

Economic Budgeting for Universities

Jeremy Stein

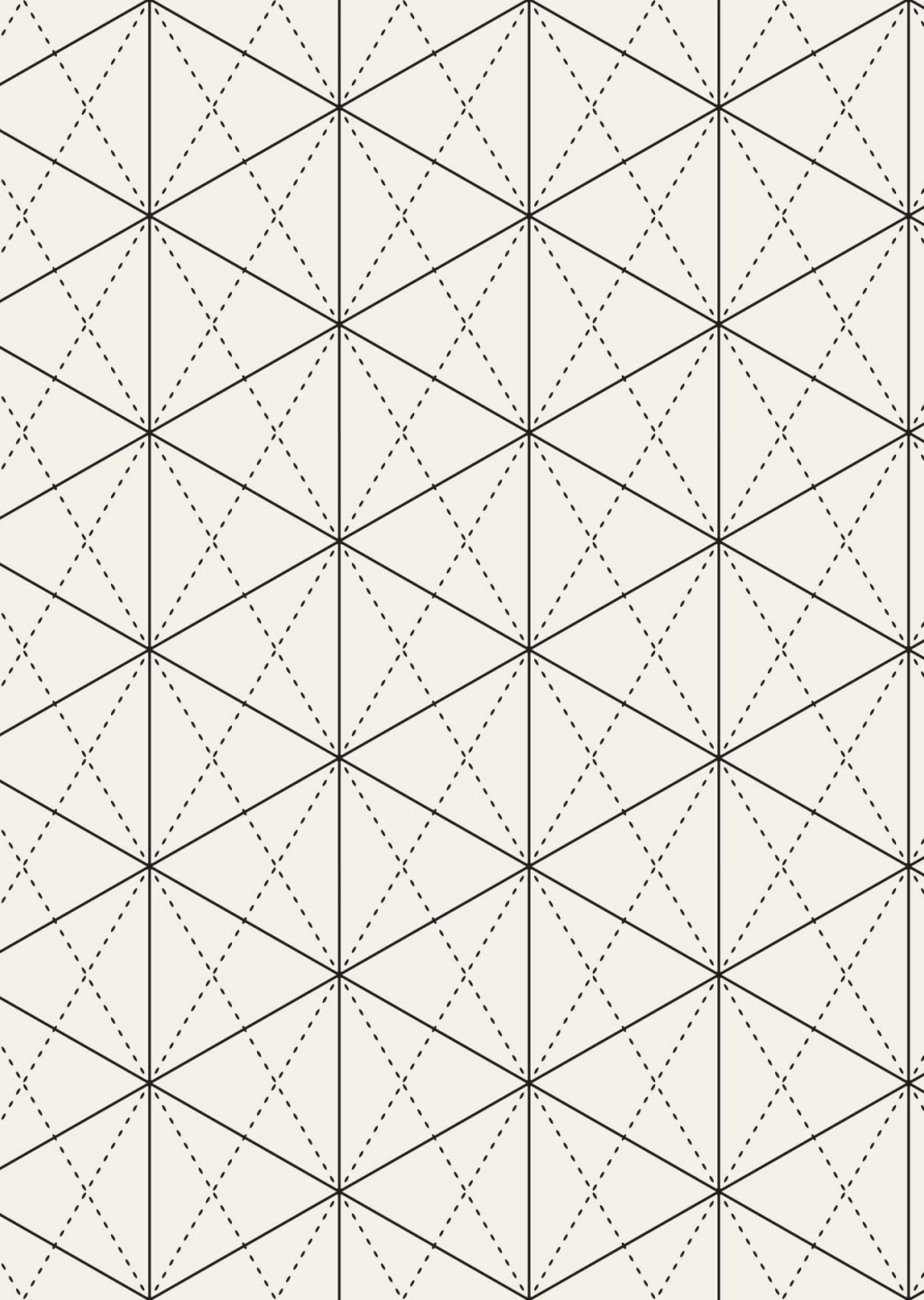
Harvard and NBER

NBER Conference on Financing Higher Education

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Background

- Academic year 2020-2021: Harvard FAS dean Claudine Gay commissions FAS Faculty Study Group to: (i) develop better understanding of our financial position; (ii) explore a range of strategic options.
- Work is dividend among eight subcommittees:
 - Economic Budgeting
 - Restricted Endowment Funds
 - Centers
 - Space
 - Departments
 - Faculty
 - Graduate School
 - Continuing Education
- Will talk today about the work of the Economic Budgeting group, which was led by John Campbell.
 - Basic goal was to think about FAS finances like economists, not accountants: is our “wealth” sufficient to fund the present value of our net expenditures over the indefinite future?
 - Are we respecting our intertemporal budget constraint?



ECONOMIC BUDGETING

Final Recommendations: June 7, 2021

Subcommittee: John Campbell (chair), Stephen Blyth, Jay Herlihy, Thomas Hollister, and
Jeremy Stein

Members of the Economic Budgeting Working Group

- John Campbell (chair), *Morton L. and Carole S. Olshan Professor of Economics*
- Stephen Blyth, *Professor in the Practice of Statistics*
- Jay Herlihy, *FAS Associate Dean for Finance*
- Thomas Hollister, *University Chief Financial Officer and VP for Finance*
- Jeremy Stein, *Moise Y. Safra Professor of Economics*

Current Approach to FAS Budget Analysis

Traditional FAS practice uses standard accounting concepts that track finances over one or a few years, including

- Operating revenues and expenses
- Depreciation of capital assets (e.g., buildings)
- Endowment distributions
- Endowment decaps and recaps (special withdrawals from and contributions to the endowment)
- Debt interest payments
- Issuance of new debt and repayment of outstanding debt
- Current-use and endowment gifts
- Changes in reserve balances

This generates a measured accounting deficit that is the main focus of concern.

The deficit can be “solved” by adjusting endowment and debt management policies, or by altering near-term spending projections.

Limitations of the Current Approach

