Cost (Budget) Planning

Outline

- Importance
- Estimating costs to compare and select
- Methods of Estimating
- Managing the Budget
  - Budget timeline
  - Budget variances
- Summary

Importance of budget planning

- Cost is one of the three project constraints
- A budget is a plan or forecast
- Cost management also includes tracking and managing variances from the planned expenditures
- Detailed estimates are important

Estimating costs to compare and select projects

- Payback, rate of return or NPV (or combine them)
- Need accurate numbers but must balance with the cost of getting more accurate estimates

Estimating methods

- Analogous estimate
  - Find a similar project or task and assume this one will be the same or similar
  - The more experience the estimator has, the better this works
  - Learn from each project
  - DPCI (Darnell-Preston Complexity Index) can help with benchmarking
- Parametric estimate
  - Parameters such as number of square feet for a building; number of kitchens, bathrooms, etc. for a house.
- Bottom-up estimating
  - Estimate each item or task and add them together
  - Generally, more accurate but takes more effort to create

Estimating Guidelines – *estimate what you expect and meet that estimate.*

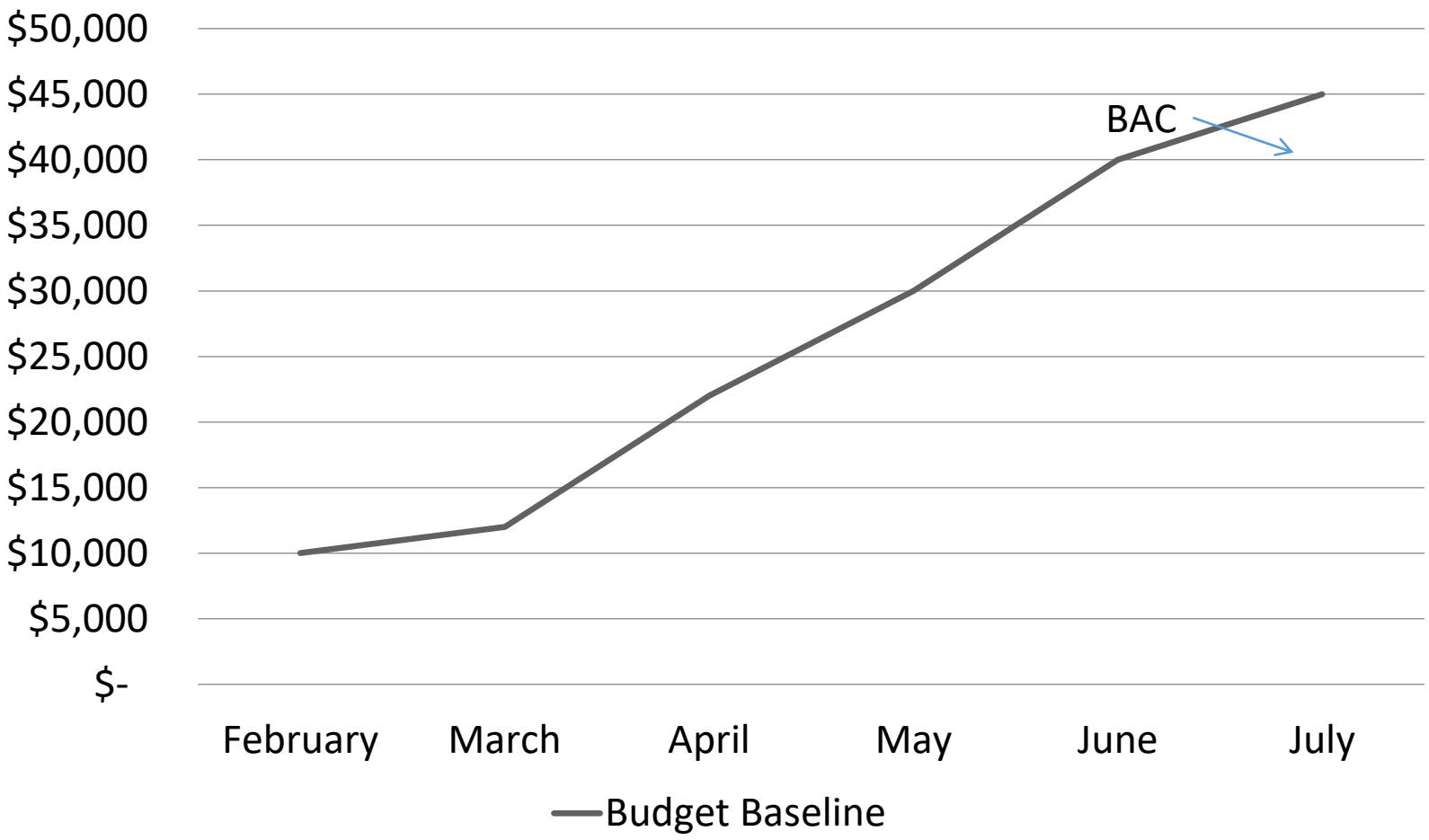
Managing the Budget

- Cash flow
  - Make a plan of WHEN the outflows will occur, and ensure that the money is available on time
  - Contingency reserves
    - For unexpected expenses that arise during the project
    - There are almost always some surprises, but can't predict at the start what it will be
    - Project Manager does not allocate to the sub-projects but manages it centrally
    - Can be spent and still be within the original project budget
  - Management Reserves
    - For scope changes
    - Not likely to be spent; not part of project baseline

Reporting Progress: Earned value management

Item	Acronym	Explanation
Budgeted Cost of work Scheduled	BCWS	Detailed estimates for each activity in the project
Planned Value	PV	Total budgeted cost as of a certain date in the project
Earned Value	EV	Budgeted cost of the completed work as of a certain date in the project
Actual Cost	AC	Actual cost of the completed work as of a certain date in the project
Budget at Completion	BAC	Total budgeted costs for the entire project

