An exploratory study on the impact of the COVID-19 confinement on the financial behavior of individual investors

Randy Priem[*]

February 2021

Abstract:

This article explores the impact of the COVID-19 lockdown in Belgium on the financial behavior of individual investors. Specifically, the article is the first to examine whether exceptional market circumstances have induced individual investors to increase their equity positions. Using a proprietary database of almost 6,5 million individual investor transactions, this article shows that most individuals used a contrarian strategy thereby buying shares when stock prices are falling. Especially investors between 18 and 35 years old and those being less experienced are found to increase their equity positions compared to other age and experience categories. Male investors seem to dominate equity markets in Belgium, even during the COVID-19 confinement period, and they increased their equity positions more in comparison to women. The patterns documented in this article are robust for the shares being constituents of the main Belgian equity index (i.e. Bel 20), for all listed shares on Euronext Brussels, and for small caps.

Keywords: individual investors, investment strategy, equity investments, COVID-19,

behavioral finance, MiFIR

JEL classification: D53, E22, E32, E44, G01, G41

1.   Introduction

In December 2019, China alerted the World Health Organization (WHO) of having around 40 cases of pneumonia in Wuhan where the infected worked at the city's Huanan Seafood Wholesale Market. Chinese officials could rule out the possibility that there was a recurrence of the severe accurate respiratory syndrome (SARS) and declared the virus as being novel. On 11 March 2020, the WHO officially declared the COVID-19 virus outbreak to be a global pandemic. At the beginning of October 2020, COVID-19 resulted in more than 36 million confirmed cases including more than a million deaths. The virus has kept millions of people in their homes, given that the large majority of countries installed travel restrictions, lock-downs, and social distancing measures to hold back the virus until a vaccine is found.

In addition to the negative impact on people's health and psychological well-being, the virus has negatively affected the global economy, leading to an increase in unemployment and business failures (Zhang et al. 2020). Certain sectors, like tourism and culture, have been facing very difficult times. Already from the onset of the virus, Japan's economy minister warned that corporate profits and factory production would be globally hit due to the coronavirus outbreak.[1] On 20 March 2020, Goldman Sachs warned that the US GDP would decrease by almost 30% by the end of the 2nd quarter of 2020 and that the virus would lead to an increase in unemployment by 9%.[2] Scott Morrisson, the prime minister of Australia, compared the COVID-19 crisis as equivalent to the Great Depression of the 1930s.[3]

Besides having a negative impact on the real economy, COVID-19 has dramatically affected financial markets all over the world. From 24 to 28 February 2020, The Down Jones

---

[1] See https://www.aljazeera.com/ajimpact/japan-warns-risks-economy-china-virusoutbreak-200128060208542.html

[2] See https://markets.businessinsider.com/news/stocks/us-gdp-drop-record-2q-amid-coronavirus-goldman-sachs-2020-3-1029018308.

[3] See https://www.straitstimes.com/business/economy/echoes-of-great-depression-as-australian-jobless-queue-for-help

Industrial Average, the Nasdaq Composite, and the S&P 500 index reported their largest one-week declines since the 2008 financial crisis. The FTSE, the UK's main index, dropped more than 10% on 12 March 2002, being its worst day since 1987.[4] Japan's stock market decreased by more than 20% from its highest position in December 2019.[5] Also in Continental Europe, equity indices fell sharply: the German Dax, the French CAC 40, and the Spanish IBEX 35 all crashed substantially. Also in Belgium, the BEL 20, being the leading equity index, faced the largest decrease in its existence (i.e. -14,21%). As central banks started taking actions[6] and pharmaceutical companies started working on coronavirus vaccines, stock prices started to rise again but did not fully recover yet. Stock markets have been deviating thus somewhat from the negative real economic situation, especially for SMEs.

In Belgium, the media issued press releases stating that individual investors were exceptionally active in financial markets. Based on an initial survey conducted by a Belgian newspaper (De Tijd), the reason is that individual investors wanted to benefit from the exceptional low stock prices and thus considered the stock market crash as an opportunity to invest. From the end of February 2020 till April 2020, many individuals also had the time to invest, as they were temporarily unemployed or were forced to work from home.[7] Many Belgian online brokers, like BinckBank, Bolero, and Keytrade witnessed a large increase in their number of clients, and the Dutch broker DeGiro, often used by Belgian individuals, even needed

---

[4] See https://www.bbc.com/news/business-51829852.

[5] See https://www.bloomberg.com/news/articles/2020-03-09/perfect-storm-is-plunging-asia-stocks-to-bear-markets-one-by-one.

[6] Where the European Central bank (ECB) initially decided not to cut interest rates despite market expectations, they increased their asset purchases by 120 billion EUR and announced an additional 750 billion EUR in open market purchases of government bonds.

[7] See https://kanaalz.knack.be/nieuws/kleine-beleggers-uitzonderlijk-actief-op-de-beurs/video-normal-1599825.html and https://www.tijd.be/markten-live/nieuws/algemeen/beleggers-zien-koopkansen-na-forse-beursdaling/10218972.html. Since March 2020, the Belgian government namely decided to introduce lock-down measures, such as the closing of pubs and restaurants, which resulted in a confinement from 17 March 2020 onwards. On 24 April 2020, the Belgian government decided to phase out the lock-down decisions with shops being re-opened on 6 May 2020. Similar measures were taken all over Europe.

to introduce a waiting list.[8] The low-interest-rate environment might have acted as a catalyst for individuals to see the temporary floor in equity prices as the right time to start investing.

On 6 May 2020, the European Securities and Markets Authority (ESMA) issued a public statement to draw investment firms' and their clients' attention to the fact that they need to continue to adhere to the obligations of the Markets in Financial Instruments Directive (MiFID II).[9] During these times of intensified market volatility, investment firms have even greater duties to provide investment or ancillary services to investors. ESMA reminded investment firms of the suitability and appropriateness requirements when providing investment advice or portfolio management. ESMA stressed that the appropriateness assessment is particularly important for new clients wishing to invest in complex financial instruments when markets are more volatile.

This article investigates the impact of the Belgian COVID-19 confinement on the financial behavior of individual investors. Specifically, the article is the first to examine whether individual investors, being forced to remain in their houses, acquired relatively more shares during the period 24 February 2020 till 30 April 2020; the COVID-19 period that negatively affected the Belgian financial market the most. The article further investigates whether individuals show different financial behavior based on their age, their investment experience, and their gender, given that these investor characteristics are important drivers of investor behavior (see Barber and Odean, 2001; Dhar and Zhu, 2006; Seru et al. 2010).

Although the literature on individual investor behavior is extensive (see infra), little is known about the impact of a financial crisis caused by a health issue on individual investors' behavior and perceptions. Previous literature documented that individual investors tend to sell

---

[8] See http://www.tijd.be/markten-live/nieuws/aandelen-brussel/belgen-kopen-voor-recordbedrag-beursgenoteerde-aandelen.
[9] See https://ganado.com/wp-content/uploads/2020/06/esma35-43-2391_esma_statement_on_covid-19°retail_investor_activity1.pdf.

winners and buy losers, the so-called disposition effect, but has not focused on the exceptional situation in which financial markets crash due to a virus for which no immediate future solution (e.g. a vaccine) is available. Also, the situation is exceptional in that investors were forced to remain in their houses or within a 'bubble' of only a few close family members and friends, and were confronted with increased mortality news but with more time to invest and follow equity markets. Indeed, where Glaser and Weber (2007) and Dzielinski (2011) have focused on investor behavior during the September 11 and the 2008-2009 financial crisis respectively, it is unclear whether their findings could be generalized to the COVID-19 situation.

In contrast to previous crises, individuals were indeed locked down in their houses for weeks and did not only need to be concerned about the economy and their jobs, but also about their health and well-being. This might have altered their perception and level of risk averseness. The setting in this article is thus unique to examine whether individuals behave differently compared to what they usually do during normal market circumstances or did during previous bear markets.

The impact of such a crisis on investor behavior is ex-ante difficult to hypothesize. On the one hand, as documented by Agnew and Szykman (2005), Dzielinski (2011), and Lam et al. (2011), a usually high volume of unexpected and dramatic news could result in information overload. Specifically regarding the coronavirus, Ahundjanov et al. (2020) document that individuals have been exposed to increased uncertainty about the potential health and economic ramifications of the virus, which triggered a surge in demand for information about the virus and its financial market implications. These scholars document that a positive correlation exists between Google Search queries related to COVID-19 and the performance of major financial indices. As individual investors, being less sophisticated as institutional ones, then have more difficulty in interpreting the frequent and sometimes conflicting information that arrives during a crisis, they could reduce their trading activity; the so-called 'status-quo bias'.

On the other hand, Glaser and Weber (2007) argue that a crisis may induce frequent changes in individuals' perceptions leading to higher trading activity. These scholars indeed observed an increase in the standard deviation of individual investors' returns and volatility forecasts directly after the September 11 stock market turmoil. Taking into account that trades from individual investors have been driving stock prices in the directions of their trades and can thus have some predictive ability for future stock returns (see Barber et al. 2009), investigating individuals' behavior in these exceptional circumstances is thus of considerable importance.

