

# The introduction and analysis of Representativeness bias

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**Abstract.** Ordinary people are difficult to keep rational when they do investments, the reason for this is behavior finance. People's reactions and perceptions are easily affected by their cognition and emotion. This study will focus on the representativeness bias which is people's shortcut and will give a new angle to think about how behavior influences our investment. In the last, the conclusion of this study is that most people may still not have enough ability to avoid the representativeness bias totally, although they have known the reason and phenomenon of representativeness bias.

**Keywords:** Representativeness bias; Investment; Behavior finance.

## 1. Introduction

The term heuristic is first discovered by Greek and means, "serving to find out or discover." (Gigerenzer, 2011). Nobel-prize winner in economy named Herbert Simon proposed the concept of heuristics in the 1950s (Schwartz, 2002). He found that people always cannot remain rational because they are always limited by their cognitive, intelligence, and amount of information. During the 1970s, Amos Tversky and Daniel Kahneman did research on cognitive bias. They also pointed out how cognitive bias influences people's judgment. Besides, the phenomenon of most people relying on mental shortcuts to make choices was found by them, one mental shortcut is called representativeness (Cherry, 2021). It means people get used to referring to past information to choose because this can help people make choices quickly. However, representativeness exists all kinds of problems that people cannot avoid unless ordinary people have enough brave to give up their solid thinking habits. Past information and experience should not be the basis that people make a judgment. This study will talk about the definition of representativeness bias in more detail and explain why people generate representativeness bias and the importance of representativeness bias. Besides, this study will introduce several specialists' ideas about representativeness bias and analyze these ideas. In the last part, this study will give three applications.

The main contribution of this study is that according to other experts' opinions, giving normal people a new visual angle to understand the representativeness bias. Furthermore, the essay will help people generate the capacity of observing the phenomenon of representativeness bias and the greatest degree of avoidance, which may happen to them.

## 2. Literature review

Representativeness bias is defined as "in many situations, people make estimates by starting from an initial value that is adjusted to yield the final answer. The initial value, or starting point, may be suggested by the formulation of the problem, or it may be the result of a partial computation. In either case, adjustments are typically insufficient. That is, different starting points yield different estimates, which are biased toward the initial values" (Kahneman, 2021). In 2021, Doctor Cherry published a passage pointing out her ideas to explain the generation of representativeness bias. There are three reasons. For example, the first one is the conservation of limited cognitive resources, which means our resources are limited but we have to make a variety of decisions every day; the second reason is that people are used to using categories and prototypes to make choices and the third reason is that overestimating the importance of similarity. To some extent, representativeness bias can help us make decisions more quickly, although it is not helpful for us to make the best correct decision in our most of the time. For instance, when people do something creative, they are easy to recall the model that they have studied. Therefore, people will follow their past knowledge and categories to make the

choice. What is more, most people have a common habit of thinking that if two things are highly similar, the outcome of these two things will be the same.

In 2021, Cammille Van Vyve put forward a similar opinion that people easily connect one thing with another thing and that they have strong similarities. When people decide on investment, they often think that the larger the company is, the better trend the company will have in the future. Besides, people are more likely to believe those companies run by excellent leaders will have a promising future. This is one of the features of representativeness bias that affect people's judgment. Therefore, the majority of people who ignore that they should consider the trend in stocks from different angles will purchase many stocks from different major companies. Besides, in 2002, a specialist named Robin proposed his idea in his book. In his opinion, people are used to believing the past data and the law of small numbers. It means that when people make some decisions, they will rely on past statistics and other Black Swan Events. A classic example is named Gambler's Fallacy, which means if a gambler loses the game in the casino all night, people may believe that this loser will win next time. Another example is a coin. If people tossed a coin the first time, the coin tailed up, and they would guess next time the coin would head up. People always make wrong decisions according to their past data and the small probability event to predict the outcome of future things.

In 2020, Wittwer thought the reason people make wrong decisions like representativeness bias is the culture. People from different countries have divergent cultural backgrounds. Therefore, people have fixed thinking pattern which is caused by their culture. He did two types of research. The first one was about American marriage and divorce. Americans have solid thinking about marriage. They thought when they married, they would develop a lifelong partnership, which means they will never divorce. Therefore, Wittwer (2020) referred to data from Harvard Law, only 5 percent of husbands and wives from America signed the prenuptial agreement but 50 percent of couples decided to divorce. Americans make the wrong decisions about marriage because of their fixed thinking from their local culture. The second one was about business. Wittwer pointed out that an insurance company named Allianz rejects to develop business in Africa because the inherent thinking of most large companies including Allianz was in the most African areas that were flooded with corruption. Therefore, Allianz didn't count the probability. It was just judged by bias, which would make this company miss a good opportunity to make more profits.

