Availability Heuristic: An Overview and Applications

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Abstract. Heuristics exist in all individuals, causing irrational and often false conclusions on the frequency and probability of events. With the recognition of behavioral finance theories, this essay includes an overview, applications, and analysis of a particular heuristic, the availability heuristic. It focuses on the potential misjudgment that may result from the availability heuristic, in order to provide an alternative perspective for economic and social issues. This essay may build a better understanding of the availability heuristic for market participants and policymakers; reducing the degree and frequency of misjudgment and human errors in influential decision-making processes.

Keywords: Availability Heuristic; Behavioral Finance; Application; Decision-making.

1. Introduction

With the recognition of market anomalies, the revolution of behavioral finance that started in the 1980s has pointed out a more flexible and comprehensive solution to current financial problems. Although many see behavioral finance as a heathen, it can be a panacea for finance, as Robert Shiller, who won Nobel Memorial Prize in Economic Sciences in 2013, claimed in an article, "What behavioral finance offers can be thought of as in fact the salvation of neoclassical finance" (Shiller, 2016). The essential difference that distinguishes neoclassical finance and behavioral finance is the understanding of market participants, specifically, the adoption of rationality and irrationality. To put it simply, behavioral finance takes into consideration of biases and heuristics; the inevitable human errors that everyone makes.

Neoclassical finance assumes all market participators are rational, making the most optimal choice at all times whilst behavioral finance recognizes the human errors that exist as an inevitable consequence of bias and heuristics which all human being holds (Vikash Ramiah, Xiaoming Xu, and Imad A. Moosa, 2015). Availability heuristic describes the phenomenon of people assuming what they can more easily recall from memory or surrounding environment as more probable or frequent, say, one may overestimate the failure rate of a kind of vacuum cleaner due to his or her own experience of that kind of vacuum cleaner having an error while using because the information of that kind of vacuum malfunction is more available; hence that person may underestimate the value of the manufacture and miss an investing opportunity. This essay aims to provide a general understanding and perception of availability heuristic, to form a clear and accurate understanding, it also features a variety of applications of availability with data and analysis.

Since Tversky and Kahneman first define heuristics in their study (1973), a variety of studies have further investigated the availability heuristic. Some studies provided information about the role that the availability heuristic has in the decision-making process, and does this mental shortcut sometimes lead to false judgment (e.g., Hertwig, and Steinmann, 2012). Since the work of Tversky and Kahneman, the academic world has realized heuristics are widely and frequently used in different fields; numerous studies were made on applications of heuristics, many of which took form in a survey (e.g., Lichtenstein et al, 1978; Jisu, Delorme, and Reid 2006) and many others utilized in-depth interview or record to discuss (e.g., Ault, Gleason, and Riley, 2000; Weyland, 2009). Now there is a variety of studies that demonstrate the heuristic in different aspects, this essay intends to integrate some of the most typical demonstrations of availability heuristic through the past few decades, discuss the effect of its common utilization, and provide a general overview and analysis.

Section two would introduce the background of the availability heuristic and further elaborate on its effect; section three, four, and five each include distinguished fields whereas the availability heuristic is noticed; the last section serves as a conclusion.

2. Overview

In order to make decisions quicker, people use heuristics, which help the process of estimating by substituting the original choice or question with a simpler one (Tversky, and Kahneman, 1973). The use of heuristics is often unnoticed, and due to its qualitative difference from the original question, the substitute question may lead to a wrong conclusion on the probability or frequency of events.

The availability heuristic shows individuals tend to estimate the probability or frequency of an event base on the effort required to recall it; the easier it is to recall something from memory, the more people tend to overestimate its likelihood; the ease of recall can be due to personal experience or information gained from surrounding environment (Hertwig, Pachur, and Kurzenhäuser, 2005). For example, an experiment included students from the University of Oregon and members of the Eugene, Oregon chapter of the League of Women Voters; the participants were asked to determine the likelihood of causes of death within the United States, between stroke and all accidents, more than 80% of the college students and league members estimated stroke as not frequent as a cause of death while it resulted in more deaths than all accidents combined by 85% (Lichtenstein et al, 1978). This false estimation can be a result of the availability heuristic, college students and league members are communities with a young average age, and stroke is less likely to occur within their social cycle, hence it is harder for them to recall death caused by stroke, leading to underestimation of risk.

Some scholars such as Ackert and Deaves also emphasize the role of egocentric judgment in the availability heuristic. In the book *Behavioral Finance: Psychology, Decision-Making, and Markets,* an experiment that required married couples to describe their contribution to a certain house chore in percentage is included. For 80% of the surveys, the total aggregated percentage of contribution claimed both of the couples are beyond 100, the result of the experiment clearly shows that people tend to overestimate their own work, as the authors stated: “a result that was highly statistically significant overall.” (Ackert, and Deaves, 2010).