This article uses a unique proprietary dataset from the Belgian Financial Services and Markets Authority (FSMA) containing 6.379.846 transactions of 442.144 individuals conducted between 3 January 2018 and 30 August 2020. The total amount of these transactions equals almost 23 billion EUR. Article 26 of Regulation 600/2014 on markets in financial instruments and amending Regulation (EU) No 648/2012 ("MiFIR")[10], requires investment firms which execute transactions, to report complete and accurate details of such transactions to the competent authority as quickly as possible, and no later than the close of the following working date. The FSMA thus receives a) all transactions effectuated by a Belgian credit institution or investment company, b) all transactions concerning transactions on a Belgian market, and c) all transactions in a financial instrument for which the FSMA is the competent authority. From those, the transactions from the individual investors were distilled.

The MiFIR database has several advantages compared to those used by other scholars. First, the database can be considered as the total population of transactions by individuals in Belgian listed stocks and hence does not suffer from a self-selection bias. Indeed, related articles use buy and sell transactions provided by brokerage firms and/or asset managers (e.g. Odean, 1999; Barber and Odean, 2000; Alok and Lee, 2006; Hirshleifer et al. 2008; Hoffmann et al. 2013;

---

[10] See https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014R0600

Gherzi et al. 2014; Luo et al. 2019) and might capture only a small fraction of the total equity traded by individual investors. Even more, their datasets could only include transactions that were effectuated as a result of individuals receiving financial information and / or advice via the broker's investment platform. Yet, individuals may pay attention to an abundance of alternative data sources driving excessive trading, which are captured in the MiFIR database.

Furthermore, it has been documented by e.g. Daniel et al. (1998) that investors who open and maintain brokerage accounts are more likely to exhibit overconfidence in their trading ability and have stronger beliefs that stock prices revert to their means in the long term. As a consequence, data coming from a brokerage firm might not be entirely representative for the whole population of individual investors, thereby not capturing investors having less confidence in their trading capabilities and merely trying to get familiar with the stock market.

Although this article focuses on Belgium, results are likely to be generalizable to other countries. Indeed, according to Heimer and Simsek (2019), European and US traders tend to trade the same assets and face similar market conditions because European and US markets overlap within a given day. These scholars also document that investors from the US and Europe are similarly experienced, use the same trading styles, and are similar in terms of average age. Within Europe, Fraser and Oyefeso (2005) offer empirical evidence that the European unification process has raised the degree of integration in European equity markets.

The evidence in this article indicates that individual trades are systemically correlated over time showing that individuals indeed buy or sell shares in concert. Individuals maintain a contrarian strategy thereby buying shares when stock prices are falling. The article documents especially young and less-experienced investors to increase their equity positions compared to other age and experience categories. Male investors seem to dominate equity markets in Belgium, even during the COVID-19 confinement period, and they increased their equity positions more in comparison to women. The patterns documented in this article hold for the

7

shares being constituents of the main Belgian equity index (i.e. Bel 20), all listed Belgian shares on Euronext Brussels, and for small caps.

The remainder of this work is organized as follows: Section 2 provides an overview of the related literature, explains why this article contributes substantially to it, and formulates hypotheses. Section 3 provides further information about the used MiFIR database, while Section 4 provides an empirical analysis of the trading behavior of individual investors thereby focusing on their age, investment experience, and gender. Finally, Section 5 concludes with a discussion and a future research agenda.

2.   Related Literature and hypotheses

This study contributes to the finance literature in many ways. First, this article contributes to the rapidly growing literature on the impact of COVID-19 on financial markets in general. Ramelli and Wagner (2020) investigate the reactions of the stock market, firms' international trade, corporate cash, and debt. They report feverish stock price reactions due to the virus. According to Alfaro, Chari, Greenland & Schott (2020), an unanticipated doubling of infections predicts stock market declines. Akhaturazzaman et al. (2020) and Zhang et al. (2002) show that correlations between countries' equity returns have increased substantially due to the virus. Goodell and Huynh (2020) and Heyden and Heyden (2020) then employ event studies examining market reactions to COVID-19 news announcements. We contribute to this stream of literature by focusing on the aggregate investment behavior of individual investors, which might drive these returns.

Second, this research fits well into the growing literature on individual investor trading. Extant literature has documented that individuals spend less time on investment analyses, do not construct mean-variance efficient portfolios as they hold only a limited number of different securities, and engage more in attention-based trading compared to institutional investors (e.g.

Lease et al. 1974; Yunker and Krehbiel 1974; Lewellen et al. 1977; Shiller and Pound, 1989; Frieder and Subrahmanyam, 2005). According to Odean (1999) and Barber and Odean (2000; 2008), individual investors often trade specifically around news events. Indeed, news events and publicity around stocks cause conversations about the issuer, which makes investors trade more frequently in their equities (see also Shiller and Pound, 1989). Gherzi et al. (2014) examine the effects of market returns on individual investors' portfolio monitoring decisions in the UK from 2004 to 2009. They compare individuals with hyper-vigilant meerkats, who increase their attention allocation after increased positive and negative market returns.

As documented by Agnew and Szykman (2005), Dzielinski (2011), Lam et al. (2011), a usually high volume of unexpected and dramatic news could, however, result in information overload. As individual investors, being less sophisticated than institutional ones, have more difficulty in interpreting the frequent and sometimes conflicting information that arrives during a crisis, they could reduce their trading activity; the so-called 'status-quo bias'. On the other hand, Glaser and Weber (2007) argue that a crisis may induce frequent changes in individuals' perceptions leading to higher trading activity.

Third, this article joins the growing behavioral finance literature showing that individual investors' trading behavior is strongly correlated due to the so-called 'disposition effect'. This effect entails that investors are more likely to sell an asset that is trading at a profit than one that is trading at a loss (see e.g. Shefrin et al. 1985; Weber and Camerer, 1998; Grinblatt and Keloharju, 2001). As a consequence of the disposition effect, net flows into the equity market will be negatively related to recent returns and vice versa. In that way, individuals tend to supply liquidity to institutions that require immediacy (Grinblatt and Keloharju, 2000). Grinblatt and Keloharju (2000,2001), Jackson (2003), Feng and Seasholes (2004), Choe et al. (2004), and Barber et al. (2009) document for the Korean, Finnish, US, Chinese, and Australian markets that systematic contrarian trading patterns amongst individual investors exist. Individual

investors' net demand is thus contrary to the overall movement of the market (e.g. Alok and Lee, 2006; Griffin et al. 2011; Ben-David et al. 2012). This disposition effect can be explained by the fact that individual investors experience a high level of psychological discomfort when confronted with poor investment decisions. Hence, during a COVID-19 confinement, where stock prices are falling, the disposition effect would suggest that individual investors become more active.

Another argument in favor of the contrarian trading behavior of individual investors is that these individuals tend to believe that stock prices follow a mean-reversion pattern (see e.g. Luo et al. 2019). When the market reacts to news (e.g. stock prices drop because of institutional or other unsophisticated investors selling their shares), they consider the market to overreact as a result of other investors being excessively pessimistic or optimistic. Individual investors often consider themselves wrongfully as sophistical investors (i.e. overconfidence) and therefore trade in a contrarian manner.

This behavior follows from their desire to take advantage of their perception that the market overreacts and will evolve back to its mean trend (see Glaser and Weber, 2007). Experimental research in cognitive psychology has indeed indicated that individuals often see patterns, like a reversion of a trend, in short sequences that are in fact completely random (Tversky and Kahneman,1971). This so-called 'gambler's fallacy' was observed in coin tossing experiments where, after a sequence of heads, individuals overestimated the probability of a tail because they expected an equal number of tails and heads. These experiments suggest that investors believe that they detect patterns in stock prices, like a mean-reversion trend, although share prices follow a non-predictive random walk (Dhar and Kumar, 2001). Individual investors are thus often believed to suffer from psychological biases and act alike. Although there are some arguments to claim that the impact of COVID-19 confinement on individual investors' trading

activity is an empirical issue, the large majority of the literature seems to suggest a positive impact. Hypothesis H1 is therefore formulated as:

H1. Individual investors trade more frequently and increase their equity positions during the COVID-19 confinement period.

Furthermore, this article contributes to the literature that examines the impact of individual investors' characteristics on their trading activity. According to Lewellen et al. (1977), an individual's age influences its investment behavior as persons tend to develop a longer-term investment horizon that increases with age. Also, older investors have a higher appraisal of their ability to outguess the rest of the investment community. If individual investors observe the COVID-19 confinement as a trigger to realize short-term gains, it would thus be most likely the younger individuals being particularly active during that period. Hypothesis H2 is therefore formulated as:

H2. Young individual investors are trading more frequently and increase their equity positions more during the COVID-19 confinement compared to their older peers.

In addition to age, also investment experience can affect trading behavior (see Lee et al. 1991; Hirshleifer, 2001) and even the macro-economy as a whole (see Korniotis and Kumar, 2011). According to Feng and Seasholes (2005), individuals having several years of investment experience become more financially sophisticated to avoid the disposition effect. Indeed, it has been documented by e.g. Brown et al. (2006), Chen et al. (2007), and Choe and Eom (2009) that the disposition effect is stronger for financially unsophisticated investors. In contrast, more experienced and sophisticated investors seem to take more risk (see Barber and Odean, 2001). Also, according to Agnew and Szykman (2005), experienced investors suffer less from information overload problems and are more likely to trade. The influence of investor

experience during the COVID-19 confinement is thus difficult to hypothesize. Hypothesis H3 is therefore formulated as:

H3. The impact of investor experience on trading activity and equity positions is an empirical issue.

