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The new battle between hedge funds and retail investors micro-communities: an insight on the GameStop case

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The new battle between hedge funds and retail investors micro-communities: an insight on the GameStop case

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Introduction

This last year was a particular one, not only as regards the global health situation, but also the social and economic one, which, as a consequence of the first, drastically changed the habits and lives of people all over the world. As in every crisis, the financial markets have also been affected, but not only by the trend and uncertainty of the future of the economy. In fact, while COVID-19 continued to spread, forcing national governments around the world to impose numerous lockdowns and quarantine periods, people, forced to remain locked up at home, began to have more and more interest in investments and trading. There would be nothing bad or unusual if it had not been that, since January 2021, some stocks have undergone a real anomalous and almost unjustified frenzy. In fact, it is not enough to attribute this sudden and boundless interest to lockdowns, to the growing volatility of the market or to the hope of an imminent recovery given by the creation of the vaccine, because what we have witnessed and are still witnessing is very different from what has always happened in the markets and during crises. Much of this boom of amateur investors is due to the appearance of new trading platforms that ask for very low or even zero commissions, which have therefore facilitated the entry to the stock markets for a large number of people, very often inexperienced and very often belonging to the age group ranging from 20 to 30 years. The world of finance therefore becomes accessible to almost anyone who has any amount aside, starting to move away from its elite identity to which only highly qualified people can be part. But this does not want to be a discriminatory discourse, because these investors, lacking the appropriate education and experience, act, in most cases, on impulse, without logic and, very often, for pure fun or in search of the risk and adrenaline typical of gambling. Thus, what for them began as a game soon becomes a battle between them, the small retail investors, and the others, the large institutional investors of Wall Street. Why? Because, as we will see in the following pages, it seems that the choice to focus precisely on the stocks on which hedge funds had considerable bearish positions, was not a coincidence. And GameStop is one of those

stocks, the stock from which everything started, the stock destined to become the symbol of a financial revolution, which, between social media forums, short-squeezes and Pump & Dump schemes, acts as a wake-up call by attracting the attention of experts, politicians and regulators.

My intent is, therefore, to shed light on the phenomenon that has shaken the financial markets during these first months of 2021, taking into consideration and analyzing both sides of the coin, where, on the one hand, there are retail investors, who, thanks to social media platforms and message boards, have joined together and managed to create a force capable of moving the market, and, on the other hand, there are institutional investors, in particular hedge funds, which were the first to have suffered from the presence of this new force.

However, before getting to the heart of the story by analyzing the GameStop case and the consequences to which it has led and to which it will lead, it is necessary to lay the foundations in order to better understand what has happened and will happen, understanding what are the mechanisms of short selling and how short sellers, in this case hedge funds, taking bearish positions, may run the risk of being squeezed.

The first chapter opens, therefore, by explaining the fundamental points of the short selling strategy, starting with the description of this financial operation, considered by many to be an unconventional practice, of its mechanisms and of the duties, but above all the risks, in which the parties involved incur, and then propose alternatives to short selling outside the cash market, which involve the use of futures and options.

The chapter concludes with an overview of the reasons that induce investors to take bearish positions on some stocks, also referring to how the mystery surrounding this strategy has led to the adoption of laws to regulate its use over the years, especially after the major crises that have affected the markets.

Among the most important short sellers there are hedge funds, to which the second chapter is dedicated, in which the characteristics of these funds, for which there is no

real definition but distinctive criteria by which they are identified, and their presence and power on the market will be presented. Their importance, however, is not only given by the large capital they handle every day, but also by the fact that they are the most active short sellers on the market, accounting for about 80% of stocks sold short. The chapter therefore tries to illustrate how and under what circumstances hedge funds engage in activist short selling campaigns, handling the pros and cons of the communication and the disclosure of their positions, concluding, and at the same time introducing, the third chapter, referring to how their public disclosure regarding GameStop stock created the exact opposite effect to what was desired.
Thus we arrive at the third and final chapter, the one that enters the heart of the story, which, combining and giving meaning to the previous chapters by projecting them into what is known as the GameStop saga, searches, through data analysis, graphics, testimonies and comments from experts and politicians, to answer the questions that professionals and nonprofessionals asked themselves in recent months. What is the role of hedge funds in this event? Is this really a battle worthy of being compared to the myth of David versus Goliath? Who is David and who is Goliath? How did individual investors shake the markets so much that Wall Street shook? What is really behind their frenzy? Is it a passing event or a phenomenon destined to last over time?

1 Some light on the mystery of the short selling pratice

1.1 What is short selling? How does it work?

Short selling: “real-time financial watchdog” – James Chanos

For investors the obvious action to take to avoid losses in overpriced stocks is to sell their long positions. But what if they can, not only avoid losses, but also profiting from falling prices? This is when short selling comes into play. Short selling is the so defined obscure and mysterious practice of profiting from the perception of overpricing by selling an asset that you don't own. Yes, that you don't own. And how is that possible? Easy, you borrow it. The equity lending market matches short sellers with the owners of the borrowed stocks: the former are required to sell the shares on the third day after the lending transaction, to deposit a margin requirement at its brokerage firm and to deposit the proceeds with the lender, the broker, as collateral, which in the US is typically the 102% of the value of the loan, whereas the latter receive in turn a fee for the “favor”. Under the Federal Reserve Board Regulation T, the initial margin requirement the short seller has to deposit is the 50% of the market value of the short position, but it can reduce to the 30% for self-regulatory organizations, like NYSE, FPA, CBOT, and so on, which are the ones that regulate the market. The loan is marked to market daily, meaning that, if the stock price increases, also the collateral required by the lender increases and, if the price decreases, the borrower receives back part of the collateral. The collateral is not simply deposited and left there, but it is invested by the lender with the purpose of earning some interest on it, which is in part returned to the borrower in the form of a negotiated rebate rate. It is precisely from the spread between this last and the current market interest rate that the fee for the lender, and consequently the cost for the borrower, originates.

1.2 Players in the short selling activity

Now, the question that arises spontaneously is: who are the brokers? Well, in the vast majority of the cases they are banks who keep in custody the lent assets and share revenues with owners under a predetermined agreement, where typically the 25% of the proceeds from the lending process goes to the bank and the 75% to the beneficial owner. Another possibility is that assets' owners choose to benefit from the more specialized reporting and flexibility provided by some specialty third-party lending agencies, which, differently from banks, don't custody the assets and offer better revenues agreements. This type of securities lenders are supported by the previous mentioned banks in the process of delivering the shares to the borrowers. Owners may also decide to play the role of lenders themselves either via an agreement or through setting a lending department: the former procedure implies that the asset to be lent is committed to the borrower for a predetermined period of time, the latter, which, due to its expansiveness, is typically pursued by large institutional investors only, permits the lender to have complete control over the process and revenues.

And who are the borrowers? Hedge funds, mutual funds, or, in general, other leveraged investors, who need to short-sell for their investment strategies. Considering the short selling activity under the point of view of hedge funds, it can be adopted in long/short strategies, that consist in buying higher-expected-return securities (undervalued) and selling short lower-expected-return securities (overvalued), or in connection with arbitrage activities. As regard the latter there are three possible investment strategies: the risk arbitrage position, which involves buying the target company securities and simultaneously shorting the acquiring company securities, the convertible arbitrage, in which the investor takes a long position in convertible securities and a short position in the underlying securities to take advantage of the prices difference, and statistical arbitrage, which makes use of mathematical models to identify pricing differentials between statistically related securities and to profit from them.

These players, in particular hedge funds, are represented by prime brokers to get the access in the equity lending market, as they are not perceived by lenders as creditworthy borrowers. In fact, it has been alleged that the use of short selling by hedge funds may represent part of a manipulative scheme, whereby hedge funds strategically issue negative research on companies in whose stocks they have accumulated bearish positions, by selling securities short or by purchasing put options and credit default swap, to drive down prices.

1.2.1 Trade-off between rights and risks

It is important to make clear the distinction between the rights and the risks shared between owners and borrowers. The former, as being the beneficial owner of the asset, has the right over any dividend, which is paid through the substitute payment by the borrower, to participate in any corporate action and to recall the security at any time, leaving the borrower with the voting right only.
If it is true that the owner retains all the rights, it is also true that he bears the majority of the risks. In fact, the first risk he has to deal with is the investment risk, which refers to where he decides to invest the collateral: risk-averse owners will choose very low risk investments, like overnight repurchase agreements, whereas risk-lovers are more likely to choose high risk investments in order to exploit as much as possible the opportunity to gain an high extra income. Owners also face the risk that the borrower, as the price of the security increases, will not be able to add money in the collateral account or that he will not return the asset borrowed: the counterparty risk, which is mitigated by the fact that the loan is marked to market daily, allowing the lender to monitor the status of the collateral and to cover the position in case of troubles. This is why it is important that owners select carefully to whom lend and impose credit limits. If, for example, the borrower fails to collect dividends payments or the lender fails to mark the loan to market, owners incur in the operational risk: the risk that borrowers or lenders fail to meet their responsibilities. Thus, owners must always have the lending system under control.

Also borrowers face some risks: if for the owner the recall of the loan is one of its main rights, looking at it from the perspective of the borrower, it represents an important risk. Even if this event occurs approximately only the 2% of the time, borrowers need to find stable lenders, typically index funds that have little portfolio turnover, in order to reduce as much as possible the probability of a recall. In fact, recalls may force borrowers to unwind their trading strategies suboptimally or to expose them to potentially poor execution in case of a buy-in, which is the situation in which the lender uses the borrower's collateral to buy the necessary shares to cover the loan.

Moreover, borrowers need to balance the recall risk with the risk of a decrease in the rebate rate, which cause an increase in the spread between it and the current market interest rate, consequently increasing the price of the loan paid by the borrower. This risk depends on how much liquid the borrowed stocks are: to an high liquidity, which is common for stocks widely held by institutional lenders, corresponds an high, even full, rebate rate, which generally ranges from 5 to 25 basis points below the Fed funds rate for each day. This spread increases to around 35 basis points for those stocks, called "trading special" or just "special", whose supply in the equity lending market shrinks or whose demand is very large, making negotiation necessary. In some rare cases, when the stock is highly demanded, the rebate rate can be negative, meaning that the lender keeps all the investment rate of return plus a premium for lending the security. Given these features, brokers allow only well-placed investors, like hedge funds, to borrow specials, denying orders from small investors. The high demanding/low suppling nature of specials is driven by special corporate events that occur occasionally like, for example, initial public offerings, mergers, in which only the stock of the acquirer are affected, dividend reinvestment discount programs and dividend payment of foreign companies.

There is also another risk for borrowers, that depends neither on the stability of lenders, nor on companies activities, but reflects the intrinsic riskiness of the short

selling strategy. Since stock prices cannot fall below zero, but can always go higher, borrowers are in a position that implies unlimited losses and is exactly when the price of a borrowed stock spikes, that they find themselves in the so called "short squeeze", being obliged to add money in the margin account. One may think that only unexperienced investors would be caught in a such situation, as it should be almost impossible that a competent investor betting on the overvaluation of a stock can experience the exact opposite event. The risk of a short squeeze does not depend on the level of expertise of the borrower, but is led to the price pressure from too many brokers buying back the stock in the attempt to cover the short position at the same time.

1.3 Short selling strategies: alternatives to the cash market

Investors can profit from the decline in value of a stock, a sector of the stock market or the overall market, not only taking short positions in the cash market, but they can do that also in the futures and options markets.
The first strategy is the one presented in the previous chapter, which involves the borrowing of a stock against a specific percentage margin and is the only one in which borrowers are exposed to the risk of short squeeze.
On the other hand, in the futures market, an investor can sell a futures contract, or, in the options market, can either buy puts or sell calls, to replicate a short selling strategy, reaching the same outcome of selling the stock on which the relatives futures and options are written.

1.3.1 Futures market

When two investors enter in a futures contract they agree to exchange a specific amount of a specific item, the underlying, at a specified future date, the settlement date or delivery date, and price, the futures price. The party that buys the contract is called buyer and takes a long position, whereas the party that sells it is called seller and takes a short position: thus, an investor who wants to take a position

similar to the one of the short seller, must sell the futures contract to have the possibility to gain on a future decrease in the price of the underlying.

As in the cash market, the buyer of the futures contract must deposit an initial margin, which is specified by the exchange or the individual brokerage firm that arranges the trade, typically in the form of an interest-bearing security. Since, like loans, also futures contracts are marked to market daily, the value of this margin account fluctuates with the futures price and, if it decreases below a specific amount, the maintenance margin, which is specified by the broker, the investor is requested to add other capital in cash, the variation margin, up to reach the total amount of the initial margin. The nature of the margin in the cash market is different from the one in the futures market: if in the previous case the difference between the stock price and the initial margin is borrowed from the broker, here the margin has a guarantee function for the seller, indicating the ability of the buyer to satisfy its obligations.

Another important difference from the equity lending market is that both parties of the contract can decide to liquidate their position whenever they want, thanks to the presence of the clearinghouse, which guarantees that both the seller and the buyer satisfy the terms of the contract. Thus, the recall risk is eliminated.

Not all futures contracts are equal, in fact, investors have the possibility to enter into three different types of contracts, depending on the underlying asset involved: single-stock futures, stock index futures and exchange-traded funds futures.

Single-stock futures Single-stock futures: as the name suggests, the underlying is the stock of an individual listed company. In the United States, these contracts, which received approval for trading in 2001, are no longer traded after the OneChicago, the only exchange offering single stock futures in the US, ceased operations in September 2020.

Even though the mechanisms behind shorting these futures contracts and shorting stocks in the cash market are very similar, there are some advantages in pursuing the futures short selling. First of all, it has to be considered the transactional efficiency,

which permits to easily find lenders in the futures market. Moreover, as previously mentioned, sellers no more face the recall risk: once the contract is established, the presence of the clearinghouse, which interposes itself as the buyer for the sale part and the seller for the purchase part, permits the two parties involved to liquidate their position prior to the designated date at which they must transact, the settlement date, without involving each other and without worrying about mutual obligations. Another aspect that should not be underestimated are the potential cost savings in shorting single-stock futures rather than stocks in the cash market. This is a potential advantage because it has to be determined and compared the costs of both strategies. In the first scenario, the buyer pays the difference between the futures price and the stock price, called basis, which effectively is the repo rate adjusted by the expected dividend and is also referred to as the net interest cost or carry. On the other hand, the seller earns this spread for financing the buyer's long position. In the latter case, instead, the broker must pay the bank through which he arranges the transaction, a fee, called the broker loan rate or the call money rate, which is subsequently charged to the short seller with a markup. In general, if the interbank interest rates are cut to extremely low levels, it is more cost reducing selling short in the cash market, as single-futures advantage is negatively affected by such an environment.

Stock index futures As opposed to single-stock futures contracts there are stock index futures contracts, which are used to take a short position in the market or a sector of it, having a specific stock index as underlying, either a broad-based or a narrow-based. The difference between the two kinds of stock market indexes resides in their "size", in fact, the latter refers to subsectors or components of the former, which, in turn, refers to indexes like the S&P 500 and the NYSE Composite Index. The parties of these types of contracts, at the settlement date, instead of exchanging the stock, they exchange cash: for this reason they are called cash settlement contracts. Going into more detail, what is traded is the difference between the futures price and the futures settlement price, which both are multiplied by a specific

multiple for the index. So, if the difference is positive, who has to pay is the seller, if negative, the buyer.
Using stock index futures to profit from shorting a market or a sector of it, as the advantages are to be compared with the short selling in the cash market of all the stocks comprising the index, or with the construction of a portfolio that replicates the index in question, it is pretty clear that investors gain both in terms of transaction costs and time.