The availability heuristic is widely used in decision making, the significance of it is that it simplifies complex questions and hence sometimes leads its user to false conclusions unconsciously. It only has been studied systematically for decades, its existence of it may trace back to countless years ago, and there is no doubt that it has caused a great impact on history. In the rest of the essay, a few fields that it applies would be analyzed.

3. Application I: Stock Market

For investors and other players in the financial system, a variety of probability needs to be contemplated. Despite effort, no investors can be completely rational due to the inevitable interference of heuristics, including availability heuristic. Effect that availability heuristic has on the stock market is indubitable, and from a various of ways. Investors substantially buy stocks that gained their attention in recent times, the stocks left them with an impression (had very low market value, mentioned by co-workers, etc) is more likely to be considered as optimal (Brad Barber, and Terrance Odean, 2007). As investors seldom choose stocks with a relatively low availability to them, many stocks may be undervalued, resulting in market failure.

Furthermore, a systematic overestimation is more likely to happened to stocks with a higher availability to numerous investors, raising risk for potential plummet in value. Multiple researchers such as Uppal, Kilka, and Weber also discussed the influence of “home bias”, a tendency derived from the availability heuristic, which illustrates investors remarkably favor local stocks (the availability of local stocks is higher for them, they can recall those stocks easier). A study by Uppal shows that 98% of the stock portfolio of investors in the United States was domestic equity, which was clearly disproportioned considering the world market capitalization of the United States market was only 36.4%. This availability-driven tendency seems to escalate when considering countries with a smaller proportion of market capitalization, according to the article, 91% of stocks in portfolios chosen by Italian investors are domestic equity, but in Italy, the capitalization of the stock market was only 1.9% at the time (Uppal, 1992; Kilka, and Weber, 2000).

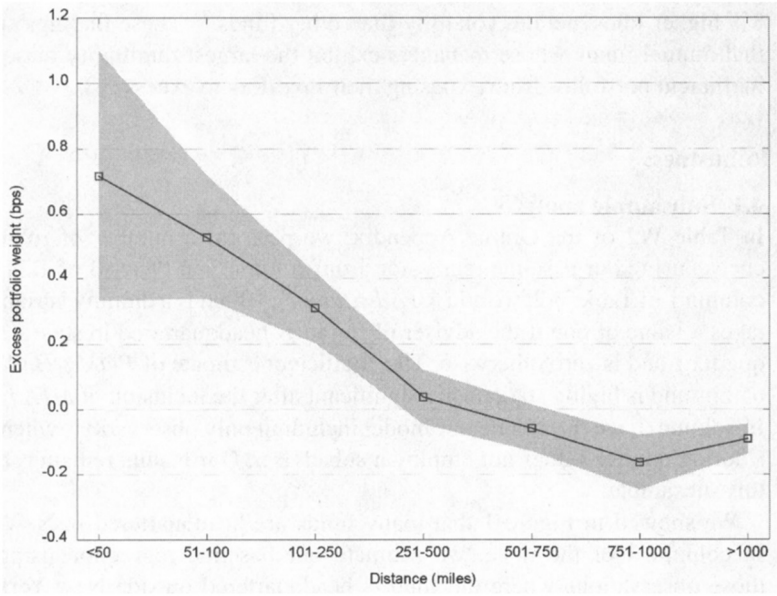

Figure 1. No Place Like Home: Familiarity in Mutual Fund Manager Portfolio Choice, Pool, Stoffman, and Yonker. https://doi.org/10.1093/rfs/hhs075

Nevertheless, considering the fact both of the two studies mentioned above were constructed more than two decades ago, some may argue the technical difficulties (lack of access to purchase, lower internet popularity rate, etc.) made it harder for common investors to invest in foreign stocks. What may settle the debate is a more recent study published in *The Review of Financial Studies*, this study discovered the tendency of mutual fund managers in the United States tends to overweight stocks of companies headquartered geographically closer to their home state (to clarify, the home state is defined as the state participants grew up in the article, not the state they were born or currently live in). As figure 1 shows, an obvious correlation between excess portfolio weight and distance between headquarter of the company to home states can be realized (Pool, Stoffman, and Yonker, 2012). In comparison with two studies the previously mentioned, the study by Pool et al. investigates professional and relatively high-end investors that live in a time with more complete globalization and adequate online stock trading system, yet they still show decision-making based on availability. Investors notably choose stocks that are geographically closer to their homes, showing a tendency to have more optimism towards stocks that are more available to them, and demonstrating the influence of the availability heuristic.

