

Behavioral finance and COVID-19: Cognitive errors that determine the financial future

Tanmay Bansal

tb444@cornell.edu

Cornell University

May 7, 2020

Abstract

The COVID-19 pandemic has resulted in dramatic economic effects, characterized by excessive stock price volatility and a market crash. Some of the phenomena in effect during the crisis, such as the excessive volatility and the unshaken confidence of financial institutions, are insufficiently explained by the traditional finance paradigm. In this paper, we explore such phenomena from a behavioral finance lens and discuss some cognitive errors and biases relevant during and after the crisis - overconfidence (miscalibration, better-than-average effect, illusion of control, optimism bias), representation bias, risk aversion, herding behavior, and availability bias. We explore each of these phenomena from the perspective of psychology, and evaluate their relevance to financial institutions and markets and the COVID-19 induced global crisis.

Keywords: Behavioral Finance, Psychology, COVID-19, Coronavirus, Financial Crisis

1. Introduction

The COVID-19 pandemic has had dramatic economic effects across the globe. According to the *International Monetary Fund (IMF)*, the world economy will face the worst recession since the Great Depression and the total output loss through 2020 and 2021 could exceed \$9 trillion [1]. During late February and March 2020, the global stock market was characterised by extraordinary volatility. As of March 27, 2020, the top 10 infected countries (along with Japan, South Korea, and Singapore, and excluding Iran) saw a 26.6% increase in risk levels from February 2020 to March 2020 [2]. The traditional finance paradigm, which suggests that markets and humans are perfectly rational and have perfect self-control, fails to explain such dramatic volatility [3]. This volatility, however, can be explained by the behavioral finance paradigm [4].

Behavioral finance suggests that investors and markets are not fully rational, and that investors are influenced by their biases and cognitive errors. It is comprised of two main components: *psychology*, which explains the fallibilities in human behavior, and *limits to arbitrage*, which argues that in an economy of rational and irrational traders, irrationality could have a sustained and significant impact [5].

This paper serves to highlight some common cognitive biases and phenomena pertaining to behavioral finance as observed during the COVID-19 induced global crisis.

2. Cognitive errors and financial crises

2.1. Overconfidence

The *Overconfidence* phenomenon is a prevalent psychological theory that is comprised of four main facets - miscalibration, better-than-average effect, illusion of control and unrealistic optimism. In the field of behavioral finance, all facets of overconfidence are shown to be prevalent on an investor level [6]. Overconfidence has also been shown to lead to stock price volatility [7]. Since volatility is a prime characteristic of the markets during the COVID-19 crisis, the four facets of overconfidence have been explored in the following sub-sections with regard to behavioral finance and its implications for the financial markets in 2020.

2.1.1. Miscalibration

Overconfidence can be defined as a specific type of *miscalibration*, a cognitive bias, in which the confidence is higher than the accuracy. Overconfidence, from the perspective of this facet, has shown to be very relevant to the field of finance. Most notably, introduction of financial rewards to incentivise correct calibration is futile and overconfidence surfaces primarily with respect to difficult tasks (known as the *hard-easy effect*) [8].

This cognitive bias is glaringly reflected in the GDP growth projections across the globe as the pandemic became more widespread. Specifically, in the case of India, GDP growth projections for 2020 were miscalibrated as much higher than the actual likely figure even as investors witnessed the crisis unfold in other developing and developed nations. *Moody's* revised its GDP growth projections for India multiple times from February through April, slashing the projections from 5.4% on February 17, 2020 to 0.2% on April 28, 2020 (*Table 1*). The growth rate projections for India remained relatively high, even though India was at a high risk of importing COVID-19 [9].

