# Methodology: Federal Funding Volatility Patterns Can Inform State Budget Planning

## Data collection

The Pew Charitable Trusts contracted with the Urban-Brookings Tax Policy Center to compile data on the volatility of federal funding to states. Tax Policy Center researchers collected publicly available historical data on federal funding and state own-source revenue for about 65 federal programs over a two-decade period (2002-2023), from federal agencies' websites and through several Freedom of Information Act requests, to establish federal funding totals. This study period was selected to encompass key periods of economic shock and stability, spanning the years before the Great Recession through the aftermath of the COVID-19 pandemic.

Collected federal funding program data was cross-referenced with Office of Management and Budget historical funding tables to validate federal outlay amounts and assess program continuity over time. Based on this comparison, the tracked programs account for roughly 90% of all federal funding to state and local governments. Data for some programs was not available for the entire study period, mostly because some programs were inactive in certain years. The Tax Policy Center used national totals and applied state shares to estimate allocations for these missing years.

## Data classification

Tax Policy Center researchers classified programs by funding type (i.e., mandatory or discretionary), means testing (i.e., eligibility based on income or financial need), and funding mechanism (i.e., formula grants, block grants, or competitive grants). For some programs, these classifications were unclear, and the researchers made judgments on categorization.

They also classified programs into six main subcategories:

- Education (27 programs and other education)
- Public assistance and welfare (26 programs)
- Transportation (five programs and other highway)
- Healthcare (three programs)
- Environmental protection (two programs)

- Energy (two programs)

And they analyzed the data based on five key four-year periods:

- 2004-2007 (pre-Great Recession)
- 2008-2011 (Great Recession)
- 2012-2015 (post-Great Recession normalization)
- 2016-2019 (pre-pandemic)
- 2020-2023 (pandemic and aftermath)

## The volatility calculation

For each program and state, researchers adjusted dollar amounts for inflation using the Bureau of Economic Analysis GDP Price Index and standardized dollar amounts on a per capita basis to account for population differences across states and over time.

The researchers then calculated year-over-year growth rates using the following formula: *(current year funding – prior year funding) / prior year funding*. This was then used to calculate the main volatility score—the standard deviation of growth rates—for each program and state for the full study period. This volatility score is expressed as percentage points.

The volatility score was also calculated for the six program subcategories and five individual programs: Temporary Assistance for Needy Families (TANF), Child Care and Development Fund (CCDF), Children's Health Insurance Program (CHIP), Medicaid, and Supplemental Nutrition Assistance Program (SNAP).

Other growth and volatility metrics were also calculated, including compound annual growth rate, average annual growth rate (AAGR), and the coefficient of variation. Additionally, Pew calculated volatility and the AAGR for the six program subcategories and the five individual programs in each state over the four-year periods.