Furthermore, the public frequently overestimates the chance of persistent profiting in the stock market. Successful investors generally receive wide press coverage whilst unsuccessful investors seldom appear in news; to attract more clients, financial institutions prefer to advertise successful experience of investing (well-performed mutual funds, etc.); to gain higher support rates, politicians and governments prefer to propagandize successes in the stock market; to attract audience attention, social media influencer and news media prefer to interview and publicize successful investors. Hence, for the general public, it is easy to recall successful investors who persistently gained a profit such as Warren Buffett, but hard to recall someone who experienced a great loss in the stock market. As a consequence of the difference in availability of success and loss in the stock market, people tend to overestimate the chance of profiting by investing in stock and underestimate the chance of experiencing a deficit (Lofthouse, 1996).

4. Application II: Marketing and Advertising

It is suggested marketing and advertising are two industries that have been both unintentionally and intentionally utilizing heuristics and biases to gain financial benefit, many marketing strategies and advertisements are deliberately designated to trigger heuristics (Jordan, and Kaas, 2002). Since

the realization of potential applications of heuristics in marketing and advertising, numerous studies have focused on how direct-to-consumer (DTC) advertising may affect perceptions of the public, and a particularly popular direction out of those studies is the use of DTC advertising in the pharmaceutical industry (e.g., Wilkes, Bell, and Kravitz 2000; Glibody, 2005; Jisu, Delorme, and Reid 2006).

There are many debates around the use of DTC advertising in the pharmaceutical industry, studies show it may influence doctors' decisions on prescriptions and cause medical malpractice, for that reason, DTC advertising is in fact banned in many countries; but on the other hand, some argue DTC advertising on drug increase medical awareness, as Frosch claimed in the article, "More than half of physicians agree that DTCA educates patients about health conditions and available treatments.10–12 In surveys of the public, nearly 75% of respondents agree that ads improve their understanding of diseases and treatments" (Handlin et al, 2003; Frosch et al, 2010). Despite the controversy, DTC advertising still flourished in countries where it is allowed for the profit it brings, according to a report by the United States Government Accountability Office (GAO), from 2016 to 2018, the pharmaceutical industry in the United States spent $17.8 billion on DTC advertising (GAO, *Prescription Drugs: Medicare Spending on Drugs with Direct-to-Consumer Advertising,* Page 9).

The availability heuristic, as a heuristic that is sometimes used to estimate the probability and frequency of events, indubitably plays a role in the perception of health and medical risk. Studies discovered exposure and familiarity with DTC pharmaceutical advertising have impacts on numerous perceptions about diseases (An, 2008; Park et al, 2007). An conducted a survey that investigate how availability of information about antidepressants may lead to wrong conclusions about depression-related perceptions among participants. Her study finds "the recall of antidepressant DTCA was a significant predictor of perceived prevalence of depression" when age, media exposure, and other factors that may potentially affect the result are controlled. Some DTC advertisement, like other advertisements that want to utilize the availability heuristic, deliberately contain a catchy slogan or dramatic scene; this not only increases the chance of the advertised product being chosen by customers but lead to wrong public health perception as well.

5. Application III: Policy Making, Group Decision, and Team Work

Leaders, from managers in private cooperation to governors, all use heuristics while making decisions and hence make human errors. Although measures to avoid personal bias or misjudgment such as evaluation, self-reflection, and statical analysis are often taken, the availability heuristic still affects and causes overestimation of probability or frequency of events. What may make these overestimations more significant is false decisions of the political elite is likely to magnify when policies are made based on those overestimations.

Through analysis and deduction of historic events, Weyland has provided historians with a different perspective to view decisions made by politics. In his 2009 article, he claimed the presence of the availability heuristic in Australia and most of Europe after the French Revolution in 1848. The rich history of revolutions in France made the news of the revolution in Paris more available to the public. As a consequence, progressives in the rest of the globe generally had an irrational overestimation of the chance of succeeding in a revolution and made irrational approaches to start a revolution. Other than taking influence from revolutions with similar conditions such as the democratization of the United States, protesters in Latin America operated a rather radical rebellion. Weyland later elaborated on the impact of the availability heuristic on a wider range in his article of 2010, he concluded that the availability heuristic served as a crucial pushing force of the three waves of contention (1830-1831, 1848-1849, and 1917-1919) in similar ways.

Due to the inevitable difference in class, social cycle, living conditions, income, and other factors, politicians are likely to have a different perception of society in comparison with the public.