Finally, besides age and investor experience, individual investors' gender could impact their trading behavior during a COVID-19 confinement. According to Lewellen et al. (1977), male investors execute considerably more security analyses and spend more time and money on trading activity than women. Men also seem to rely less heavily on their brokers' advice. Furthermore, theoretical studies (e.g. Benos, 1998; Odean, 1998) have proposed that overconfident investors are more likely to trade. The reason is that they react more readily to signals about differences between current and future asset prices because they overestimate the precision of their signals relative to the precision of other traders' signals. Put differently, overconfident investors overestimate their trading skills. According to Barber and Odean (2001), psychological research indicates that men are more overconfident than women and are therefore more likely to trade. During volatile markets with more news being released on shares, overconfident men could be more eager to trade than women. Hypothesis H4 is therefore formulated as:

H4. Male individual investors are trading more frequently and increase their equity positions more during the COVID-19 confinement compared to their female peers.

3. Dataset

This article uses the MiFIR dataset provided by the Belgian Financial Services and Markets Authority (FSMA), representing the total population of transactions by Belgian individuals. The dataset contains various transactional information, such as the market values of the equity

being bought, the place of trading, the identity of the broker, the issuers of the shares, together with information on the ultimate buyer and seller, such as its gender and age.[11]

As in Griffin, Harris and Topaloglu (2003), the analyses are run for the most liquid and actively traded stocks, being the constituents of the BEL 20 (i.e. the main equity index in Belgium). BEL 20 shares are being quoted in every Belgian newspaper and very often referred to in Belgian TV news.[12]

The dataset contains 6.379.846 transactions from 3 January 2018 till 30 August 2020 of which 1.071.604 were executed during the COVID-19 confinement period, which is defined as the period from 24 February till 28 April 2020 (i.e. the period capturing the Belgian COVID-19 confinement period +/- a few business days to encompass investor short-term anticipations). The dataset contains the transactions of 442.144 individuals trading for almost 23 billion EUR, of which almost 4 billion during the COVID-19 confinement. Hence, it can be considered as the total population of transactions in Belgian listed stocks. As in Gherzi et al. (2014), weekends and holidays were excluded from the analyses as the stock market is then closed. To remove the influence of outliers, all variables were winsorized at 5%-95%.

4.   Empirical analyses

Most previous empirical studies performed multivariate regression analyses when analyzing investor behavior. In doing so, the dependent variable is mostly a performance measure to see

---

[11] While the MiFIR database includes comprehensive data on individuals acquiring direct shareholdings, no information is available on indirect shareholdings through financial institutions, like mutual funds, or financial holdings.

[12] The BEL 20 is a capitalization-weighted index and consists of 20 companies traded on the Brussels stock exchange (i.e. Euronext Brussels). The composition of the index is reviewed annually based on closing prices of the last Friday in February. In addition to meeting a set of criteria demanding a company to be representative for the Belgian equity market, at least 15% of its shares must be considered free float. The company must possess a free float market capitalization of at least 300.000 times the price of the index on the last trading day of December. The weights of the companies in the index are capped at 15% but range freely with changing share prices. At the time of this research, the following companies arer part of the BEL 20: Ackermans & van Haaren, Aedifica, Ageas, AB InBev, Aperam, ArGEN-X, Barco, Cofinimmo, Colruyt, Galapagos, GBL, ING Group, KBC, Proximus, Sofina, Solvay, Telenet Group, UCB, Umicore, and WDP.

whether individuals' actions lead to an under- or over- performance (e.g. Alok and Lee, 2006; Bauer et al. 2009). Yet, the main research question of this article is not to detect whether individuals' behavior led to improved performance but rather to analyse how these individuals behaved in the first place during exceptional market circumstances. To do so, transaction data was aggregated to follow, week by week, the buy and sell amounts of the investors. A weekly frequency is compatible with prior literature (see e.g. Grinblatt and Keloharju, 2000).

To examine whether investor characteristics, like their age, experience, and/or gender had a significant influence on the buy and sell amounts during COVID-19, and thus whether a different behavioral pattern can be observed for different types of individuals, the methodology of Brown et al. (2006) is followed by employing univariate statistical tests (ANOVAs). These are suitable to detect whether the average is different between different age, experience, and gender groups.[13] Although regression analyses are considered to be the main econometric tool in empirical finance and economics studies, a considerable number of published articles in the area of investor behavior needed to rely on univariate analyses only (see e.g. Edgington and Hayter, 2001; Bowe and Domuta, 2004; Maditinos et al. 2007; Lebbe and Rauf, 2014; Xing et al. 2016).

---

[13] Multivariate regression analyses have the advantage that they allow examining the influence of these characteristics statistically controlling for one another. Yet, the buy-sell amount spread (see infra) can only be calculated at an aggregate (daily or weekly) level (i.e. not at the level of the individual transaction), while an investor characteristic is specific for every transaction. Examining the influence of the investor characteristics on the traded amounts of buy transactions only is more feasible but would not allow to see the full picture. Indeed, certain individual investors might buy and sell considerably at the same time, which would not be taken into consideration when only examining buy transactions. When aggregating the buy-sell amount spread per category to be used as dependent variables, and either taking the natural logarithm or dividing by the total buy-sell amount per day, multicollinearity issues arise. Furthermore, as the COVID-19 confinement period only captures 47 days, the power of the statistical tests is considerably limited due to a sufficient number of daily observations. Future research having a longer time period, containing also multiple stressed market circumstances, could examine whether the results continue to hold when controlling for other factors and can be generalizable to other crisis situations.

4.1. The activity of individual investors during the COVID-19 confinement period

Figure 1 displays the amounts traded (buy and sell transactions) from the 44th week of 2019 (i.e. 28 October 2019 till 3 November 2019) till the 35th week of 2020 (i.e. 24 August 2020 till 30 August 2020). The COVID-19 confinement ran from the 9th week (i.e. 24 February) till the 18th week of 2020 (i.e. 30 April). During the COVID-19 confinement, individual investors traded considerably more, clearly in contrast to Dzielinski (2011), Lam et al. (2011), and Agnew and Szykman (2005) stating that when investors receive too much information, they reduce their trading activity. Buy transactions increased substantially from 50 million EUR in the week before the crisis (i.e. 17 February to 23 February) to 283 million EUR in week 12 (i.e. 16 March to 22 March 2020). Sell transactions increased from 61 million EUR before the crisis to a maximum of 141 million EUR in week 13 (i.e. 23 March to 29 March 2020).

Figure 1 further displays that the value of buy transactions increased relatively more compared to sell transactions during the crisis period, indicating the contrarian strategy of the Belgian individual investors. Where there was a single peak for buy transactions, two smaller peaks can be observed for sell transactions indicating that individuals were first selling their positions as a first reaction to the crisis but then started to buy when shares were quoted at floor prices. The second sell peak might be explained by certain individuals immediately selling their acquired shares to generate short-term profits.[14] Figure 1 further indicates that, although individual investors were strongly buying shares during the confinement period, the large majority did not immediately sell them in the weeks thereafter. The finding is in line with Hoffmann et al. (2013) observing that investors did not de-risk their investment portfolios during the 2008-2009 financial crisis.

---

[14] In order to test this assumption, particular individual investors should be followed over time. One caveat of this article is that this granularity of the data is currently absent.

A similar pattern can be observed when examining the number of effectuated transactions, where the number of buy transactions was almost six times a high during the COVID-19 confinement period and the number of sell transactions almost three times as high with two peaks having a value of only one-third of the peak of the number of buy transactions (not reported).[15] The argument that individual investors did not start to buy or sell more but rather effectuated larger transactions can thus be ruled out.

****

Insert Figure 1 about here

****

Table 1 presents the weekly buy and sell amounts focussing on the weeks during the COVID-19 crisis.[16] In line with Jackson (2003), the buy-sell amount spread is calculated for each time period t :

$$buy - sell\ amount\ spread_t = buy\ amount_t - sell\ amount_t \qquad (1)$$

This table shows that where individuals bought and sold equivalently the same before and after the crisis period, they bought almost three times as much as they sold at the beginning of the COVID-19 confinement and two times as much in the weeks thereafter. The total buy-sell amount spread adds up to a total of 641.187.661 EUR.

****

Insert Table 1 about here

****

---

[15] Non-reported results are available upon request.

[16] Weekly aggregated were created in order to rule out the potential effect of certain back-to-back trades and reduce the impact of high-frequency trading. Although these type of transactions are not executed by retail financiers, their presence (although rare) could indicate potential data quality issues.

4.2.   The division into age categories

Figures 2 and 3 display the amounts traded for respectively buy and sell transactions for several age categories.[17] Figure 2 shows that individuals in every age category increased their buy transactions during the COVID-19 confinement. Where the youngest individuals (>=18-35 year) in the week before the crisis bought for approximately 2 million EUR, they acquired 21 million EUR in the 13th week of 2020 (i.e. from 23 March to 27 March 2020). This increase was not persistent as the amounts bought at the end of August 2020 are back at pre-COVID-19 levels.

Figure 2 further displays that the most active age categories are (in descending order): >50-60 years, >60-70 years, and >35-50 years old. As expected, these individuals could have more funds to invest as most of them no longer need to pay off mortgages or financially support their children. The COVID-19 confinement did not change the pecking order. The least active age category is the one from >80-100 years. Not surprisingly, this is the smallest category as most people are not lucky enough to achieve these ages. The oldest category increased its buy activity during COVID-19 but their activity levels were only increased for 4 weeks.

