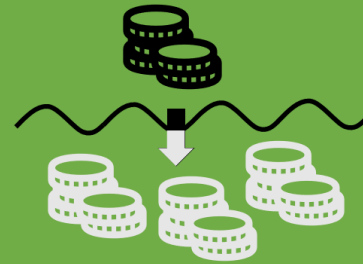


# Decision Bias: Sunk Cost Fallacy



## Biases in Pharma R&D Decision-Making: Sunk Cost Fallacy

### Introduction

Despite continuous scientific advancements in biology, medicine and data science, the pharmaceutical and biotechnology industry continues to see variable productivity from its R&D spend, with multi-year endeavors in many organizations to improve this. However, it has often proved elusive. While establishing scientific frameworks and leveraging quantitative approaches have shown some improvement, this may not be sufficient for a further and sustained increase in R&D productivity. For example, more attention could be paid to the cognitive and behavioral biases (e.g., confirmation bias, availability bias, consensus bias, anchoring, sunk cost fallacy) that often affect the decision-making processes across the pharmaceutical R&D value chain, considering their prevalence and high potential to affect decision makers.

With a series of short articles on these cognitive and behavioral biases in the context of pharma R&D, we hope to draw more attention to them and spur the dialogue and exchange of ideas that could help to mitigate their impact on R&D decision-making.

### Sunk Cost Fallacy

The **sunk cost fallacy** is omnipresent... even in current deliberations on how industry players will work and collaborate in the post-pandemic future.

As an example of such considerations, we might hear: “Now that we spent all this money to build our marvelous new cafeteria, we would like our employees to benefit from it. Hence, remote working is not really an option for us. We would like that our employees work on site for most of their time.”

While this line of argumentation appears logical at the first glimpse, it is a typical example of how the sunk cost fallacy, a cognitive bias, impairs good decision-making. Irrespective of a company’s point of view on hybrid and remote working models, the non-retrievable cost for building that new cafeteria should not impact their decision on where their employees should perform their work in the future.

Whereas the cafeteria example is relevant for all industries, there is indirect evidence that decision-making in pharma R&D is particularly susceptible to the sunk cost fallacy due to the lengthy and costly nature of pharma R&D. Those who have been involved in a phase 2 drug development project where obstacles to the path forward have emerged has probably experienced the temptation that the sunk cost fallacy offers: “Now that we have invested all this money, time, resources, and effort, we simply cannot discontinue this project.” The truly unbiased decision-maker who can resist the sunk cost fallacy, would ask instead: “Now that new obstacles have emerged, what is the probability that our asset becomes a viable and differentiated product?, How does this probability fit into our decision-making framework taking other assets into account?, How much more investment is needed to get to the next decision point?” Of course, similar go/no-go decisions happen at multiple moments across the pharma R&D value chain. However, the more advanced an asset is the more prevalent is the sunk cost fallacy. **Loss aversion** is a related cognitive bias that contributes to the sunk cost fallacy because people are likely to put more weight on the feelings associated with a loss rather than on those corresponding to an equivalent gain (e.g., we feel the loss of a terminated long-term project more than the gain of reallocating the resources to another opportunity).

## Examples how the sunk cost fallacy impairs decision-making in pharma R&D

### Assets

- Progressing the go /no-go decision because "we've invested so much into this asset, and it would be a waste if we discontinue this program at this stage"
- Going into indications not in line with our strategy, because "we already have this asset and invested a lot into it"

### Business Development

- "We've already invested so much in this field (e.g., indication, pathway, modalities) with this portfolio, so the addition of this deal will prevent that investment from becoming redundant"

### Consortia Projects

- Difficulty to discontinue if "we've already put in a lot of effort"

### Diagnosis

- Health care providers favoring the diagnostic test that allows to use their "new shiny toy" more frequently

### Equipment & Technology

- Running legacy experiments mainly because "we have this expensive equipment, and it would be a shame not to use it"; instead of identifying the most effective validation experiments based primarily on project needs.
- Situations where only internal equipment or in-house capabilities can be used for certain experiments or analyses because "we have already paid for them/that," while in fact external group/service may be better, quicker, or more affordable.

### Footprint

- Inability to relocate, companies keeping large campuses despite clear signs that many roles are becoming remote.

### Relationships & Networks

- "We've exited this TA but invested so much into the clinical network/KOL/academic group that we still want to keep investing just in case we want to go back to this area of science at some point in the future."

### Talent

- "We've invested so much into this group or leader - their role/skills became obsolete, but let's continue with the same group or leader"

## How can we avoid or at least mitigate the sunk cost fallacy?

The #1 step towards success is simply being aware of the sunk cost fallacy when making high-stakes decisions in pharma R&D. Oftentimes, it can be helpful to use an analogue with no sunk cost – e.g., “would I have made the same decision if this was an external asset that I haven’t yet put any resources towards?”. While “just be aware of it” sounds like a simple fix that is easy to implement, one must consider that high-stakes decisions usually happen under pressure and with emotions, and as a consequence it becomes increasingly difficult to spot the sunk cost fallacy.

### So, what other options exist?

A mitigation measure that is, in theory, applicable to many biases and flaws in decision-making is leveraging “unbiased expertise”. A group of people who do not have any stakes in a drug development project (e.g., colleagues from another project team) are more likely to spot the sunk cost fallacy than the individuals dedicated to the project team or their superiors sitting in decision-making committees. This is especially true if the “unbiased experts” would be specifically tasked to watch for situations that may fall prey to the sunk cost fallacy.

Also, there is potential in leveraging IT systems and mathematical algorithms to guide rational go/no-go decisions in pharma R&D. Computers and algorithms are certainly immune to the sunk cost fallacy. They could be tailored to the attributes that decision-makers (project teams, decision-committees within and across portfolios) would like to apply to inform their go/no-go decision-making and include company internal and publicly available historical data. These attributes could comprise but are not limited to observed success rates, financial profiles, and opportunity cost analyses. However, the challenge for this mitigation measure may be the difficulty in setting up these algorithms and avoiding data biases when doing so (e.g., including data not available at the time of a given decision), and even more so for the decision-makers to systematically include these algorithms in their decision-making process.

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*The views reflected in this article are the views of the authors and are not associated with the views of any of their respective professional affiliations.*

## **References and further reading**

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