It is meant for people to analyze the representativeness bias because it has influenced people's daily life in many ways. Cherry (2021) also stated the importance of representativeness bias. Firstly, she introduced healthcare; secondly, she thought that representativeness bias has influential on Criminal justice; thirdly, people may have stereotypes about many things. In the hospital, doctors often take the same way of medical treatment when they think that the symptom of the illness is similar to the illness that they know, which will make doctors ignore other significant relevant information. This may lead to misdiagnosis. Another example is that Jurors may make mistakes because they may think those people who have similar characteristics to suspects are criminals. Besides, people always believe that farmers are hard-working, teachers are friendly to students and scientists are intelligent. Therefore, people can always see the phenomenon of representativeness bias in our daily life but most people cannot notice it so that is why more and more specialists analyze representativeness bias.

Above all, most people cannot make rational choices because they do not have enough knowledge and information. Therefore, for making choice more efficiently, people find a way named representativeness. In this way, people refer to past experiences and knowledge to make the right judgment that they think. However, representativeness bias has many problems. The first problem is that past information and knowledge cannot represent the situation people face today. People cannot predict the weather tomorrow according to the weather today. Although today is a rainy day, it cannot represent tomorrow will be a rainy day too. Secondly, connecting one thing with another is not correct in most situations. A student who gets high scores do not mean this student does not play video games and a student who always fail exam also cannot be proved this student is lazy and not hard-working.

Many things are not important although people make wrong judgments in many areas, once people do the wrong judgment, it will cause irreparable harm like a misdiagnosis.

### **3. Application**

#### **3.1 Application 1**

It is really common for people to see the representativeness bias in their life. One example is an investment. In many cases, our emotions affect our decisions and because of those emotions and psychological influences, people make irrational decisions (Irshad, 2016). When people saw a manager in a famous bank investing the stock. One day, the price of this stock rose quickly, and most people would follow this manager. Therefore, whatever this manager put his money on what companies, all people who hoped to gain much more money from the stock would follow this manager.

However, the fact of this thing is not so simple. People make the mistake of representativeness bias. There are three reasons. First of all, ordinary people didn't analyze by themselves like collecting information about all companies that they would buy from and comparing the data of all kinds of companies, they just thought that the manager in the bank must do the most correct judgment. Secondly, this thing just happened one time and most people believed that managers in banks would succeed every time. Therefore, most people still believe in the law of small numbers, small sample things will happen all the time. Humans are easy to adapt something specialists call "the law of small numbers," which is hypothetical that small samples faithfully represent total populations (Pompian, 2012). However, a small probability event cannot be used to judge the whole of an event because an event must include different situations and these situations have different probabilities. Thirdly, in this situation, people just believed the past information. In the past, the manager in the bank invested successfully but this didn't mean this manager would be successful in the next investment.

Above all, for judging the trend of stock successfully and avoiding the mistake of representativeness bias. People must know enough correct information and analyze this information carefully. Although people can try their best to do that, they may still not avoid the mistake of representativeness.

#### **3.2 Application 2**

Nowadays, more and more people think that the more expensive a product, the better is this product. Especially for some rich people, when they want to purchase something, most of them only chose expensive products. They cannot distinguish what products are most suitable for them. Besides, they do not care about anything, they only use price to define the quality of products. Therefore, they always think those cheap products are bad.

For example, when people decide to purchase a laptop, most rich people only like Apple because Apple is too expensive. This is not true because people make mistakes about representativeness bias. They only focus on price. They refuse to consider other important information. They need to choose a laptop according to their requirements. Workers in Apple sold 20 million Mac and MacBook units in 2020 (Curry, 2022). Some laptops which are equipped with a windows system may be better than the Apple system. Besides, most Windows laptops are cheaper than Apple. People need to spend around \$2000 on a laptop from an Apple brand like MacBook Pro. However, most laptop equipped with a windows system only needs around \$1000. What is more, Windows laptops have more functions than Apple such as computer games. Therefore, people should purchase laptops according to their requirements rather than price.

Overall, most rich men who purchase laptops only care about price, which makes them ignore their requirements and other elements. Therefore, for making the best choice, people have to give up their stereotypes.

