

EVM: Definition and Calculations

Earned Value Basic Inputs	
Term	Description/Calculation
PV	Planned Value (Also known as BCWS – Budgeted Cost of the Work Scheduled)
	PV = Planned value of the work that is scheduled in our current baseline.
BAC	Budgeted cost at completion.
	BAC=TOTAL PV for Project
AC	Actual Costs (Also know as ACWP – Actual cost of the work performed)
	AC= Actual Costs (Total of all invoices, labor, parts, etc).
EV	Earned Value (Also know as BCWP – Budgeted cost of the work performed)
	EV= Total Planned Value of Activity or Project * % Complete.

Percent Complete	
Term	Description/Calculation
PCIB	Percent Complete Index – Budget
	PCIB = EV / BAC
	The percentage of work that is complete based on baseline budget. Use this if we trust our initial project baseline.
PCIC	Percent Complete Index – Cost
	PCIC = AC / EAC _{re}
	The percentage of work that is complete based on revised estimate of the project costs. Used if we have to revise baseline, are using rolling wave planning, etc.

Variance	
Term	Description/Calculation
CV	Cost Variance (compares budgeted costs to the actual amount spent).
	CV = EV - AC
	<p>Negative number = over budget. </p> <p>Positive number = under budget. </p>
SV	Schedule Variance (Compares the work that should have been done at this time, to the amount actually completed).
	SV = EV - PV (Note: PV at this point in time, not total PV for activity.)
	<p>Negative number = work scheduled to be complete at this time is not done. </p> <p>Positive number = work NOT yet scheduled to be complete at this time has been done </p>

Estimating Work Complete Methods	
Professional Estimator	Used when activity is long (80-90 days) or very complex.
0/100 Rule	No earned value is counted for an activity until it is 100% complete.
50/50 Rule	Percent complete calculated at fifty percent when activity starts. Remaining 50% is calculated when activity is complete.
25/75 Rule	Percent complete calculated at twenty-five percent when activity starts. Remaining 75% is calculated when activity is complete.

Cost Performance Indexes	
Term	Description/Calculation
CPI	Cost Performance Index. Measures how effectively we are using our budget.
	$CPI = EV / AC$
	CPI < 1 : Over Budget 
	CPI = 1 : On Budget 
	CPI > 1 : Under Budget 
TCPI	To Complete Performance Index
	$TCPI = (BAC - EV) / (BAC - AC)$
	TCPI < 1 : More Budget than Work Left 
	CPI = 1 : Right amount of remaining Budget for remaining work. 
	TCPI > 1 : More Work than Budget Left 

Schedule Performance Index	
Term	Description/Calculation
SPI	Schedule Performance Index. Measures how efficiently we are completing the scheduled work. *
	$SPI = EV / PV$ (Note: PV at this point in time, not total PV for activity.)
	SPI < 1 : Behind Schedule 
	SPI = 1 : On Schedule 
	SPI > 1 : Ahead of schedule 
* Note: When a task or project is complete, it's SPI will equal 1, regardless of if the project is completed late or early. Therefore SPI is useful when a task is underway or when the bulk of the project work is being performed. Project Managers should also use the baseline schedule when making judgements about project schedule performance.	

Forecasting	
Term	Description/Calculation
ETC *	Estimate to Complete. What the remaining work will cost if our current CPI holds.
	$ETC = (BAC - EV) / CPI$ or $ETC = (BAC - EV) / (EV / AC)$
EAC *	Estimate cost At Completion. What the project will cost if our current CPI holds
	$EAC = AC + ETC$
VAC	Variance At Completion
	$VAC = BAC - EAC$
* If our baseline is inaccurate, or if we have reason to believe that CPI will not remain the same, ETC, EAC, and VAC may be based on Revised Estimates (sometimes referred to as ETC_{re} , EAC_{re} , and VAC_{re} respectively).	

Note on Performance Indexes and Context: When reviewing the CPI, SPI and TCPI for the project, it is important to know the percent of the project that is complete. If TCPI is 1.5, but we have only completed 2% of the project, it might not be cause for alarm. If TCPI is 1.5 and we have completed 50% of the project, then it might be time for serious re-evaluation of our baseline and the project.