- Reports are hard to interpret without a good knowledge of accounting.
- Reports do not distinguish between temporary deficits and long-term structural deficits.
- “Solutions” are frequently misleading because their future costs remain hidden:
 - Decaps reduce future endowment distributions.
 - Borrowing must be repaid in the future.
 - Reduced capital spending can imply deteriorating facilities.

An Alternative Long-Term Budget Framework (1): Cash-Flow Forecasts

We propose an alternative framework that begins with long-term cash-flow forecasts:

- We forecast the operating revenues and expenses of the FAS, which are driven by mission priorities rather than financial management.
- We also forecast capital expenditures, including the balance of undergraduate house renewal and all expenditures needed to maintain the FAS physical plant.
- We place minimal reliance on accounting conventions.
- We capture the long-term consequences of all scenarios by extending forecasts into the indefinite future, with appropriate growth rate assumptions for outyears.
- Forecasts are in nominal (current-dollar) terms with an inflation assumption.

An Alternative Long-Term Budget Framework (2): Discounting to the Present

We need to express cash flows at different dates in comparable units.

To do this, we calculate their present value using standard discounting methodology.

We use a nominal discount rate, since we are discounting nominal (current-dollar) cash flows.

- Our nominal discount rate equals the expected real return on the endowment (5% in the base case) plus assumed inflation (2% in the base case).
- For example, revenue of \$107 next year has a present value of \$100 because \$100 invested in the endowment today is expected to generate \$107 next year.

The present value of the operating and capital costs of FAS exceeds the present value of its operating revenues.

Equivalently, the present value of all future cash flows is negative.

An Alternative Long-Term Budget Framework (3): Adding Up Present Values

The present value of all future cash flows is negative because the operating and capital costs of FAS exceed its operating revenues.

We add the assets of FAS: the current market value of the endowment, less the value of outstanding FAS debt.