Date	Projected Growth Rate	Δ Projection	Cases	Δ Cases
Feb 17, 2020	5.4%	-18.18%	3	-
Mar 9, 2020	5.3%	-1.85%	48	1500%
Mar 27, 2020	2.5%	-52.83%	883	1739.58%
Apr 28, 2020	0.2%	-92%	31360	3451.53%

Table 1: GDP Growth Rate Projections (2020) by *Moody's* and Confirmed Cases in India [10]

2.1.2. Better-than-average effect

People possess an unrealistically positive view of themselves and consider themselves superior to an average representative of their groups in their respective fields [11]. In the context of financial markets, *better-than-average effect* has been shown to correspond with higher trading volumes [12] as traders consider their information as better compared to their peers. More specifically, overconfident CEOs and managers consider their abilities to be superior and this has shown to have an influence on corporate policies as well as overinvestment. *Ho et al.* discuss that overconfident managers overestimate the sustainability of a positive state and underestimate the risk profile of their investments. These biases lead 'overconfident banks' to ease lending standards, increase lending amounts, increase leverage, and incur additional debt. As soon as a financial crisis commences, however, overconfident banks suffer higher capital losses, more

severe drop in their net worth, and a higher likelihood of CEO turnover and failures than for non-overconfident banks [13].

Overconfident financial institutions, as characterized by the riskiness of their investments prior to the 2020 Stock Market Crash, are therefore likely to suffer higher losses and failures post the crisis. This shall also set a precedent for the upcoming years, which would then be marked by more conservative and low-risk investments.

2.1.3. *Illusion of control*

Psychological research has shown that people often tend to believe that they are able to influence events that may purely be governed by chance [14]. This cognitive bias is known as the *illusion of control*. Stress, competition, implemental mindset, choice, environment, and familiarity are conditions that have shown conducive to the development of an illusion of control and consequently as maladaptive for traders [15]. This facet was particularly characteristic of the 2008 Financial Crisis - the overconfidence in the risk management models that caused the financial bubble to burst is an example of *illusion of control*.

This *illusion of control* is prevalent in firm reactions to the current crisis as well. In a study by Wang *et al.*, an information analysis on disclosures (earnings conference calls and Form 10-K) of corporate firms during the first quarter of 2020 reveals a negative market reaction. This suggests that the market underestimated the impact of the COVID-19 outbreak on the firms [16].

2.1.4. *Unrealistic optimism (Optimism Bias)*

The *Optimism Bias* relates strongly to the *better-than-average* effect (2.1.2). People typically believe that they are more likely to experience positive events and less likely to experience negative events, especially if the events are perceived as 'controllable'. In the context of finance, for example, people believe that their chances of achieving financial success are higher than others [11]. *Optimism bias* was also prevalent during the 2008 Financial Crisis as untested models were justified with an optimistic attitude while negative possibilities were played down [16].

Optimism Bias is also discernible in the current scenario. Even as banks witnessed their profits plunge and expected billions in loan losses [17] during the 2020 Stock Market Crash, investors remained optimistic as they expected The Federal Reserve System of the United States slash rates, buy bonds, provide aid, and backstop credit markets [18].

2.2. *Representation Bias*

Representativeness Bias or *Representation Bias* is a cognitive bias in which people associate a thing with its analogues and forecast its future based on that of the analogues [19] (specifically, *horizontal representation bias*). In behavioral finance literature, this bias has been shown to impact the quality of investments. Investors often consider past returns as representations of potential future returns and therefore have been found to make decisions based on the bias that past price trend is representative of future price trend [6].

The 2020 stock market crash is frequently being compared to the 2008 Financial Crisis and the Great Depression of the 1930s. Such comparisons are examples of *representation bias*. *Statman* warns that while the market today may seem to be analogous to that of the early 2009 when a stock market decline reversed into a stock market increase, the market today may instead represent the stock market in late 1929, when the decline did not reach its true low until 1932 [20]. In fact, biased comparisons may negatively impact the markets in the long run since they are merely sentiment-based representations.

2.3. Risk Aversion

Risk Aversion is the phenomenon of reluctance to seeking higher risks and instead preferring lower risk alternatives. Risk aversion is known to be significantly affected during exceptional situations. Most notably, investors divested more stock and risk aversion increased substantially following the 2008 Financial Crisis [21].