Exchange-traded funds futures Like in stock index futures, in ETFs futures contracts investors deal in terms of cash rather than having a direct exposure to the underlying asset, which, in this case, is the chosen exchange traded fund.
Looking at the benefit of selling short ETFs futures contracts instead of stocks in the cash market, also in this case, there is the cost advantage associated to the exploitation of the performance of an index or sector, commonly related to the commodity or the currency market, without the commitment of a large amount of capital and time. Moreover, ETFs enable investors to quickly enter the position and to capitalize on markets drawdown momentum, as these products do not have uptick rules like stocks in the cash market, where investors need to wait that the stock they want to sell short trades above its last executed price.

Continuing to speak about ETFs, investors can pursue a second investment strategy: shorting directly ETF shares. This choice could be led for the same reasons that hold also for futures contracts, like the impossibility to suffer short squeezes, as ETF shares can be increased or decreased on any trading day by any Authorized Participant, which is a designated dealer that creates or redeems fund share, and the absence of the "uptick" rule, as ETFs have the same usefulness in risk management of futures, swaps and options. So, why investors should prefer selling short ETFs instead of futures contracts? The reason resides in the life of the two instruments: futures have a limited life obliging investors to roll forward their positions as contracts approach expiration, whereas, ETF shares have an unlimited life, allowing

investors to hedge indefinitely and to avoid the roll risk, which reflects the possibility of a negative market effect if the position is rolled forward.
It is not surprising that, for their trading flexibility, open-endedness capitalization and diversification, investors recur in the short selling of ETF share to reduce the total risk in an investment position or portfolio.

1.3.2 Options market

Like futures contracts, options contracts are agreements between sellers and buyers to exchange a particular asset, the underlying, at a specified future date, the expiration date, and price, the strike or exercise price. The difference, here, is that there are no margin requirements and the contract does not represent an obligation, but rather an option to buy or sell, depending on if the option is a call or put respectively, the underlying security at the expiration date. Margin is, in some sense, replaced by the option price, or premium price, which is the upfront fee that the buyer of the option must pay to the seller to have this right, and represent the maximum loss that the buyer could incur in, as, if the price of the underlying does not meet his expectations, he can decide to not exercise his right. Options can be categorized depending on the exercise style, which specifies when the buyer has the possibility to exercise the option: European options give the chance to do it only at expiration, whereas American options allow for more flexibility, enabling investors to do it whenever they want, prior or on the expiration date.
An investor, who wants to gain on a possible future decrease in the price of an asset, has two choices: he can either buy a put option, obtaining the right of selling the underlying and profiting from the difference between the exercise price and the actual price of the asset prior or at expiration date, or sell a call option, gaining its selling price. Clearly, in the first case, the profit is higher and the loss is limited to the price of the call. It is important to note that, the profit gained from a long position in a put option is lower than the one from short selling the same underlying asset in the cash market or from selling a futures contract, as, in the first strategy,

it must be considered the cost of buying the option. The same hold for the possible loss incurred in a short position in a call option.
Similarly to futures contracts, options can be written both on stocks and indexes, but they can undergo essential modifications by Long-term Equity Anticipation Securities (LEAPS) and Flexible Exchange (FLEX) options.

Stock and index options Stock options are options listed on the exchange in which the underlying is 100 shares of an individual stock. The value of the strike price and the spot price are, respectively, the value of the underlying asset at the time of the settlement of the contract and the value of the underlying asset at the expiration or exercise date, when the parties physically transact the shares.

Like in the futures market, in index options, the underlying is a stock index, either broad-based or narrow-based, and, in case of the exercise of the option, what is traded between the two parties of the contract, is not the underlying itself, but the cash difference between the exercise price, which in this case is called the strike index, and the index price at the day of exercise. To determine the monetary value of the underlying stock index option it is necessary to multiply the current cash index value by a multiple, which is specified in the contract and is also used to determine the strike index in monetary terms.

LEAPS and FLEX options Since stock options and index options contracts have short maturities, no longer that one year, LEAPS can be traded to capitalize on higher maturities, which can range from more than one year up to 39 months from issue, allowing long-term investors to gain exposure to prolonged price movements, without recurring to the use of the rolling contracts over process, which would expose them to market changes in the underlying price and to additional option premiums. The features and mechanism of this type of options are more or less the same as the ones of the listed options, but with some technical differences. First of all, the value of the options is affected by different phenomena: the price of stock options

is sensitive to the movements of the underlying and to the passage of time, whereas the price of LEAPS is more linked to changes in volatility and interest rates. Remaining in the premium field, if it is true that LEAPS options give the underlying more time to move and thus give investors more time to make a profit, it is also true that this benefit has a cost, which increases the price of these options compared to the one of stock options, according to the time value. Investors can further exploit the wider time frame by taking the opportunity to sell the option contract before expiration, receiving its theoretical value, which is derived by various pricing models.

If an investor wants more flexibility, he can trade FLEX options, which allow both the writer and the buyer to customize most of the features of a contract for either stock or index options, including the underlying, the strike price, the expiration date and the exercise style. Not only these options permits to negotiate terms, but they also provide some important benefits, like the protection by a clearinghouse from counterparty risk, which is associated with the over-the-counter market, where these options, being customized, trades.

1.4 Why are stocks overvalued?

As already seen, investors engage in the short selling activity to exploit their perception of overpriced stocks and thus profiting from the future expected decrease in their price. But what lead stocks to be overpriced? And how do investors recognize them?

When studying finance in theory, the most common assumptions are that investors can and want short sell to the same extent to which they take long positions and that they are equally informed and have homogeneous rational beliefs about the market, what Sharpe calls "homothetic expectations". In such an efficient market, stocks are always correctly priced reflecting all available information (Fama 1970, Fama 1971) and deviations from their fundamental value are always exploited by arbitrageurs who bring back stocks value to their fundamentals. In reality things

are quite different. It is enough to think about the Great Depression, the Black Monday, the Dotcom Bubble or the 2008 Financial Crisis, to understand that stocks prices do not follow this efficient market theory. In fact, well informed investors are prevented from mitigating overpricing phenomena because of their inability to easily sell short.

1.4.1 Sophisticated and unsophisticated investors: asymmetric influence on stocks prices

To make clear this inefficiency, it is first necessary to consider how the divergence of opinions among investors affects stocks prices.
Broadly speaking, investors can be divided into optimists and pessimists, depending on their sentiment, which, in the context of equity investments, refers to the excess of expectations, either positive or negative, possessed by investors. Sentiment often leads investors to take irrational and often erratic decisions, causing the overvaluation or the undervaluation of the traded stocks.
According to several researches, the impact of uninformed and unsophisticated trading is more prevalent and evident in the optimistic investors, making overpricing phenomena more likely to occur than underpricing ones. Thus, focusing on overvalued stocks, according to the "overvaluation hypothesis" supported by authors like Miller (1977), Duffie et al. (2002) and Jiang (2005), optimists would be the vast majority of investors holding them, as they are able to buy without limitations, and, as a consequence, they would be the ones setting their price with the potential to create and fuel a speculative market bubble. Moreover, as already anticipated, given that investors are not equally informed and have not the same sentiment about future returns of stocks, among optimists there would also be overoptimists, whose decisions, which are made without the use of fundamental data, cause a further overvaluation of the stock price. This phenomenon is particularly evident in those stocks with low capitalization, as, in a market with limitations on cash borrowings and short selling, the limited necessary amount of money to buy those stocks allows

investors to obtain a higher number of the total outstanding shares, with respect to stocks with high capitalization (Jacobsen et al. 2000).

1.4.2 Short selling costs and constraints

To further increase the overvaluation phenomena, there is also the fact that investors do not have the ability to easily sell short due to the presence of costs and constraints, which prevent negative opinions from being incorporated into stocks prices, leading them to be biased by the view of optimists.
Short selling costs reflect the denial of two common assumptions that are made when studying market performance and stock pricing: the collateral, that the short seller deposits with the lender, has the same size as the assets borrowed and the market rate on borrowed cash offsets with the rate received on the collateral. In fact, in reality, short sellers suffers both differences as costs. First, the size of the deposited collateral is higher that the value of the borrowed assets. Second, as the securities lending market is not a centralized market with a market-clearing price, the market rate is different from the rebate rate, that is, the rate the short seller receives from the cash deposited as collateral with the lender is lower than the rate the short seller pays on the borrowed cash deposited as collateral. One possible reason for low rebate rates is the high demand or low supply of stocks. Clearly, short selling has a cost.

Not only costs can prevent investors from short selling, but also, and more importantly, constraints related to law and regulations imposed by several countries to stop speculators from driving stock prices down to artificially low levels.
Although they were additionally reinforced after the sudden demise of Lehman Brothers and the following price collapse of listed financial securities in the 2008 Financial Crisis, the first short selling regulation dates back in 1610, only 8 years after the foundation of the Amsterdam Exchange, indicating that this investment activity has always created disagreements among market participants on whether it

is a bad or a good practice.

Short selling world regulations before the 2008 Financial Crisis One of the most significant changes in international investing for the short selling activity was the growth of the depository receipt market in the United States (American Depository Receipts) and Europe (Global Repository Receipts), which has introduced the possibility for domestic investors to be exposed to the world equity markets without leaving their countries. From that moment on, investors were thus enabled to sell short in another country dual-listed stocks, avoiding the regulations affecting their domestic market. In fact, many countries, like China, Colombia, Greece, Pakistan, Perù, Venezuela and Zimbabwe, prohibited the short selling activity, while, in other countries where it was allowed, like Argentina, Brazil, Chile, Finland, Hungary, New Zealand, Philippines and Turkey, it was not widely practiced due to tax laws or unclear rules. Additionally, in some markets, like the ones of Poland and Greece, only the largest and most liquid stocks were allowed to be shorted, thus imposing a limit on the short selling activity. There were other rules that posed a significant restriction: the prohibition for individual investors in Sweden to sell short without having borrowed the stock in advanced, the permission to short sell only to the members of the Athens Derivates Exchange in Greece prior to the 2001 or only to domestic investors in Brazil, or, more importantly, in the US, the restriction through the uptick rule, under which securities could be shorted only after their price had risen. This last was repealed shortly before the onset of the global financial crisis, in 2007.

Short selling constrains after the 2008 Financial Crisis and the European Debt Crisis: US and Europe under comparison Although short selling regulation did not represent a priority on the international reform agenda, after the global financial crisis many restrictions, either permanent or temporary, were implemented both in the US and in Europe to improve the financial stability, especially with respect to financial institutions, during extreme market conditions in these

advanced economies. The two sides of the Atlantic have some similarities as well as some divergences. In fact, if in the US restrictions are more severe due to the presence of the American regulatory agency, the Security and Exchange Commission (SEC), only in Europe there are restrictions on the short selling of sovereign debt and Credit Default Swaps (CDSs), a clear consequence of the European Debt Crisis started in the 2010.

Europe As often happens, the need for improvement in the regulatory system surges after a crisis, and it is also the case for Europe with respect to the financial and sovereign debt crises, which trigger the need for harmonization in reforms, centralization of powers and expansion of the regulatory perimeter. Thus, in 2009, the Committee of European Securities Regulators (CESR) started to look at the formulation of pan-European standards on short selling activities and the European Council deemed necessary the harmonization of the Member States on the topic. Moreover, the perception that, during the financial crisis, hedge funds have contributed to the decline of prices, and the consequent negative association between them and short selling, contributed to the proposal by the European Parliament to ban the naked short selling practice all over the Europe.
The situation worsened further with the advent of the sovereign debt crisis. In fact, both the German and the French governments condemned speculators of taking advantage of the severe economic crisis that has hit several European countries, in particular Greece and Poland, and of having further aggravated it with the use of naked sovereign CDSs, which has led to higher borrowing costs for the governments concerned.
France and Germany not only pointed the finger at speculators, but also at credit rating agencies, which were considered to play an important role in influencing markets in both crises.
In light of these insurgences the European Commission proposed, in September 2010, together with the European Market Infrastructure Regulation about Over the Counter (OTC) derivatives, a short selling regulation, which, after very demanding

and prolonged negotiations, produced a more strength final set of rules. Following the suggestions from the Franco-German governments, the resulting regulation contained restrictions on naked short selling on shares and on both sovereign bonds and CDSs, permitting only legitimate hedging activities, with an extraterritorial scope independent of investors location. Additionally, the regulation imposed private and public reporting requirements on the covered short selling of shares and only private on the covered short selling of sovereign bonds. National Competent Authorities (NCAs) have been vested with supervisory and investigatory powers in order to ensure Member States compliance with regulations and are also allowed to temporarily suspend restrictions on sovereign debt short selling in cases where the liquidity of sovereign bonds drop below a specified level. On top of that, the European Securities and Markets Authority (ESMA) has direct intervention powers and serves as a coordinator among NCAs. With regard ex-post measures, there are no harmonization, but rather are Member States entitled to establish applicable rules, which must be submitted to the ESMA supervision on an annual basis.

Together with the NCAs power to temporarily suspend restrictions on the short selling of sovereign bonds, the EU has introduced other temporary restrictions in order to address adverse events that could threaten the financial, monetary and budgetary stability of Member States, banks or systematically important financial institutions, which may consequently cause the instability of the EU financial system. These restrictions, which have to be imposed or renewed by the NCAs after notifying the ESMA, in addition to covering direct short selling practices, also cover synthetic short sales, which mimic the outcome of the direct short selling activities but, as seen in previous sections, are created through the use of derivatives like futures and options. Moreover, through the circuit breaker mechanism, NCAs have the power to temporarily prohibit or restrict the short selling of securities which intra-day price has fallen significantly with respect to the previous trading day.

United States Like the European Union, also the US took stronger measures addressed to the restriction of the short selling activities after the 2008 Financial

Crisis, with both short-term and long-term objectives: the former, pursued by the Federal Reserve and the Treasury, focuses on the maintenance of the financial stability of the system and on the restraint of the systematic risk, whereas the latter, pursued by the SEC, focuses on the efficiency and liquidity of the market and on the efficient allocation of resources. As previously anticipated, if on one side, the US was less onerous than the Europe, by not providing any regulation regarding the sovereign debt market, but rather focusing on the OTC derivates and the related clearing obligations, on the other side, the US was more rigorous with respect to seasoned equity offerings (SEOs), by imposing ex-ante restrictions on both covered and naked short selling that precede those events. Looking at the similarities, the SEC introduced several constraints with respect to the naked short selling strategy, including the imposition of the locate requirement, under which, brokers are required to locate securities available for borrowing prior to engaging in an equity short sale. Moreover, the SEC adopted permanently the "naked short selling anti-fraud rule" that was implemented during the crisis in order to identify those short sellers who have deceived about their ability to fulfill their obligations.