We add the present value of future gifts that FAS expects to receive, net of future costs associated with those gifts.

The total is still negative and represents a shortfall in assets relative to activities of FAS.

Finally, we annualize this shortfall to obtain a structural FAS budget deficit.

- The structural deficit is the shortfall times the expected real return on the endowment (5% in the base case).
- If the FAS received additional annual real (inflation-adjusted) income of this amount every year, the present value of that income would equal the shortfall.
- To eliminate the shortfall, FAS needs to permanently increase revenue or decrease costs by this amount.

Advantages of Our Framework

Our framework:

- Eliminates the need to model endowment and debt management decisions which can only change the timing of cash flows, not their present values. In particular, Corporation decisions about endowment payouts have no effect on our analysis.
- Makes clear that the size of the endowment must be compared with the obligations it is already expected to fund. Looked at this way, the FAS endowment is inadequate.
- Focuses attention on the important decisions, which are about managing operating revenues, operating costs, and capital expenditures.
- Easily accommodates alternative assumptions about the return on the endowment and the growth rates of various types of revenues and expenses. Scenario analysis reveals which features of the environment and which FAS decisions are important for long-term financial sustainability.

Implementation of our Framework

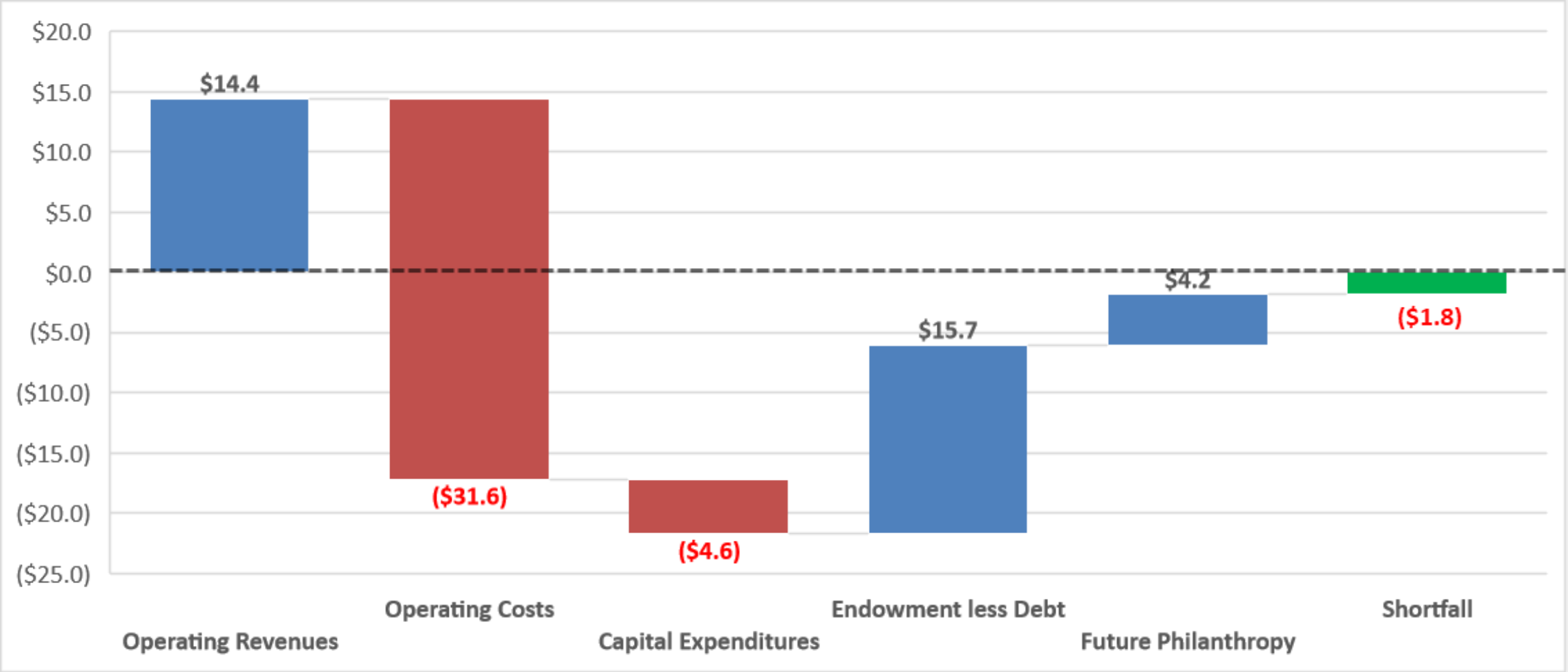
Implementation:

