

# Exercise: Calculating Cost Variance

## What Earned Value Management Is

*Project managers have to account for performance to stakeholders by comparing planned results to actual ones. That comparison is the essence of earned value management (EVM), and the method inside it is earned value analysis (EVA) — a way of evaluating actual performance against the full performance measurement baseline of scope, schedule, and cost.*

What makes it worth learning is that EVA does two jobs at once. It tells you whether you are deviating from the baseline right now, and it lets you forecast where the project will land on cost and completion date if nothing changes. A schedule report tells you that you are late. A cost report tells you what you have spent. EVA tells you both in the same picture, which is why a project can be behind schedule and under budget at the same time — exactly the situation in this exercise.

## Exercise

In the latest earned value report for your project, you see the CPI is 1.2, the SPI is 0.8, the PV is \$600,000, and the SV is -\$120,000. You can't find the CV in the report, so you need to calculate it based on the information given.

## What is the CV?

## Answer

The formula for CV is  $CV = EV - AC$ , so we need EV and AC. Neither is given directly, but both can be recovered by rearranging a formula you already know to solve for the term that is missing.

**Step 1: find EV.**  $SPI = EV \div PV$ , so rearranging gives  $EV = SPI \times PV$ .

$$EV = SPI \times PV$$

$$EV = 0.8 \times \$600,000$$

$$EV = \$480,000$$

**Step 2: find AC.**  $CPI = EV \div AC$ . Substituting what we know gives  $1.2 = \$480,000 \div AC$ .

Multiply both sides by AC to get it out of the denominator, then divide both sides by 1.2 to isolate it.

$$1.2 \times AC = \$480,000$$

$$AC = \$480,000 \div 1.2$$

$$AC = \$400,000$$

**Step 3: solve for CV.** With EV and AC in hand, the original formula gives the answer.

$$CV = EV - AC$$

$$CV = \$480,000 - \$400,000$$

$$CV = \$80,000$$

CV is positive, which means the project is under budget — consistent with a CPI above 1.0.

*Each variance is simply the gap between two bars.*

## A Second Route to EV

The SV in this question is not filler. Schedule variance is  $SV = EV - PV$ , so rearranging it gives  $EV = PV + SV$  — a one-step path to the same number:

$$EV = \$600,000 + (-\$120,000)$$

$$EV = \$480,000$$

Either route is correct, and getting the same EV both ways is a useful check on your work. That is the point of the exercise: any of these formulas has three terms, so knowing two of them gets you the third. A gap in the report is usually solvable from what you already have.

## How the Exam Presents EVM

Very few exam questions actually contain formulas, but EVA is on the exam and understanding it wins those questions. The Prep book is direct about the trade-off: memorizing the formulas makes earned value questions easier, and if you cannot memorize them, you must at least be able to interpret them. Knowing that a negative cost variance means over budget will eliminate wrong answers even if you have forgotten that it is

calculated  $EV - AC$ .

Expect interpretation more often than arithmetic. A scenario gives you an index or a variance and asks what it means, or asks what you should do about it. Greater than 1.0 is good for CPI and SPI, less than 1.0 is bad — and the reverse is true for TCPI, which is the reversal most often missed. When a question does hand you numbers, check what it gives you before reaching for a formula; as here, the value you need is often one rearrangement away.