As regard temporary constraints, as the onset of the financial crisis right after the repeal of the uptick rule increased criticism, the SEC decided to introduce its variant in 2010, consisting in the combination of a circuit breaker and an alternative uptick rule, with the aim of preventing abnormal price declines and favoring long sellers, as well as of restoring investor confidence and promoting market efficiency. Thus, trading centers have to temporarily prevent the short selling at a price less or equal to the national best bid of those securities whose price has fallen by 10 per cent or more with respect to the closing price of the previous trading day. The rule, which is applicable to all equity securities listed on a national securities exchange and traded either on exchange or OTC, restricts only direct short selling strategies, ignoring synthetic short sales through the use of derivatives, being thus less burdensome than the European temporary regulations.

Short selling constraints triggered by the COVID-19 pandemic As global markets have been hit by the global pandemic, financial regulators, especially in Europe, further tightened restrictions on short selling activities for several months, starting from March 2020, to preserve market confidence and financial stability, vulnerable to the activities of speculative short sellers. The restrictions implemented to prohibit or limit short sales on entire index, trade venues and exchanges for a limited number of months, were mostly triggered by the extreme volatility of the markets but also by the uncertain future of the global health condition, the mispricing of stocks, primarily due to the misinformation from media and social networks and the sudden and uncertain arrival of health and social measures.

Among European countries both covered and naked short selling were further prohibited or limited with the implementation of new rules, as well as the creation or the increase of net short positions and the use of derivatives to replicate short selling strategies.

The US have not further limited short sellers in the wake of the COVID-19 pandemic, but relied on the restrictions already in place, like the automatically triggered alternative uptick rule, as the SEC believed in the short selling contribution to the efficiency and liquidity of the market.

Are short selling constraints really effective? Before looking at the real consequences of short selling restrictions it is worth noting that, in both the US and the EU, there is strong evidence of the political influence on short selling rules, a presence that may have distorted and altered the real needs of the financial markets. In fact, on one side there is the restriction on sovereign government bonds, which further evidences the political intervention with the absence of rules on corporate bonds, and, on the other side, there is the direct supervision of the Congress on the SEC, that can be noticed in the reintroduction of a modified uptick rule.

Not only there are conflicts between the thoughts of political and economic forces, but also between governments. In fact, the previously mentioned possibility for investors to avoid domestic restrictions by trading in other countries, is further

boosted by the rules divergences among countries and the lack of an harmonized global response to the need of regulating short selling activities. Investors are thus enabled to engage in regulatory arbitrage, not only exploiting regulatory differences between different regions, but also between different nations in the same region, like in Europe, where the lack of coordination among NCAs in implementing temporary restrictions has caused uncertainties and additional costs on commercial parties.

But the real question is whether short selling constraints have proved to be efficient and to achieve the objectives set in implementing them.
While regulations were searched by countries for improving the efficiency of the markets, they have almost always proved to give the opposite result. In fact, as short selling is a complicated topic on which there have always been conflicting opinions, restrictions, in particular the temporary ones, tend to create even more confusion instead of shedding light, involving a trade-off between the short-term benefits of the bans and the longer-term subtle benefits of short selling. It is precisely due to this lack of awareness on the real effects of short selling on the market and the financial system as a whole, that this trading strategy has often been used as a scapegoat for most of the biggest financial and non-financial crisis, creating the fictitious need for regulatory reforms, which, in turn, being quite often disproportionate, unclear and heterogeneous among countries, have proved to damage the execution quality of short sale orders and the liquidity of the market. Moreover, the ban on short selling prevents the views of short sellers from being fairly integrated and reflected in the market, allowing prices to artificially inflate and to distort the fair value of securities.

2 The hedge fund industry

2.1 Why are hedge funds important when speaking about short selling?

As we have seen in the previous chapter, short sellers play a very important role in the transmission of negative information into prices. If, on one side, many market participants enjoy the benefits of that, on the other side, however, short sellers are very often criticized, as, in transmitting their information, they hit hardly investors who have long positions in the securities involved. In fact, as mentioned before, in history people blamed short sellers for all the bad events that have ever happened, including Black Tuesday, Black Monday, 2008 Financial Crisis, inducing people to think that short sellers "are like looters after a hurricane" (Andrew Cuomo – 2008), to perceive that "short selling is characterized as inhuman, unAmerican, and against God" (Owen A. Lamont – 2004), and to compare them to mythological monsters, "People think I have two horns and spread syphilis" (James Chanos – 1985), demonstrating the strong negativity of the sentiment against short sellers.
Having in mind this, looking at what happens once short positions are disclosed and become publicly observable, there is evidence of an extensive amount of litigation against short sellers, just think about the investigations by the SEC and the FBI. Not only government agencies have the power to make the life of short sellers hard, but even companies can use several corporate policies with the purpose of harming them, like engaging in large dividends payments, positive guidance earnings or reducing their access in earnings calls. The 2016 paper of Jones, Reed and Waller, provides consistent evidence on it and, not surprisingly, it shows that, once Europe passed the regulation requiring short sellers to disclose their positions, the level of short selling activities dropped, which further demonstrate the idea that short sellers do not like being publicly observable and subject to criticism.
These events led the birth of a new phenomenon, the rise of high profile short selling campaigns. When it comes to it, the spotlight is mainly on hedge funds, not

only because they manage trillion of dollars and are among the biggest players of the market, but also, and more importantly, because they are the most active short sellers. In fact, according to Ian Appel and Vyacheslav Fos (2020), they are behind the 80% of the total short sales. Moreover, hedge funds are in a better position to deal with the risks associated with short selling: they have contractual prohibitions that limits their drawn of capital and they can better handle, to some extent, short squeezes, if they happen.

Before seeing in details the dynamics and effects of these campaigns, it is necessary to understand what hedge funds actually are and what their size and power on the market are.

2.2 A view into the features of hedge funds

2.2.1 Is there a proper definition of hedge fund?

According to David Vaughn (2003), policy advisor at the SEC focusing on the regulatory aspects of private funds, it does not exist an universally accepted meaning of the term hedge fund. It is believed that it has been first applied in 1949 to the private equity fund managed by Alfred Winslow Jones, which combined long and short equity positions in order to hedge the exposure of the portfolio to market movements: from here the expression hedge fund. Today, however, hedge funds are no longer defined by a particular strategy, but there are different opinions about their definition and description.

In general, hedge funds are organized as private investment firms or offshore investment firms which not only buy stocks for long-term appreciation, like the conventional portfolio managers who are long equities, bonds and cash in different proportions varying with the desired level of risk, but also sell stocks short in order to eliminate market risk and remain fully invested. Furthermore, they are different from mutual funds in that they not seek relative returns measured on the performance of a benchmark index, but rather hedge funds managers seek absolute returns by

putting emphasis on maximizing individual stock selection and magnifying capital gains by using an assortment of trading techniques and instruments, often including short selling, derivatives and leverage. Due to the fact that hedge funds take both long and short positions, if the stock selection is good, it does not really matter whether the market goes up or down and, in light of this, it is not surprising that hedge funds neither get out of the market nor use formula investment programs.
Not only is the definition of hedge fund subject to different opinions, but also its contribution to the stability of the market. In fact, they are perceived as contributors to both its volatility and its stability, reminding us of the heterogeneous atmosphere surrounding short selling.

2.2.2 Identification of hedge funds through distinctive criteria

George Soros, manager of the Quantum Fund, speculator on the breakdown of the European Monetary System in 1992 and on the Southeast Asian currencies in 1997, and from whom derives the association of hedge funds with speculative instruments, defined hedge funds as three-dimensional funds based on the main peculiarities that characterize them: functional, environmental and social dimension.
The functional dimension represents the extensive use of leverage in the investment strategies, through borrowed cash, balance sheet leverage, or derivatives, instrument leverage. Even though the adoption of this practice by hedge funds has been always not understood at all, as they do not benefit from tax advantages, the use of leverage permits to enhance returns, to obtain a degree of notional exposure grater then the fund capital base, to target desired levels of volatility or to take arbitrage positions to profit from mispricing. As seen in the previous chapter, in US short sellers are required to deposit with the lender the 50% of the value of the short position as collateral, thus being limited in the maximum level of leverage allowed by Regulation T, but hedge funds are able to bypass this restriction by establishing offshore investment vehicles in less restrictive jurisdiction or by adopting the "portfolio margining", which was approved by the SEC in 2005 and allows for the calculation of margins

on a portfolio basis rather than on a security by security basis. The level of leverage used is not always the same, as it depends on the type of investment strategy the fund decides to adopt and on the related risk-return trade-off and costs, which also vary according to the way in which the fund obtains leverage, but, in general, they are higher for less creditworthy funds and for securities with high credit risk and volatility.

The environmental dimension refers to the fact that hedge funds, which are accessible only by ultra-wealthy individuals or institutional investors, face less strict regulations than other investment funds. In this regard, considering the 1940 Investment Advisers Act, which, among other provisions, requires investment funds to disclose certain information to client, to register their funds with the SEC and to disclose their investment strategies, books and records, hedge funds have the ability to avoid to comply with it thanks to the fact that the calculation of the number of their clients relies on considering only the entire funds they advise rather single individuals, permitting thus hedge funds to be qualified under the private adviser exemption.

Things changed when, after the global financial crisis, in the 2010, the US enacted specific regulations relating to alternative funds with the Dodd-Frank Wall Street Reform and Consumer Protection Act, effectively changing the registration requirements of hedge funds, which, during the crisis, were accused of helping the rise of the speculative bubble and, after its burst, of earning hundreds of millions of dollars from the losses on securities linked to mortgage securitizations, to the creation of which hedge funds contributed through credit default swaps, entered into to bet on the bankruptcy of the issuing banks. In other words, some argue that many of the securitizations were created in order to offer high-yield bonds to hedge funds. The Private Funds Investment Advisors Registration Act included within the Dodd-Frank Act made important changes that had an impact on hedge funds: it abolished the private adviser exemption, which had allowed hedge funds to avoid the registration with the SEC, requiring the hedge funds with more than 150 millions of

dollars in assets under management to register, and changed reporting, disclosure and record keeping requirements in order to facilitate the valuation of systemic risk by the SEC.

The regulatory grip around hedge funds has once again been loosened by the Republican Trump Administration, under which, as found by a study conducted by the Georgetown University, the dollar amount of fines ordered and the number of enforcement actions undertaken by the SEC saw a 16% drop in its first year relative to the last year of the Obama Administration.

The third dimension, the social one, refers to the corporate structure of hedge funds that allows them to avoid running into the legislation on solicitation of public savings, thus favoring a considerable degree of opacity. Hedge funds are therefore almost always set up as companies, in order to avoid the assimilation to collective savings organizations, like the traditional mutual funds, and to escape to the excessive limitations on the freedom to operate. In particular, they are commonly structured as either limited partnerships or corporations. Under the limited partnership, the fund, which is managed by the general partner, who has unlimited liabilities both for debts and obligations, cannot make investment solicitations and the partners, who have limited liabilities in relation to their invested capital and do not participate in the management of the business, cannot be more than 100, avoiding the obligation of registration with the SEC. On the other hand, in a corporation, which is usually established in offshore countries, aiming at operating with less constraints and benefiting from strong tax exemptions, all partners, including the manager, are equally liable in relation to the share capital held and there is no limit on the number of partner that can join the fund. Nevertheless, the new Administration with the establishment of the Democratic Joe Biden at the White House, gives the perception that the tendency is to tighten the hedge fund regulation once again in the future.

2.2.3 Hedge funds managers and investors: who is better off?

In addition to these identification criteria, hedge funds are further characterized by the fact that, since they are not bound by predefined investment objects, they engage in various financial activities using financial instruments that are generally beyond the reach of mutual funds and allow them to be highly flexible in their investment options and to be able to engage in more aggressive strategies and positions such as short selling, trading in derivative instruments, like futures and options, and the use of financial leverage to improve their risk-return profile. Additionally, hedge funds are able to obtain optimal returns with minimal levels of risks thanks to the diversification of investment strategies, which also reduces the volatility, and the fact that, as previously mentioned, their performance is not correlated to a benchmark index and the return on investments is not linked to the market trend, but rather to the specific ability of the fund manager to choose the right assets and strategies to achieve absolute returns, thus reducing the systematic market risk. In this regard, to avoid free riders traders, investors know little or nothing about the composition of the portfolio and therefore about the level of risk and the strategy applied by the hedge fund in which they are investing, thus operating in a context of asymmetric information in which their investment becomes effectively a bet on the ability of the manager. This balance of trust and responsibility between investors and manager is also reflected in the commission structure that provides for a combined charging model: the remuneration of managers is equal to a fixed rate, the management fee, of the assets under management, that is the total market value of the securities managed over a specific period by the fund, plus a performance-based fee, calculated as a percentage of all profits made by the increase in the asset under management over a given period. In this way, the interests of investors are aligned with those of the fund manager who is incentivized to produce high positive returns. The performance fee is almost always combined with the high-water mark clause that gives the management the right to collect the fee only on the amount of assets that exceed the higher net asset value ever reached, the high-water mark, in order to ensure that

commissions are not paid on the profits used to offset the losses of previous years and thus paid twice for the same part of return. Alternatively to the high-water mark clause, the performance-based fee can depend on the hurdle rate, which, similarly to the high-water mark clause, represents the minimum rate the manager must reach to get paid, but, differently from the high-water mark clause, is independent of the historical return of the fund. Although the commissions are linked to the performance of the fund with the aim of protecting the benefits of investors, among the latter there are those who argue that this mechanism of reward can represent an incentive for managers to take on high levels of risk, collecting high performance fees if things go well, but not sharing the losses if the strategies used do not produces the desired outcomes. Investors must further take into account that, unlike other funds, such as private equity funds, hedge funds are not subject to the claw-back provision, which, in the event of sufficiently high losses, gives investors the right to recover part of the performance fees, the carried interest, previously paid.

2.2.4 A paradigm shift in the asset management industry

But who are the hedge fund investors? And what are their objectives? If, in the past, hedge funds were mandated by high-net-worth individuals to generate absolute returns, now are institutional investors to dominate the scene, each with different investment objectives leading to differences in asset allocations, risk-return profiles, time horizons, and liquidity expectations. These new investors are exploiting hedge funds strategies as a way to supplement, if not replace, their other investments in traditional long-only equity, credit or fixed income, in order to reduce the overall volatility and to have access to more attractive risk/return profiles.
Changing investors imply changing investment model. The old one, two-tiered, is based on the beta, which is given by the returns attributable to the market, and on the alpha, which measures the returns obtained thanks to the skills of the fund manager. The new one, still relies on alpha and beta sitting at the opposite side of the investment product universe, but, between them, there are other products, like

the long/short alternative beta and the long-only smart beta. With this new investment model, investors are accepting that portfolio diversification does not come from investing in different asset classes, but rather in the different risk factors, which capture the risks that explain the risk premia, of these asset classes.

The smart beta, also referred to as strategic beta or market beta, gives investors exposure to equities and fixed income providing better risk-adjusted returns than traditional investment strategies. It can be seen as both a passive and an active technique, as its performance is correlated with the one of the equity and fixed income indices but the recourse to the use of one or more factors allows for modifications.

The alternative beta, also referred to as hedge fund beta, alternative risk premia or risk premia, allows investors to short securities also in the alternatives world, and, even though it is closely related to the smart beta, it is almost uncorrelated with the related market thanks to a multi-factor approach, which include factors such as momentum investing, value and size, and the possibility to go both long and short. These features allow alternative beta to offer higher risk-adjusted returns than traditional and smart beta.