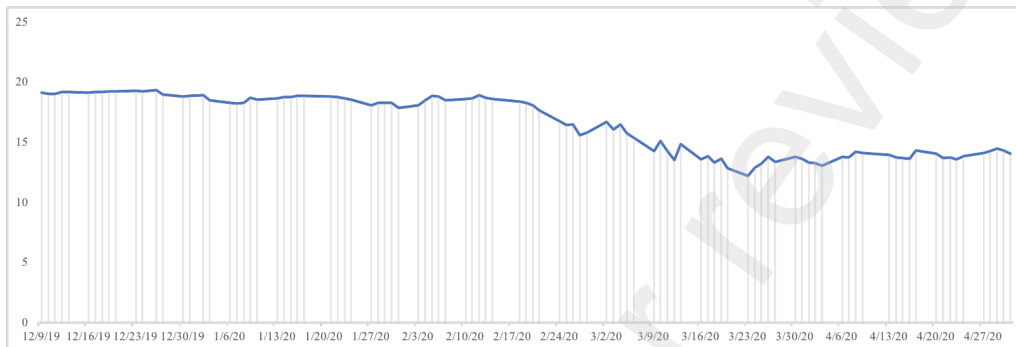


Figure 1: DJIA/Gold Ratio (Dec 9, 2019 - May 1, 2020)

During the COVID-19 pandemic and the resulting 2020 Stock Market Crash, financial risk aversion is bound to change as well. Indeed, *Bu et al.* find that risk aversion in Wuhan substantially increased with the rapid spread of COVID-19 in the city [22]. Furthermore, gold is considered a safe investment and it gains in value as risk aversion increases [23]. The price of gold increased by 7% (USD) / 7.5% (EUR) / 12.72% (INR) from February 2, 2020 to May 1, 2020, hence providing additional evidence that risk aversion has increased as a function of the COVID-19 global crisis. *Figure 1* presents the ratio of the Dow Jones Industrial Average (DJIA) with gold prices (USD) for a 6-month period (from December 9, 2019 to May 1, 2020). The drop in the ratio beginning late February also indicates the increase in risk aversion. While further research on risk aversion as a consequence of the COVID-19 pandemic beyond Asia is needed, it is likely that a similar increase in risk aversion would characterise investor behavior across the globe.

2.4. Herding Behavior

An *Information Cascade* is a phenomenon where multiple people make the same decision in a sequential fashion. This is a theory characterizing *herding behavior*, where traders discount their private information and instead trade in accordance with the observed trades. In the case of the 1997 Asian Financial Crisis, the contagion increased at first and herding behavior continued throughout the crisis to the later stages [24].

Given the severity and surprise of the current market crisis, there is reason to investigate any change in herding behavior of investors in global markets. Interestingly, cryptocurrency markets did not observe any significant change in herding behavior, at-least until March 13, 2020 [25]. Although cryptocurrency markets are tied to global economic activity, they are decentralized and hence may not be directly comparable to traditional financial markets in terms of herding behavior. Further research is required to evaluate the existence of unusual herding behavior.

2.5. Availability Heuristic

Availability Heuristic or *Availability Bias* is a cognitive error whereby judgements are biased based on the suitable instances that come to mind. In the context of behavioral finance, *Thakur* suggests that both investors and financial institutions believe in the risk management capabilities of the banks after a long streak of positive outcomes. This overestimation of the risk management capabilities and placement of excessive trust in investors and the markets further leads to an underestimation of true risk. Eventually, there is increased market entry, more buyers of loans, access to low-cost funding, lax regulation, and higher-risk investments, all of which eventually leads to a crisis [26]. The build up to the 2008 Financial Crisis was characterised by this theory.

Public trust in financial institutions and markets had increased in recent years, long after the 2008 Financial Crisis. While literature on public trust in financial institutions after the 2020 Stock Market Crash is limited and characterised primarily by uncertainty, it is crucial to recognize the *availability bias* and readjust expectations as investors. Financial market turbulence and crises have shown to result in a significant drop in citizens' trust [27] and *recency bias* drives investors to give more emphasis on recent events. Therefore, if the market impact further significantly impacts financial institutions in the upcoming months, there will be a drop in trust in the financial system that would shape the markets in the upcoming years.

3. Conclusion

In the time of a global crisis such as the ongoing pandemic, we tend to focus on what is most easily accessible and consume information at its face value while we adjust to the crisis. This is ironic, since a global crisis is precisely when we need to be most careful. It is crucial to consider our subconscious biases and decide further action accordingly. Some of the cognitive phenomena in behavioral finance that are most relevant to the COVID-19 are presented in this paper - overconfidence, representation bias, risk aversion, herding behavior, and availability bias. There are many more cognitive errors beyond behavioral finance that we make in our daily lives. However, I hope that this small reminder of our psychological shortcomings helps us better navigate the crisis.