### 3.3 Application 3

The stereotype is one of the reasons that cause the representativeness bias. Nowadays, the average person for making more profits will try to invest money in stocks. They reject to follow any other person, they just analyze all kinds of information from different companies by themselves. However, they always only focus on the most important information and ignore other significant information.

For example, when they see a computer company that sells the most products in this area, normal people will spend the most money on the stock of this company. However, this way is wrong because people give up to see the profits, leaders in this company, and other significant things. By contrast, when people see a company that does not have enough profits, they will give up to purchase the stock of this company. This is also totally wrong, the reason of which is that people just focus on profits, they do not try to see other information equally like the innovations of this company and future trends. They just believe things that they pay the most attention to.

Most people cannot avoid stereotype because people are easy to believe things that they think is right. They are afraid to put stereotypes down, which means that the average person cannot judge one thing correctly using all information equally. There is no way for all people to ignore this mistake.

## 4. Conclusion

This passage has studied the origin of representativeness, its importance of that, and the reason why people have the thinking habit about it according to many specialists' passages. About three applications, the first one is about stock investments; the second one is about people's shopping habits; the third one is about companies' investments. These are common examples that happen in people's daily life.

Although much grind has been devoted to the debiasing of people's judgments, no corresponding work has been found on the debiasing of group judgments (LAI-HUATLIM, 2002). Representativeness bias influenced people daily in many ways and specialists have known the reasons why people think about using representativeness bias but people still cannot solve problems about representativeness bias. It is really difficult for people to give up thinking about experiences and stereotypes when they face new problems.

The arouse of this essay is that help people understand how the representativeness bias as one part of the behavior finance influences people's investments and how they can try their best to avoid wrong decision making which is caused by representativeness bias.

## References

- [1] Curry, D. (2022). Apple statistics. <https://www.businessofapps.com/data/apple-statistics/>.
- [2] Cherry, K. (2021). What Is the Representativeness Heuristic? <https://www.verywellmind.com/representativeness-heuristic-2795805>.
- [3] Gigerenzer, G., & Gaissmaier, W. (2011). Heuristic Decision Making. [www.annualreviews.org](http://www.annualreviews.org). doi:10.1146/annurev-psych-120709-145346.
- [4] Irshad, S., Badshah, W., & Hakam, U. (2016) Management and Administrative Sciences Review. Effect of Representativeness Bias on Investment Decision Making. [https://www.researchgate.net/publication/328996161\\_Effect\\_of\\_Representativeness\\_Bias\\_on\\_Investment\\_Decision\\_Making](https://www.researchgate.net/publication/328996161_Effect_of_Representativeness_Bias_on_Investment_Decision_Making) e-ISSN: 2308-1368, p-ISSN: 2310-872X Volume: 5, Issue: 1, Pages: 26-30.
- [5] LAI-HUATLIM., & IZAKBENBASAT1. (2002). The debiasing role of group support systems: an experimental investigation of the representativeness bias. <https://doi.org/10.1006/ijhc.1997.0137>.
- [6] Pompian, M. (2012). Behavioral Finance and Wealth Management: How to Build Investment Strategies That Account for Investor Biases. Representativeness Bias. <https://doi.org/10.1002/9781119202400.ch7>.
- [7] Schwartz, H. (2002). The Journal of Socio-Economics Volume 31, Issue 3, 2002, Pages 181-189. Herbert Simon and behavioral economics. [https://doi.org/10.1016/S1053-5357\(02\)00161-0](https://doi.org/10.1016/S1053-5357(02)00161-0).

- [8] Tversky, A., & Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases. *Science*, 185(4157), 1124–1131. <https://doi.org/10.1126/science.185.4157.1124>.
- [9] Van Vyve, C. (2021). Representativeness bias: beware of misleading associations [https://www.easyvest.be/articles/en\\_US/Post/representativeness-bias-beware-of-misleading-associations](https://www.easyvest.be/articles/en_US/Post/representativeness-bias-beware-of-misleading-associations).
- [10] Wittwer, J. (2020). 3 Mechanisms That Bias Our Decision-Making: Representativeness Bias. <https://successacrosscultures.com/2020/07/03/3-mechanisms-that-bias-our-decision-making-representativeness/>.
- [11] Zheng, J., Ming Yuan, J. & W. Lien, J. (2015). <https://www.researchgate.net/journal/SSRN-Electronic-Journal-1556-5068>. <http://dx.doi.org/10.2139/ssrn.2635427>.