- **Administrative**: Trump and Biden administrations have spent $960 billion in total to delay tax days, defer employee payroll tax collection, expand Accelerated and Advance Payments (CAAP) Program, wave or defer student loan, issue eviction moratorium, and provide some income support
- **Legislative**: Congress authorized over $6.03 trillion spending in loan and grant programs for small businesses, income support, state and local funding, stimulus checks, healthcare industry, tax credit expansion, and other spending.
- **Federal Reserve:** The FED expanded its balance sheet, provided liquidity measures and other loan purchase programs totaling $7.15 trillion




* Data source: Covid money tracker, committee for a responsible federal budget. https://www.covidmoneytracker.org/

# Modeling Supply and Demand Shocks to the Economy 2020-2023 Using REMI PI+

| | Employment/Output | Change | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| **Supply Side** | | | | | | | |
| 2020 Covid Shutdown Impact on Output | Negative Impact on Output in Major Industries | Percent | 0 | -5 | 0 | 0 | 0 |
| Supply Chain Bottleneck/ Energy and Food Market Disruption | Production Cost Increase to Major Industries | Percent | 0 | 3 | 3 | 3 | 1 |
| Labor Force Participation Rate for Worker>50 | Both Genders, All Races, Age >50 | Percentage Points | 0 | -2 | -2 | -2 | -2 |
| **Demand Side** | | | | | | | |
| Consumer Spending Declines Due to Covid Lockdowns | Consumption Decline in Major Industries | Proportion | 0 | -0.05 | 0 | 0 | 0 |
| Stimulus Checks /Income support/Tax Policies from Federal and State Government | Transfer Payments | Nominal $ (B) | 0 | 1500 | 1500 | 1000 | 500 |
| Government Spending | Federal Civilian Government Output | Nominal $ (b) | 0 | 500 | 500 | 250 | 0 |

# Shocks to the Economy 2020-2023

| **Category** | **2020** | **2021** | **2022** | **2023** | **2024** |
|---|---|---|---|---|---|
| **Total Employment** | -7.85% | 5.58% | 0.10% | 0.96% | 0.38% |
| **Private Non-Farm Employment** | -10.26% | 4.80% | -0.54% | 1.07% | 0.43% |
| **Population** | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| **Labor Force** | -1.34% | -1.34% | -1.34% | -1.34% | -1.33% |
| ***Gross Domestic Product*** | *-9.53%* | *3.84%* | *-0.73%* | *0.74%* | *0.25%* |
| **Output** | -8.71% | 5.01% | -0.16% | 0.72% | 0.25% |
| **Value-Added** | -9.53% | 3.84% | -0.73% | 0.74% | 0.25% |
| **Personal Income** | 5.88% | 11.77% | 5.37% | 3.03% | 0.30% |
| ***Disposable Personal Income*** | *7.34%* | *12.54%* | *5.91%* | *3.28%* | *0.30%* |
| **Real Disposable Personal Income** | 1.53% | 5.92% | -0.33% | 1.17% | 0.25% |
| **Real Disposable Personal Income per Capita** | 1.53% | 5.92% | -0.33% | 1.17% | 0.25% |
| ***PCE-Price Index*** | *5.72%* | *6.25%* | *6.26%* | *2.09%* | *0.05%* |