References

- [1] G. Gopinath, The great lockdown: Worst economic downturn since the great depression. imf blog, 2020.
- [2] D. Zhang, M. Hu, Q. Ji, Financial markets under the global pandemic of covid-19, *Finance Research Letters* (2020) 101528.
- [3] R. J. Shiller, From efficient markets theory to behavioral finance, *Journal of economic perspectives* 17 (2003) 83–104.
- [4] R. A. Olsen, Behavioral finance and its implications for stock-price volatility, *Financial analysts journal* 54 (1998) 10–18.
- [5] N. Barberis, R. Thaler, A survey of behavioral finance, *Handbook of the Economics of Finance* 1 (2003) 1053–1128.
- [6] W. F. De Bondt, A portrait of the individual investor, *European economic review* 42 (1998) 831–844.
- [7] A. V. Benos, Aggressiveness and survival of overconfident traders, *Journal of Financial Markets* 1 (1998) 353–383.
- [8] B. Fischhoff, P. Slovic, S. Lichtenstein, Knowing with certainty: The appropriateness of extreme confidence., *Journal of Experimental Psychology: Human perception and performance* 3 (1977) 552.
- [9] D. Brockmann, Event horizon–covid-19, 2020, URL: <http://rocs.hu-berlin.de/corona> (2020).
- [10] A. Dev, Moody's cuts forecast for india's gdp growth this year to 0.2% (2020).
- [11] D. Skala, Overconfidence in psychology and finance-an interdisciplinary literature review, *Bank I kredyt* (2008) 33–50.
- [12] M. Glaser, M. Weber, Overconfidence and trading volume, *The Geneva Risk and Insurance Review* 32 (2007) 1–36.
- [13] P.-H. Ho, C.-W. Huang, C.-Y. Lin, J.-F. Yen, Ceo overconfidence and financial crisis: Evidence from bank lending and leverage, *Journal of Financial Economics* 120 (2016) 194–209.
- [14] S. E. Taylor, J. D. Brown, Positive illusions and well-being revisited: separating fact from fiction. (1994).
- [15] M. Fenton-O'Creevy, N. Nicholson, E. Soane, P. Willman, Trading on illusions: Unrealistic perceptions of control and trading performance, *Journal of occupational and organizational psychology* 76 (2003) 53–68.
- [16] V. X. Wang, B. B. Xing, Battling uncertainty: Corporate disclosures of covid-19 in earnings conference calls and annual reports, Available at SSRN 3586085 (2020).
- [17] K. Helms, Largest us banks expect billions in loan losses, profits plunge (2020).
- [18] T. Westbrook, Forex-dollar slips as optimism holds ahead of fed (2020).
- [19] C. Zhang, An important factor on bearish expectations of investors: application of cognitive biases in market forecasts, *China Business Research of Economic Theory* 7 (2008) 73–74.
- [20] P. McCaffrey, Meir statman on coronavirus, behavioral finance: The second generation, and more (2020).
- [21] L. Guiso, P. Sapienza, L. Zingales, Time varying risk aversion, *Journal of Financial Economics* 128 (2018) 403–421.
- [22] D. Bu, T. Hanspal, Y. Liao, Y. Liu, Risk Taking during a Global Crisis: Evidence from Wuhan, Technical Report, Working Paper, 2020.
- [23] R. Demirel, K. Gkillas, R. Gupta, C. Pierdzioch, Time-varying risk aversion and realized gold volatility, *The North American Journal of Economics and Finance* 50 (2019) 101048.
- [24] T. C. Chiang, B. N. Jeon, H. Li, Dynamic correlation analysis of financial contagion: Evidence from asian markets, *Journal of International Money and finance* 26 (2007) 1206–1228.
- [25] L. Yarovaya, R. Matkovskyy, A. Jalan, The effects of a 'black swan' event (covid-19) on herding behavior in cryptocurrency markets: Evidence from cryptocurrency usd, eur, jpy and krw markets, *EUR, JPY and KRW Markets* (April 27, 2020) (2020).
- [26] A. Thakor, Lending booms, smart bankers, and financial crises, *American Economic Review* 105 (2015) 305–09.
- [27] S. Wälti, Trust no more? the impact of the crisis on citizens' trust in central banks, *Journal of International Money and Finance* 31 (2012) 593–605.