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Growth vs. Value: The Effect of the Covid-19 Pandemic

Barbara Rašiová

Economic University of Bratislava, Department of National Economy, Slovakia

Abstract

Growth and value are popular terms in the lexicon of finance. For many years, scholars and investment professionals have claimed that value strategies outperform the growth ones, even in major market declines. However, since the early 2010's, this seems to no longer hold, as growth strategies consistently generate superior returns. With declaration of Covid-19 as a pandemic, stock markets across the world were confronted with immense uncertainty. Taking the recent trend reversal in outperformance into consideration, such economic climate sparks interest in the differences in the response of growth and value strategies. Using log returns data for value and growth portfolios during the 2010-2021 period, this study provides empirical evidence that value portfolios show greater sensitivity to the Covid-19 pandemic. While findings show that the pandemic had a profound impact on the performance and riskiness of both portfolios, they clearly indicate higher volatility, frequency of extreme losses and average loss in the value portfolio, which further extends the growth outperformance to market downturns.

Keywords

Value, Growth, Pandemic, Return, Risk

JEL Classification

G1, G11, G14

Introduction

The explosion of academic interest in value and growth investment strategies can be traced back to the 1990s (Fama and French, 1992; Lakonishok, Shieifer, and Vishny, 1994). In the wake of these studies, academics shifted their attention to the ratio of book value to market value (B/M) of equity as one of the prominent explanatory variables for the cross-section of average stock returns (Chan and Lakonishok, 2004). The academic community has generally reached an agreement that value investment strategies based on stocks with high B/M ratio, on average, outperform growth investment strategies, which are centred on stocks with low B/M ratio1. Nonetheless, this pattern seems have come to the reversal in the decade after the Global Financial Crisis, when value stocks have shown historically atypical yet continuous underperformance (Frazier, 2021; DiCiurcio et al., 2021).

With the emergence of the Covid-19 pandemic, the world's stock markets had to face great uncertainties. Thus, most stock market indices around the world have registered their biggest one-day falls on record, whilst no sector has been left undamaged. Post the pandemic outbreak, stock markets all over the world performed badly, suffered increased volatility and experienced negative returns (Singh et al., 2020; Zhang et al., 2020). Growth and value portfolios were no exception; however, an in-depth analysis of their reaction to the recent market decline is yet to come. As a result, this paper aims to address the effect of the pandemic on the two types of portfolios by comparing their performance and riskiness before and during the Covid-19 crisis. To study the behaviour of growth and value investment strategies in detail, their return and loss distributions are carefully inspected employing various graphical tools and measures. The methods used in the empirical analysis include summary statistics, quantile-quantile plots, and risk measures such as value at risk and expected shortfall.

Results suggest that in the pre-Covid period the value portfolio not only underperformed the growth one, but it also endured higher tail risk and expected loss. For the Covid period, findings provide evidence that the pandemic had a severe impact on the performance and riskiness of both portfolios. The initial analysis reveals that the impact on the returns' distribution in terms of the skewness and kurtosis is slightly bigger in the growth portfolio. However, the careful investigation of the loss distribution and tail risk reveals the pattern of higher sensitivity to the pandemic in the value portfolio with regard to greater volatility, prevalence of extreme losses and average loss, which further validates the findings of the current research (Frazier, 2021).

[1] This phenomenon is known as value premium.

Corresponding author:
Barbara Rašiová, Dolnozemská cesta 1, 852 35, Slovakia
Email: barbara.rasiova@euba.sk

The remainder of the text is structured as follows. In the first section a concise outline of the literature on value versus growth debate is provided. The second section is focused on the presentation of data used in the empirical analysis and the description of methodology. Next section interprets the obtained results on the comparison of the performance of the two types of strategies in the Covid-19 pandemic. The remaining two sections summarize the main findings and offer conclusion.

Literature Review

The origin of terms value and growth can be traced back to the first half of the 20th century (Graham and Dodd, 1934). Since their early introduction into the practitioner literature and confirmation by academic literature, the topic of value and growth investing has become an outstanding example of the fruitful exchange of ideas between academic research and investment practice (Basu, 1977; Fama and French, 1992; Capaul et al., 1993; Lakonishok, Shieifer, and Vishny,1994).