- We base our analysis on the FAS multi-year financial plan for FY21 through FY24, and growth rate assumptions thereafter.
- Base case assumptions are given below. The main focus is on a nominal discount rate of 7%, corresponding to a real endowment return of 5% consistent with Harvard's 5% long-term endowment payout rate.
- For comparison, we also consider a nominal discount rate of 6% to illustrate the exposure of FAS to lower endowment returns.

<u>Inflation Assumptions</u>	
Inflation Rate	2.0%
Real Growth Rate Assumptions	
- Compensation (FY24 & Beyond)	1.0%
- Def'd Maint (FY24 & Beyond)	1.0%
- Student Inc (FY24 & Beyond)	1.0%
- Sponsored Rev (FY24 & Beyond)	0.0%
- Other Income (FY24 & Beyond)	0.0%
Nominal Discount Rate - Scenario 1	7.0%
Nominal Discount Rate - Scenario 2	6.0%

Base Case: Present Value Shortfall of \$1.8 billion

Results are present values measured in billions of \$'s



Interpretation of the Base Case

Interpretation of our findings:

- **In our base case, the FAS has a present value shortfall of \$1.85 billion.**
- **This corresponds to a real structural deficit of \$92 million (5% x \$1.85 billion) per year.**
- Full details are presented in a spreadsheet on the next slide.
- Column 1 shows present values under the base case assumption of a 5% average real endowment return corresponding to a 7% nominal discount rate.
- Column 2 shows present values under an alternative assumption of a 4% average real endowment return corresponding to a 6% nominal discount rate.
- Remaining columns show cash-flow forecasts for specific future years.

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Scenario Analysis (1): Endowment Returns

Scenario analysis can be used to understand the sensitivity of our results to alternative assumptions about endowment returns:

- The FAS is extremely vulnerable to a lower average return on the endowment. If we use a 6% discount rate, corresponding to a 4% average real return on the endowment, the present value shortfall is \$6.81 billion corresponding to a real structural deficit of \$272 million ($4\% \times \6.81 billion) per year.
 - In the current market environment of low interest rates and high stock prices, the assumption of a 5% real return is ambitious and 4% may be more realistic.
- The realized return on the endowment in any one year also has an important impact on FAS finances.
 - A return of 11.2% above the assumed 5% real return, or a 16.2% real return, would eliminate the shortfall in the base case.
 - On the other hand a return of 11.2% below the assumed 5% real return, or a real return of -6.2%, would double the shortfall in the base case.
- These results highlight the exposure of the FAS to financial market risks.

Scenario Analysis (2): Growth Rates of Operating Cash Flows

Scenario analysis can also be used to understand the sensitivity of our results to alternative assumptions about the growth rates of operating cash flows:

- Our results are highly sensitive to these assumptions.
- In the base case we assume that real compensation growth of 1% per year resumes in FY24 and subsequently, and also that real student income grows at 1% per year (but other revenue sources do not grow in real terms).
- If we assume 0.5% faster growth in real compensation from FY24, the shortfall increases by about \$2.4 billion and the structural deficit increases by about \$120 million; if we assume 0.5% slower growth, the shortfall and structural deficit are eliminated.
- The long-term budget framework correctly focuses attention on ways to grow revenues over time relative to costs.