A study recorded and analyzed a case that demonstrated misjudgment of public opinion due to the availability heuristic: In a neighborhood, the local neighborhood association holds regular meetings,

which were usually poorly attended. However, a serval government representative attended one of the meetings during a governmental annexation. In that meeting, a member who had to pass a few speed bumps every day raised a proposal to remove all the speed bumps; due to poor attendance at the meeting, his opinion was more noticeable and available and left an impression on the government representative. A few weeks later street department crew started to remove the speed bumps, only to find objections from residents. A public vote was held at the following meeting of the neighborhood association, which had more than 500 participants, and the great majority of the participants objected to the removal of speed bumps due to safety concerns, proving the original decision to be an overestimation of public opinion. To the government representatives, demand for removing the speed bumps was more available information, under the effect of the availability heuristic, they wrongly judged the true preference of the general public (Ault, Gleason, and Riley, 2000).

When it is about group decision and team work, availability heuristic may also result in egocentric judgement (as mentioned in the latter part of section two). The self-serving bias of overestimation of one's own contribution to teamwork is proved to be a wide tendency that applies even in more educated groups or even groups that deliberately discuss team members' contribution to work to achieve a fair distribution of credits; further indicating its influence may extend to the higher end of the finance field. Research recently published in PNAS demonstrates even scientific researchers overestimate their contribution to professional studies they participated. As figure 2 shows, in general, the more the collaborators, the more credits are overestimated, and all of the surveyed academic groups have an aggregated contribution higher than 100%, while the surpass is between 17% to an astonishing 158% (Herz et al, 2020).

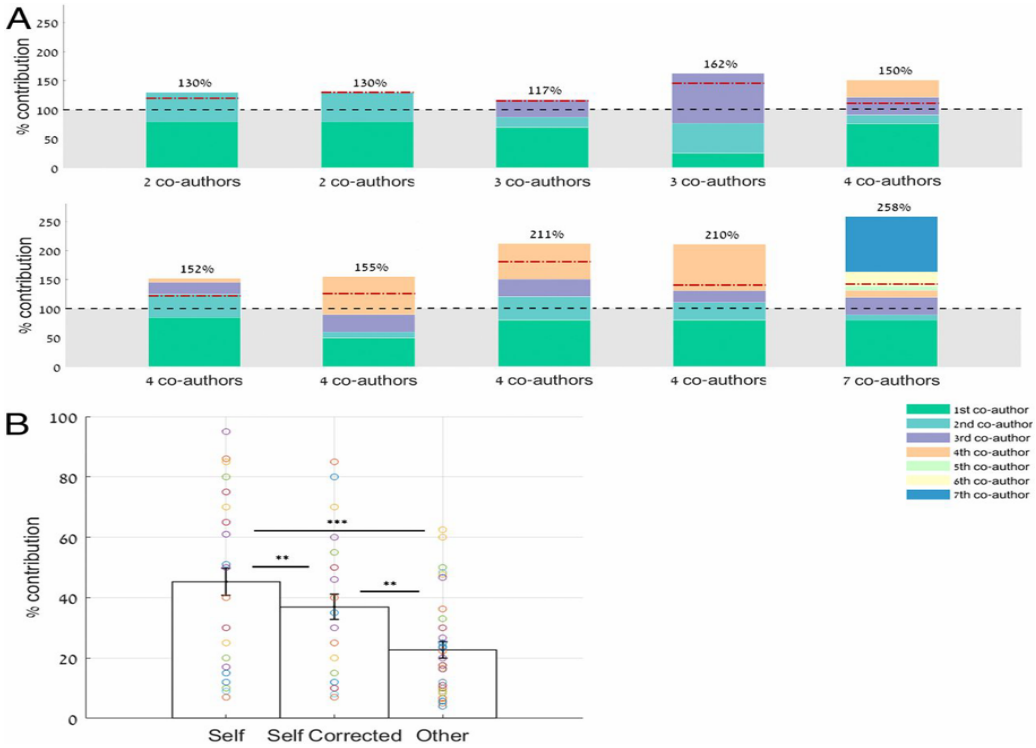

Figure 2. Aggregate Contribution of Co-Authors, Herz et al. https:// www. pnas.org/ doi/10.1073/ pnas.2003500117

6. Conclusion

The availability heuristics describes the tendency of people tends to determine the probability or frequency of an incident base on the ease of recall. Like all heuristics, it is a mental shortcut employed by people to make faster decisions. However, heuristics are irrational and sometimes lead to a false conclusion, in the case of the availability heuristic, it is commonly overestimations of probability or

frequency. There is a variety of financial applications of the availability heuristic, including the stock market, marketing, advertising, political decision, and policy making. Although applications of the availability heuristic do have positive effects, there is also a chance of vicious consequences, making consideration of availability crucial.

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