Figure 3 illustrates that sell transactions only increased moderately, in terms of amounts traded, for the youngest age category, and even decreased for the category with individuals being older than 80 years. It appears that during the 9th week of 2020 (i.e. from 24 February till 28 February 2020) mainly individuals being between 60 and 70 years old sold equities (i.e. 47 million EUR), followed by individuals between 50 and 60 years old and individuals between 70 and 80 years old (i.e. both 38 million EUR).

---

[17] The age categories were chosen in order to have groups that capture the different generations (i.e. taking categories being 10 to 15 years different from each other) while being sufficiently large in order to execute statistical tests. As in Bauer et al. (2009), transactions of minors being younger than 18 are excluded as it is unclear whether these individuals decided for themselves or their parents giving consent were the decision makers. Non-reported analyses indicate that individuals from 18 to 35 years represent 11,34% of the main dataset. The category from >35-50 years represents 23,67%, the category >50-60 represents 25,30%, the category >60-70 represents 22,92%, the category >70-80 represents 12,72%, and the category >80-100 represents 3,95% of the sample.

In the 12th week of 2020 (i.e. 16 March to 20 March), mainly individuals in the category >50-60 years sold shares (i.e. 45 million EUR) followed by individuals between 60 and 70 years old (i.e. 39 million EUR) and individuals in the category >35-50 (i.e. 33 million EUR). The pecking order is thus different between the two sales peaks during the COVID-19 confinement period, illustrating that people between 60 and 70 were more eager to sell shares compared to their somewhat younger peers. Interestingly, in the weeks after the COVID-19 confinement, mainly individuals in the category >50-60 sold their shares followed by persons in the category >35-50. The youngest age category sold during the 23rd week of 2020 (i.e. 1 June to 7 June) a considerable amount of their shares (i.e. 13 million EUR), potentially generating returns from initially buying them at floor levels.

<center>

****

Insert Figure 2 and Figure 3 about here

****

</center>

Table 2 presents the average buy-sell amount spread per age category during 2019 and the COVID-19 confinement period. This table shows that, in absolute terms, the buy-sell amount spread is almost 65 times as large during the COVID-19 confinement period for the youngest age category (i.e. from 73 K EUR to 4,7 M EUR). These young investors did not suffer from the previous Great Financial Crisis and might thus be less aware of the true risks of investing in stocks.

For the individuals in the category >35-50, the buy-sell amount spread is 9 times as large, where it increased with a multiplicative factor of 6 for individuals being older than 50 and younger than 70. Individuals between 70 and 80 years old have a buy-sell amount spread being 4 times as large during the COVID-19 confinement period. For the oldest individuals in our database, the buy-sell amount spread is only 3 percent in absolute figures during the COVID-19 confinement period in comparison with 2019. Table 2 again illustrates that the contrarian strategy is followed mainly by the youngest individuals. The results of an ANOVA

analysis indicates that the differences between the age categories are statistically significant (F-value: 6,2923; p-value: 0,0000).

<center>
****

Insert Table 2 about here

****
</center>

4.3. The division into investor experience categories

Figures 4 and 5 display the amounts traded for respectively buy and sell transactions divided into investor experience categories.[18] These categories are calculated based on the number of transactions effectuated since the beginning of the MiFIR database (i.e. 2 January 2018).[19] Figure 4 shows that individuals in every category increased their buy transactions during the COVID-19 confinement period. In contrast with Feng and Seasholes (2005), the results thus do not show that individuals having several years of investment experience became more financially sophisticated to avoid the disposition effect. Rather, investors who are more experienced seem to take more risk by choosing equity investments, in line with Barber and Odean (2001). This finding is also in line with Agnew and Szykman (2005) who find that financially literate and experience investors suffer less from information overload problems and are thus more likely to trade. Where non-frequent investors (i.e. 1 to 5 transactions) in the week before the COVID-19 crisis bought for merely 3 million EUR, they acquired BEL 20 shares for approximately 25 million EUR in week 11 (i.e. 9 March to 13 March 2020). Figure 4 furthermore indicates that it were mainly the individuals having a moderate level of investor

---

[18] Non-reported analyses indicate that individuals having 1 to 5 transactions represent 7,81% of the dataset. The category from 6 to 20 transactions represents 19,16 %, the category 21 to 100 transactions represents 35,51%, and the category >100 transactions represents 37,52%.

[19] A caveat of this study is that only a rudimental measure of investor experience could be used given the short time frame of data available. Also, the proxy could capture investment style and horizon. Yet, as a robustness check, a binary variable was constructed indicating whether a particular transaction was the first transaction of the individual since the beginning of the MiFIR database. Qualitatively similar results were obtained. In addition, the number of transactions over a rolling window of 3 months before the investment under consideration was analysed, but individuals did not seem to execute more than 6 transactions over that time frame. Hence, this measure did not allow to draw granular conclusions. A similar conclusion can be drawn when looking at the number of investments realised before the COVID-19 confinement.

experience (i.e. between 21 and 100 transactions) that became relatively more active during the crisis period rather than the investors having a history of more than 100 transactions. This finding concurs with Gervais and Odean (2001) documenting that individual investors have difficulty learning from their experiences, and if they learn, this is a slow process. The effect of investor psychology on trading and risk-taking behavior is therefore considered to be persistent (see Barber and Odean, 2001).

One can observe in Figure 5 that non-frequent investors (i.e. 1 to 5 transactions) do not seem to sell much more during the COVID-19 confinement period and afterwards. Mainly individuals having conducted more than 20 transactions seem to increase their sales. That is, they doubled their sale from approximately 29 million EUR in the week before the crisis to 70 million EUR in week 13 (i.e. 23 March to 29 March 2020). In the weeks following the COVID-19 confinement, it were also mainly the frequent investors being most active.

****
Insert Figure 4 and Figure 5 about here
****

Table 3 presents the average buy-sell amount spread per age category during 2019 and the COVID-19 confinement period. In absolute terms, the average buy-sell amount spread during the COVID-19 crisis is almost five times as high for the individuals having the least experience in our dataset. For the individuals who conducted between 6 and 100 transactions, their buy-sell amount spread is around nine times as high as in 2019. This indicates that it are mainly the moderate investors that bought more than they sold. For the frequent investors (>100 transactions), the average buy-sell amount is almost four times as high as in 2019. The results of an ANOVA analysis indicates that the differences between the investor experience categories are statistically significant (F-value: 2,7605; p-value: 0,0435).

****
Insert Table 3 about here
****

20

4.4. *Division based on gender*

Figures 6 and 7 display the amounts traded for respectively buy and sell transactions of male and female individuals.[20] Figure 6 allows observing that both men and women bought more shares during the COVID-19 confinement period. Where women acquired pre-COVID for approximately 18 million EUR, they bought for 98 million EUR in week 12 (i.e. 16 March to 22 March 2020). Although women became more active, the Belgian equity market seems to be dominated by men, who increased their buy activity relatively more during COVID-19 than women (i.e. from 41 million EUR to 238 million EUR). Figure 7 illustrates that both women and men sold their shares more actively during COVID-19 with men relatively more compared to women.

********************************\
Insert Figure 6 and Figure 7 about here
********************************\

Table 4 presents the average buy-sell amount spread for women and men during 2019 and the COVID-19 crisis. In absolute terms, the average buy-sell amount spread during the COVID-19 crisis is almost five times as large for men compared to 2019 (i.e. 57 million EUR compared to -10 million EUR). For women, the average buy-sell amount spread has increased with a multiplicative factor of around 3. Table 4 thus indicates that men were relatively buying more than they were selling in comparison with women. The results of an ANOVA analysis indicates that the differences between the gender categories are statistically significant (F-value: 281,7964; p-value: 0,0000).

********************\
Insert Table 4 about here
********************\

---

[20] Non-reported analyses indicate that only 9,55 % of the individuals in our dataset are women compared to 90,45% being men.

5. Sensitivity analyses

First, as shares being part of the BEL 20 get a considerable level of attention in the news, our results might be biased towards shares for which news is prevalent. For these shares, the amount of information could thus have a larger effect on the investment behavior of retail investors than for other listed firms on the Belgian stock exchange. Therefore, the analyses were replicated to transactions in shares being part of the Bel All Shares Index (i.e. the continuous market). The results were quantitatively similar and the same conclusions can be drawn. As in Barber and Odean (2008), analyses were also performed for small-capitalization stocks: a subsample of Belgian listed shares with a market capitalization smaller than 940 million EUR. It can be observed that during the COVID-19 confinement period, transactions in small caps increased considerably with buy transactions being more prevalent than sell transactions. Indeed, where small caps were bought and sold before the crisis for approximately 20 million EUR per week, this amount increased during the crisis period to 69 million EUR for buy transactions and 54 million EUR for sell transactions. Regarding the analysis based on age, investor experience, and gender, results are qualitatively similar (not reported).

Second, subsample analyses were conducted based on the geographical origin of the broker to analyze whether there are significant differences between the transactions effectuated by a Belgian broker (i.e. a broker being active in the same country as the individual) compared to those executed via a foreign broker. Belgian brokers were used almost twice as compared to foreign brokers (being mainly French and German brokers), but no different conclusions can be drawn for either subsample of domestic vs. foreign brokers (not reported).

Finally, analyses were run to detect whether differences could be observed concerning short selling and securities financing transactions during the COVID-19 confinement compared to the weeks before. As reporting agents are not obliged to fill in the short-selling data field of the MIFIR data reporting and securities financing transactions seemed almost absent over the

entire life period of the MIFIR database for individual investors, no meaningful analyses could be effectuated.