Value stocks are a class of stocks whose price to-book ratio is very low, or conversely, book-to-market ratio is very high relative to the market average, which is due to the poor performance in the past with expectations that the situation will not improve soon (Graham and Dodd, 1934). As a result, value stocks are not perceived as popular by investors (Hillier et al., 2010). However, the poor performance does not refer to default in particular. Instead, it rather signals that the company reached its maturity and therefore its growth rate stabilized. Another stream of research argues that stocks become value stocks when “value” companies are in distress and are therefore trading at low prices (Fama and French, 1998; Chen and Zhang, 1998). These scholars suggest that, in addition to distress, other factors such as high financial leverages, overcapacity, and uncertainty of future earnings make value stocks unappreciated by most investors.

Growth stocks are commonly defined as stocks that are traded at high prices relative to their fundamentals, such as the book value (Graham and Dodd, 1934; Fama and French, 1998; Bourguignon and De Jong, 2003). They are characterized with earnings potential and growth rates remarkably higher than the market average with expectation that this will persevere in the future. Contrary to value stocks, growth stocks seen as desired, due to the (potential) creation of innovative products and grasping market opportunities (Bourguignon and De Jong, 2003). A growth investor selects stocks expecting an acceleration of earnings growth, and consequently a run-up in price. Such investors are choosing companies for the long-term investment based on the expectation that they are likely to change structurally.

Over the years, the academic community has generally come to agree that investment strategies based on value stocks, on average, outperform growth investment strategies. Much less consensus exists, however, about the underlying reasons for the superior returns (Chan and Lakonishok, 2004). Previous studies report that B/M ratio is strongly correlated with the stock’s future performance and highlight it as a prominent return predictor (Fama and French, 1992; Lakonishok, Shleifer, and Vishny, 1994). There is, nonetheless, a disagreement concerning the source of this trend. Some researchers take the position of the efficient market hypothesis and attribute the higher returns of value strategies to their increased risk (Fama and French, 1992; Vassalou and Xing, 2004). To the contrary, others point out that the stock market participants are overly optimistic about low B/M stocks and appear to consistently over-estimate their future growth rates relative to value stocks. This optimism causes growth stocks to earn negative excess returns (Lakonishok, Shleifer, and Vishny, 1994).

However, this trend seems to have come to the reversal in the recent years. Value leadership began to abate around 2011 considering the newest technology trends such as digitization and cloud migration, along with historically low interest rates as a result of the Global Financial Crisis (Frazier, 2021; DiCiurcio et al., 2021). Taken together, it helped give rise to an environment that saw market participants pile into stocks of innovative companies at the expense of more cyclical equities. At the height of this growth-fuelled period, annualized 10-year returns for the Russell 3000 Growth index less those of its value counterpart reached oscillated around 4.0% in the previous decade.

The current economic climate sparks interest in the differences in performance of growth and value stocks in a situation of crisis. It is a well-known fact that with the World Health Organization (WHO) declaration of Covid-19 as a pandemic, stock markets across the world started plummeting and experiencing negative returns. The financial market risk has increased in response to the uncertainty of market conditions and stocks became highly volatile (Singh et al., 2020; Zhang et al., 2020). Be that as it may, the differences in the effect of the pandemic on growth and value stocks have not yet been analysed, which is the principal objective of this study. Presently there is a lack of unanimous consensus in the literature about the impact of adverse market conditions on the two types of stocks. On one hand, there is empirical evidence that value stocks show lower than average sensitivity to market downturns and tend to outperform both the growth stocks and the market (Folkinshteyn et al., 2017; Saji, 2012). On the other hand, the current pandemic could have caused growth stocks to become somewhat of a safe haven for investors given the economic shutdowns and transitions to remote work, brought on by the virus outbreak (Frazier, 2021). This study aims to contribute to the existing research addressing the differences in the performance of value and growth portfolios in market declines and provide a coherent analysis of their response to the Covid-19 pandemic.

Methods

The data used in the empirical analysis were the portfolios formed on B/M ratio obtained from the Kenneth French Data Library, including all NYSE, AMEX, and NASDAQ stocks for which the market equity data were accessible on Center for Research in Security Prices database. The dataset includes value-weighted daily simple returns of portfolios divided into multiple categories based on their B/M ratio. The obtained sample ranges from the beginning of January 2010 to the end of December 2021 with two distinct subperiods to capture both the pre-Covid and Covid period. The breakpoint is the first official case of Covid-19 in Wuhan city reported to the WHO on December 31st, 2019.

