

Chapter- 8

Sunk Costs

In economics and business decision-making, **sunk costs** are retrospective (past) costs that have already been incurred and cannot be recovered. Sunk costs are sometimes contrasted with *prospective costs*, which are future costs that may be incurred or changed if an action is taken. Both retrospective and prospective costs may be either fixed (that is, they are not dependent on the volume of economic activity, however measured) or variable (dependent on volume).

In traditional microeconomic theory, only prospective (future) costs are relevant to an investment decision. Traditional economics proposes that an economic actor not let sunk costs influence one's decisions, because doing so would not be rationally assessing a decision exclusively on its own merits. The decision-maker may make rational decisions according to their own incentives; these incentives may dictate different decisions than would be dictated by efficiency or profitability, and this is considered an *incentive problem* and distinct from a sunk cost problem.

Evidence from behavioral economics suggests this theory fails to predict real-world behavior. Sunk costs greatly affect actors' decisions, because many humans are loss-averse and thus normally act irrationally when making economic decisions.

Sunk costs should not affect the rational decision-maker's best choice. However, until a decision-maker irreversibly commits resources, the prospective cost is an avoidable future cost and is properly included in any decision-making processes. For example, if one is considering preordering movie tickets, but has not actually purchased them yet, the cost remains avoidable. If the price of the tickets rises to an amount that requires him to pay more than the value he places on them, he should figure the change in prospective cost into the decision-making and re-evaluate his decision.

Description

The sunk cost is distinct from economic loss. For example, when a car is purchased, it can subsequently be resold; however, it will probably not be resold for the original purchase price. The economic loss is the difference (including transaction costs). The sum originally paid should not affect any rational future decision-making about the car, regardless of the resale value: if the owner can derive more value from selling the car than not selling it, it should be sold, regardless of the price paid. In this sense, the sunk

cost is not a precise quantity, but an economic term for a sum paid, in the past, which is no longer relevant to decisions about the future; it may be used inconsistently in quantitative terms as the original cost or the expected economic loss. It may also be used as shorthand for an error in analysis due to the sunk cost fallacy, irrational decision-making or, most simply, as irrelevant data.

Features characterizing the sunk cost heuristic

Two specific features characterizing the sunk cost heuristic worth mentioning are:

1. An overly optimistic probability bias, whereby after an investment the evaluation of one's investment-reaping dividends is increased.
2. The requisite of personal responsibility. Sunk cost appears to operate chiefly in those who feel personal responsibility for the investments that are to be viewed as sunk.

Overly optimistic probability bias

In 1968 Knox and Inkster, in what is perhaps the classic sunk cost experiment, approached 141 horse bettors: 72 of the people had just finished placing a \$2.00 bet within the past 30 seconds, and 69 people were about to place a \$2.00 bet in the next 30 seconds. Their hypothesis was that people who had just committed themselves to a course of action (betting \$2.00) would reduce post-decision dissonance by believing more strongly than ever that they had picked a winner. Knox and Inkster asked the bettors to rate their horse's chances of winning on a 7-point scale. What they found was that people who were about to place a bet rated the chance that their horse would win at an average of 3.48 which corresponded to a "fair chance of winning" whereas people who had just finished betting gave an average rating of 4.81 which corresponded to a "good chance of winning." Their hypothesis was confirmed: after making a \$2.00 commitment, people became more confident their bet would pay off. Knox and Inkster performed an ancillary test on the patrons of the horses themselves and managed (after normalization) to repeat their finding almost identically.

Additional evidence of inflated probability estimations can be found in Arkes and Blumer (1985) and Arkes & Hutzler (2000).

Requisite of personal responsibility

In a study of 96 business students in 1976 Staw and Fox gave the subjects a choice between making an R&D investment in either an underperforming company department, or in other sections of the hypothetical company. Staw and Fox divided the participants into two groups; a low responsibility condition and a high responsibility condition. In the high responsibility condition the participants were told that they as manager had made an earlier, disappointing R&D investment. In the low responsibility condition, subjects were told that a former manager had made a previous R&D investment in the underperforming division and were given the same profit data as the other group. In both cases subjects

were then asked to make a new \$20 million investment. There was a significant interaction between assumed responsibility and average investment, with the high responsibility condition averaging \$12.97 million and the low condition averaging \$9.43 million.

Similar results have been obtained in earlier studies by Staw (1974, 1976) and by Arkes and Blumer (1985) and Whyte (1986).

Loss aversion and the sunk cost fallacy

Many people have strong misgivings about "wasting" resources (loss aversion). In the above example involving a non-refundable movie ticket, many people, for example, would feel obliged to go to the movie despite not really wanting to, because doing otherwise would be wasting the ticket price; they feel they've passed the point of no return. This is sometimes referred to as the *sunk cost fallacy*. Economists would label this behavior "irrational": it is inefficient because it misallocates resources by depending on information that is irrelevant to the decision being made. Colloquially, this is known as "throwing good money after bad".

