The Pandemic's Impact on the Intersections of Financial Literacy, AI, and Behavioral Economics

Shreeya Julakanti

Santa Susana High School

ABSTRACT

In the present day of artificial intelligence and technology's boom during the recovery stages of the pandemic, there has been a significant impact on our economy. The decision-making biases of those affected by the COVID-19 epidemic have changed due to an increased reliance on e-commerce sites and technology in general. Additionally, the socioeconomic statuses of individuals have been affected by the pandemic, and this has been a big factor in the mental well-being of these people. Studies on both the correlation between consumer behavior and online shopping as well as the relationship between an individual's mental health and their income level have been analyzed and presented by this paper. This publication will also look into the implications and limitations of technology's impact on the economy, considering the effects of the pandemic.

Introduction

With the ever-changing circumstances in the modern economy due to COVID-19, many unforeseen changes have come into play. The newfound focus on adopting AI and technology to reach consumers, the decisions made by them have been affected significantly. Through countless research studies analyzing the market, researchers have been able to dive into the psychological effects of the ever-changing economy during the pandemic, and how that compares to prior the pandemic. The younger generations seem to have been affected more greatly on fronts such as their decision-making ability on applying to higher education or delving straight into the workforce. Finances and its management have been impacted in a way unlike before, and have notably been identified as a significant source of stress during these difficult times where people are trying to recover from the pandemic. In the scope of the modern economy throughout history, the pandemic has been seen as one of the largest perpetrators since the great recession in 2006. This paper will look into market research and studies on behavioral science both prior to the pandemic and during it to analyze the cognitive decision-making and mental health of youth has been affected, as well as its intersection with the adoption of new technology and AI. Specifically, the publication will analyze various financial models, surveys, and research findings that can leverage a paradigm shift in the way youth's accessibility to financial literacy is improved upon.

The Effects of Youth's Financial Management on Major Future Decisions

In the realm of finance, youths' financial knowledge serves as a vital asset in ensuring that youth are able to establish the appropriate foundations for behaviors and future financial behaviors. Financial literacy in itself alludes to the ability of one to balance a checkbook, manage a credit card, prepare a budget, take out loans, and purchase insurance. (Jacob et al., 2000) With these rising concerns, many financial organizations have devised "tests" of financial knowledge — in quizzing and assessing youth on their knowledge surrounding compound interest, expected returns on savings, and financial charges for charges. When the 2001 Americans for Consumer Education Competition survey was conducted, findings exemplified that an average student was capable of answering only 35% of questions correctly

— whilst the 2002 survey from the jumpstart Coalition for Personal Financial Literacy exuded a percentage of 50% of questions answered correctly. (Sondra et al., 2005) These surveys shed light on the reality that in spite of many youth having banking accounts including savings accounts, and many of them are aware and receptive of budgeting behaviors, a startling amount of only 23% of youth were able to follow, and adhere to their financial budget.

When researchers delved into financial literacy of youth in an Australian society with regards to their knowledge of choices of funds, investments, credit cards, and loans, findings indicated that students' assessment and knowledge of financial literacy were closely tied to the students' respective knowledge of credit cards — with regards to having solid years of study, credit card status, and daily routine of utilizing their credit cards. (Samy et al., 2008) However, when research was conducted on a marginalized population of Malaysian youth, when an empirical study delved into the financial literacy and financial distress of youth from a set of questionnaires for 430 youth, findings alluded to a moderate level of financial literacy and financial distress. In Malaysia, where youth have less knowledge surrounding savings for emergencies, children's education and management of credit and risks, researchers saw how these situations surrounding lack of knowledge can lead to emotional stress (Socyberty et al., 2006).

Cognitive Biases on Financial Decisions

In the intersections of behavioral finances and investment, the investment market originates from the concepts of psychological decision-making. In a particular study that examined the effects of cognitive biases on investment decisions in a marginalized population of Nepal, five cognitive biases — including availability, anchoring, overconfidence, herd instinct and regret aversion were measured. When testing on 179 participants in the stock market investment through a quantitative method in combination with a questionnaire, the study uncovered a concrete link between cognitive biases and irrationality, which subsequently had an impact on investment decision-making.

In another study that examined cognitive biases — specifically, overconfidence bias, findings showed that illusion of control bias does have a subsequent impact on decision-making. (Syarkani, 2022) This comes to show how when individuals make investment or financial choices, cognitive biases that are developed upon incorrect conclusions can lead individuals to make the wrong financial decisions.