Despite all these changes and developments that have enabled hedge funds to develop new solutions to provide superior methods of investment and to meet the individual demands of different investors, the product for which hedge funds are best known remains the alpha. Defining alpha, which can be generated from security selection or market timing in both long and short positions, it measures the difference between the actual and the expected returns of the fund, given the beta, that is, its level of risk in relation to one or more variables, like the market index. The importance of alpha resides in the fact that the added value it creates goes beyond what can be obtained by matching the beta of the fund with the beta of a market, or by applying specific factors or rules to an investment. Despite delivering alpha is becoming increasingly difficult, hedge funds are still able to do that thanks to the combination of skills, knowledge, market timing and judgement to use and understand sophisticated financial models which enable managers to price risk,

identify value in the capital structure of a company and to express an investment thesis for which investors build a reasonable expectation on what they will get when making an allocation and what they should pay for it.

2.2.5 Growing size and power of hedge funds

Talking about the size and the power of hedge funds, according to Preqin, an alternative assets data provider, there were about 17,378 hedge funds in the world in 2020, a figure that is set to fluctuate continuously due to the constant opening and closing of funds. The most important hedge funds are located throughout the world, mainly in Europe, Asia and US, but the vast majority is headquartered on the East Coast, especially in New York. According to the All-American Buy Side Compensation report by Institutional Investor, in 2018 fund managers earned on average almost 1.5 millions of dollars, a surprisingly increasing number if we consider that only one year before, in 2017, the average compensation was around 0.9 millions. These increase, besides indicating the high level of experience and talent required, is one of the indicators showing that this industry is constantly growing. In fact, hedge funds have grown considerably since the early 90s, not only in terms of size, with a constant increase in the assets under management, but also in terms of media attention obtained for their brash strategies and huge earnings often correlated with the greatest financial crises. Although, as mentioned before, they are the subject of many debates and their identity is still unclear to many, their presence and effect on the market are increasingly evident and strong, just think that, as the hedge fund data provider Hedge Fund Research reports, in 13 years, the global assets under management went from 1.5 trillion of dollars in 2006 to 3.6 trillion of dollars in 2019. As can be easily guessed, this growth trend slowed down in 2020, especially in the first three months, with the rise of the COVID-19 pandemic, which, together with the consequent lockdowns, "drove intense volatility across asset classes, steep equity market declines, and near record lows in investors risk tolerance", as the Hedge Fund Research states. The pandemic has had a particularly negative effect

on smaller hedge funds, which have been forced to close due to the lack of financial resources needed to compete with the biggest players. Fortunately, the direction of the hedge fund industry seems to have changed course already in the summer of 2020, when, in a study conducted by the Alternative Investment Management Association and KPMG, the 57% of hedge fund managers interviewed declared that they had started, or plan to start, a new hiring campaign, and the 71% said that the productivity resulting from the smart working encouraged them to consider the outsource of certain activities, like the operational and technological ones, in order to make costs and work more efficient.

If, thanks to these considerations it is not difficult to understand that the hedge fund industry is in continuous expansion, to perceive its importance and power on the market it is necessary to consider not only the media attention hedge funds have acquired over the years following their involvement in the most important events that have shaken the financial world, but also, if not above all, their ability to influence the other players in the market through the engagement in activist campaigns.

2.3 Hedge funds short selling campaigns

2.3.1 Activist campaigns by hedge funds

Looking again at the paper of Ian Appel and Vyacheslav Fos, it investigates the campaigns engaged by hedge funds examining the effects of their public communications. The authors take as an illustrative example what happened between the Greenlight Capital hedge fund and the private equity firm and mezzanine capital lender Allied Capital. In May 2002, Einhorn, the hedge fund manager, voluntary announced a short position in Allied Capital, accusing the firm of using accounting gimmicks to hide losses. The next day the stock price dropped over 10%. As an immediate response, in June 2002, the SEC started investigating the hedge fund, not the company, and only two years later, in June 2004, the SEC switched the focus to Allied Capital, and, in particular, to what Einhorn claimed in its initial statement

in May 2002. Three years later, in June 2007, the company settled with the SEC without any financial penalty, but, in turn, it was acquired in March 2010 at a 90% discount relative to its peak value. Even though, this valuation reduction, at least part of it, can be attributed to the short seller, in the sense that the hedge fund made sure that the negative news about the company were disclosed sooner rather than later revealing its overvaluation, when David Einhorn described in his book his experience about this case he said that "most short sellers remain anonymous, and after seeing what I have gone through for simply calling a spade a spade, who could blame them?", understanding why short sellers decide to remain private and not talk about what they are doing.

Turning back the attention to hedge funds, how common is that they engage in short selling campaigns? First, it is important to say that short selling campaigns engaged by hedge funds with significant short positions involve a very high degree of risk: in part because of the asymmetry of rewards, reflected, as already seen in the previous chapter, in the unlimited gain for long investors and unlimited loss for short sellers, and in part because of the financial leverage of the short selling targets. As a matter of fact, highly leveraged companies are more likely to be targeted by short selling campaigns, due to the easiness of bringing them down and pressure them. Moreover, the success of short selling campaigns, at least in the US, is certainly not supported by prompt actions by federal agencies, which tend more easily to prosecute short sellers rather than investigating fraudulent actions taken by companies to inflate stock prices.
Nevertheless, according to the paper, since 2008 there are approximately 25 high profile campaigns per year, a surprising number if we consider that prior to 2008 there were only on average 5 campaigns per year, primarily initiated by activists hedge funds, which allegations relate to valuation, fraud, problems with business models and so on. These campaigns, which proved to have significant effects in the valuation of securities, spark the response of other market participants, induc-

ing a more active short selling activity and consequently provoking an increase in litigations against companies. These effects are going to be stronger when hedge funds have experience in activism, particularly when hedge funds engage in hostile activist campaigns, and when they point out specific problems with companies. In fact, it seems that the market is going to rebound specific allegations about companies rather than just general statements about overvaluation.

Talking about position disclosure, why hedge funds tell publicly what they are doing? This is actually not clear: on one side hedge funds can be very aggressive short sellers, publicly disclosing problems about target companies to drive down prices, on the other side, one of the key feature of hedge funds is that they value privacy, avoiding to talk about what they are doing.
Moreover, in the paper of Ljungqvist and Qiant (2016), which focuses on the public disclosure of short selling positions, emerges that, if, for small arbitrageurs, speaking publicly is one way to resolve limit to arbitrage, because they have limited capital and cannot engage in large short positions, for hedge funds, instead, there is less concern about arbitrage limits, making public disclosures somewhat unnecessary.

2.3.2 Is communication more effective than trading strategy?

Trading strategy is combined with strategic communication not only to better transmit information into prices but also to lead to changes in the behavior of other shareholders. In line with this theory, Ian Appel and Vyacheslav Fos (2020), discovered that hedge fund campaigns are correlated with approximately the 10% increase in aggregate short interest, indicating a positive response by short sellers to the strategic communication of hedge funds. Furthermore, they identified positive correlation also with the prospect of litigation against the target companies, such as shareholder class actions.
Nevertheless, not all types of communication are equally effective and have the same impact on the market, highlighting the differences between the effects and the strat-

egy of the disclosure of positive and negative information. As many panelist have shown in their papers, when hedge funds have long positions, the type of activism they engage in is communicating privately with the management of the companies in order to share opinion about changes and improvements, and switching to public information disclosure only after failing in their purpose of driving prices up through this direct confront with the management. For short positions things are different. In fact, when hedge funds engage in short selling they are more likely to engage in public communication rather than in private one, as the latter can provide benefit to the company, improving its performance and deteriorating the probability for short sellers to make a profit.

Communication differences are not only evident from the distinction between long and short positions and positive and negative information, but also from the type of information disclosed and from whom information are disclosed, highlighting the increasingly importance of investor reputation and credibility of allegations. In fact, as already mentioned, specific allegations have more power than general claims of overvaluation, and this is further evidenced by the fact that other short sellers are more induced to follow what hedge funds do when they point out specific problems of companies. This trend is reflected in the dramatically different stocks price dynamics following the two types of allegations shown in the paper of Ian Appel and Vyacheslav Fos: with general allegations the market does not respond to them and short sellers do not pile in, whereas, when hedge funds speak into details, the market response become more negative, amplifying the short positions. Additionally, not only the stock price of the target company is affected by the announcement of a short selling campaign with specific allegations, but also the likelihood of litigations and short interest, both with an even increasing trend than otherwise experienced. To better understand this just think that specific allegations have an impact on cumulative abnormal returns of the target firm of -9% for a period that goes from 10 days before and 100 days after short position announcement, in contrast with only the -1% of the impact provoked by general allegations, which is not much different

from the effect of an increase in the short interest only.
Speaking about reputation, the authors found that hedge funds with a considerable experience, measured by the number of long campaigns in which they have engaged in, and which make use of hostile tactics are more likely to pursue active short selling campaigns, the latter doubling the former.
The opening question was if the communication, better said, the strategic communication, is more effective than the trading strategy. The answer is: they complement each other. This idea stems from the evidence that a large increase in the level of the short interest predicts a short selling campaigns and explains the possibility that investors switch to an active and more aggressive behavior when the trading strategy per se is not sufficient to transmit negative information into the price of the stock of the target firm. This incremental impact of active short selling campaigns reflects on the returns dynamics, which, as reported in the paper, suffer an impact of approximately -3.5% in a 20 day window period around announcement and -7% if the window is further extended by other 90 days after announcement.

Not in all circumstances, however, the choice of hedge funds to adopt a strategic communication and to disclose their own position works in their favor. The threat that someone could take advantage and benefit from the knowledge of which companies are the target of and are heavily shorted by hedge funds is just around the corner. As well as the threat of a consequent short squeeze. In the following chapters we will see exactly this, going into the detail of the dynamics that led to the creation of the "GameStop saga".

2.3.3 Hedge funds active short selling campaign in the GameStop saga

As previously mentioned, if on one hand the announcement of a short selling campaign facilitates short sellers by allowing them to make their bearish positions profitable, on the other hand it makes them much more vulnerable to attacks by other market participants, who, until the public disclosure, remain unaware of the

campaigns in which short sellers are engaged in. In fact, the latter, through specific techniques of placing orders, are able to dissimilar and camouflage their positions, in order to prevent the market from reacting immediately nullifying their profit attempts.

The drawback of the disclosure is what has triggered the chaos around the GME stock.

Andrew Left, the director of Citron Research, one of the major hedge fund with bearish positions in the GME stock, stumbled upon what will later be seen as an error to declare on the social network Twitter, which, moreover, is undergoing an ever increasing involvement in the dynamics of the stock markets, its negative expectations regarding the trend in the price of the stock: "Tomorrow at 11:30 EST Citron will livestream the 5 reasons GameStop $GME buyers at these levels are the suckers at this poker game. Stock back to $20 fast. We understand short interest better than you and will explain [...]" and again "[...] $GME going to $20 buy at your own risk". The first post was published on Tuesday, January 19, the second on Thursday 21. On Friday 22, the stock, with an opening price of $42.59, closed at $65.01, going in the opposite direction to that predicted by one of the most famous short sellers. Actually, not only by him. Other hedge funds, including the most involved Melvin Capital, have made use of the aforementioned magnifying power of strategic communication, disclosing negative news on the financial situation of the stock and on the future of the company. After all, these big hedge funds can't be entirely blamed. With 71.2 million of shorted shares out of 49.3, therefore equal to a short interest of 144.34% of the free float, it was nearly impossible that they could continue to leverage only the weak fundamentals of the company over the past three years. Moreover, the corporate landscape of GameStop at the beginning of 2021 was not so bad. It is true that the company had closed 2020 with losses of $464.4 million, a high figure but that, if it is considered that the losses in 2019 were $794.8 million, casts a promising light on the company and on the stock. At the end of 2020, in fact, GameStop had seen a boom in online sales of +309%, probably merit,

or cause, depends on the point of view from which you want to see the story, of the COVID-19 pandemic, which has locked up billions of young people and fans of the world of video games, the so-called gamers, in homes around the world. Another reason, more linked to fundamental and technical analysis, which explains the change in the corporate landscape of GameStop, is the arrival of the activist investor and large shareholder Ryan Cohen, a billionaire entrepreneur with the merit of having transformed the website of supplies for animals that he co-founded, Chewy, in a rapidly growing business. His interest in GameStop was driven by his idea of pushing the company into the e-commerce business by borrowing the successful model implemented for Chewy: "GameStop needs to evolve into a technology company that delights gamers and delivers exceptional digital experiences – not remain a videogame retailer that overprioritizes its brick-and-mortar footprint and stumbles around the online eco-system". In line with his beliefs, Ryan, in January 2021, accumulated a 13% stake in the company, thus obtaining, together with two of his nominees, three seats in the board, an event that led to a premarket spike of 8% on January 11.
Therefore, the recourse to a more aggressive approach by hedge funds, seems to be, also in light of what has been said about activist campaigns and disclosure of information, the wisest choice to try to chase away the unfavorable prospect that was being created on their bearish positions. But, trying to save themselves and pull water to their mill, focusing, during the first weeks of January ,in particular on the extent of losses of GameStop in 2020 in relation to the growth in sales of videogames, the hedge funds, or rather, the emission of extreme information, contributed to the creation of the perfect conditions for a short squeeze.

Now, what everyone has wondered and continues to ask is how this could have happened. How did the major hedge funds specialized in short selling, like Melvin Capital and Citron Research, make a mistake of this magnitude? After all, as mentioned above, they can rely on a group of highly skilled analysts and professionals, a

fact also pointed out by the representative of the other side of the coin, Keith Gill, during his testimony before the U.S. House of Financial Services Committee, asserting that “Hedge funds and other Wall Street firms have teams of analysts working together to compile research and analyze shares of companies. Individual investors do not have those resources”. But what really allow to get a taste of the causes that led to the defeat of the big players in suits are the words he said immediately afterwards: “Social media platforms like Reddit, YouTube and Twitter are levelling the playing field”.

But let’s proceed one step at a time, analyzing and trying to clarify what were the crucial moves and the key points of the two parties involved, hedge funds and retail investors.

3 The GameStop saga

GameStop Corp. is "a money-losing mall retailer in a dying business during a pandemic". No one can blame the vision of the Bloomberg columnist Matt Levine when describing a company that sells video games at the mall without having an online business during a deadly pandemic, and having, as a consequence, a net loss of $275 million on revenue of $5.2 billion in 2020 with a stock price that went from $62.11 in 2007 to $18.84 in December 2020. As one can expect, investors, and in particular, hedge funds, agree with him, shorting more than the GameStop entire float: short interest is 71.2 million shares out of the outstanding 49.3 million shares, that is, the 144.34%. As already seen in the previous chapter dedicated to the short selling investment strategy, shorting a stock entails borrowing shares, selling them with the promise of returning them later, paying a fee for borrowing the shares, putting up a collateral of the same value of the borrowed shares and returning them in advance if the lender asks for them back. As stock price increases significantly, short sellers get "squeezed": their borrowing costs rise, they must post additional collateral, lenders can call for their stock back and some short sellers might have to surrender buying back stocks to close their positions. A feedback loop exists: stock price goes up, short sellers give up, they buy stocks to cover short positions and the stock price goes up more. Not only short sellers push the stock price higher, but also options market makers who buy shares to hedge the call options sold on that stock. In fact, retail traders that want to gamble on a stock, can buy call options to get leveraged exposure to the stock. The number of shares needed to the option seller to hedge its exposure is the "delta", that is, the sensitivity of the option price to the stock price, or, in other words, how much the option behaves like the stock. As the stock price changes also the delta changes by the amount called "gamma", which, in fact, measures the sensitivity of the delta to the price of the stock and consequently defines of many more shares the option seller needs to buy to perfectly hedge his position as the price increases. Additionally, people with pessimistic feelings about the same stock can enter long into a put option contract, where, on the other side,

the seller, who has sold short the stocks to cover the position, needs to buy back the stocks and close its short position as soon as the price starts to rise, pushing up further the stock.

