Rainy Day Fund Modeling – Technical Details

The Bipartisan Policy Center (BPC), working with the National Center for Higher Education Management Systems (NCHEMS), has created a dynamic model to help evaluate and inform its flexible block grant proposal to improve higher education affordability. Specifically, the model allows users to adjust various parameters of a proposed system of flexible federal block grants to states to enhance college affordability and fill rainy day funds (RDFs) that automatically supplement state spending on higher education when state budgets are harmed by economic recessions. This document provides greater detail about that modeling. Modifiable elements of the model—the parameters that can be controlled to affect the outputs—are highlighted in yellow.

State Allocations of Federal Funding

As detailed in the first policy recommendation in BPC's report, A New Course for Higher Education, flexible federal block grants to states could be allocated by state using a variety of parameters, directing more or less funding to states based on measurements of those parameters. The model can include up to 11 parameters, and each parameter can make up between 0% and 100% of the allocation weighting, with the total weight equaling 100%.

Including a parameter in the weighting allocates a larger portion of federal funding to states that perform better on that parameter based on recent data. For instance, including the change over time in average tuition and fees at public institutions in a state as a parameter causes the model to allocate proportionally larger maximum funding levels to states where tuition has decreased (or increased less) over time, and including GDP per capita as a parameter increases the maximum funding level for states with lower GDP per capita. Broken down by category, the parameters that can be used in state allocations of federal funding are:

- State Commitment: 1) Tax effort (tax rate times percentage of state revenues dedicated to higher education); 2) state higher education appropriations per full-time equivalent (FTE) student
- Affordability: 3) change in tuition and fees over time, 4) net price for low-income students; 5) net price for middle-income students; 6) need-based aid per FTE
- 7) GDP per capita
- 8) Percent of students receiving Pell Grants
- Institutional Adequacy: Revenue per FTE at: 9) public two-year institutions, 10) public comprehensive and regional four-year institutions, and 11) public research universities

The allocation weighting was then scaled by each state's population age 16-54 so that larger states are eligible for more funding, on average.

The size of the annual maximum federal investment in flexible block grants can be specified, as can the match required to be provided by a state to receive the federal funding—for instance, requiring $1 of new state spending per $4 of new federal funding provided (or a 25% state match). The model assumes a maintenance of effort (MOE) requirement, such that states cannot reduce or redirect spending to meet the requirements of the match but must instead invest new funds. It is assumed that each state invests an amount sufficient to receive the maximum federal grant that the state is allowed to receive as set by the formula-based allocation weighting above.

Target Size of Rainy Day Funds

The target size of the RDFs can be set by the user to a percentage of the highest recent annual state spending on higher education, with an option to use either SHEF or IPEDS data (see data sources, below).

Estimated Rate of Return on Investments Held by Rainy Day Funds

It is assumed that the RDFs will be invested in a portfolio of securities to produce an annual return on investment that will shorten the length of time required to reach the target size specified. The rate of return of the investment portfolio can be specified freely.

Federal Contribution to Rainy Day Funds

Of the maximum federal funding that each state is eligible to receive under the block grant program, some portion can be directed to fill the RDF, and the remainder is assumed to be directed to other college affordability programming. Several different formulae can be selected in the model to calculate the annual amount of federal funds that are directed to fill the RDFs. These formulae include basing the amount of funding directed to the RDF on a variety of measures of state appropriations and support for higher education (using SHEF or IPEDS data). For instance, the model can direct a dollar amount equivalent to a percentage of recent annual state support for higher education (with the percentage set by the user). Another option is for the model to calculate the contribution to the RDF as a percentage of all new federal funding being received by a state under the block grant program (i.e., the portion not otherwise devoted to affordability spending), varying from 0% to 100%. Regardless of which formula is used to determine the annual federal contribution to the RDF, the model sets the maximum annual federal contribution to the RDF at the maximum annual federal block grant in each state.

State Contributions to Rainy Day Funds

Of the new spending that the state is investing as matching funds to receive the new federal block grant funding, some portion can be directed to fill the RDF. As above for the federal contribution, several different formulae for committing state funds to fill the RDFs can be used, including basing the fill rate on a variety of definitions of state appropriations and support for higher education (using SHEF or IPEDS data) or by assuming a contribution as a percentage of new state funding (i.e., the portion not otherwise devoted to affordability spending), varying from 0% to 100%. Regardless of which formula is used to determine the annual state contribution to the RDF, the model sets the maximum annual state contribution to the RDF at the annual state match invested to receive maximum federal block grant funding.

Filling and Drawdown of Rainy Day Funds

Using the above parameters and their calculated interactions, the model determines how quickly the RDF for each state would be filled. The model can also be used to estimate the drawdown on the RDFs during a recession—assuming partial or complete drawdown under differing economic conditions—with the release of funds determined by state or national data and the existence of a recession being determined by GDP change, unemployment change, or both. Under those given conditions, the amount of funding to release can be specified, allowing the model to determine remaining funds and the number of years it would take to replenish the RDF after a recession.

Data Sources

For the variables determining state by state apportionment of federal funding, data for the population (age 16-54) were obtained from the Census Bureau's American Community Survey (ACS). Data on undergraduate enrollment, state appropriations, degrees awarded, change in published tuition and fees, net price of attendance, proportion of students receiving a Pell grant, and revenues from tuition and fees were extracted from the National Center for Education Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Data on tax effort were drawn from State Higher Education Executive Officers Association (SHEEO) State Higher Education Finance (SHEF) reports. Data on need-based aid were obtained from the National Association of State Student Grant and Aid Programs (NASSGAP). Data on gross domestic product (GDP) per capita came from the Bureau of Economic Analysis (BEA).

For variables regarding the creation, filling, and withdrawals from the RDFs, revenue and enrollment data used to run the model were extracted from the IPEDS and the SHEF. Economic data to run the model, such as GDP and unemployment rates by quarter, were extracted from the Bureau of Labor Statistics (BLS).

In all cases, both state-level and national data were included where relevant.