Let's Run the Numbers Before We Proceed

When we are given a variety of financial metrics to use in the project selection process, it might be helpful to keep some heuristics (general guidelines) in mind.

There are a few project basic financial metrics that we are likely to encounter during our preparation for the PMP Exam. We should become familiar enough with them to know why some are preferred over others. We should also know how to use them (if required) for the PMP Exam and also be able to discuss them or use them in "real-life" situations.

To be consistent with the "numbers theme" of this column, I am listing some frequently appearing metrics in what I think is their rank order of their helpfulness in performing a financial analysis of a portfolio of projects.

My 1st-choice metric would be "Profitability Index." It is most commonly defined as the NPV for an investment divided by the total investment required for that project. This metric respects the time value of money in calculating the NPV, and it also takes into account the size of the investment (in the denominator). This metric allows for fair comparisons between large and small investments. A positive index indicates a favorable investment with larger indexes being "better" investments. In "real life" situations, a "Profitability Index" larger than 0.20 (or 1:5 in ratio form) would be considered attractive by many analysts because the project is earning 20 percentage points more than the discount rate used in the NPV portion of the calculation. We see some discussion around PMP Exam sample questions using layman's term for this index (i.e. Cost benefit ratio or Benefit cost ratio) because a few PMP Exam prep questions have been published using "non-standard" terminology. If this metric appears on the PMP Exam with a label other than "Profitability Index," then you are welcome to use whatever formula your common sense and experience tell you to use. Remember that ambiguous questions eventually get removed from the PMP Exam question bank, and you should not find very many of them.

My 2nd-choice among the common metrics would be "Internal Rate of Return" (IRR). It is expressed in % with larger percentages indicating "better" investments. The IRR for a project is defined as that "discount rate" at which the Net Present Value (NPV) of the project is equal to zero. This metric is not influenced by the size of the potential project being analyzed. Calculating IRR usually requires a financial calculator or spreadsheet because IRR is discovered through a large number of "trial and error" calculations done automatically in financial calculators. MS Excel has made calculating IRR much easier (even for PMs). This metric appears routinely in PMP Exam sample questions.

My 3rd-choice metric would be "Net Present Value" (NPV). It is expressed in Dollars, Pounds, Euros, Yen, etc. with positive NPVs being considered favorable investments. It assumes that surplus funds are reinvested at the discount rate. Very large projects can have fairly high NPV but require huge investments. Therefore, the investments may not be as attractive as the high NPV would suggest. We would seldom invest in a project with a negative NPV unless the government required us to make the investment or some executive owner has the desire and authority to force us to do so. This metric appears routinely in PMP Exam prep questions.

My 4th-choice metric would be "Discounted Payback." It uses the same methods as NPV to "discount future benefit streams by a pre-determined percentage per year (the discount rate) and is used to calculate how long our initial investment is at risk. In other words, how long is it going to take for us to get all of our initial investment back with interest? A shorter Discounted Payback Period is better than longer ones presuming all streams are discounted using the rates. This metric seldom appears in PMP Exam prep questions.

My (distant) 5th-choice metric would be (simple) "Payback." It simply looks at the future stream of benefits and calculates how long it will take to get our initial investment completely returned to us WITHOUT DISCOUNTING the value of the future benefit stream. Because this metric does not show respect for the "time value of money," it is seldom used in real life by financial professionals unless they are selling us something on commission (like an investment for retirement). That's because they know very well that a dollar in the future is not worth at much as a dollar today. This metric appears routinely in PMP Exam prep questions. My question is why does it appear so routinely when very few professional financial analysts use it?

Many financial textbooks suggest that basic NPV calculations assume reinvestment at the discount rate (usually the "cost of capital"), and IRR calculations assume reinvestment at the IRR value. However, scholars recently have shown that if we are using the common approach to calculating NPV and IRR, the "reinvestment rates" do not matter because basic NPV and IRR calculations include only the initial return on the initial investment.

With that said, many organizations now use a Modified NPV (MNPV) and/or Modified IRR (MIRR) that calculate the Future Value of all cash flows (including reinvestments) as of a particular date in the future (and then discount that lump sum value to get present value). However, we do not see many references to MNPV and/or MIRR in PMP Exam sample questions, and I presume they are beyond the expected scope of the PMP Exam.

By now some of you likely want to tell me that I should have selected a different ranking for these common (or not-so-common) financial metrics. That's ok with me. When you write your column on financial metrics, you can put them in whatever order you want.

Rather than succumb to the temptation to memorize certain responses, we should learn something about these standard financial terms and then be prepared to apply our mature common sense to the real PMP Exam questions. If enough responsible candidates follow that approach, the "bad" questions on the PMP Exam will automatically be removed in a timely manner by the rigorous statistical analysis performed on them by PMI-HQ.

Now, aren't you glad we don't have to learn how to use a slide-rule to deal with this stuff?

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