What was happened is that, in January 2021, the so called "Redditors" have decided to buy GameStop shares in bulk. How did they do it? In both the two ways mentioned above: the first one, through the direct purchase of the shares, the second one, with the acquisition of call options. Initially these investors were driven by the belief that the stock was undervalued, probably following the words of Michael Burry, a predominant figure in the 2008 crisis, the one that shorted the American real estate market. What Redditors have found afterwards, is that on some stocks there existed a short position bigger than the float: as previously mentioned, in fact, GameStop was one of them. Not surprisingly, retail investors have profited from this situation and entered very aggressively in GameStop, buying stocks and call options, forcing hedge funds with bearish positions to liquidate them and creating a short squeeze.

In addition to the short squeeze, which is nothing new among the Wall Street white-collars, the market has experienced what is called a Pump & Dump, a kind of fraudulent scheme that in the past was used through the typical telephone calls among brokers and retail investors. Through this method, which is generally used with penny stocks and cryptocurrencies, investors try to make the price of a small cap stock rise very quickly (pump) and then sell it once the maximum price is reached (dump). To set this mechanism in motion, investors buy shares in bulk and leverage the market maker: after buying a large enough number of calls to raise the price, because, as we have seen above, the seller of the call, the market maker, needs to buy a delta number of shares to cover its position, investors monetize those calls, forcing the market maker to close his hedging positions selling the shares and lowering thus their price.

On the other hand, the continuous soaring of GameStop was a contagious effect and hedge funds managers lost confidence that short positions would stop rising in value

and covered heavily shorted stocks, fearing that social-media-fueled investors would focus on companies in which they were short. Additionally, they also began selling their shares in companies, in order to reduce the risk in their portfolios, causing other investors in those firms to suffer.

From this brief explanation it is not difficult to understand that the combination of these events has created a multiplier effect that caused a rapid increase in the price of GameStop stock creating an anomalous situation and putting in crisis large investors who were short. And this squeezed investors were exactly hedge funds.

3.1 David vs Goliath: who is who

3.1.1 Hedge funds role in the GameStop saga

Certainly, after this episode, hedge funds will think very carefully before engaging in short selling campaigns and disclosing their bearish positions, as they have done with GameStop, in which they have seen an opportunity to profit from its overvalued stock stemming from an obsolete business model. In fact, betting against brick-and-mortar retailers and on their online disrupters has been a popular theme among hedge funds for years, including Melvin, which is known for its uncommon dynamic of running an expansive and aggressive short book that has sometimes made up the bulk of the gains of the fund. But the same competitive short book has driven losses recently, causing Melvin to drop by 15% in just three weeks at the beginning of 2021, due to a series of bad bearish bets on some stocks including GameStop. This bad performance of one of the most successful hedge funds in recent years highlights the significant losses suffered by short sellers in a period where major indexes have reached new record highs, underscoring a market exuberance that many traders and portfolio managers affirm they have not seen since the dot-com bubble burst 20 years ago.

As mentioned in the previous chapter, the mistake of hedge funds was to disclose extreme information about GameStop, in a desperate attempt to preserve their prof-

its. Short sellers, in fact, decide to go public with their allegations of why the stock is destined to fall in order to try to speed up the price correction process as, having to hedge their positions, they have much less control over the time horizon than their long counterparts, and therefore, by speeding up times, they try to reduce the window of exposure to the risks inherent in the short selling activity as seen in the chapter dedicated to this strategy. Whether these risks arise from a change of course in fundamentals (the company reports fundamentals that are much better than expected, becomes the target of an acquisition or gets a fresh cash infusion that gets the company out of danger) or from the opposite view of other investors, the final effect does not change: the share price rises, putting short sellers in a bad position, who, being forced to buy back shares to cover their positions, push the price up further, and, if the process gets out of control, a short squeeze is created in which short sellers panic and try to get out of their positions.

Before seeing how this process was triggered in the GameStop case and what the possible consequences have been and will be, we must first understand what were the reasons that pushed short sellers, and in particular hedge funds, to sell short the share of this brick-and-mortar retail company up to the 144.34% of the free float. To do this, it is useful to analyze the GameStop operating history.
GameStop, like all the brick-and-mortar retail companies, had a though 2020, but it has been having a tough time well before the COVID-19 pandemic, as can be sharply seen in Figure 1, where revenues and net profits started to decline as early as 2017. The latter were almost zero in 2018 and then became losses from 2019. It can be futher noticed how GameStop has already seen declining operating margins from 2016 and was shutting down stores in the years coming into 2020. The reason for this declining trend is that is has been brought sided by online retailers on one hand and online gaming platforms on the other. Hence, the company was already in trouble coming into 2020, year in which, despite the online sales surged, revenues dropped even more and GameStop was forced to close down stores, as the increase

was not enough to offset losses.

As its operating meltdown was happening, also its stock price melted down. In Figure 2 is represented the stock price of GameStop from January 2015 to December 2020. It can be seen how, starting from the end of 2015, the price fell sharply each year thorugh 2019. 2020 was an interesting year, because, even if in 2019 the stock price had been pushed down, that meltdown went into a full-fledged span, especially in the early months of the COVID-19 crisis, March, April and May, in which the stock price dropped as low as $2.80 and talks about bankruptcy started coming up because of the lease and debt payments on the 6,000 stores which forced the company to shut down some of them and made it lose money.

With this scenario there was a very real chance that GameStop will not make it and that drew in the short sellers, which, even though towards the end of 2020 the stock went up, signaling a pushback, continued to congregate in the stock, and this can be demonstrated with a very simple statistic. Figure 3 shows the total shares sold short, the free float and the short interest from 2017 to the beginning of 2021. It can be easily seen that the short interest, which is the percentage of the total shares sold to the total shares available, the free float, started, as expected, to grow in 2019, a growth that almost stabilized in 2020 and then increased further between late 2020 and early 2021, indicating that short sellers were very active in that period. In fact, Andrew Left, has not only posted on Twitter his beliefs about the future of the GME price, but, as an active short seller generally does, he had also disclosed a thesis with his allegations of overvaluation.

If he and the other short sellers were that confident about the future of the company to push the short interest so high, what went wrong? What happened? Why is this case different from other cases of short squeezes? The truth is that the game has changed in the last decade. More precisely, the people who initiate short squeezes have changed, together with the purpose.

3.1.2 From large institutional to small individual retail investors

The last paragraph ends by giving a hint on the possible causes of the defeat of short sellers, in particular of hedge funds, and on why the short squeeze of the GameStop case is different from previous ones. The cue suggests that the game has changed, that the players and their purpose have changed: if, until the last decade, it was the large institutional investors who caused short squeezes, probably guided by valuation analyses or pure economic interests, now are the small investors who, guided by the love for the companies in which they trade in or by belonging to some group that shares the same ideas and passions, are at the forefront in squeezing short sellers. In this case, however, things are still different.

The small retail investors who in the last two weeks of January 2021 decided to buy GameStop shares massively, both through the direct acquisition of the shares and through the purchase of call options, which, as previously seen, imply the purchase by the sellers of sufficient shares to hedge their positions, were not driven by a real interest in the company, but by the desire to teach hedge funds a lesson. This, in fact, according to Hasso, Müller, Pelster and Warkulat (2021), is the first case of predatory trading attributed to retail investors rather than institutional investors. Predatory trading induces and exploits the need of some investors, in this case short sellers, to reduce their positions through a forced liquidation, in this case the massive purchase of shares. The short squeeze is a perfect example of this strategy. Furthermore, it is no coincidence that there has been talk of game change, as the traders who participated in the GameStop frenzy have generally had a speculative trading past, especially in stocks with lottery-like features. The decision by these high-volatility investors to trade GameStop, therefore, reflects an attraction to gambling.

The transition from institutional investors to retail investors has certainly been facilitated by the appearance of trading platforms that ask for low, if any, commissions, allowing easy access to the stock market for a large number of novice traders, especially between 20 and 30 years old. Their young age contributed to the fact that

these traders have proven to be far less risk-averse and more active than traditional investors. This last feature, which is a possible side-effect of the pandemic, that has forced millions of people to stay locked up at home, the increased market volatility, the wide variety of stocks trading at historical low prices and the prospect of a quick recovery, are reflected in the participation of these novice investors in forums and message boards, thus managing to interact with each other, discuss investments and receive advice from more experienced investors. Their main focus, however, is detached from acting on solid financial principles and focuses more on having fun and being able to be entertained in a period of crisis such as the one that characterized 2020 and 2021. In fact, looking at Figure 4, it can be seen how high frequency trading, although it has experienced a period of growth in 2006, the year in which it became mainstream, has not substantially changed much in volume until the last year, when, from March 2020, it started to experience a dramatic growth, especially in the days characterized by the GameStop short squeeze. This spike in the volume of trades can therefore be attributed to a massive activity in the aforementioned online forums, in particular in the Reddit forum r/WallStreetBets, an activity which, as we already know, is a consequence of the restrictions caused by the COVID-19 pandemic.
As can be seen from Figure 5, during those days, in fact, there were a lot of people who started to push massively against short sellers, making the trading volume to pick up and the stock price of GameStop to climb: it went from around $20 to almost $350 in just 10 days. Hedge funds were forced to exit their positions with huge losses, suggesting that retail investors accomplished their mission to harm and kick them out of business.

Before moving on with this story, it is important to see if there was something underlying the push back on GameStop that can justify the massive increasing in the trading of its stock.

3.2 What lies beneath the GameStop frenzy?

Is GameStop a company that worth so much that short sellers screwed up? To answer this question it is appropriate to take the company as it is and to value it. For this purpose I considered the valuation created by Aswath Damodaran, represented in Figure 6. His valuation, which reflects probably the best case scenario, reveals that GameStop, in 2021, is going to come back quickly from its 2020 travails, almost reaching the 2019 revenues levels, which will continue to grow primarily because the company, thanks to the plans for its future by Ryan Cohen, is going to be able to sell more products online, pushing margins up close to where they used to be before the COVID-19 crisis. Since the core business of the company will be online, Damodaran kept the reinvestment low and, with its coming back in 2021, he got a value of $47 for the stock. It cannot be ignored that GameStop still have debt and lease payments due near term, and, based on Moody's Ba1 bond rating, Damodaran attached a 12% probability of failure. Many could believe that this last figure is too optimistic, but it is suitable for an upbeat valuation of this kind.
As can be seen from Figure 7, which represents the price of the stock based on different assumptions for revenues and margins, it is difficult to come up with a pathway that can get the stock to the prices seen in those days of frenzy.
To answer the question, the massive and fast growth of the share price of GameStop cannot therefore be considered a consequence deriving from a careful valuation of the company, however optimistic it may be. This implies that the price does not actually reflect the real value of the company, thus absolving short sellers, better said, hedge funds, from possible valuation errors.

The following question that arises spontaneously is why this happened and why right now. Basically, it was the consequence of the convergence of three forces that have been playing out in the finance world over the last decade.
The first one can be attributed to a "loss of faith in experts", as defined by Damodaran, partly due to their tendency to keep people in the dark about their work, especially

regarding the mistake they make, and partly due to the increasing availability of information, also the more technical and specific ones, which has allowed and still allows even uneducated people to specialize in almost every aspect of human activity, from finance to economics, from science to politics. Furthermore, the situation was not benefited by the numerous political failure and, as far as financial markets and banks are concerned, by the global financial crisis of 2008, which acted as a "wake-up call".

The second force concerns the fact that every disagreement, no matter what area it refers to, becomes a personal and political affair in which people take their part based on preferences or ideals, regardless of what the reality of the facts is.

The last force, which is perhaps the most important and powerful one that has allowed investors to act in unison, is precisely the membership of the aforementioned forums and message boards, which not only facilitates and accelerates the actions of the crowd, but, by making a connection with the first force, puts the judgments and knowledge of this crowd above the opinion of the experts. This is often due, and here there is the connection with the second force, to purely personal reasons or dictated by belonging to a group, but completely disconnected from objective theories and facts.

The GameStop case is therefore characterized by the convergence of these three forces: the retail investors have shown a loss of faith in experts, the hedge fund, and have decided, through their union thanks to the Reddit forum r/WallStreetBets, to give strength to and to make their ideas prevail, which, as one can understand by reading the comments on these social media platforms, are dictated by personal and political reasons, often linked to a hatred towards hedge funds and regulators, and not by reasons concerning the operations and performances of the company.

However, it now remains to understand what really drove retail investors to act as a crowd and unleash a frenzy on the GameStop stock.

Were their actions guided by the belief that the company could be worth more than

its share price told and therefore represents a good investment? Unlikely. As the valuation of the company seen above has clearly shown, even considering the most optimistic case possible, it is really difficult, if not impossible, to be able to give a financially educated explanation to such a fast and high growth in the price of the GameStop stock.
Have retail investors been driven by the belief that they can enter into a good trade? It may be that some of them thought that the excitement of the story would lead more and more people to buy GameStop shares, but this can only happen if a few people are getting out of their position and thus selling the shares. The problem, in fact, is that, in such a situation, where most people, being short, try to close their positions to limit the losses, there is the risk of being caught in a stampede.
Did the investors act in the interests of the company? It is true that, as mentioned before, the age of many of the investors who have participated in this kind of game, in addition to explaining their low risk aversion and their attitude to gambling, also makes sense to a possible emotional attachment to GameStop, which prompted these videogame enthusiasts investors to compulsively buy its shares so as not to see it go towards bankruptcy. If so, if their real purpose was to save the company, they certainly didn't choose the right way to do it. The share price has soared, it is true, but, since this growth does not change any of the business dynamics and that the real possible reason for the failure of GameStop comes from online retail and online gaming platforms, its financial position has remained and remains as precarious as it was before the frenzy. On the contrary, by pushing the stock to values such as to disproportionately increase its price, they have made it much more difficult for the company to be able to be a possible target of a possible acquisition and therefore to find the way to be able to survive as part of a larger company.
Were their actions dictated by the hatred towards Wall Street and the desire to damage hedge funds? Could be. As mentioned before, experts are no longer seen as powerful and mysterious figures capable of who knows what magic, rather the mistakes they made in the past radically changed their reputation. Moreover, both

short sellers and hedge funds, which are seen as fee-earning machines run by enriched managers who bring nothing on the investment table, are frowned upon and certainly do not enjoy a good position within social ideology. It must be said, though, that carring two or three hedge funds out of the game does not cause major damage to the business, much less to Wall Street. In fact, after losing 53% on its investment in January 2021, the hedge fund Melvin Capital saw $2.75 billion of emergency financing injected from Point72 Asset Management, Citadel LLC and its partners. Therefore, the biggest threat to hedge funds is not a group of young amateur retail investors, but rather their own performance. In the last decade, in fact, hedge funds have not exactly reflected what was said earlier in the chapter dedicated to them: they did not implement particular investment strategies to make tons of money and beat the rest of the market, but rather underperformed it, bleeding money out to passive vehicles like ETFs and index funds.
So, what was the real goal of this "game"? The reality is that there was no real reason for this frenzy. The combination of the aforementioned factors certainly contributed to this, but what lies behind this sudden swelling of the GameStop share price seems to be a real Pump & Dump scheme.

