The Trap of Anchoring Effect: A Study on the Impact of Anchoring Effect on Decision-Making

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Abstract. This paper investigates the effect of anchoring effect on individuals' decision-making process. Anchoring effect is a psychological phenomenon where people make a judgment based a reference point and then make adjustments based on upon that. Due to insufficient judgement the final judgment is subject to the influence of the reference point. This paper discusses the role anchoring plays in decision-making, its positive effect and negative effect. In addition, this paper explains why the negative effects exist and how to solve them, thereby optimising our decision-making process. The paper would introduce prevalence of this mental heuristics in retail industry and showcase how anchoring effect could be used to boost sales of healthier organic product, thereby improving on quality of life, and how it may be used against consumers, resulting in overconsumption of goods and services. Possible solutions that could be used to deal with the negative impacts include educating the general public about this phenomenon and using an anti-anchor.

Keywords: Anchoring Effect; Economics; Finance; Mental Heuristics.

1. Introduction

The purpose of this paper is to investigate the anchoring effect on decision-making by individuals and firms. Anchoring effect happens when a person makes an assessment, and the result becomes very biased towards an initial condition that is presented to the person. This topic is of great relevance in today's geopolitics. Anchoring effect, for example, has an effect on people's perception of ongoing Russian-Ukrainian war. At the start of the war Russian troops took significant advances, though its sub-par performance afterwards gave Ukrainian forces a chance to pick themselves up and managed to reach a stalemate. Yet the initial situation has made some people, even military experts, believe that the war would end in annexation of Kiev. This is an example of anchoring bias. People overweight the importance of the initial information and made an assessment strongly biased towards it. This highlights the significance of anchoring and adjustment in the context of geopolitics. This example shows that this mental heuristics could have profound impact on human judgment, and this is not exclusive to geopolitical events. People making their personal decision would be greatly affected by it. This has thus become necessary to research anchoring effects.

2. Literature Review

Anchoring and adjustment as a psychological heuristic has long been documented. Tversky and Kahneman (1974) defined anchoring and adjustment as establishing a starting value and making adjustment based on it [1]. For example, in an experiment, subjects were asked to determine the proportion of African countries in the United Nations. In this set up, subjects were first shown a random number generated by a wheel of fortune, they were then asked to indicate how their estimates compare. After that, they produce their estimates. The study found that the random number given at the beginning had a significant impact on the estimates of subjects. Those whose random numbers were 10 produced a median estimate of 25, and those whose number is 65 produced a median estimate of 45. In this experiment it can be seen that people, when making estimates, can be influenced by factors that have little to do with the estimates themselves. In addition, anchoring bias could also stem from insufficient calculations. In a separate experiment, test subjects were instructed to calculate, under tight time constraint, 8 factorial, in both ascending and descending orders. It was found that a

smaller estimate was produced when it was given in ascending order and vice versa. This is because to answer the question quickly, the respondents may perform the first few steps of calculations and estimate a value based on that. Therefore, the ascending factorial would "appear" to be smaller than the descending factorial. In this example, people used the first few numbers in the factorial as a reference and extrapolated an answer from them.

Some papers attempted to quantify the effect of anchoring and adjustment. Jacowitz and Kahneman (1995) used anchoring index [2]. In this setup subjects were placed into three groups. One group was given no anchor at all and the other two groups were given a high anchor and a low anchor respectively. The exact values of the anchors were determined on a "rule of thumb" basis. Typically investigators may use specific percentiles from the unanchored group as anchors. The Median(high anchor) refers to the median of the higher anchor group and the Median(low anchor) refers to the median of the lower anchor group. This indexation offers us a nice way condense the impact of anchoring into a single number, thus making comparison of anchoring effects easy. However, this is only a descriptive statistics and may offer us very little guidance on its statistical significance. For example hypothesis testing cannot be performed nor can its confidence level be dettermined based on it. To tackle this issue the paper transformed the anchoring index into the percentiles corresponding to the data from the group with no anchoring (it is called the calibration group). This would permit all kinds of statistical comparison, such as Student's t test. The conclusion of this paper echoed with the aforementioned texts, though the paper is important in its own way, for that it incorporated statistics into anchoring effects.