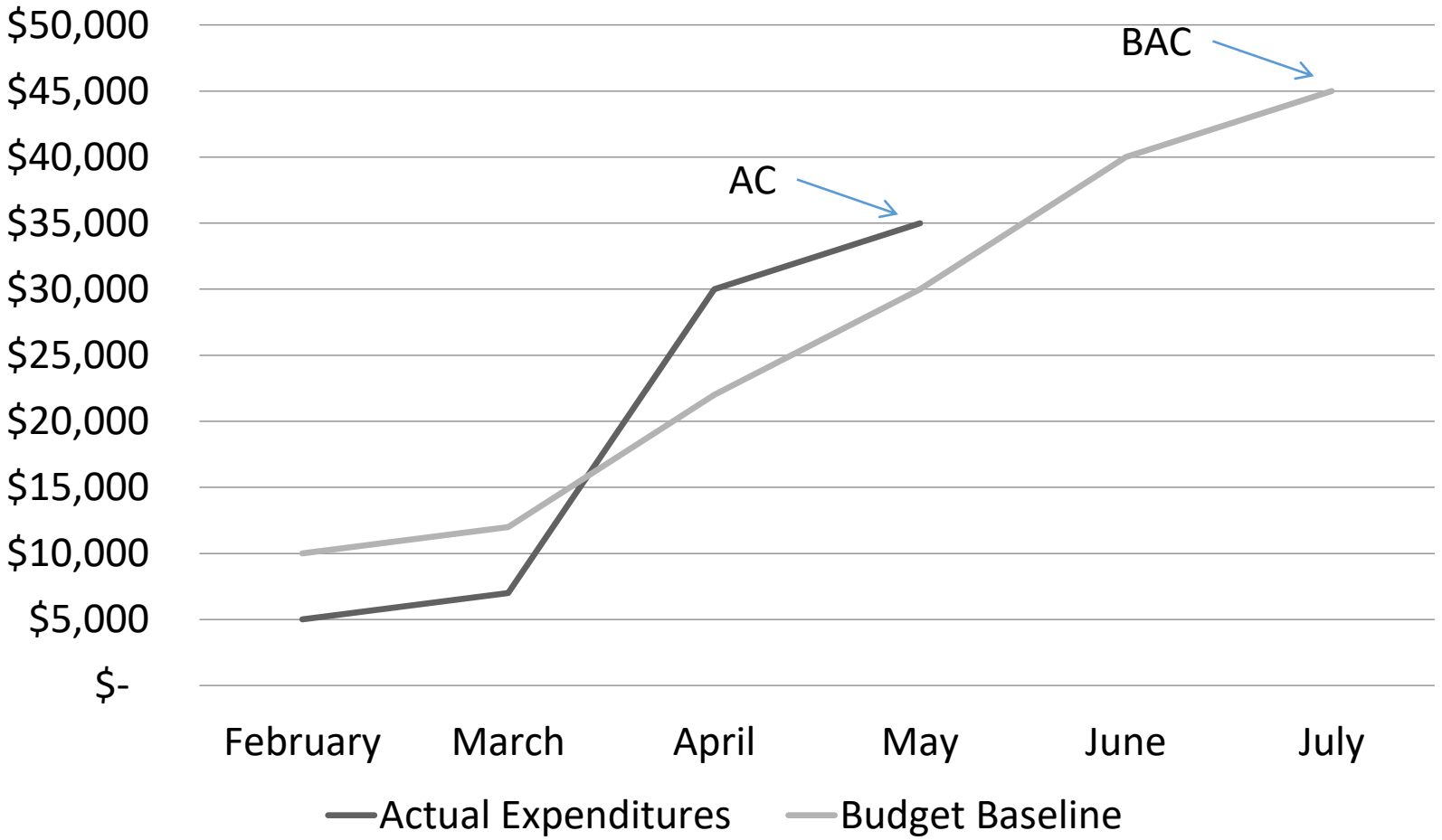
Project Cost Chart



Budget Baseline and Project Cost Chart

- The project budget is usually shown graphically, illustrating the cumulative planned spending.
- Typical shape for the budget curve is s-shaped, with less spending at the beginning and end of the project.
- Add the periodic expenditures on a regular basis to create the Project Cost Chart.

Project Cost Chart (up to May)



Schedule Variance: SV

- Difference between planned and actual progress

$$SV = EV - PV$$

  - Positive value: project is ahead of schedule
  - Zero: project is on-time
  - Negative: project is behind schedule

Cost Variance: CV

- The difference between the earned value and the actual cost is the cost variance:

$$CV = EV - AC$$

  - If positive, you are achieving more than you predicted for the money
  - If zero, you are right on the plan
  - If negative, you are achieving less than you predicted for the money

Schedule Performance Index: SPI

- Compares progress on the scope to spending:

$$\mathbf{SPI = EV \div PV}$$

  - SPI less than one indicates the project is behind schedule
  - SPI of one is right on schedule
  - SPI greater than one the project is ahead of schedule

Cost Performance Index: CPI

- Compares the budget spent to date with progress to date:

$$\mathbf{CPI = EV \div AC}$$

  - A value greater than one: under budget
  - Equal to one: on budget
  - Less than one: overspending the budget