3.2.1 The Pump & Dump scheme: a new form of entertainment or a pure fraud?

The Pump & Dump technique, which seems to have become the new favorite form of entertainment, especially in the cryptocurrency market, for this new era of young retail investors with gambling attitude, represents in effect a market manipulation scheme. This technique, or rather type of fraud, consists in artificially raising the price of a small cap stock, such as that of GameStop, with the ultimate goal of selling the shares purchased before the "pump" to a higher price. Although it has become mainstream especially in the last period, this technique has been also implemented in the past, the difference lies in the methodology through which it is carried out. In fact, if initially investors were reached through phone calls, be-

fore, and emails, later, now things have become even more fast and easy thanks to the already seen forums and message boards, which, as mentioned above, allow to group and connect an ever-increasing number of users from all over the world in a few seconds. The "game" works as follows. The organizers of the fraud, the so-called "whales" in the cryptocurrency market because they possess rich wallets and are therefore able to manipulate the market with their moves, communicate to the users subscribed to forums or message boards that, on a certain date and time, there will be the implementation of the "pump", thus inviting everyone to be ready in such a way as to be able to make "easy" profits. What they do not say, however, is which stock will be involved, which is not surprising considering that, if they reveal it in advance, everyone would try to buy it as soon as possible to increase their profit, undermining the profit target of the organizers, which, as one can easily understand, is based on a fraud, on the exploitation of other, more unwary, investors. In fact, the organizers of the Pump & Dump, by purchasing the shares in advance, gain the most profit from this scheme, while the other investors, exploited to disproportionately pump the share price up, buying late when the price is already on the way to its peak, manage to earn very little, or, in almost most cases, suffer losses due to the closing of positions by the "scammers", a maneuver that causes the cascade closure of the positions of all the other investors, causing the price to fall, the "dump", in a few seconds.

Analyzing the GameStop price chart, Figure 8, it can be clearly seen how it began to grow almost gradually from January 12, 2021, and then experienced a dizzying growth, going from a closing price of $76.79 on January 25, to one of $147.98 on the 26th, reaching a closing price of $347.51 on the 27th. This runaway growth seems to represent the first part, the "pump" of the Pump & Dump scheme. Subsequently, according to the latter, as can be seen from the chart, on January 28, the share price fell as fast as the growth of the previous day, going from a closing price of $347.51 to one of $193.6 in 24 hours: the "dump". But it is not ended here, because, looking at the graph, it can be noticed the presence of a second spike. The day following the

"dump", in fact, on January 29, the stock underwent what appears to be a second "pump", reaching a closing price of $325, and then falling again from the next day, following once again the dynamics of this fraudulent strategy.
The frenzy that characterized the GameStop stock in those days of January can therefore be associated with a real case of Pump & Dump. This theory is further supported by the messages of mutual incitement not to give up, also containing a hint of fun, which not only filled the Reddit forum, but also depopulated on other social media platforms such as Twitter: "Do not sell! Keep buying even at $400 we set the price as long as we keep buying and holding. Do not sell! Buy GME!", "Just bought more, lets go", "Keep buying", and so on. It is no coincidence, in fact, that the Wall Street Journal has defined these young retail investors as "an army of single bullish traders who exhorted each other".
It must be said, however, that this case of Pump & Dump is different from those that usually take place in the cryptocurrency market. If the mechanism is the same, that is to pump, thanks to the fraudulent involvement of many investors, the price of a small cap stock and then close the position at the price peak to make the most profit possible, what changes is the timing. To understand this, just compare the graph of the trend of GameStop, Figure 8, with that of the cryptocurrency Viacoin, Figure 9. At first glance the two graphs look similar, showing the same characteristic pattern of a Pump & Dump: a steep rise in price followed by an equally steep descent. The difference lies in the speed with which these two phases take place: in the case of the cryptocurrency, in fact, both the appreciation and the depreciation take place within a few minutes; in the case of GameStop, on the other hand, the ascent and the descent of the price have a much longer timeframe, in fact, as seen above, the change in the price trend occurs from one day to the next and then even repeats itself in the following days. What does this difference mean? The speed of the Viacoin Pump & Dump, which can also be observed in the analysis of the price trend of other cryptocurrencies, is an intrinsic characteristic of this technique, as allows the organizers to act in such a way as not to leave time for other investors to

close their position in profit. With the GameStop case, on the other hand, thanks to the prolonged duration of both the "pump" and the "dump", if an investor had closed the position late with respect to the organizers, he, or she, would still have managed to make a good trade. In fact, as has been read on social platforms and newspapers, thousands of small retail investors have managed to make big gains. Furthermore, the sharp decline in the stock price is attributable not only to the joint closure of positions in the attempt of implementing the "dump", but also to the halt of operations by the most involved online broker, Robinhood, a move that clearly killed the momentum of this stock, halting its climb and cutting the profits of investors, but, looking at the situation from another point of view, limiting the wounds that hedge funds were suffering.

Making a brief digression, this move by Robinhood was indeed perceived as an act of power by Citadel Securities, the Wall Street giant that manages about 25% of all US stock trading and main partner of Robinhood, not only by the layman public, but also by the Congress, fueling allegations that Robinhood changed its trading rules to favor its large Wall Street clients, who, as already seen, were certainly not in a good position with respect to the rise in GameStop shares. Thus, Vlad Tenev, the 34-year-old founder of Robinhood, came under pressure in Congress, in which he was pressed by Democratic and Republican deputies, and in particular by the head of the Financial Services Committee, Maxime Waters, who asked for an explanation on the temporary limits on GameStop purchases imposed in those days. In response to accusations of favoritism, Tenev justified trade restrictions as decisions necessary to respond to the increased demand for collateral from the authorities, and not to favor hedge funds at the expense of retail investors.
This incident has also contributed to the creation of fertile ground to compare the GameStop saga to the myth of David against Goliath, but, as we all know, media must sell stories, trying to make their readers identify with them in order to build a viral narrative. The reality, in fact, as Tenev also reiterated, is a little bit differ-

ent. First of all it is important to consider that Robinhood, as every broker, has a reputation risk, in that it tries to avoid that its platform is used in a speculative manner to the point of creating systemic problems in the market and market manipulation. On the other hand, there also are operational risks involved in the brokerage practice, in that high volume trades can create cash problems and force the broker firm to behave like Robinhood did. In fact, a broker, like Robinhood, is required from the Depositary Trust and Clearing Corporation, which manages the clearinghouses, to maintain a minimum cash collateral with the clearinghouse before the trade is executed. The cash requirement is higher during period of high volatility due to the possible existence of systemic problems. In this regard, during the GameStop phenomenon, Robinhood, which was no more able to post collaterals with the clearinghouse, was forced to recapitalize for $1 billion and to apply for $600 million line of credit from Goldman Sachs and J.P. Morgan. Another aspect to take into consideration is that the broker has the right to manage the risk of the more vulnerable investors, limiting the transactions of those clients that are using too much leverage in order to avoid unpleasant events, like the one occurred in 2020 when a Redditor kills himself for having loose $730 thousand in a naked option. Additionally, for a broker, it is very important to stay away from regulatory inquiries by the SEC: already in December 2020 Robinhood had to pay $65 million, and the last thing it wanted was to have problem with the SEC.
So, the "restrictive" behavior of Robinhood was nothing but in line with the management policies of a broker that must protect itself and its traders. Furthermore, in support to this, both Citadel and Melvin Capital distanced themselves from the decisions of the trading platform, emphasizing the absence of favoritism: "We had no role in trading limits", said Kenneth Griffin, CEO of Citadel; "We played no role in trading decisions", said Gabriel Plotkin, CEO of Melvin, adding that "our moves are not conducted to manipulate the market".

Bringing back the attention to the initial focus, that is to the diversity of the Pump

& Dump of GameStop compared to those observable in cryptocurrencies, now it remains to understand what this difference is due to. The most plausible hypothesis is that, in this case, the choice to appreciate the shares of GameStop was not engineered by few powerful investors, but rather orchestrated unanimously by all retail investors, who, as seen above, thanks to their union through the Reddit forum, managed to move the price of the stock significantly. Whether they have been driven by hatred towards hedge funds and towards Wall Street, by a passion for videogames, by a nostalgic feeling towards the company, by faith in the projects of Ryan Cohen or simply by the search for something exciting to break the boredom and the monotony that came with the pandemic, it seems that these traders have all agreed, that they all, or at least many, have been whales, an hypothesis in line with what was discussed above regarding the messages of exhortation not to give up that crowded the web during those days.

Therefore, we cannot speak of a fraudulent attitude of a few to the detriment of many, but the fact remains that it was a fraudulent attitude of many, the retail investors, to the detriment of a few, the hedge funds and the part of retail investors who did not well understood what was happening but that they had decided to ride the wave of what appeared to be easy money anyway. Not least, there has been market manipulation, and, whenever there are people who buy a block of shares and advertise that stock as absolutely wonderful for the purpose of manipulating the market, it is referred to as violation of securities laws. In fact, even if it has not yet been officially labeled as a scam by regulators like the SEC, this affair has certainly piqued the interest of politicians and lawmakers, leading to the aforementioned congressional hearing. In front of the Financial Services Committee, in fact, not only Robinhood, Citadel Securities and Melvin Capital, the big ones in the situation, have paraded, but also the representatives of the small ones, the retail investors, with Steve Huffman, CEO of Reddit, on one hand, and, on the other, Keith Gill, aka “Roaring Kitty”, the youtuber behind the boom of GameStop, main promoter of the short squeeze.

The story has also aroused the comments of many experts and high-level politicians, including the Massachusetts Attorney General, William Galvin, who, carefully examining the situation, called for GameStop trading to stop, and the White House, the whose press secretary said the administration was concerned about the integrity of the market. Moreover, they find it appropriate, if not necessary, to review and refine the functioning of the stock market, as they see the dizzying rise of GameStop shares not as an isolated case.

3.3 Is GameStop a one-time case?

GameStop case may be seen as an anomaly, but in reality it is more likely to be the first wake-up call of what could turn out to be a radical transformation of money and markets. Starting from January, in fact, retail investors have used the strength of their union, obtained thanks to Reddit and other social platforms, not only to pile up in the stock of GameStop, but also in the shares of other companies that, commonly to the brick-and-mortar videogame retailer, they were heavily shorted by hedge funds and other institutional investors or had a low free float. Among these stocks, called "meme stocks" because they are valued for their popularity on social media rather than for their operational performance, the ones that stand out most for making a lot of young investors millionaires in 2021 are those of Takung Art and AMC Entertainment.

Takung Art Co., Ltd., based in Hong Kong, operates an online platform that brings together artists, art dealers and art investors to trade precious works of art mainly in the People's Republic of China. As can be seen from the graph in Figure 10, its shares, although they started to rise as early as January and February 2021, have really experienced the frenzy of retail investors starting from mid-March. As of June 11, 2021, in fact, Takung Art shares have performed at their best on an annual basis, with a price performance of 1,179.73% YTD, higher than the one of GameStop, which was 1,069.80%. If, however, retail investors were attracted to GameStop for its high short interest, what drove them towards Takung Art was

its low float, with only 9.3 million shares available to be traded. Part of the price increase can be attributed to speculation regarding the interest of the company in non-fungible tokens, the NFTs, an interest, however, never declared by Takung Art, but on which retail investors have pushed a lot in forums and message boards. As with GameStop, therefore, even the frenzy for the stock of Takung Art seems to be groundless, a thesis further supported by the fact that the operating model of the company has been in decline for years, with 2020 revenues that have not even managed to reach those made in a single quarter of 2016.
Moving to AMC Entertainment the story does not change that much. The stock of the movie theater chain has in fact risen by 1,919.34% YTD as of June 11, 2021, outperforming both GameStop and Takung Art, Figure 11, attracting the attention of retail investors towards the end of January thanks to its high short interest, and then experiencing a real frenzy, nearly doubling in late May. Its short interest is not the only point in common with GameStop: with over $4 billion in net debt, bankruptcy, only a few days away, seemed to be his only fate, but, unlike GameStop and other meme stocks, AMC was unable to raise enough capital to find itself on net cash positions, not to mention the $473 million in deferred rent obligations that not even a return of the business to pre-pandemic levels would be able to cover.
As AMC Entertainment, also GameStop has experienced, from the end of May, a second wave of enthusiasm from retail investors that has also involved other meme stocks such as Bed, Bath & Beyond, Express and BlackBerry, Figure 12, which were widely discussed on Reddit and on other social media platforms from the beginning of this phenomenon. In fact, looking at the chart, it can be clearly seen how these stocks have all followed pretty much the same price movement starting from January 2021.

GameStop, Takung Art, AMC Entertainment and the other meme stocks show us, therefore, that retail investors have no intention to play by the rules neither to leave the market, so much so that some traders have compared the recent market turmoil

to March 2020 or autumn 2008, but, in this case, it can happen at any time, as the price history of the stocks shows us. Additionally, a study conducted by Deutsche Bank after the first round of price hikes at the beginning of the year, reports that the majority of the surveyed retail investors has the intention to continue to invest, and possibly invest more, when the pandemic will be over. “The retail rally is real. And it’s not going away”.

Conclusions

In the last chapter we saw how GameStop cannot be considered a one-of-a-kind case, not only because it is not the only stock to have been targeted by the frenzy of retail investors, but also, and above all, because the latter have demonstrated not planning to stop, even when the world is back to pre-pandemic normalcy. And it is this last feature that makes the turmoil created in the financial markets by this new phenomenon different from previous crises.

The novelty, in fact, is that now non-institutional investors, thanks to the platforms such as Reddit and WallStreetBets, can come together and act as a force without any specific reason linked to financial valuations and fundamentals. This is something that no institution, no hedge fund, no mutual fund can do because that would be collusion. It turns out that retail investors are able to communicate and cooperate with an incredible strength resulting in a new force in the market that has to be record with and for which the possible need for a regulation is being considered.

Both the world of finance and that of politics have proposed to review and refine the mechanisms of the markets and to regulate the activities of online brokers, which, as we have seen, with their low or even no commission fees, facilitate the operations by small retail investors. Even white-collar workers on Wall Street, those who until now have always tried to avoid and circumvent any attempt to regulate trading operations, have expressed their consent to greater control of their new enemies. In fact, GameStop short squeeze has certainly served hedge funds to learn that, from now on, when they decide to take bearish positions on some stocks, they will have to conduct more in-depth research to understand if, on that stock, there is the possibility that there may be a feeling of nostalgia or of belonging that could trigger the support of some group of investors or if retail investors may decide to spend their time gambling or investing just for fun in that stock. In other words, they have to deal with the growth of a new power in the market, a market in which investors with large capital, high degree of experience and equipped with the most sophisticated technology have always been the masters.