With the aim of analysing, contrasting and comparing the trends in behaviour, as well as the riskiness of growth and value stocks during the Covid-19 pandemic, two categories of portfolios are distinguished (Fama and French, 1998). The growth portfolio, consisting of stocks, whose B/M ratio is in the 30th percentile of all stocks, and the value portfolio, which is comprised of top 30% of stocks sorted on B/M ratio. Prior to the analysis conducted in the programming language *R*, all returns undergo a logarithmic transformation.

The empirical analysis is twofold; firstly, the differences between value and growth portfolios in the pre-Covid period are discussed, and secondly, their reaction and performance in the pandemic is observed. It begins with an examination of simple summary statistics of log returns such as the first two moments[2], median, minimum and maximum for both types of portfolios in both subperiods, which facilitates the observation of the main trends at the first glance. The subsequent investigation also addresses the third and fourth moment[3] in order to inspect the symmetry of the returns' distribution and determine the heaviness of the distribution tails and the associated tail risk.

Finally, two of the most popular risk measures currently used in the financial sphere are calculated: historical value at risk (VaR) and expected shortfall (ES). Thanks to its straightforward calculation and intuitive interpretation, VaR is probably the most widely used risk measure in financial institutions, which has also made its way into the Basel II capital-adequacy framework. It represents the maximum expected loss with a certain confidence level. For example, if a portfolio has a one-day 95% VaR of $1 million, that means that there is a 5% probability that the portfolio will fall in value by more than $1 million over a one-day period if there is no trading. However, as pointed out by Yamai and Yoshiba (2002), VaR only measures the distribution quantile, and disregards extreme loss beyond the VaR level, which leads to the ignorance of important information regarding the tails of the underlying distribution, i.e., tail risk. Another drawback of VaR is that it is not subadditive, which implies that VaR of a portfolio can be higher than the sum of VaRs of the individual assets in the portfolio. This can cause serious practical problems, since information provided by VaR may give a wrong sense of security and induce suboptimal investment choice.

ES, also referred to as conditional VaR, is proposed as a conceptually better alternative (Artzner et al., 2002). It is calculated by averaging all the returns in the distribution that are worse than the VaR of the portfolio at a given level of confidence. For that reason, it is always bigger than VaR. Therefore, contrary to VaR, it accounts for the tail risk in a more comprehensive manner, considering both the size and likelihood of losses above a certain threshold. In addition, satisfying the subadditivity condition, it covers the main properties deemed necessary to reach reliable conclusions with regards to risk management (McNeil et al., 2015). On the other hand, being more complicated in construction that VaR, ES is much more challenging to backtest, since more information needs to be considered, which constitutes its major drawback.

Considering all advantages and disadvantages, the risk management community has made no definite conclusion about which of the two risk measures is superior. As a result, both are used and described in the analysis in the next section.

Results

There will be the Results obtained are divided into three categories, with each of them comparing the effect of the Covid-19 pandemic on growth and value stocks in a unique way. The first one provides an overview of straightforward summary statistics such as, but not limited to the first and second moment. The next category is concentrated on the description of portfolios' return distribution and its deviations from normality by analysing the next two moments. Finally, the last category of results reports the differences in distribution of losses using two different risk measures.

Overview

The concise overview of summary statistics per portfolio for the pre-Covid period is presented in Table 1. The "N" column denotes the number of observations, which is the same for both portfolios. Although the mean log return presented in "Mean" column is significantly higher for the growth portfolio, their median returns are equal, which

[2] Mean and standard deviation.
[3] Skewness and kurtosis.

implies the higher number of observations further from the average in value portfolio. Columns “Pctl(25)” and “Pctl(75)” displaying the first and third quartile of the log returns’ distribution suggest bigger interquartile range for the value portfolio.

The remainder of calculated statistics confirms the greater variability in value portfolio. Standard deviation “St.Dev.” is noticeably higher in value portfolio, which indicates more substantial fluctuations of the value portfolio in the pre-Covid period. The minimum and maximum observed log return, “Min” and “Max” respectively, indicate bigger shocks of the value portfolio relative to the growth portfolio as well, since the minimum return for the value portfolio is more than 1.5 times smaller than for the growth portfolio. The maximum return of the value portfolio is more than 1.2 times bigger than the one of the growth portfolios.

Table 1. Summary statistics for the period of 01/2010-12/2019.