6. Conclusions and discussion

This article documents that individual trades are systemically correlated indicating that individuals indeed buy or sell shares in concert. Individuals maintain a contrarian strategy thereby buying shares when stock prices are falling due to a virus. The article documents especially young, less-experienced, and male individual investors to increase their equity positions. The patterns documented in this article hold for the shares being constituents of the main Belgian equity index (i.e. Bel 20), all listed Belgian shares on Euronext Brussels, and for small caps.

As the database does not contain information on whether individuals have used on-line brokers and/or received investment advice, future research could examine whether individual investors started speculating on stock market evolutions by themselves or whether they received advice from investment firms to do so. One caveat of this article is thus that the findings might not reflect individual investors' own decision making and opinions, but rather the results of investment advice, which the individual passively followed.

Another area for future research would be to examine whether wealthier individual investors make different investment decisions compared to those who just have sufficient funds to start trading. One can expect the former to be more active in their contrarian trading behavior as they can afford to take on more risk. In case no information is available on the amounts of liquid funds an individual has, one can use the information on where the individuals are domiciled, given that housing prices in a particular region can be a proxy for the amount of wealth an individual has.

Besides, future research could examine whether there is a difference in stressed market circumstances in terms of the shares that are being bought. As documented by Bodurtha et al. (1995) and Barberis et al. (2005), different investor groups trade within different natural habitats or groups of stocks. Alok and Lee (2006) observed that individual investors tend to concentrate their shareholdings in small, high book-to-market (i.e. value stocks), low institutional ownership, and low-priced stocks. During stressed markets, individual investors might thus not only increase their buy activity but also change their preferences and/or sentiment towards certain shares. Future studies could examine whether the risk-taking behavior of individuals increased during the COVID-19 confinement period (i.e. investing in high-beta stocks, stocks having a higher level of adverse selection because of being younger, etc.). This analysis would allow concluding whether time-varying preferences of individuals are due to risk aversion differences or irrational sentiment.

Finally, trading data only reveals patterns and trends, which suggest that individuals behave in a certain matter. Quantitative financial data, however, does not allow researchers to examine the ideas, thoughts, and perceptions of individual investors, which can only be measured with the help of surveys. Glaser and Weber (2005), for instance, conducted survey analyses of German individual investors at the beginning of August 2001. They found evidence that return forecasts of investors were significantly higher after September 11, suggesting a belief in mean reversion. Hoffmann et al. (2013) conducted surveys to examine whether investor perceptions changed during the 2008-2009 financial crisis. They found evidence that investor perceptions fluctuated significantly during the crisis but less than return expectations. Besides, Gherzi et al. (2014) surveyed 617 UK private individuals to explore investors' attitudes and disposition with financial markets. They detected that investors increase their portfolio monitoring following both positive and daily negative market returns. Future research could examine whether individual investors changed their perceptions during the COVID-19 confinement and were

aware that they were following a contrarian strategy and increased their risk-taking behavior. These insights might also be useful for market regulators when attempting to increase individuals' financial literacy.

References

Agnew, J.R., and L.R. Szykman (2005). "Asset allocation and information overload: The influence of information display, asset choice, and investor experience," *Journal of Behavioral Finance* 6(2): 57-70.

Ahundjanov, B.B., S.B. Akhundjanov, and B.B. Okhunjanov (2020). "Information search and financial markets under COVID-19," *Entropy* 22(7): 791-809.

Akhtarazzaman, M., S. Boubaker, and A. Sensoy (2020). "Financial contagion during COVID-19 crisis," *Financial Research Letters, Forthcoming.*

Alfaro, L., A. Chari, A.N. Greenland, and P.K. Schott (2020). "Aggregate and firm-level stock returns during pandemics*," NBER Working Paper.*

Alok, K., and C.M.C. Lee (2006). "Retail investor sentiment and return comovement," *Journal of Finance* 61(5): 2451-2486.

Barber, B., and T. Odean (2000). "Trading is hazardous to your wealth: The common stock investment performance of individual investors," *Journal of Finance* 55(2): 773-806.

Barber, B., and T. Odean (2001). "Boys will be boys: Gender, overconfidence, and common stock investment," *Quarterly Journal of Economics* 116(1): 261-292.

Barber, B., and T. Odean (2008). "All that glitters: The effect of attention and news on the buying behaviour of individual and institutional investors," *Review of Financial Studies* 21(2): 785-818.

Barber, B., T. Odean, and N. Zhu (2009). "Systemic noise," *Journal of Financial Markets* 12(4): 547-569.

Barberis, N., A. Shleifer, and J. Wurgler (2005). "Comovement," *Journal of Financial Economics* 75(2): 283-317.

Bauer, R., M. Cosemans, and P.M.A. Eichholtz (2009). "Option trading and individual investor performance," *Journal of Banking and Finance* 33(4): 731-746.

Ben-David, I., F. Franzoni, and R. Moussawi (2012). "Hedge fund stock trading in the financial crisis of 2007-2009," *Review of Financial Studies* 25(1): 1-54.

Benos, A.V. (1998). "Aggressiveness and survival of overconfident traders," *Journal of Financial Markets* 1(3): 353-383.

Bodurtha, J.N., D. Kim, and C.M.C. Lee (1995). "Closed-end country funds and US market sentiment," *Review of Financial Studies* 8(3): 879-918.

Brown, P., N. Chappel, R. da Silva Rosa, and T. Walter (2006). "The reach of the disposition effect: Large sample evidence across investor classes," *International Review of Finance* 6(1): 42-78.

Bowe, M., and D. Domuta (2004). "Investor herding during the financial crisis: A clinical study of the Jakarta Stock Exchange," *Pacific-Basin Finance Journal* 12: 387-418.

Chen, G., K. Kim, J. Nofsinger, and O. Rui (2007). "Trading performance, disposition effect, overconfidence, representativeness bias, and experience of emerging market investors," *Journal of Behavioral Decision Making* 20(4): 425-451.

Choe, H., and Y. Eom (2009). "The disposition effect and investment performance in the futures market," *Journal of Futures Markets* 29(6): 496-522.

Choe, H., B. Kho, and R.M. Stulz (2004). "Do domestic investors have an edge? The trading experience of foreign investors in Korea*," NBER Working Paper.*

Daniel, K., D. Hirschleifer, and A. Subrahmanyam (1998). "Investor psychology and security market under- and overreactions," *Journal of Finance* 53(6): 1839-1885.

Dhar, R., & A. Kumar (2001). "A non-random walk down the main street: Impact of price trends on trading decisions of individual investors." *Yale's International Centre for Finance Working Paper. 1-40.*

Dhar, R., and N. Zhu (2006). "Up close and personal: Investor sophistication and the disposition effect," *Management Science* 52(5): 726-740.

Dzielinski, M. (2011). "When does company-specific news matter? Determinants of news-related stock returns." *University of Zurich Working Paper.*

Edgington, D.W., and R. Hayter (2001). "Japanese direct foreign investment and the Asian financial crisis," *Geoforum* 23: 103-120.

Feng, L., & M.S. Seasholes (2004). "Correlated trading and location," *Journal of Finance* 59(5): 2117-2144.

Feng, L., & M.S. Seasholes (2005). "Do investor sophistication and trading experience eliminate behavioural biases in financial markets?" *Review of Finance* 9(3): 305-351.

Fraser, P., & O. Oyefeso (2005). "US, UK and European stock market integration," *Journal of Business Finance & Accounting* 32(1): 161-181.

Frieder, L., & A. Subrahmanyam (2005). "Brand perceptions and the market for common stock," *Journal of Financial and Quantitative Analysis* 40(1): 57-85.

Gervais, S., & T. Odean (2001). « Learning to be overconfident," *The Review of Financial Studies* 14(1): 1-27

Gherzi, S., D. Egan, N. Stewart, E. Haisley, and P. Ayton (2014). "The meerkat effect: Personality and market returns affect investors' portfolio monitoring behaviour," *Journal of Economic Behavior and Organization* 107: 512-526.

Glaser, M., & M. Weber (2007). "Why inexperienced investors do not learn: They do not know their past portfolio performance," *Finance Research Letters* 4(4): 203-2016.

Goodell, J.W., and T.L.D. Huynh (2020). "Did congress trade ahead? Considering the reaction of US industries to COVID-19," *Finance Research Letters* 36: 1-10.

Griffin, J.M., J.H. Harris, and S. Topaloglu (2003). "The dynamics of institutional and individual trading," *Journal of Finance* 58(6): 2285-2320.

Griffin, J.M., J.H. Harris, T. Shu, and S. Topaloglu (2011). "Who drove and burst the tech bubble?" *Journal of Finance* 66(4): 433-463.

Grinblatt, M., M. Keloharju (2000). "The investment behaviour and performance of various investor types: A study of Finland's unique data set," *Journal of Financial Economics* 55(1): 43-67.

Grinblatt, M., M. Keloharju (2001). "What makes investors trade?" *Journal of Finance* 56(2): 549-578.

Heimer, R., A. Simsek (2019). "Should retail investors' leverage be limited?" *Journal of Financial Economics* 132(3): 1-21.

Heyden, K.J., T. Heyden (2020). "Market reactions to the arrival and containment of COVID-19: An event study," *Financial Research Letters,* Forthcoming.