Within cognitive frameworks of cognitive biases, there are two forms of biases — regret bias and conservatism bias. Within the scope of regret bias, researchers argue that the regret and pain associated with not making the right investment choices can stem from not making the right decisions. In the scope of conservatism bias, researchers argue that investors can sometimes be too slow or too conservative to update their beliefs in response to the new updates — within the market. Thus, according to Swiller (1992), conservatism can be the end result of having overconfidence, which can hinder the investors' decision to analyze new information and market findings and results.

Technology's Intersection with Consumer Behavior

Technology and artificial intelligence have become increasingly prevalent in the modern economy, amongst businesses. The shift to online shopping during the COVID-19 pandemic is due to the increased convenience of buying goods. Many direct-to-consumer brands utilize online platforms to sell their products, and online shopping is an emerging trend in the age group from 18-23. (Stimak, 2021) E-consumers tend to prioritize clear information about a product, as well as convenience and the presence of a wide variety. According to the study, e-loyalty to keep consumers buying products is categorized as e-satisfaction, online services, and the perceived value of the firm. Research was conducted on Mlinar, the largest bakery in Croatia with over 200 stores in 2019, during the beginning of the COVID-19 pandemic. It is the only web store which sells cakes nationwide in Croatia. Over 85% said that their reason to buy from the Mlinar web shop was that it was time saving, and less than 5% attributed their purchase to previous experience. The three components of the e-loyalty model were: over 47% of customers were satisfied, over 50% were content with the online services provided, and over 57% of customers had a good perception of Mlinar. As a result, it could

be concluded that the efficiency of a web shop, e-loyalty, and the relationship between the customer and company were the major components which enabled the success of the business e-Commerce store. Research conducted in Iraq for the sales of technology from Samsung Electronics showed a shift from 2% online store sales in 2019 to a shocking 16% in 2020 during the COVID-19 pandemic, supporting the conclusion that the presence of e-commerce increased in multiple markets during the COVID-19 pandemic. (Ali, 2020)

A shift to digital finance (DF), a type of financial service which utilizes technology and artificial intelligence to provide financial services for a reduced cost, has also affected consumer online shopping. With the introduction of bitcoin and financial tools and assets that have complemented the growth of new emerging markets, coupled by the pandemic's impact, DF has helped increase consumption on digital markets do to its ease of use and the reduced costs. The research conducted used the spatial econometric model to show that DF has also had a positive effect on consumer online shopping in local and neighboring areas. (Zhu, 2023) Furthermore, advancements in artificial intelligence and machine learning have had a profound impact on the economy worldwide. Implementations of ML and AI are foreseen to have a large impact on digital markets since they allow for companies to properly analyze e-markets, online searches, and social media trends as shown by the survey conducted by Lancieri & Sakowski. Finally, with the growth of Artificial Intelligence and Machine Learning tools that enable tailored and personalized marketing and targeted advertisements on social media for customers, there have been significant growth in company sales as a result of utilizing customer data to draw attraction. (Gikas et al., 2019) ML can help reduce costs of production and transportation through the usage of pricing algorithms shown by various simulations (Calvano et. al.,). In the world of finance, AI can also take control of portfolio decisions and can buy stocks according to its own analysis. However, implementation costs to switch to AI based systems and externalities related to data sharing may make the efforts more challenging.

Income Inequality's Impact on Mental Well-being

In identifying the socioeconomic issues surrounding income inequality, research has uncovered that people with lower income who receive financial benefits from the government tend to have a variety of psychological stressors as a result of their status in society. The presence of the pandemic has added on to the burden of these folks with the implementation of social distancing requirements evoking feelings of loneliness and increased medical concerns relating to the risk of contracting COVID-19. According to Erzen & Cikrikci, 2018, lack of socializing and the presence of a smaller network of people have correlations with depression and anxiety, most predominantly in older men (Liu et al). There is also a correlation between the socio-economic status of a person's neighborhood and mental health, with poorer environments having negative effects on a person's psyche (Fong et. al 2019). Amongst Welsh Adults it was concluded that lower levels of income correlated to poorer mental health in 2007, prior to the pandemic. People who are receiving benefits from the government also had correlations with feeling ostracized from society. A study was conducted on people in Wandsworth which analyzed the correlation between COVID-19 and the mental health of its residents from both higher income brackets and lower income brackets. Individuals receiving benefits on average displayed higher feelings of loneliness, anxiety, and depression. Those with higher income displayed better physical and mental health, and a lower perceived risk of COVID-19. It can be concluded that prior to COVID-19 there was a correlation between income levels and poorer mental health, but the pandemic caused this issue to become larger with the additions of increased feelings of loneliness and stress from perceived medical risks and expenses. Those who were from higher income brackets were also affected by the pandemic, but less than those who were receiving benefits from the government. (Jaspal, 2020)

