

The Economic, Environmental Issues and Future Development of Avocado Industry

Yuhan Gu^{1,a,*}

¹Shenzhen Senior High School, Shenzhen, 518040, China

a. omaha007@163.com

**corresponding author*

Abstract: The purpose of this article is to provide part of the answer to three questions that are about the avocado industry in China: (i) Why do avocados enter the Chinese market successfully, which is usually researched by interviewing people who buy avocados often and asking the reasons why they make the purchase; (ii) How will avocados develop in the future with such environmental problems, which is often faced by many products in agriculture practices; and (iii) How should consumers behave in light of rational actor model and human decision bias, which is what ordinary people should do to help settle global issues. These questions are common and inevitable worldwide but are yet to be solved. Understanding these questions could help people make better purchases and improve consciousness and action to solve global issues.

Keywords: avocado industry, environment, sustainability, economy

1. Introduction

Modern people are so busy that they often ignore elements in their everyday life. Avocados are so popular that we see them in a myriad of dishes from countries worldwide, and avocado toast sure is a symbol of high-quality life. However, has anyone thought of the rationale behind the avocado industry? This paper aims to identify avocados' economic and environmental issues: how avocados became a smash hit among the Chinese middle-class young people? How could environmental problems affect the trade and development of the avocado economy? What should average consumers do? I am studying avocado problems and future developments because I want to generally understand how a smash hit is promoted and spread around the globe, why the economic status quo of agricultural products, and the developing dilemma and future transition of those products, in order to help my readers learn about the extensive network behind a seemingly ordinary fruit and the avocado industry so that readers can better decide their purchase of an array of products and learn to care about hows and whys of global issues. To this end, an anecdotal interview was implemented through Wechat voice calls with 50 middle schoolers. Mathematical and behavioral economics models were adopted to examine why target consumers buy avocados and the rationale. An empirical experiment was also conducted to find out the major accused problem of avocado plantations. The subjects gave their opinion about those problems through a more profound interview. It is found that there are many different factors influencing purchase, including advertisements, availability, unreliable scientific results, etc. The rational actor model and game theory do not apply to this situation in some ways. People rely on a limited number of heuristic principles that reduce the

complex tasks of assessing probabilities and making predictions to simple judgmental operations [1]. Human decisions can be overwhelmingly irrational, not as assumed in behavioral economics. Avocados do consume a large quantity of water, and middle schoolers care about environmental issues to a great extent. This finding bridges the avocado economy's gap and future development in Chinese middle-class families. However, further research and a larger sample are needed to overcome the limits of the research scope due to the lack of research equipment and funds.

2. Background

Some scholars have studied the same topic about the relationship between economic and environmental problems in recent years. Consumer interest in avocados increased significantly recently [2]. According to Migliore et al., avocados have become famous for various reasons: neophilia attitudes, credence attributes, etc [3]. There are many problems behind this popularity. In light of Y Sharon, B Bravdo, and N Bar, from the environmental aspect, avocado plantation causes an energy crunch and the depletion of many resources, in particular water [4]. Deforestation is also a huge problem. Chávez-León G et al. studied the correlation between avocado crop expansion and deforestation in Michoacán, Mexico [5]. According to Khan, Kakabadse, and Skouloudis, avocados hurt the sustainability of Mexico's environment. There are also economic problems [6]. González-Estudillo et al. implemented a study about the avocado economy in social ecology and sustainability development [7]. The economy cannot be robust if the natural resources are at risk, and the human capital is also not good enough because of their health problems. Denvir et al. and A Madariaga, A Maillet, and J Rozas also researched the relationship between the ecological and economic problems of avocados [8-9]. The environmental problems are severe. Although there are benefits economically, avocado production also results in inequality and other issues.

3. Research Procedure

So this study followed. First, I calculated the volume of water consumed by the two avocado trees contrary to the other two bougainvillea trees I planted, controlling the other factors such as sunshine, amount of dirt, and plant age. This experiment lasted for about a month. Conducting an empirical experiment by myself would add to the reliability of the material supplied for the subjects of the following experiment: the interview part. Because of limited access to cutting-edge technology, abundant resources, or a wide range of people willing and able to participate in my study, I chose convenient sampling, which means I chose my classmates as experimental subjects. Their consumption behavior may still tell us something about the consumption behavior of teenage avocado buyers in China. They were all teenagers aged 15-17. Half of them were male, and half were female. I used video calls to interview them about their opinions by asking them five questions about the avocado industry. Below is the list of questions I used in the semi-structured interviews:

1. How many avocados does your family buy each year?
2. Describe the reasons why you buy avocados.
3. (The following is a random section, 1/3 of the people did not need to answer the following part.)

Avocado production causes damage to the environment. Here is an experiment and some further information about the development problems of avocados. Please read it through.

4. How many avocados do you plan to buy each year now (It is OK if there is no change.)?
5. Could you give some suggestions on avocados' environmentally friendly trade in the future?
6. Any other thoughts about the future development of avocados?