A question arises spontaneously: could the GameStop saga, and, more generally, this new crowd of investors, who are able to accumulate a large number of shares so as to put some of the largest hedge funds in difficulty without the use of any financially educated strategy but only thanks to social media platforms such as Reddit, democratize the market? Who knows, but certainly this episode, even if it is now an understatement to call it like that, taught everyone something.

First of all, it is the demonstration of how the world of investments and, more generally, the financial market, has undergone a major change, especially in the last decade. If, before, to become part of this world, it was necessary to have a certain level of education and experience, now, access is allowed to the vast majority of people, thanks to the increasingly easy accessibility to data and information and to the high availability of online trading platforms and technological tools. Therefore, those who until recently were considered the greats of finance, now have to deal with a new presence in the market, a presence that has proved to be uncomfortable due to its unpredictability and lack of formal structure: portfolio managers are no longer dictating market movements and will likely be forced to follow or at least consider what retail investors do. However, what has most amazed and what gives more to think about is the total lack of financial logic in the moves of retail investors. If, on the one hand, there are professionals, institutional investors, whose skills rely on in-depth research and analysis, on the other hand, there is a mass of amateur investors, who, in most cases, act as instinct, as in gambling, or as a consequence of belonging to some social media group led by a belief that has little to do with the fundamentals of finance.

Is a stock becoming a way to be part of a club? Is a stock becoming a way to have fun? If yes, the stock takes value beyond and unrelated to the cash flows of the company, just as gambling has value, and it provides entertainment for which people are willing to pay. So, now, the price of a share, which is determined by the mood of retail investors, by the momentum and by fraudulent trading strategies that have the sole purpose of manipulating the market, is even more detached from

the real value, which, instead, refers to what companies are and what their business is. And, taking a long-term view, this growing difference causes, in turn, the growth of arbitrage opportunities.

By broadening the perspective and taking into consideration the market in general, can all this have harmful consequences on it? Difficult to say, it is still too early, but, certainly, it must be taken into account that such events have quite a few repercussions on what investors think of the market, perhaps weakening the confidence they have in it, leading them to request an higher equity risk premium, which reflects precisely the feelings that investors have about the market and the future. Last but not least, it must be considered that hedge funds could implement a reversal with regard to activist short selling campaigns, which, carrying out the aim of lowering the price of shares sold short through the disclosure of general or specific allegations against companies, inevitably reveal the identity of the bearish positions of hedge funds, risking to capture the attention of retail investors and thus obtaining the opposite effect to the desired one.

To conclude, I do not think that we should look at this phenomenon in a totally negative way, but that it should be taken as a signal of a new presence on the market and that, above all, it should not be underestimated, as Wall Street professionals, including hedge funds, have been doing until now, labeling individual investors as "dumb money", deeming them lacking the wit and experience needed to make the right moves, especially in turbulent times.

Whether this new group is liked or not, it is still right to respect it, and, the main and fundamental thing, is to start accepting a possible democratization of the market, because money and markets are changing and market participants and regulations must change with them.

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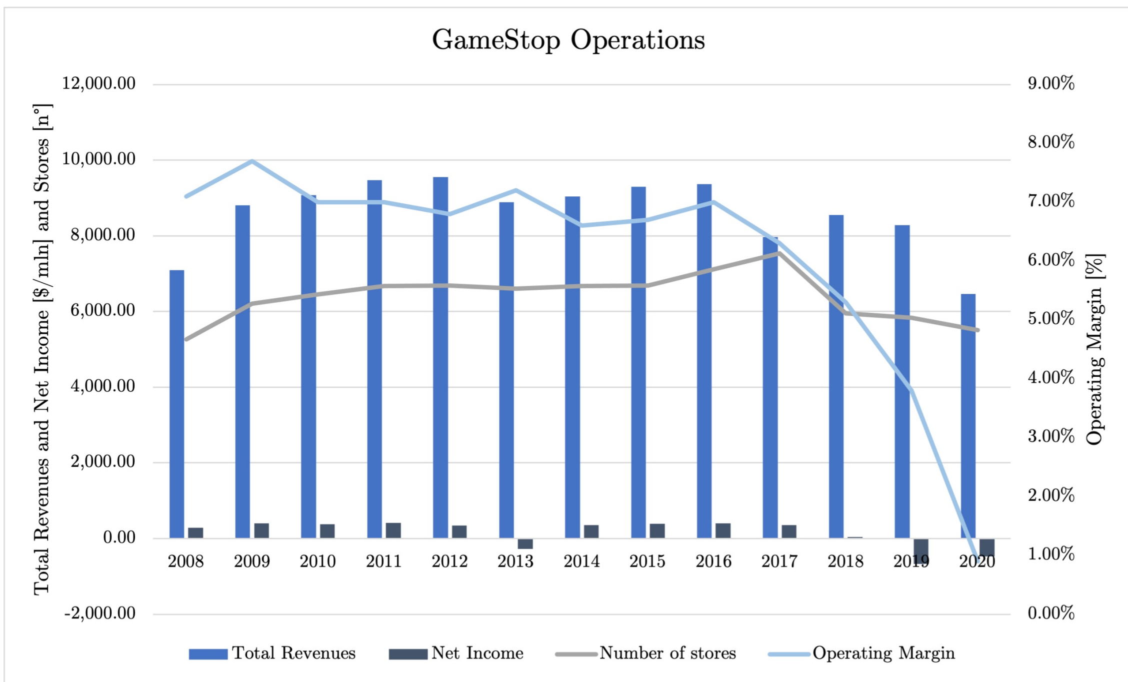

Figure 1: GameStop operting history from 2008 to 2020 (source: Refinitiv data)

Figure 2: GameStop stock price history from January 2015 to December 2020 (source: Refinitiv data)

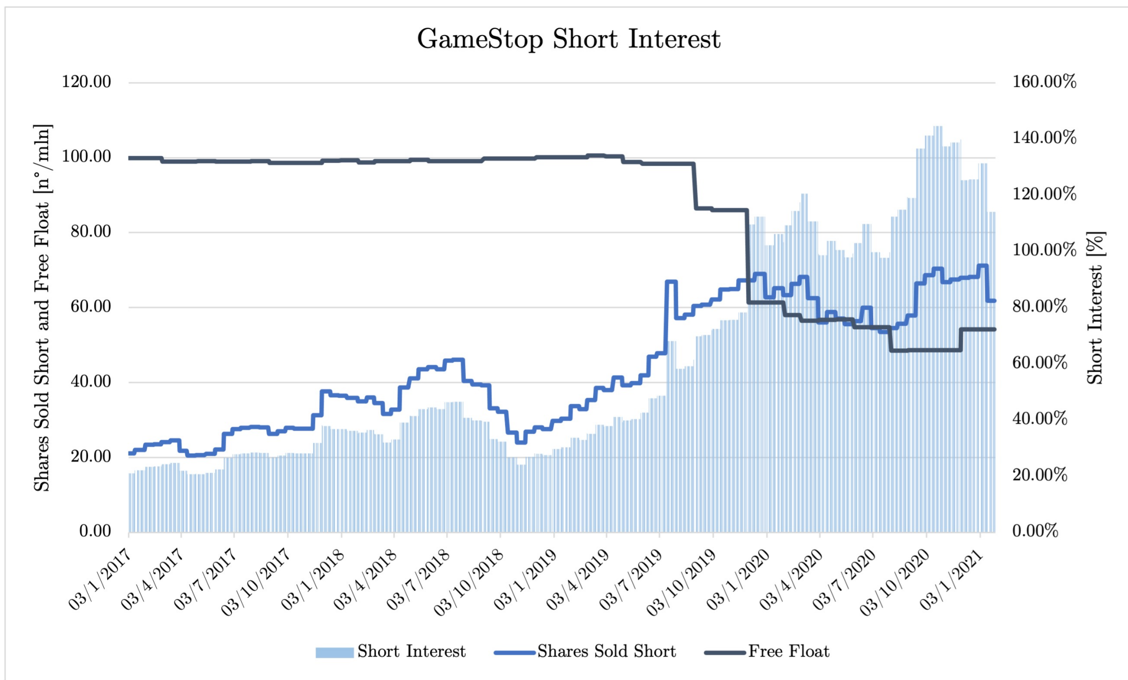

Figure 3: GameStop total shares sold short, free float and short interest from 2017 to January 2021 (source: Refinitiv data)

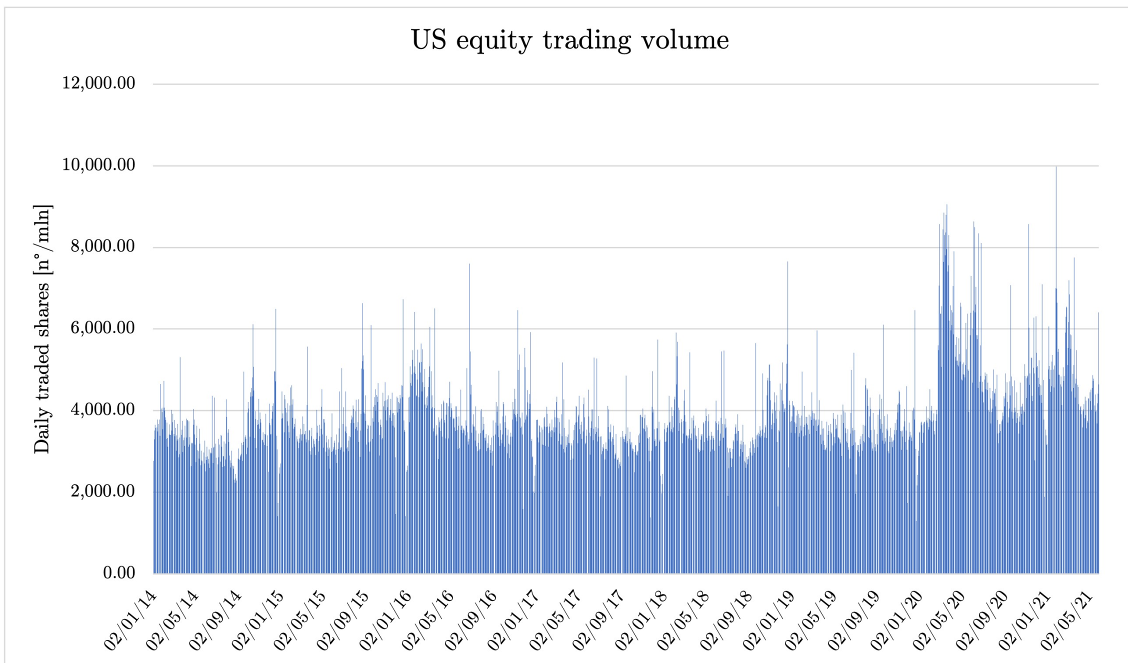

Figure 4: US total equity trading volume from January 2014 to May 2021 (source: Cboe data)

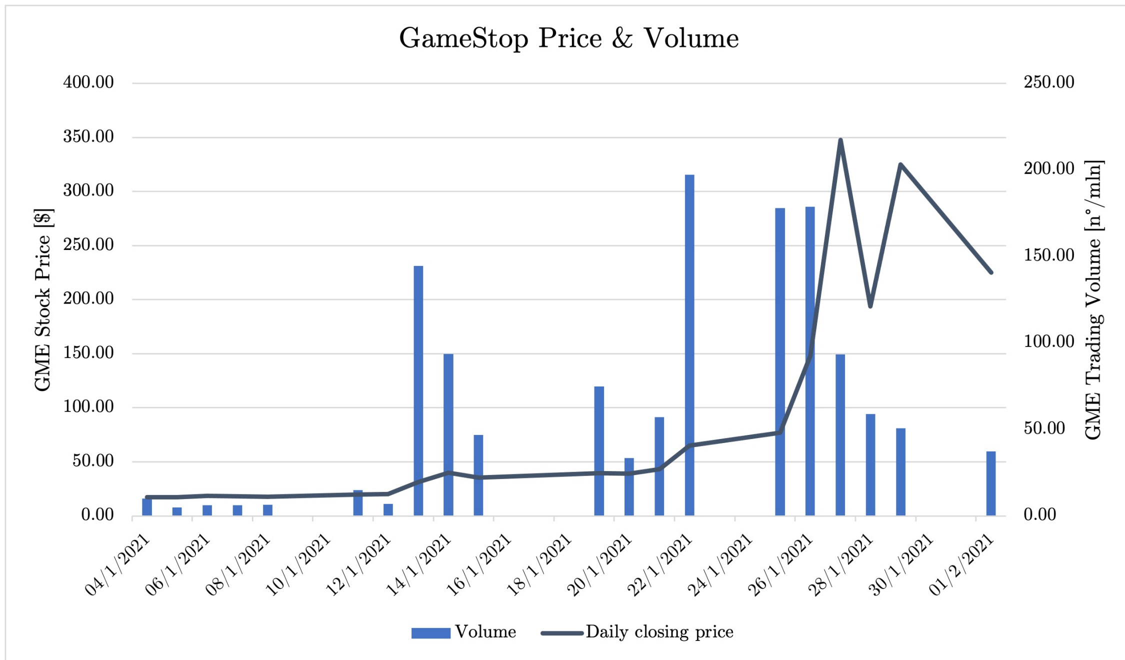

Figure 5: GameStop stock prices and trading volume in January 2021 (source: Refinitiv data)

GameStop: A Best Case Scenario?

The Story

Like other brick and mortar companies, GameStop struggled with the COVID shutdown, with a surge in online sales not offsetting the lost sales from closed stores. However, the company's troubles predate 2020, with revenues dropping and stores being closed for much of the prior five years, and operating margins dropping down to close to nothing. In thia valuation, I look at a an upbeat and perhaps close to best-case valuation of the company, with sales recovering quickly in 2021 to close to 2019 levels, and subsequent growth primarily in online sales more than making up for fewer stores. In addition, I assume that the company's margins will move towards the online retail average, and that the ratings agencies' assessment of their bankruptcy risk (which is viewed by some as over optimistic) are correct (the Ba1 rating drives the risk of failure).