Hoffmann, A.O.I., T. Post, and J.M.E. Pennings (2013). "Individual investor perceptions and behaviour during the financial crisis," *Journal of Banking & Finance* 37(1): 60-74.

Hirshleifer, D.A. (2001). "Psychology and asset pricing," *Journal of Finance* 56(4): 1533-1597.

Hirshleifer, D.A., J.N. Myers, L.A. Myers, and S.H. Teoh (2008). "Do individual investors cause post-earnings announcement drift? Direct evidence from personal trades." *The Accounting Review* 83(6): 1521-1550.

Jackson, A. (2003). "The aggregate behaviour of individual investors," *SSRN Working Paper.*

Korniotis, G.M., and A. Kumar (2011). "Do older investors make better investment decisions?" *The review of Economics and Statistics* 93(1): 244-265.

Kyle, A.S. (1985). "Continuous auctions and insider trading," *Econometrica* 53(6): 1315-1336.

28

Lam, C.F., D.S. DeRue, E.P. Karam, and J.R. Hollenbeck (2011). "The impact of feedback frequency on learning and task performance: Challenging the 'more is better' assumption," *Organizational Behavior and Human Decision Processes* 116(2): 217-228.

Lease, R.C., W.G. Lewellen, and G.G. Schlarbaum (1974). "The individual investor: Attributes and attitudes," *Journal of Business* 29(2): 413-433.

Lebbe, A., and A. Rauf (2014). "Individual investor behaviour: Pre and post crisis study on Bahrain," *Journal of Emerging Trends in Economics and Management Sciences* 5(5): 457-464.

Lee, C.M.C., A. Shleifer, and R.H. Thaler (1991). "Investor sentiment and the closed-end fund puzzle," *Journal of Finance* 46(1): 75-109.

Lewellen, W.G., R.C. Lease, and G.G. Schlarbaum(1977). "Patterns of investment strategy and behaviour among individual investors," *Journal of Business* 50(3): 296-333.

Luo, C.P., E. Ravina, and L.M. Viceira (2019). "Retail investor contrarian behaviour around news and the momentum effect." *SSRN Working Paper.*

Maditinos, D.I., Z. Sevic, and N.G. Theriou (2007). "Investors' behaviour in the Athens Stock Exchange," *Studies in Economics and Finance* 24(1): 32-50.

Odean, T. (1998). "Volume, volatility, price, and profit when all traders are above average," *Journal of Finance 53:* 1887-1934.

Odean, T. (1999). "Do investors trade too much?" *American Economic Review* 89(5): 1279-1298.

Ramelli, S., and A.F. Wagner (2020). *"Feverish stock price reactions to COVID-19," SSRN Working Paper*

Shefrin, H., M. Statman, and S. Meir (1985). "The disposition to sell winners too early and ride losers too long: Theory and evidence," *Journal of Finance* 40(3): 777-790.

Seru, A., T. Shumway, and N. Stoffman (2010). "Learning by trading," *Review of Financial Studies* 23(2): 705-739.

Shiller, R.J., and J. Pound (1989). "Survey evidence on diffusion of interest and information among investors," *Journal of Economic Behavior and Organization* 12(1): 47-66.

Tversky, A., and D. Kahneman (1971). "Belief in the law of small numbers," *Psychological Bulletin* 76: 105-110.

Weber, M., and C.F. Camerer (1998). "The disposition effect in securities trading: An experimental analysis," *Journal of Economic Behavior & Organization* 33(2): 167-184.

Xing, L., M. Jamshid, and G. Han (2016). "Holiday trading in China: Before and during the financial crisis," *Journal of Applied Finance & Banking 6(2)*: 117-126.

Yunker, J.A., and T.L. Krehbiel (1974). "Investment analysis by the individual investor," *Quarterly Review of Economics and Business* 28(2): 90-101.

Zhang, D., H. Min, H., and J. Qiang (2020). "Financial markets under the global pandemic of COVID-19," *Financial Research Letters* 36: 1-6.

TABLE 1. Amounts traded

Period		Buy Amount (€)	Sell Amount (€)	Buy-Sell Amount Spread (€)
2019 (weekly average)		31.377.105 €	46.921.881 €	-15.544.776 €
2020 Week 9	24/02 till 28/02	148.929.639 €	154.026.419 €	-5.096.780 €
2020 Week 10	02/03 till 06/03	185.561.907 €	66.521.510 €	119.040.397 €
2020 Week 11	09/03 till 13/03	283.428.021 €	98.647.727 €	184.780.294 €
2020 Week 12	16/03 till 20/03	229.285.795 €	141.475.450 €	87.810.345 €
2020 Week 13	23/03 till 27/03	201.684.754 €	104.100.248 €	97.584.506 €
2020 Week 14	30/03 till 03/04	134.575.300 €	89.917.504 €	44.657.796 €
2020 Week 15	06/04 till 09/04	114.287.152 €	77.514.786 €	36.772.366 €
2020 Week 16	14/04 till 17/04	97.000.910 €	65.585.305 €	31.415.605 €
2020 Week 17	20/04 till 24/04	97.902.951 €	50.319.648 €	47.583.303 €
2020 Week 18	27/04 till 30/04	74.657.393 €	78.017.564 €	-3.360.171 €
Total during first wave				**641.187.661 €**
2020 Week 19 till 35 (weekly average)	04/05 till 30/08	61.272.226 €	59.857.056 €	1,414,720 €

Note. This table presents the buy amounts, sell amounts, and the buy-sell amount spread for 2019, the COVID-19 confinement period (i.e. week 9 till 18 from 2020), and the weeks thereafter. The sample includes all equity transactions from Belgian individual investors in BEL 20 shares, collected from the MiFIR database from the Financial Services and Markets Authority.

TABLE 2. Buy-sell amount spread per age category

Age category	Average buy-sell amount spread in 2019 (weekly basis. €)	Average buy-sell amount spread during the COVID-19 crisis (weekly basis. €)
>=18 - 35	-73.273 €	4.755.521 €
> 35 - 50	-1.173.333 €	11.279.641 €
>50 - 60	-2.261.321 €	14.313.294 €
>60 - 70	-1.364.453 €	11.958.020 €
>70 - 80	-1.136.929 €	5.013.260 €
>80 - 100	-1.579.108 €	54.086 €

Note. This table presents the buy-sell amount spread per age category in 2019 and during the COVID-19 confinement period (i.e. week 9 till 18 from 2020). The sample includes all equity transactions from Belgian individual investors in BEL 20 shares, collected from the MiFIR database from the Financial Services and Markets Authority.

## TABLE 3. Buy-sell amount spread per investor experience category

experience category	Average buy-sell amount spread in 2019 (weekly basis. €)	Average buy-sell amount spread during the COVID-19 crisis (weekly basis. €)
1-5 transactions	-1.774.107,45 €	8.442.904,39 €
6-20 transactions	-1.561.035,08 €	13.717.989,62 €
21-100 transactions	-1.779.050,11 €	16.235.991,08 €
> 100 transactions	-1.707.366,36 €	6.785.899,00 €

Note. This table presents the buy-sell amount spread per investor experience category in 2019 and during the COVID-19 confinement period (i.e. week 9 till 18 from 2020). The sample includes all equity transactions from Belgian individual investors in BEL 20 shares, collected from the MiFIR database from the Financial Services and Markets Authority.

TABLE 4. Buy-sell amount spread per gender

Gender category	Average buy-sell amount spread in 2019 (weekly basis. €)	Average buy-sell amount spread during the co-19 crisis (weekly basis. €)
Males	-10.879.125 €	57.037.151 €
Females	-6.499.092 €	19.357.246 €

