Marginal Analysis: What it means to think at the margins…or not

Economists look at how costs and benefits change with small changes in actions. We call this marginal analysis. Marginal analysis is perhaps the key concept in understanding the basic principles of economics. Simply put, **marginal analysis** is an acknowledgement that people (should) make a decision based on the incremental gains and losses that result from that decision, and that **sunk costs** (money, time or other things of worth already expended and unredeemable) should not matter.

Marginal analysis balances the additional benefits from an action against the additional cost. We make decisions every day in this way. For instance, a business owner uses marginal analysis, weighing benefits and costs, when deciding whether or not to expand production. A student does the same when deciding if another hour of studying is a good idea. A parent likewise deliberates over giving her child an allowance or not. Economists call this type of decision making process "thinking at the margins." This means that if the additional benefit exceeds the additional cost, one should complete the action. One should keep taking the action as long as the benefit exceeds the cost. To ensure that all excess benefits (those that exceed costs) are accrued or added up over time, the action should be repeated until, for the last action, the benefits just equal the costs.

Stop and Jot: What is marginal analysis?

Yet, we shouldn't be surprised that not all decisions are made using marginal analysis. Our emotions, experiences, and perceptions of the world often impact our decision making process. This is not to say that such non-marginal analysis thinking is wrong. In fact, it is part of what makes us human. For example, not thinking at the margins is readily demonstrated in our political system, where perceptions and ideology play a large role in decision-making. Elected officials sometimes fail to ignore sunk costs. For example, when the National Aeronautics and Space Administration (NASA) launched into orbit the Hubble Space Telescope, astronomers expected vast new gains and insights in their scientific explorations. Unfortunately, someone goofed. While being tested after being in orbit, scientists and engineers at NASA discovered some flaws in the mirrors used in the telescope that significantly diminished the ability of the telescope to gather signals from deep space. The scientists were devastated, but immediately set upon ways to rectify the problem. Of course, the solution was costly. Many elected officials were outraged, some calling the Hubble Space Telescope a $2 billion boondoggle and debacle. There was a strong movement to deny any more funds to the project, since NASA had not gotten it right initially. These elected officials, representing constituents concerned about federal government spending, considered the sunk cost (money already spent on the telescope) in their decision-making process. While this may reflect how our political system works, it does not demonstrate a marginal analytical approach to the decision.

However, using marginal analysis would result in a much different decision-making process. The $2 billion or so dollars already spent on the Hubble Telescope should not matter, if we are thinking at the margins. What is relevant is whether the benefits of fixing the telescope outweighed the costs of leaving it as it was. In its flawed state, the Hubble Telescope could still perform many useful and interesting scientific functions. Corrected, it could perform more. The only relevant question at that point was whether or not the additional scientific discoveries that would come from fixing the problems would be worth the cost of the repairs. From a marginal analysis perspective, the initial expenditure to build and launch the Hubble Space Telescope should not matter anymore.

Stop and Jot: Why was the decision about further funding for the telescope not an "economic" decision?

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Like our elected officials, we seem to violate marginal analysis all the time, counting sunk or emotional costs in our decision-making. People often go to shows, concerts, or sporting events that they claim they do not want to attend because they have already bought the tickets. That is the key, since the tickets have already been purchased, the marginal cost of attending is probably very small, just some time and exertion. The potential gains from the event–the enjoyment from the activity–must have been high when the tickets were first purchased. We know this because when buying the tickets, the cost was high (it included the dollars spent). The expected benefits, at the time of purchase must have been high as well, and exceeded the costs. Now, let's say a month later after buying the tickets, the expected benefits of attending the event are diminished. Perhaps you are tired that day or there is something else you would rather do. The benefit of not attending is seen as greater than the cost. For example, staying home and catching up on sleep is a decidedly better use of your time. Hence, when thinking at the margins, the initial high benefit of attending the event becomes an overall net cost and should not factor into a decision made at the margin. Using marginal analysis, we should now choose to not go to the event since the costs of going (being more exhausted) are greater than the benefit (getting sleep and feeling better). Yet, many of us would go anyway because the fact that the tickets were already bought (a suck cost) weighs heavily on us. OK, we say to ourselves, I bought the tickets so I should probably go.

Economists recognize that our emotions, experiences, and perceptions have a significant impact on our decision-making process. Marginal analysis, or thinking at the margins, is one of many tools that economists use to gauge or analyze how human beings make decisions that impact the economy.

Adapted from: Roseman, Robert E. "Marginal Analysis." School of Economic Sciences. 22 August 2009. 8 July 2014 <http://faculty.ses.wsu.edu/rosenman/dist301/Margin.htm>.

Questions

1. Scarcity forces individuals, firms, and governments to make choices. How do rational decision makers make decisions? Are human beings always rational in their decision making? What other factors play a role?

2. Give an example from your own life how you made a decision using marginal analysis (even though you didn't know the name of it). Did you "irrationally" factor in *sunk costs*?

3. How do individuals violate the concept of thinking at the margin? From a non-economic perspective are these violations necessarily a bad thing? Give an example of a violation and determine whether it's appropriate or not.

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