Estimated Cost to Complete the Project: ETC

- Formula to use depends on what the PM expects with regard to future project costs and whether the original budget assumptions remain valid
- ETC if past variances are not expected to continue:

$$\mathbf{ETC = BAC - EV}$$

- ETC if past variances are expected to continue at the same level

$$\mathbf{ETC = (BAC - EV) \div CPI}$$

- Estimated Final Project Cost: EAC

$$\mathbf{EAC = ETC + AC}$$

Budget Timeline

- Contractual agreements often require partial payments
- Prepare a schedule, based on contractual and other expenditure requirements

Summary

- Cost estimations may be used to choose between options
- Managing the budget includes
  - Estimating costs and setting a budget
  - Determining when the budgeted costs should occur
  - Tracking expenditures
  - Managing variances between the budget and the expenditures
- Methods of Estimating
  - Analogous, Parametric, Bottom-up
- Managing the Budget
  - Budget timeline
  - Budget variances

Summary (continued)

- Budgeting and Cost Management are important activities for project managers
- There are several methods for estimating the costs
- Estimated costs may be used to choose between options
- Project progress and budget management are closely related and can be managed with indices: BCWS, PV, SV, AC, CV, SPI, CPI, ETC, BAC and EAC
- Contingency funds allow for the unexpected
- Reporting to the team and to management are important components in budget management