The purpose is to test the popularity of avocados in our teenagers' lives and why they are attached to them. It is also essential to know how much they care about the environmental and eco-

conomic problems caused by the production of avocados. Moreover, some peculiar ideas are received from youngsters about the future development of avocados concerning the economy and environment simultaneously.

Then a WeChat poll of the same questions above is carried out to broaden the limit of my research. I changed the six questions into multiple-choice questions in light of the answers from my classmates. I used a random function to let only half the people receive the water consumption data about the avocado tree and further information. By analyzing the poll results, avocado marketing in China is unraveled to a greater extent. Comparing the two halves also tells us how people's minds changed about the purchase, and we know how much people care about environmental issues and the relationship between the economy and the environment.

4. Findings

From the empirical experiment, water consumed by avocado trees is three times more than that consumed by bougainvilleas, a typical tree type. That is to say that avocados consume too much water, as most other researchers suggest. According to my interview, the average range of avocado purchases is approximately four to twenty each year. The mean, mode, and median are 8.7, 4, and 8. Most people give out reasons like avocados are delicious, healthy, and green. Many cuisines include avocados, so the menus remind them to buy avocados.

On top of that, others say avocados are sugar-free, which is a bonus. Many bloggers recommend avocados on social media, so avocados are trendy. As for the people who read the article, 80% said they would buy fewer avocados, caring more about environmental problems than expected. There is also a myriad of suggestions for future avocado development. Many say the avocado exporter countries can develop a tourism industry, allowing tourists to pick fruits and buy those they pick when they leave. The gangster problem can also be partly solved since more attention is paid to avocado plantations through tourism.

Moreover, others say that exporter countries can promote cooperation with the largest importers to deal with gangsters. To make money, local gangsters set the price high and rob the profit of local farmers, and the importers will be willing to lower the cost while settling a human right problem. Regarding environmental problems, technology is a demand curve shifter, so if universities research to analyze the actual value of avocados and let the bubble burst, the demand will decrease. On top of that, some also mentioned the Fair-Trade movement, which seeks to help farmers in developing countries get a fair price for their products, such as avocados, while promoting environmentally sustainable practices and the ethical treatment of farmers.

Table 1: The results from the WeChat poll.

The results from the WeChat poll	
mean	10.6
mode	6
median	10
Reasons to buy	50% eat avocados for a change 23% think avocados are sugar-free and healthy 18% stress avocados are delicious for them 5% admit they are affected by social media 4% others (do not know)
After reading the article	On average, they say their purchase will decrease by 46.4%

Above is all the data available, and the following will be the analysis. I used economic theories to analyze human decision-making. Why are those people affected by avocado marketing? What is the rationale behind those purchase reasons? How can we become more rational (deal with the economic and environmental problems as we want) while making a decision? Learning about how we can make rational purchases concerning global issues is the best ordinary people can do to contribute, which is more helpful than the macroscopic suggestions above. This is also part of the point of this paper. I will explain it through the debate between rational choice and psychological approaches to consumer behavior. It is assumed in behavioral economics that humans are rational agents with precise information, sufficient time, and capability who seek to maximize their utility. This is the rational actor model, or game theory, where agents can be modeled as the maximization of a preference action subject to constraint. However, those constraints already make them irrational. Preferences are state and social context-dependent, and the probability an agent attaches to a possible event can depend on how much the agent likes or dislikes the outcome, namely confirmation bias. There are specific marketing strategies in light of the principles above, so what consumers should do is know it to avoid it. Belief updating can be socially rational but is rarely an individual, socially isolated process, so that is why social media plays such an important role. Consumers should learn to treat social media more rationally. As the psychological approaches say, because of the psychological limits of the organism, actual human rationality-striving can, at best, be an extremely crude and simplified approximation to the kind of global rationality that is implied, for example, by game-theoretical models [10].

People often lack perfect information about outcomes and probabilities and do not have the time and cognitive capabilities to make the calculations implied by the rational choice theory. Of course, it is not necessary to be perfect, but consumers should learn to be aware of their irritation and try to be more comprehensive. So it is inevitable to talk about heuristics here: consumers are satisfiers. People rely on a limited number of heuristic principles which reduce the complex tasks of assessing probabilities and making predictions to simple judgmental operations. These heuristics are generally quite helpful, but sometimes they lead to severe and systematic errors [1]. According to Tversky and Kahneman, 1974, there are two probability-assessment heuristics consumers need to avoid: representativeness and availability [1]. As for representativeness, it is easier to assess similarity than to compute probabilities.

Avocados look like a healthy fruit, but there is no comprehensive scientific report on the probability of becoming healthier, so consumers must recognize this. If a set of the class is more available by being likely to be recalled, it will seem more frequent and reasonable to agents. As a result, when consumers see avocado products everywhere, they should realize that something is everywhere, but it does not mean it is reasonable. Moreover, this particular thing should be paid attention to and researched. The popularity of avocados is also maintained by status quo bias. As long as people have in mind that avocados are popular and stylish, they will be reluctant to change this idea. So what consumers should do is challenge their old ideas. People can better fulfill their obligation to deal with economic and environmental problems by making themselves more rational buyers.