Note. This table presents the buy-sell amount spread per gender in 2019 and during the COVID-19 confinement period (i.e. week 9 till 18 from 2020). The sample includes all equity transactions from Belgian individual investors in BEL 20 shares, collected from the MiFIR database from the Financial Services and Markets Authority.
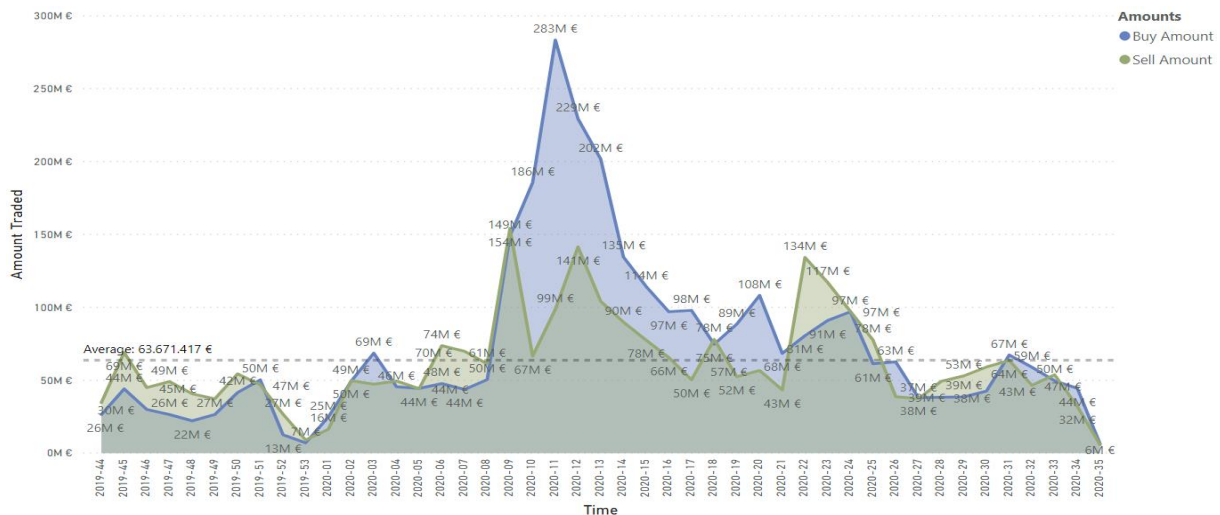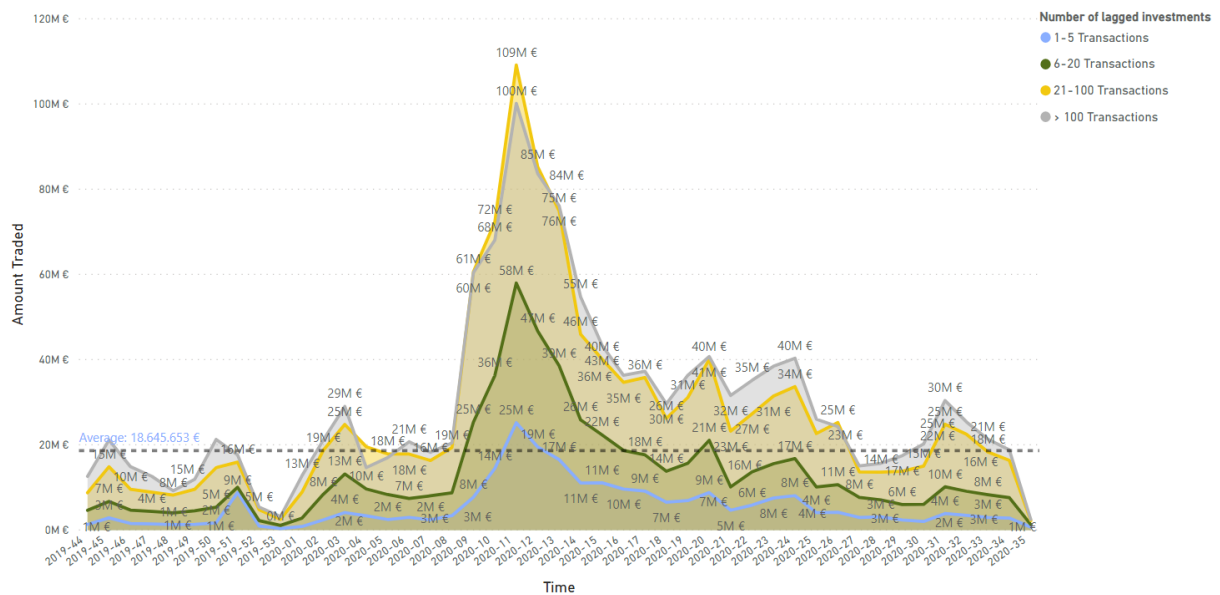
Fig.1. Activity of individual investors during COVID-19. This figure plots the weekly amounts traded from the 44th week of 2019 (i.e. 28 October 2019 till 3 November 2019) till the 35th week of 2020 (i.e. 24 August 2020 till 30 August 2020). The COVID-19 confinement period runs from the 9th week (i.e. 24 February) till the 18th week of 2020 (i.e. 30 April). The sample includes all equity transactions from Belgian individual investors in BEL 20 shares, collected from the MiFIR database from the Financial Services and Markets Authority.
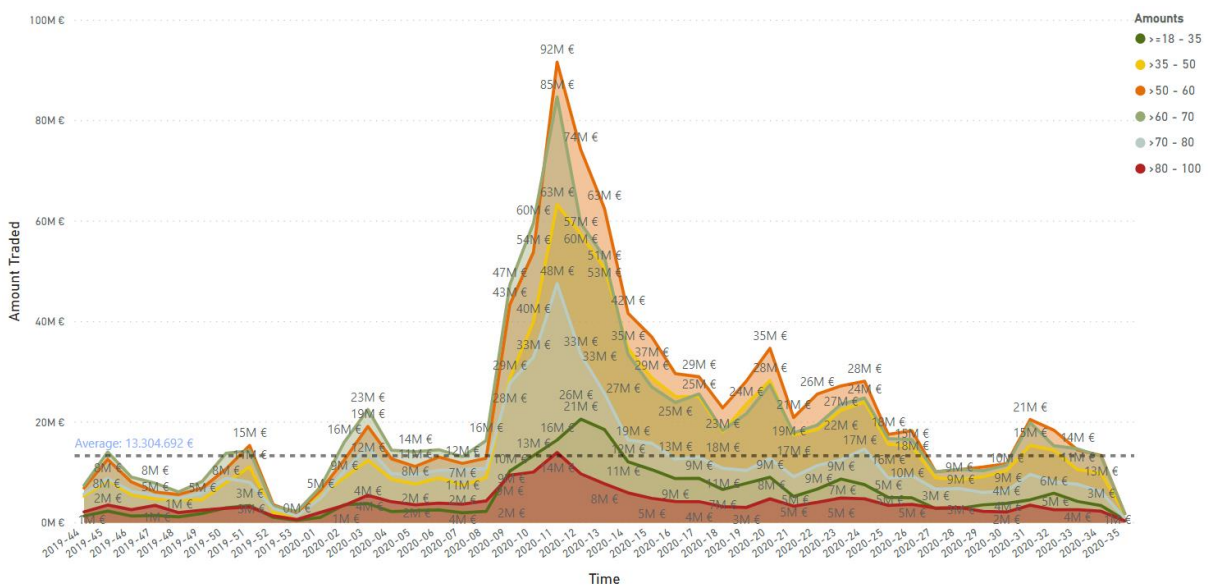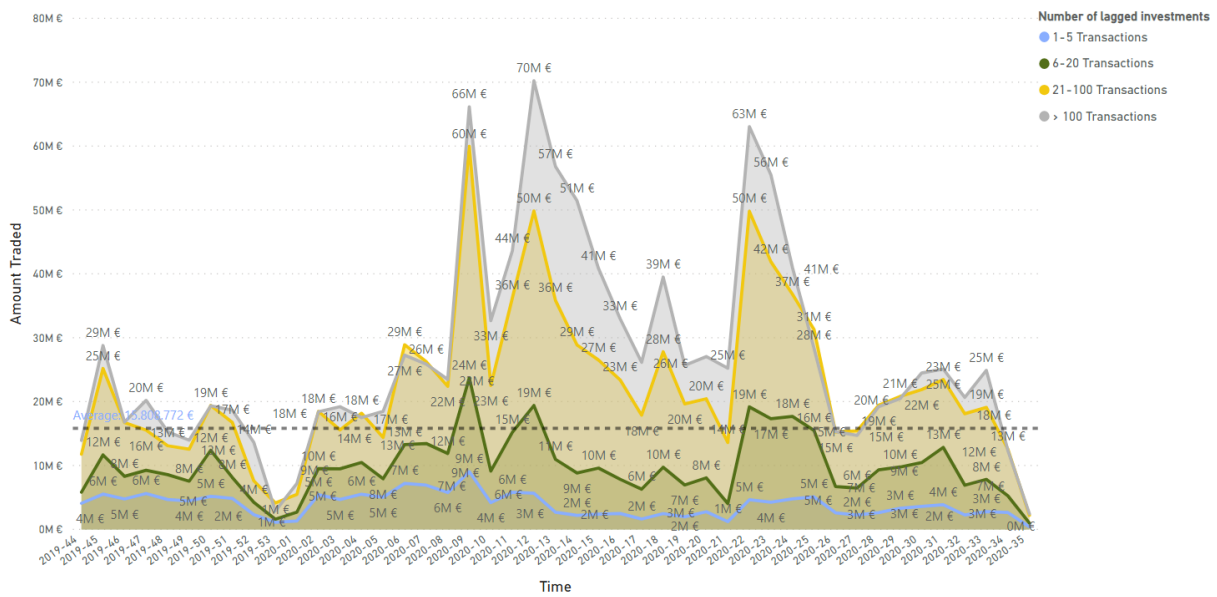

