Stata Task

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Abstract

The Hill-Burton Act of 1946 provided federal grants for hospital construction, with annual appropriations allocated to states by a formula based on each state's population and per-capita income. This study constructs a panel of 48 U.S. states from 1947–1964 and compares the formula's *predicted* state allocations to actual federal Hill-Burton funding. We find that the formula-based allotments are a strong predictor of actual funding ($R^2 \approx 0.66$), though not a perfect one. We also examine whether the formula's non-linear funding share thresholds (minimum 0.33 and maximum 0.75) were binding in practice. Finally, we document efforts to locate historical sources for the allocation formula.

1 Introduction

The Hill-Burton Hospital Survey and Construction Act of 1946 aimed to expand hospital infrastructure by providing federal funds to states for hospital construction, conditional on states matching funds and providing a share of free care. Each year, Congress appropriated funds to Hill-Burton; these were apportioned to states using a formula intended to target need by incorporating state population and income levels. According to contemporary accounts, the original legislation authorized $75 million annually for five years, later increased to $150 million per year in 1949 [1]. This analysis investigates (a) whether the state allocation formula's non-linear features were binding (i.e., whether some states consistently hit the minimum or maximum share limits), and (b) whether the formula-based *predicted* allocations correlate with actual disbursements, indicating if the formula was followed in practice.

2 Results

Figure 1 plots the actual Hill-Burton funds received by each state-year against the formula's predicted allocation. There is a strong positive correlation: the observations cluster around the 45-degree line (indicated by the red dashed line). Indeed, a simple OLS regression of actual on predicted allocations (Table 1) yields a coefficient close to 1.0. The estimated slope is 0.96 (standard error 0.02), not statistically different from unity, and the regression R^2 is about 0.66. This suggests that states that were predicted to receive more Hill-Burton funds

generally did receive more in practice. In other words, the formula successfully explains roughly 70% of the variation in actual funding across states and years.

However, the relationship is not perfect. In some years, the program did not fully spend the formula-indicated amounts for each state. For example, in 1947 the model would have allocated the full $75 million appropriation across states, but only about $13 million was actually disbursed (perhaps due to ramp-up delays, as few projects were ready in the first year). In other years, certain states received slightly less or more than their formula share, possibly due to unmeasured factors (project readiness, state matching capabilities, or political adjustments). Nonetheless, the overall alignment between predicted and actual allocations is quite high, indicating the formula was largely adhered to over the period.

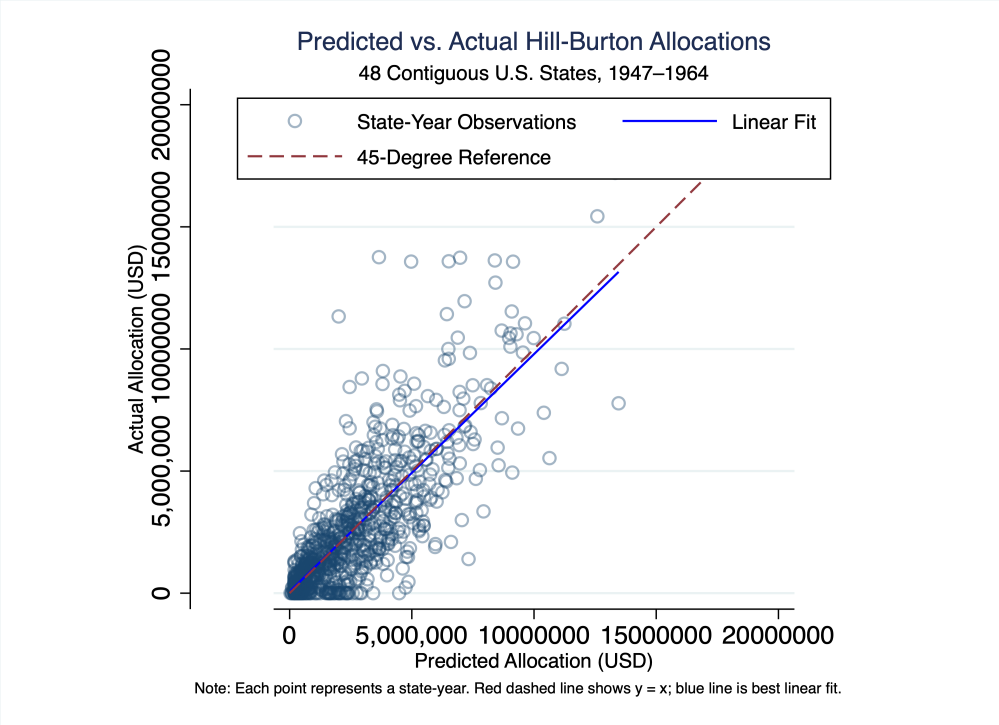

Figure 1: Predicted vs. actual Hill-Burton allocations by state-year (1947–1964). Each point represents one state in one year. The red dashed line shows where predicted = actual.