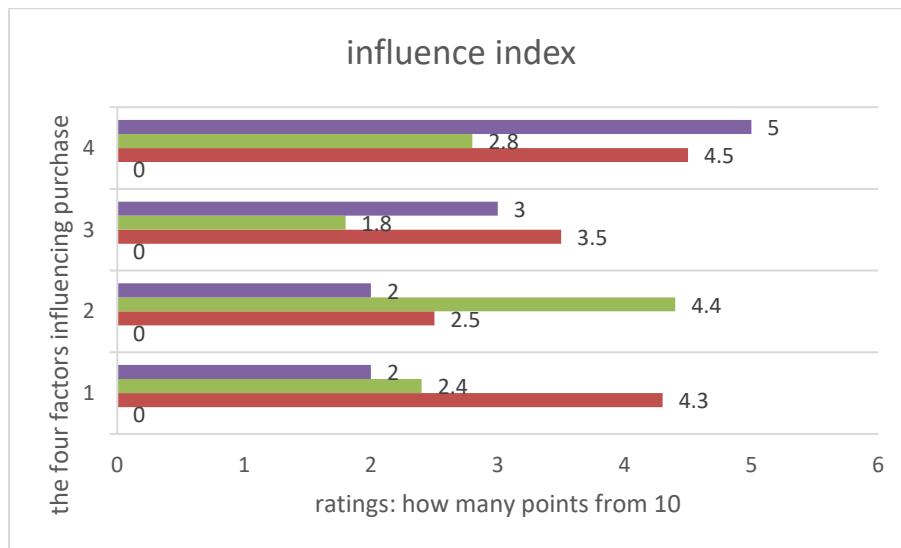


Figure 1: This table indicates the ratings the interviewees give out about how many points out of ten points they would say this factor influences their purchase. Yellow bars represent the 50 middle schoolers. Grey bars represent people who participate in the Wechat poll. Orange bars represent a mix of the two groups above. Number 1 represents healthy and delicious. Number 2 represents green and sugar-free. Number 3 represents inspiration from cuisines. Number 4 represents social media advertisements.

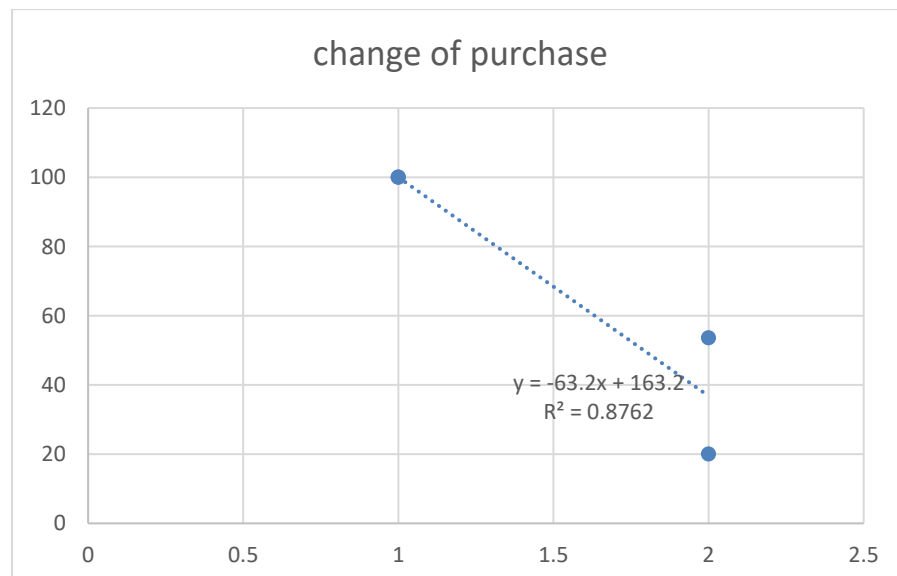


Figure 2: This graph represents how people change their minds about how many avocados they buy after learning about environmental issues. (2,20) represents middle schoolers, while (2,53.6) represents people participating in the Wechat poll.

5. Conclusion

The main point of this study is to learn about the economic phenomenon of avocados becoming stylish in China, the environmental issues, and the relationship between the future development of avocados and their environmental impact. Several ways in which consumers should behave to solve those issues are suggested. The history of avocados becoming fashionable is mainly because of ad-

vertisements, but they damage the environment in some ways. A transition of this trade is needed, and the best to start is with rational decisions from ordinary people. Admittedly, my research was hamstrung by some setbacks. First, my samples are convenient, not representing a broad picture of Chinese avocado consumers, let alone avocado consumers worldwide. In light of my research, what future researchers can do is send emails to more representative samples and offer monetary incentives if they finish the questionnaire. Another challenge is that the samples I chose might not have acted naturally. They knew I was researching, so they might have wanted to say they would buy fewer avocados in the future, but there was no action.

Given that I could only interview my classmates in this phase, the possibility of a Hawthorne effect was inevitable. However, what future researchers can do is not ask the audience my fourth question immediately but wait until two months later. Instead, they can just simply ask the audience again how many avocados they bought in the past two months. Data will be more reliable if the research is conducted this way.

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