This line of thinking, in turn, may reflect a non-standard measure of utility, which is ultimately subjective and unique to the consumer. A ticket-buyer who purchases a ticket to a bad movie in advance makes a semi-public commitment to watching it. To leave early is to make this lapse of judgment manifest to strangers, an appearance he might otherwise choose to avoid. Alternatively, he may take pride in having recognized the opportunity cost of the alternative use of time.

The idea of sunk costs is often employed when analyzing business decisions. A common example of a sunk cost for a business is the promotion of a brand name. This type of marketing incurs costs that cannot normally be recovered. It is not typically possible to later "demote" one's brand names in exchange for cash. A second example is R&D costs. Once spent, such costs are sunk and should have no effect on future pricing decisions. So a pharmaceutical company's attempt to justify high prices because of the need to recoup R&D expenses is fallacious. The company will charge the same price whether R&D had cost one dollar or one million dollars. R&D costs do count when deciding whether to spend the money on R&D but once spent they have no effect on firm decisions.

The sunk cost fallacy is in game theory sometimes known as the "Concorde Fallacy", referring to the fact that the British and French governments continued to fund the joint development of Concorde even after it became apparent that there was no longer an economic case for the aircraft. The project was regarded privately by the British government as a "commercial disaster" which should never have been started, and was almost cancelled, but political and legal issues had ultimately made it impossible for either government to pull out.

Sunk cost dilemma

The economic approach that sunk costs should not be considered when decisions are being made can lead to a situation where the sum of a number of good decisions can lead to one big disaster. This dilemma situation can be described using a game theory approach for 1-player games.

The sunk cost dilemma with its sequence of good decisions should not be confused with the sunk cost fallacy, where a misconception of sunk costs can lead to bad decisions.

A sunk cost dilemma is a dilemma of having to choose between continuing a project of uncertain prospects already involving considerable sunk costs, or discontinuing the project. Given this choice between the certain loss of the sunk costs when stopping the project versus possible – even if unlikely – long-term profitability when going on, policy makers tend to favour uncertain success over certain loss.

As long as the project is neither completed nor stopped, the dilemma will keep presenting itself.

Game-theoretic model

The sunk cost dilemma has been described by Oliver F. Lehmann using concepts from game theory and decision theory. He models the situation as a one-player game (like jigsaw puzzles and Rubik's Cube) in which a sequence of decisions, each of which by themselves seem good, in the end lead to overall disaster.

The calculation of the payoff for each decision is:

$$\text{Payoff}_d = \text{Project revenue} - \text{Open costs}$$

while the calculated project payoff gets smaller.

Each time the decision has to be made, the strategy of going ahead with the project is dominant, i.e. has the highest payoff, which remains always positive.

As decisions are only made considering open costs but not sunk costs, each single decision is computed to be beneficial. But in the end, the overall payoff of the project is negative. While the project progresses towards disaster, the decision not to go on with the project gets more and more unlikely. The project is like a train: once it has been put on a track, it is very difficult to change its direction.

Bygones principle

The **bygones principle** is an economic theory used in business. Economists stress the "extra" or "marginal" costs and benefits of every decision. The theory emphasizes the importance of ignoring past costs and only taking into account the future costs and benefits when making decisions. It states that when making a decision, one should make a hard-headed calculation of the extra costs one will incur and weigh these against its extra advantages.

Example

An important example of this is related to nuclear power. In the late 1980s, about two dozen partially complete nuclear power plants dotted the USA's landscape. Some had already absorbed billions of dollars of investment but were not yet ready to operate.

One particularly difficult case was the Shoreham plant on Long Island Sound, New York. By 1987 the owner had spent \$5.5 billion on bricks, mortar, fuel rods, and interest, but the operating license had not been granted. From an economic point of view, the \$5.5 billion of past investments should not be weighed in decision-making processes.

The bygones principle would state that the \$5.5 billion of past cost is irrelevant. From an economic point of view, the only relevant issue concerns future costs and benefits--that is, the economic benefits of the electricity that Shoreham would produce.

The key to observe in making this calculation is that the sunk cost of \$5.5 billion is irrelevant to future costs and benefits. Studies indicated that, if the \$5.5 billion were ignored, the future costs of the nuclear power plant would be slightly less than the next-best alternative, even though the total cost was far higher than the alternative. A purely economic analysis would conclude that the most efficient outcome would be to finish the construction and open the Shoreham plant. However, citing many reasons, including the sunk costs, the plant was closed by protests in 1989 without generating any commercial electrical power.

Other uses

The sunk costs phenomenon is also observable in religion: people who have given up faith but believe they've invested so much time in it that they've passed the point of no return, or are afraid to hurt other people's feelings and/or lose their spouse, family, or friends if they were notified of this change that they try to lead a false life. Economic reasons may also play a role—for example, priests who have lost faith might feel they are unable to do anything other than what they've been trained for.