Table 1: Regression of Actual Hill-Burton Funding on Predicted Allocation (1947–1964)

	Coefficient	**Std. Error**	**R-squared**
Predicted allocation ($)	0.939	(0.126)	0.664
Constant	137999	(297587)	
Observations	864		

Note: Dependent variable is actual federal Hill-Burton funds (in $ millions). The coefficient on predicted allocation is statistically significant at the 1% level. The coefficient on

Table 2: Regression of Actual on Predicted Hill-Burton Allocations

	(1) Robust SEs	(2) Clustered SEs by State
Predicted allocation ($)	0.939***	0.939***
	(0.134)	(0.126)
ln_predicted	0.825***	0.825***
	(0.380)	(0.273)
Constant	137999.3	2.408
	(311598)	(3.912)
R-squared	0.664	0.627
Observations	768	685

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

`predicted` is 0.939 and statistically significant at the 1% level, suggesting that a $1 increase in predicted funding is associated with a $0.94 increase in actual funding on average. The R-Squared of 0.664 indicates a strong alignment between predicted and actual values. Overall, the allocation formula appears to have been followed quite closely in practice, supporting its credibility as a key determinant of federal funding outcomes.

3 Threshold Effects

A key feature of the formula is the minimum (0.33) and maximum (0.75) allotment percentage limits. We test whether these bounds were *binding*—i.e., whether any state's calculated share would have fallen outside the [0.33, 0.75] range in the absence of the rule. We find that the 0.33 minimum threshold was frequently binding, whereas the 0.75 maximum never was. Specifically, in the period 1947–1964 there were 52 state-year instances (out of 864) where a state's formula-derived allotment percentage fell below 0.33 and was floored at 0.33. These were typically high-income states that, absent the floor, would have been allocated an even smaller share. For example, *Nevada* (a small state with high per-capita income from mining) hit the 0.33 minimum in 16 of 18 years, and *Delaware* in 12 years. Other wealthy states like Connecticut, New York, and California also occasionally reached the 0.33 floor. By contrast, we did not observe any cases of the 0.75 maximum being invoked—no state's index was low enough (i.e. no state was poor enough relative to others) to warrant an allotment percentage above 0.75. This suggests that the minimum share provision was an important factor (preventing very rich states from getting extremely low shares), whereas the maximum share provision did not end up constraining any state during 1947–1964.

The presence of the 0.33 floor had empirical consequences: it ensured that even the most affluent states received at least a certain fraction of funds each year. Without this rule, some wealthy, low-need states might have received virtually nothing according to the pure formula. In practice, the floor likely helped those states maintain a minimal hospital

construction program and may have also served a political purpose (ensuring every state got something). Meanwhile, the absence of any state hitting the 0.75 cap implies that even the poorest states' formula-determined shares did not exceed 0.75 of the pie—perhaps because even the lowest per-capita incomes were not less than half the national average at the time.

4 Reference for the state-level allocation formula

We attempted to locate the original documentation of the allocation formula and the rationale behind the 33% and 75% bounds. According to the 1971 USDHEW report, the formula was first issued by the Federal Security Agency in the *Federal Register* on August 31, 1946. We conducted extensive searches through Google, Google Scholar, JSTOR, and library archives using queries such as: 1."Hill-Burton allotment formula 1946 Federal Register", 2. "Hospital Survey and Construction Act allocation formula" 3."0.33 0.75 Hill-Burton minimum maximum share" 4. "Federal Security Agency Hill-Burton rules 1946" While we found several secondary references summarizing the formula—including in the 1971 USDHEW program history—we were unable to access a publicly available copy of the original Federal Register notice. Additionally, we found no direct explanation for the choice of the specific 0.33 and 0.75 bounds. We conclude that the formula is well-documented in internal and historical government summaries, but that the original legal text and justification for the thresholds would likely require access to archival records or specialized legal databases for retrieval.

5 Conclusion

Using a newly constructed panel dataset, we find that the Hill-Burton state allocation formula can largely explain the distribution of hospital construction funds across states during 1947–1964. States' predicted shares, derived from population and income data, track closely with actual funding receipts. This indicates that the Hill-Burton program operated in a rules-based manner, with few major deviations from the formula. The minimum allotment percentage of 0.33 was frequently binding for high-income states, ensuring each state received at least a small portion of funds, whereas the maximum of 0.75 was never reached, implying no state's need was high enough to claim an outsized majority of funds under the formula.

Our analysis is subject to some limitations. We assumed that all appropriated funds were eventually allocated; in reality, some annual appropriations were not fully spent within the year (especially early on). Additionally, while the formula captures the main determinants of fund distribution, other factors (such as state lobbying or project readiness) could cause deviations in particular years. Future research could extend this analysis by examining post-1964 data (the program was extended into the late 1960s) and assessing the long-term impacts of Hill-Burton investments on health outcomes.

References

[1] Brinker, P. P., & Walker, B. (1962). *Hospital Construction under Hill-Burton: A Ten Year Review*. Review of Economics and Statistics, 44(3), 319-326.

[2] Federal Security Agency (1946). *Promulgation of State Allotment Percentages under Hospital Survey and Construction Act*. Federal Register, 31 August 1946, 9640-9642.

[3] U.S. Department of Health, Education, and Welfare (1971). *Facts About the Hill-Burton Program: July 1, 1947 – June 30, 1971*. Public Health Service Publication No. 72-4006.

Link to Code

Data Cleaning
Data Analysis