Previous examples of anchoring applied to subjects people have very little interest. However, it would be wrong to assume that anchoring and adjustment is not prevalent in topics that people care about. Plous (1989) found that people experienced anchoring bias when asked to assess the possibilities of nuclear war [3]. The question was very relevant in the environment of 1989 and it has been found that even with such topicality anchoring and adjustment still played a role in making estimate. Furthermore, the robustness of this psychological phenomenon has been reaffirmed countless times in different domain, including general knowledge (Strack & Mussweiler, 1997)[4], gambles and lotteries (Chapman & Johnson, 1994)[5], negotiation (Galinsky & Mussweiler, 2001)[6], and price estimates (Mussweiler, Strack & Pfeiffer, 2000) [7].

2.1 Application of Anchoring Effect in Stock Market

One application of achoring effect found by George and Hwang (2004) observed that an investing strategy that utilises the 52-week high value of the CRSP stock would outperform the typical strategy that uses historical return as an indicator of good stocks [8]. To be specific, the first strategy would long any stock that approaches its 52-week high and short any stock that approaches its 52-week low. The other typical strategies would then long any stocks or industries that have outstanding return (top 30%) history and short any stock that underperforms (bottom 30%). They found that the first strategy outperforms the other. The psychological reason behind this is anchoring effect. Whenever a stock approaches its 52-week high, investors would, either consciously or unconsciously use this as a reference point and assert that the stock would not go up any further. This reasoning, however, is usually unfounded, as the reason for this stock price increase may be fundamental, such as a change in management or better product, and this fundamental reason that causes the stock to go up has no reason not to keep pushing the stock up once it reaches its 52-week high. Because of false reasoning, investors may be reluctant to buy the stock that reaches its 52-week high. This provide an excellent investment opportunity for deviants of anchoring effect, who would keep buying even though the stock price is nearing its 52-week high. When the market finally overcome the anchoring effects and realise the stock is fundamentally valuable, it would get rallied up and give a high return.

2.2 Application of Anchoring Effect in Housing Market

Another application of anchoring bias is in the housing market. The appraised value of a house is the product of initial listing price and a series of negotiation. The objectively true value, however,

may deviate from the appraised value. During this process, anchoring bias would play a role, as transaction always starts with a listing price, and this could be used as a reference. The following negotiation can be seen as adjustment, and it is often found that such adjustments are often insufficient.

Northcraft and Neale (1987) investigated this with a field experiment [9]. Subjects were instructed to value houses in Arizona. They were initially presented with a packet of information regarding the housing. They were then subsequently led to visit the property on site. Before they gave their valuation, subjects were split into four groups, each group presented with a different listing price. This would serve as the anchors for each group. Finally, subjects were instructed to give an appropriate appraisal price, listing price, a price that they were willing to buy, and the lowest price that they were willing to buy. This experiment was performed on amateurs as well as professionals.

The results are as followed. Clearly anchoring effect has an impact on decision making. Those who were presented with a lower listing price produced lower estimates on the properties, and vice versa. The results were also statistically significant, exhibiting a high F-score and t-score. It can be noted that even professionals were not immune to anchoring effect, as they, too, produced a greater estimates when given a higher listing price. In addition, another contribution of this paper is that it showed that even in an information-rich environment, people are prone to anchoring bias.

3. Investigation

3.1 The Positive Effect of Anchoring

Anchoring and adjustment could affect consumer purchasing decision making in a positive way by encouraging consumption of organic food. It has been shown that in Shan, Diao and Wu (2020) [10]. In the paper authors seek to investigate the impact of anchoring effect on consumers' attitude and intention to purchase organic food. There are two questionnaires for control group and four for the test groups. The test subjects in the test groups were given a high anchor and a low anchor, then they were asked to make a judgment on the organic food. The sample selection was random to ensure representativeness. The results were that respondents exposed to a lower anchor price had a nicer opinion on the organic food and revealed a higher intention to purchase the food than those who were exposed to a higher anchor price. This shows that a higher anchor price would likely improve consumers' attitudes towards an unfamiliar good and thus increase their purchase intention. These results indicate that government could try to increase the consumption of organic food by having a higher anchor price. This would be beneficial as organic food is free from pesticide residues and problematic chemicals. By switching to organic food, the consumers can enjoy healthier food that are more beneficial to their long-term health.