Discussion, Limitations and Promising Future for Research

In recent years, ML and AI have steadily been advancing, allowing for advancements in targeted advertising and social media algorithms (Calvano et. al.,) Researchers have been conducting more research on the direct impacts of AI on job placement, as well as its effects on a company's growth. As a direct consequence of the re-opening of workplaces and schools, mental-health related disorders related to the isolation in the pandemic have begun to slowly decrease due to social interaction and reduced income-level related stress. There have also been more efforts towards improving youths' knowledge of financial literacy in recent years, shown by an increased number of states in the US adopting personal finance into their curriculum. However, there are some limitations in regards to the decision-making ability and heavy internet reliance of individuals. Although the restrictions posed by the 2019 pandemic have shown a gradual decline in recent times, the use of technology for commerce as well as the financial decision-making ability of youth have been greatly impacted for years to come. Cognitive biases will be ever-present as they are incredibly hard to eliminate while making investment decisions as well, and it is quite difficult to anticipate that there will be much change in relation to this issue.

Conclusion

In summary, there is a direct correlation between COVID-19 and the behavior of consumers on electronic markets. There has been a noticeable shift to online shopping, and the decision-making ability of consumers was altered. Further research shows that biased decisions have a strong correlation to irrationality. Targeted advertisements using machine learning and increased options on e-commerce sites were identified as newer developments which were adding on to this phenomenon. A lack of financial knowledge amongst youth is also incredibly prevalent, with less than 1/4th of young adults following a proper budgeting plan. This affects their emotional well-being, and during the pandemic, numerous surveys have shown that people who classify or have low income or are struggling with their money show signs of loneliness, depression, and anxiety to a greater extent than before the pandemic. However, with the economy recovering and new opportunities being created with the advancements in technology, the future is looking rather promising and the psychological well-being of populations will hopefully increase as a result. In conclusion, there are strong causal relations between factors such as technology, financial stress, income level, and decision-making biases to the well-being and behavior of consumers during the pandemic, but with the recovering of the economy we can be hopeful that positive changes will be eminent once again.

References

Abrardi, Laura, and Carlo Cambini. "Artificial Intelligence, Firms and Consumer Behavior: A Survey." *Artificial Intelligence, Firms and Consumer Behavior: A Survey*, 26 July 2021, onlinelibrary.wiley.com/doi/epdf/10.1111/joes.12455.

Ali, Bayad Jamal. "Impact of Covid-19 on Consumer Buying Behavior toward Online Shopping in Iraq." *SSRN*, 13 Nov. 2020, papers.ssrn.com/sol3/papers.cfm?abstract_id=3729323.

Gkikas, Dimitris C., and Prokopis K. Theodoridis. "Artificial Intelligence (AI) Impact on Digital Marketing Research." *SpringerLink*, 1 Jan. 1970, link.springer.com/chapter/10.1007/978-3-030-12453-3_143.

Jaspal , Rusi. "Socio-Economic Inequalities in Social Network, Loneliness and Mental Health during the COVID-19 Pandemic." *Sage Journals* , 7 Dec. 2020, journals.sagepub.com/doi/10.1177/0020764020976694.

Zhu , Mingzhun, et al. "How Does Digital Finance Affect Consumer Online Shopping: A Comprehensive Analysis Based on Econometric Model." *Finance Research Letters*, 25 Feb. 2023, www.sciencedirect.com/science/article/abs/pii/S1544612323001071.

Štimac, Helena, et al. "How Web Shops Impact Consumer Behavior?" *Tehnički Glasnik*, 13 Sept. 2021, hrcak.srce.hr/clanak/381288.

Syarkani, Y., & Alghifari, E. S. (2022). The influence of cognitive biases on investor decision-making: the moderating role of demographic factors. *Jurnal Siasat Bisnis*, *26*(2), 183–196. https://doi.org/10.20885/jsb.vol26.iss2.art5

Zindel, Márcia Longen, Thilo Zindel, and Marcelo Grangeiro Quirino. "Cognitive bias and their implications on the financial market." International Journal of Engineering and Technology 14.3 (2014): 11-17.