The Assumptions

	Base year	*In 2021*	*Years 2-5*	*Years 6-10*	*After year 10*	*Link to story*
Revenues (a)	$ 5,162	15.0%	3.00% →	2.00%	2.00%	Quicky 2021 recovery + Growth to pre-crisis revenues
Operating margin (b)	-4.20%	2.0%	2.00% →	5.74%	5.74%	Move towards online retail margins
Tax rate	25.00%		25.00% →	25.00%	25.00%	NOL of $730 million buffers tax impac
Reinvestment (c)		Sales to Capital =	4.96		29.76%	Net decrease in stores, more tech investment
Return on capital	-20.80%	Marginal ROIC =	136.16%		6.72%	Margin expansion and stagnant revenues
Cost of capital (d)			6.23% →	6.72%	6.72%	Cost of capital relatively stable, but failure probability based on Ba1 bond rating

The Cash Flows

	Revenues	*Operating Margin*	*EBIT*	*EBIT (1-t)*	*Reinvestment*	*FCFF*
1	$ 5,936	2.00%	$ 119	$ 119	$ 156	$ (37)
2	$ 6,114	3.50%	$ 214	$ 214	$ 36	$ 178
3	$ 6,298	4.24%	$ 267	$ 267	$ 37	$ 230
4	$ 6,487	4.99%	$ 324	$ 276	$ 38	$ 238
5	$ 6,681	5.74%	$ 384	$ 288	$ 39	$ 248
6	$ 6,868	5.74%	$ 394	$ 296	$ 38	$ 258
7	$ 7,047	5.74%	$ 404	$ 303	$ 36	$ 267
8	$ 7,216	5.74%	$ 414	$ 311	$ 34	$ 277
9	$ 7,375	5.74%	$ 423	$ 317	$ 32	$ 285
10	$ 7,522	5.74%	$ 432	$ 324	$ 30	$ 294
Terminal year	$ 7,673	5.74%	$ 440	$ 330	$ 98	$ 232

The Value

Terminal value	$ 4,915	
PV(Terminal value)	$ 2,649	
PV (CF over next 10 years)	$ 1,531	
Value of operating assets =	$ 4,180	
Adjustment for distress	$ 401	Probability of failure = 12.00%
- Debt & Minority Interests	$ 1,155	*Based on Ba1 rating from Moody's*
+ Cash & Other Non-operating assets	$ 446	
Value of equity	$ 3,069	
- Value of equity options	$ -	
Number of shares	65.10	
Value per share	$ 47.14	Stock was trading at = $240.00 (January 21, 2021)

Figure 6: GameStop valuation (source: Damodaran data)

GameStop: Value per Share today		Revenues in 2031 [bln] (Revenues in 2020 = $5.2 bln)			
		$ 5.00	$ 7.50	$ 10.00	$ 12.50
Operating margin in 2031	2.50%	$ 11.78	$ 14.44	$ 17.07	$ 19.71
	5.00%	$ 29.82	$ 40.14	$ 50.43	$ 60.84
	7.50%	$ 47.79	$ 65.79	$ 83.76	$ 101.94
	10.00%	$ 65.76	$ 91.44	$ 117.07	$ 143.02

Figure 7: GameStop sensitivity analysis (source: Damodaran data)

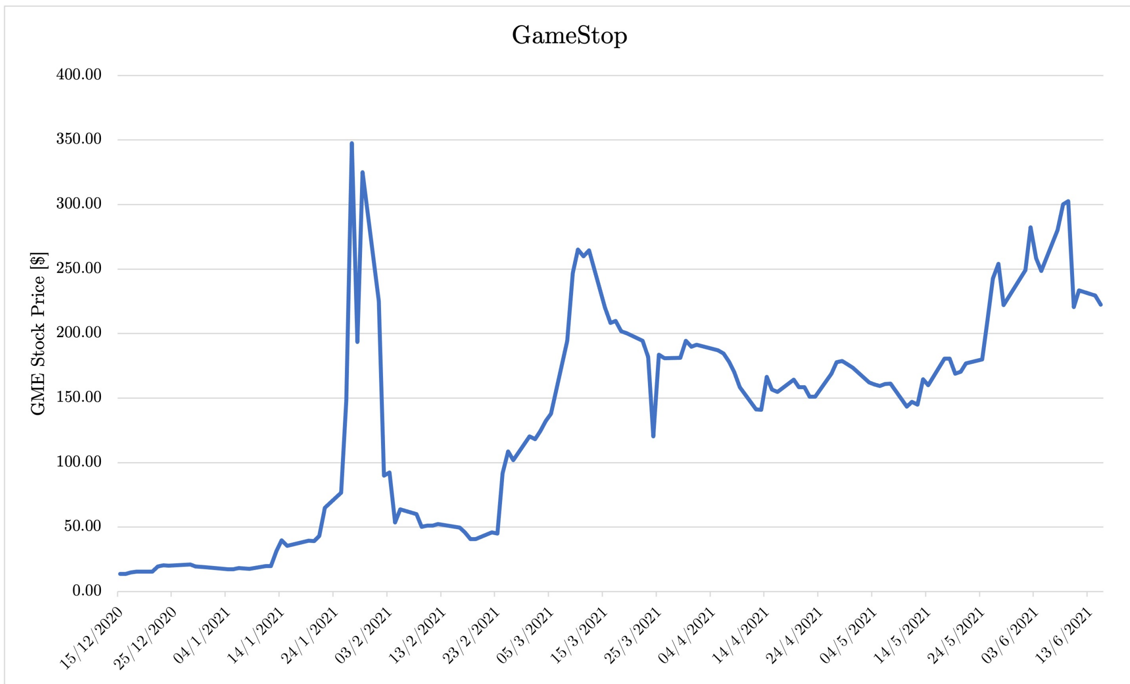

Figure 8: GameStop stock price history from mid-December 2020 to mid-June 2021 (source: Refinitiv data)

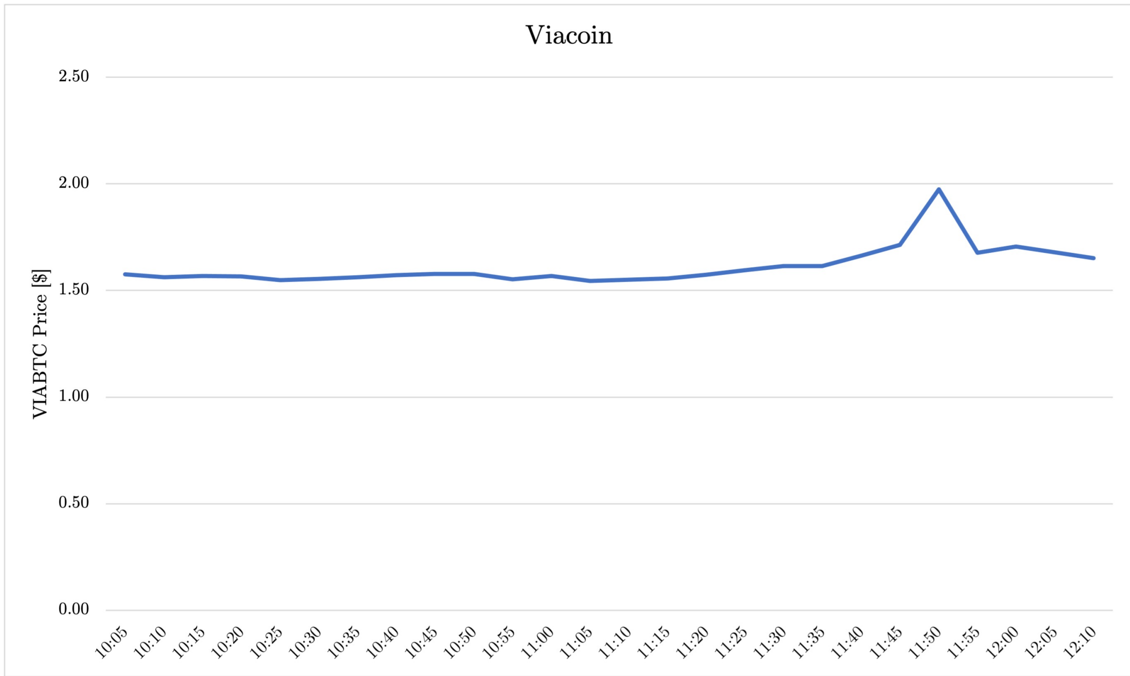

Figure 9: Viacoin Pump & Dump example on April 23, 2021 (source: TradingView data)

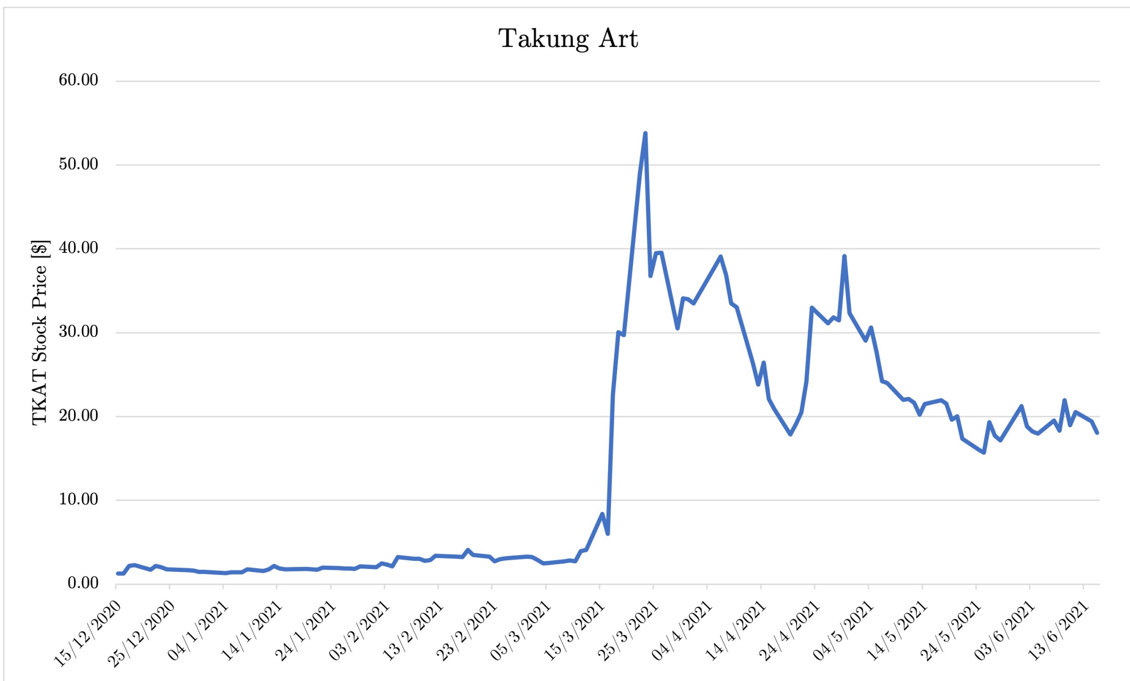

Figure 10: Takung Art stock price history from mid-December 2020 to mid-June 2021 (source: Refinitiv data)

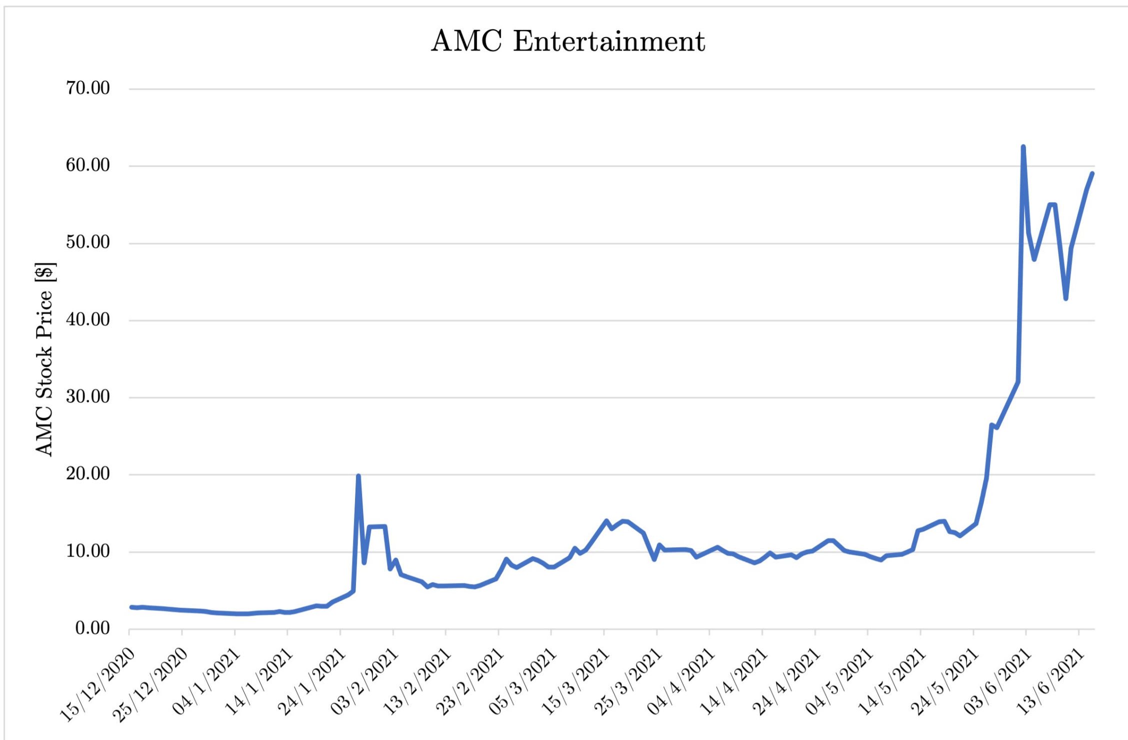

Figure 11: AMC Entertainment stock price history from mid-December 2020 to mid-June 2021 (source: Refinitiv data)

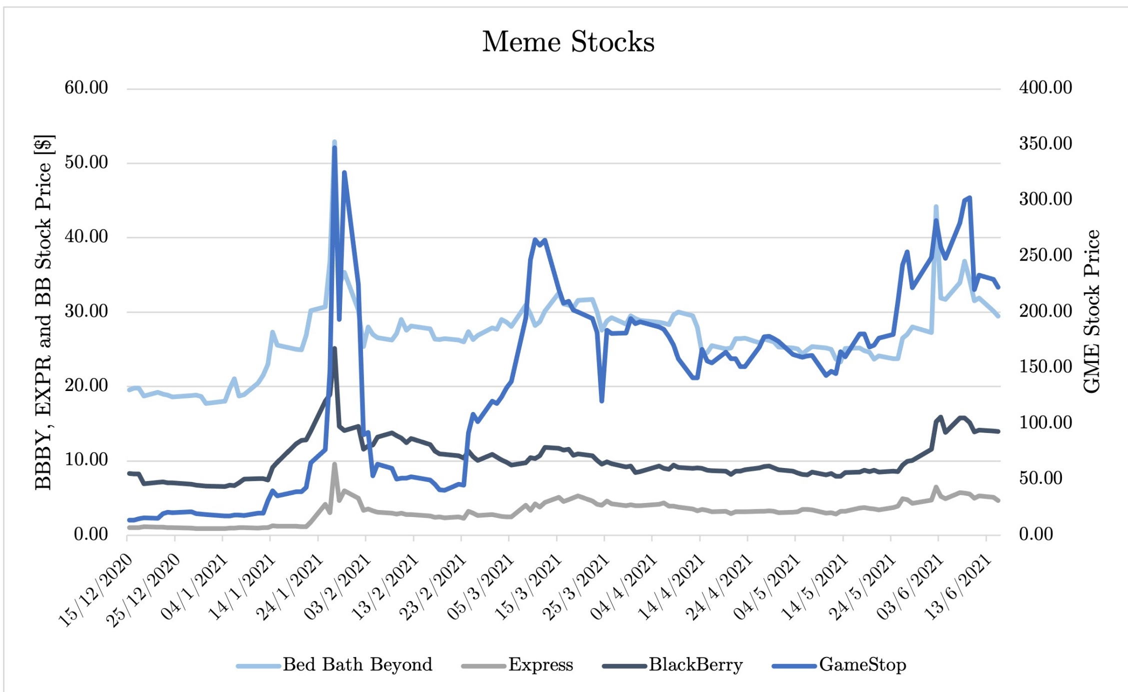

Figure 12: Bed, Bath & Beyond, Express, BlackBerry and GameStop stock price history from mid-December 2020 to mid-June 2021 (source: Refinitiv data)

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