Fig. 2. Buy activity of individual investors divided into age categories. This figure plots the weekly amounts traded from the 44th week of 2019 (i.e. 28 October 2019 till 3 November 2019) till the 35th week of 2020 (i.e. 24 August 2020 till 30 August 2020) divided into age categories. The COVID-19 confinement period runs from the 9th week (i.e. 24 February) till the 18th week of 2020 (i.e. 30 April). The sample includes all equity transactions from Belgian individual investors in BEL 20 shares, collected from the MiFIR database from the Financial Services and Markets Authority.
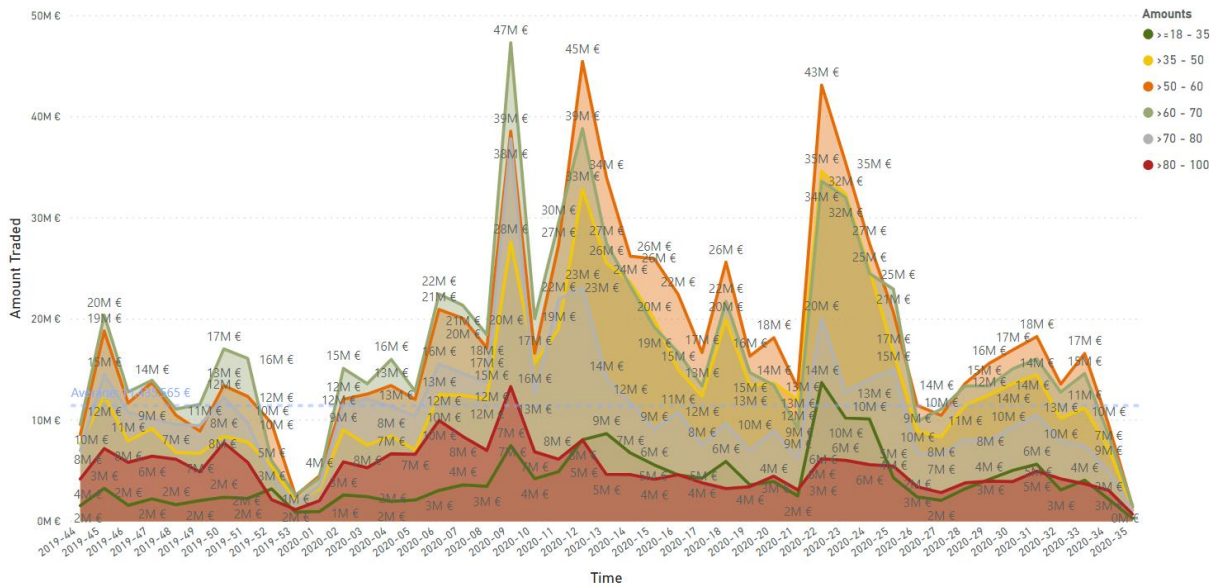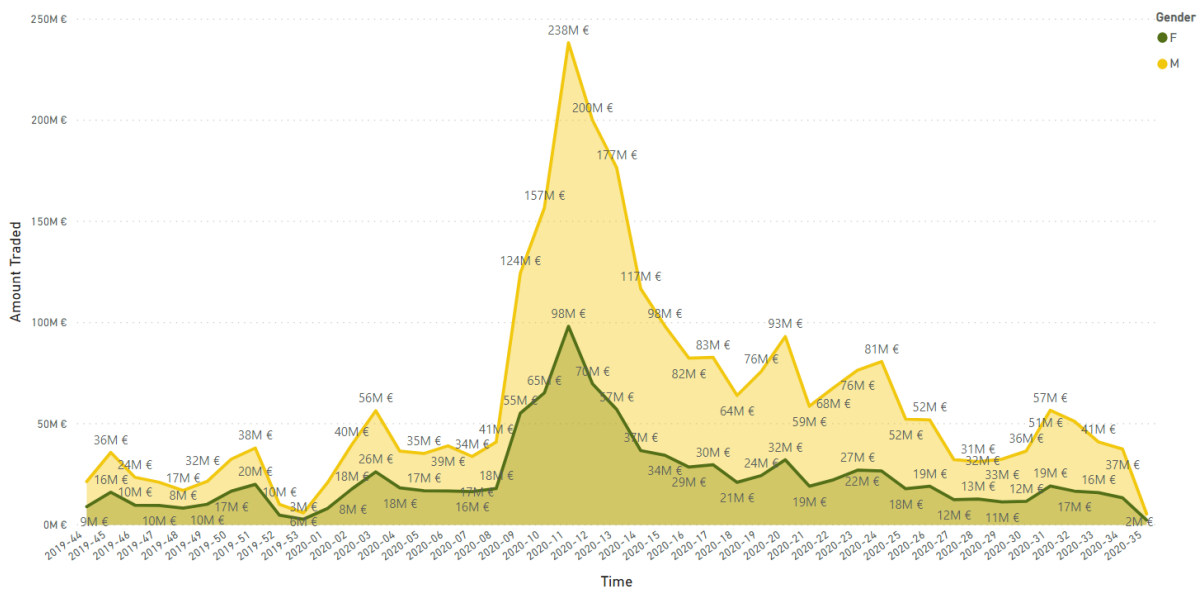
Fig. 3. Sell activity of individual investors divided into age categories. This figure plots the weekly amounts traded from the 44th week of 2019 (i.e. 28 October 2019 till 3 November 2019) till the 35th week of 2020 (i.e. 24 August 2020 till 30 August 2020) divided into age categories. The COVID-19 confinement period runs from the 9th week (i.e. 24 February) till the 18th week of 2020 (i.e. 30 April). The sample includes all equity transactions from Belgian individual investors in BEL 20 shares, collected from the MiFIR database from the Financial Services and Markets Authority.
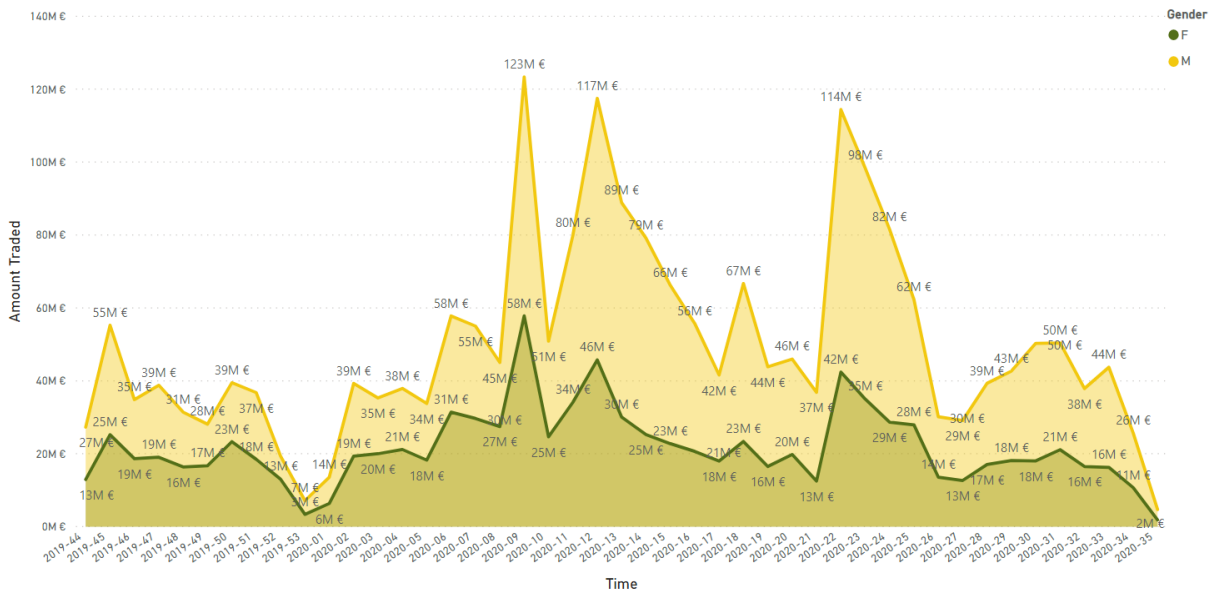

Fig. 4. Buy activity of individual investors divided into investment experience categories. This figure plots the weekly amounts traded from the 44th week of 2019 (i.e. 28 October 2019 till 3 November 2019) till the 35th week of 2020 (i.e. 24 August 2020 till 30 August 2020) divided into investment experience categories. These categories are calculated based on the number of transactions effectuated since the beginning of the MiFIR database (i.e. 2 January 2018). The COVID-19 confinement period runs from the 9th week (i.e. 24 February) till the 18th week of 2020 (i.e. 30 April). The sample includes all equity transactions from Belgian individual investors in BEL 20 shares, collected from the MiFIR database from the Financial Services and Markets Authority.

Fig. 5. Sell activity of individual investors divided into investment experience categories. This figure plots the weekly amounts traded from the 44th week of 2019 (i.e. 28 October 2019 till 3 November 2019) till the 35th week of 2020 (i.e. 24 August 2020 till 30 August 2020) divided into investment experience categories. These categories are calculated based on the number of transactions effectuated since the beginning of the MiFIR database (i.e. 2 January 2018). The COVID-19 confinement period runs from the 9th week (i.e. 24 February) till the 18th week of 2020 (i.e. 30 April). The sample includes all equity transactions from Belgian individual investors in BEL 20 shares, collected from the MiFIR database from the Financial Services and Markets Authority.

Fig. 6. Buy activity of male and female individuals. This figure plots the weekly amounts traded from the 44th week of 2019 (i.e. 28 October 2019 till 3 November 2019) till the 35th week of 2020 (i.e. 24 August 2020 till 30 August 2020) for male and female individuals. These categories are calculated based on the number of transactions effectuated since the beginning of the MiFIR database (i.e. 2 January 2018). The COVID-19 confinement period runs from the 9th week (i.e. 24 February) till the 18th week of 2020 (i.e. 30 April). The sample includes all equity transactions from Belgian individual investors in BEL 20 shares, collected from the MiFIR database from the Financial Services and Markets Authority.

34

Fig. 7. Sell activity of male and female individuals. This figure plots the weekly amounts traded from the 44th week of 2019 (i.e. 28 October 2019 till 3 November 2019) till the 35th week of 2020 (i.e. 24 August 2020 till 30 August 2020) for male and female individuals. These categories are calculated based on the number of transactions effectuated since the beginning of the MiFIR database (i.e. 2 January 2018). The COVID-19 confinement period runs from the 9th week (i.e. 24 February) till the 18th week of 2020 (i.e. 30 April). The sample includes all equity transactions from Belgian individual investors in BEL 20 shares, collected from the MiFIR database from the Financial Services and Markets Authority.