In public policy domain, anchoring effect can guide people to make the right decision. This includes encouraging healthier lifestyle, devoting more resources to more charitable causes, and reducing consumption that is related to global warming. To encourage healthier lifestyle is to consume more healthier products, such as the organic food, but there is no reason to stop at there. Consumption of high quality food and healthier diet should also be promoted. In addition, a healthier lifestyle would also mean to stay away from products that cause long-term health issues, such as cigarettes. Anchoring effect can then be exploited to encourage or discourage the use of such products. For example, to encourage the consumption of vegetables, the advertisements at supermarkets could mention the vegetables at a higher quantity. Instead of saying "£3 for 5", they could say "£6 for 10". Even though there is no fundamental difference between the two, the latter establish a higher reference point. Due to anchoring and adjustment heuristics, people would use this reference point to base their purchase upon and make adjustment, The adjustment is often insufficient, thereby resulting in a higher purchase quantity. This would increase their purchase of healthy products and therefore their consumption would be higher. Similarly, in promotion for charitable causes similar reference point could be set up higher, guiding people to donate more money. Furthermore, products with less carbon footprint could be promoted in similar fashion.

3.2 The Negative Effect of Anchoring

Anchoring and adjustment also arise in consumer behaviours. When considering how much one should buy, anchoring effect may play a role. In this case anchoring affects people negatively by failing to buy the perfect quantity of goods. This is because during shopping our default quantity of purchase is often 1 or 2. Starting with a default value as a reference, consumers slowly adjust upwards to account for qualities, budget, and the importance of the goods. It is often the case that the adjustment might be insufficient because of the dull nature of shopping. Consumers would not perfectly assess the utility brought about by the goods, rather they operate on a rule of thumb. Wansink, Kent, and Hoch (1998) discussed this [11].

The setup of the experiments was as followed. The first experiment explored the anchoring effect by having two forms of price information, multiple unit pricing and single unit pricing. An example of multiple unit pricing is £10 for 10 cans of Coca Cola, and an example of single unit pricing is £1 for one can of Coca Cola. It has been found that multiple unit pricing could increase sales by 12%. Anchoring effect produced an impact as it established an anchor in multiple unit pricing, giving consumers a higher reference point and due to insufficient adjustment downwards, quantities bought by the consumers increase. In the following experiments, anchoring effect is introduced in the form of purchasing limit and advertisements. In all cases, higher sales were observed in the presence of higher anchors.

3.3 Measures to Address Negative Impacts

The lesson for the managers of shopping malls and supermarket is very simple. One way to improve sales is to use high-anchor-based information. It could be promotion, selling advertisement, or simple price information. Due to the attention of consumers (or a lack thereof), consumers usually make insufficient downward adjustment if their anchors start off very high, therefore it should increase sales in a single time shopping. However, this may or may not translated to an increase in profit. This is because the sales increase this time would mean that consumers are able to stay away from their next shopping longer. The fall in frequency of shopping could offset the rise in revenue brought about by the anchoring effects.

In the case of housing valuation, anchoring bias works in this case because listing price exists as an anchor, and there would be impossible to remove such anchor, as no houses are sold without a listing price. What local authorities can do, however, is to make the anchor as accurate as possible and to make aware the existence of anchors. Local authorities could help improve the situation by advising on pricing of the properties, thereby producing a more impartial, fairer value. Authorities could also produce campaigns that reminds people that listing prices are not always accurate. In addition, another way to tackle the effect of anchor could be to have an “anti-anchor”. That is, potential buyers could also give a offering price on the properties without knowingly listing price. In effect these two anchors could cancel out, thereby eliminating the anchoring effect.

4. Conclusion

In conclusion anchoring effect can have profound impact on consumer decision-making. Anchoring effect is a type of heuristics where people make decisions based on a starting reference point. The reference point may have very little relevance to the subject of interest. Adjustments are then made to arrive at a final judgment. Due to the fact that adjustments are often insufficient, the final judgment, whether it is a number, an opinion, or an object, may be highly affected by the starting reference point. This paper examines the positive and negative impacts of anchoring effect. These include its application to persuade consumers to buy more organic food, over-consumption of unhealthy products. At last, some solutions have been proposed to tackle the negative impacts.It is expected that this study will be a guide for people to correctly understand the mechanism of the anchoring effect and learn how to break through its negative effects.

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