Portfolio	N	Mean	St.Dev	Min	Pctl(25)	Median	Pctl(75)	Max
Growth	2,516	0.001	0.009	-0.063	-0.003	0.001	0.005	0.054
Value	2,516	0.004	0.012	-0.096	-0.005	0.001	0.007	0.065

Source: Own elaboration based on data from Kenneth French Data Library.

The line plots in Fig. 1 are in line with the aforementioned results. The log returns of both portfolios oscillate around zero and appear to follow the similar pattern. However, the deviations from zero are far more pronounced and frequent in value portfolio. Although the higher occurrence of extreme returns in value portfolio is visible in both ways, i.e., both extreme positive and negative returns are present, Fig. 1 portrays the more ample prevalence of extreme negative returns, which is an indication of negative skewness.

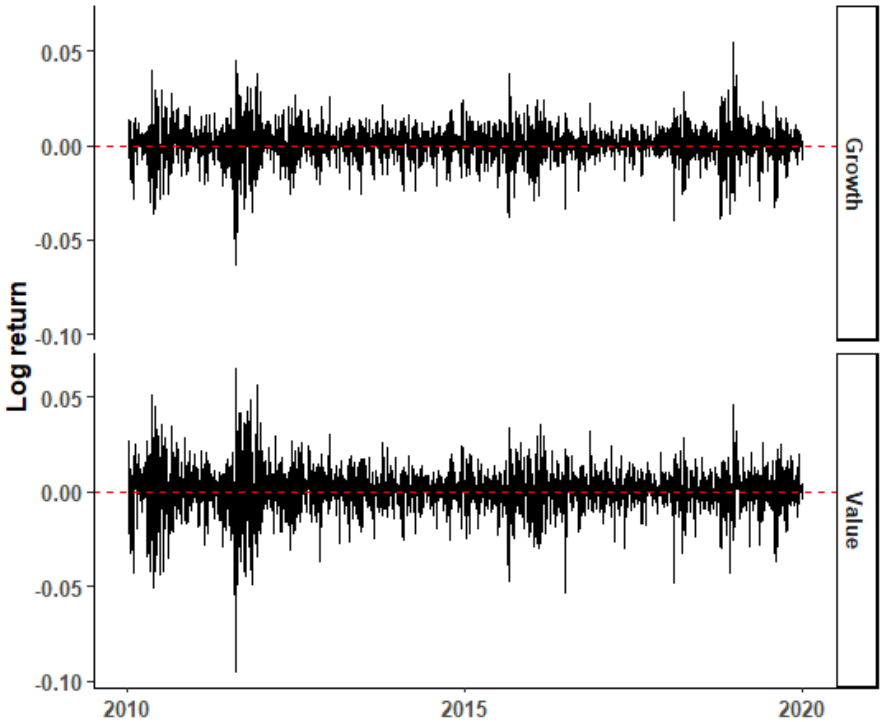

Fig. 1. Daily log returns for the period of 01/2010-12/2019. Own elaboration based on data from Kenneth French Data Library.

The same statistics calculated for the Covid period are outlined in Table 2. Even though the growth portfolio outperformed value in the pre-Covid period, the mean return of both portfolios becomes equal in the Covid period. For the growth portfolio, the mean return is two times smaller than the median, signifying that the returns are negatively skewed. This highlights the risk of left tail event[4], which is the global pandemic in this case. Skewness is addressed in detail in the following section. The volatility of both portfolios dramatically increased in the Covid period to roughly double of its original values. The bigger spread of returns is reflected in the remaining columns as well and clearly visible in Fig 2. The initial shock at the beginning of 2020 is noteworthy as it provoked a period of unusual volatility in both portfolios, which attain both their maximum and minimum values in a short time period.

[4] Also known as “black swan events”.

Table 2. Summary statistics for the period of 01/2020-12/2021.

Portfolio	N	Mean	St.Dev	Min	Pctl(25)	Median	Pctl(75)	Max
Growth	505	0.001	0.017	-0.122	-0.005	0.002	0.008	0.086
Value	505	0.001	0.024	-0.153	-0.009	0.001	0.012	0.119

Source: Own elaboration based on data from Kenneth French Data Library.

Nevertheless, in contrast to the pre-Covid period, they do not appear to be following the same pattern afterwards. The log returns of the growth portfolio stabilize fairly quickly and resemble a white noise, with exception of smaller fluctuations. On the other hand, the shock in the value portfolio does not diminish fast and seems to initiate a period of high and persistent volatility until the beginning of 2021, when returns start to balance.

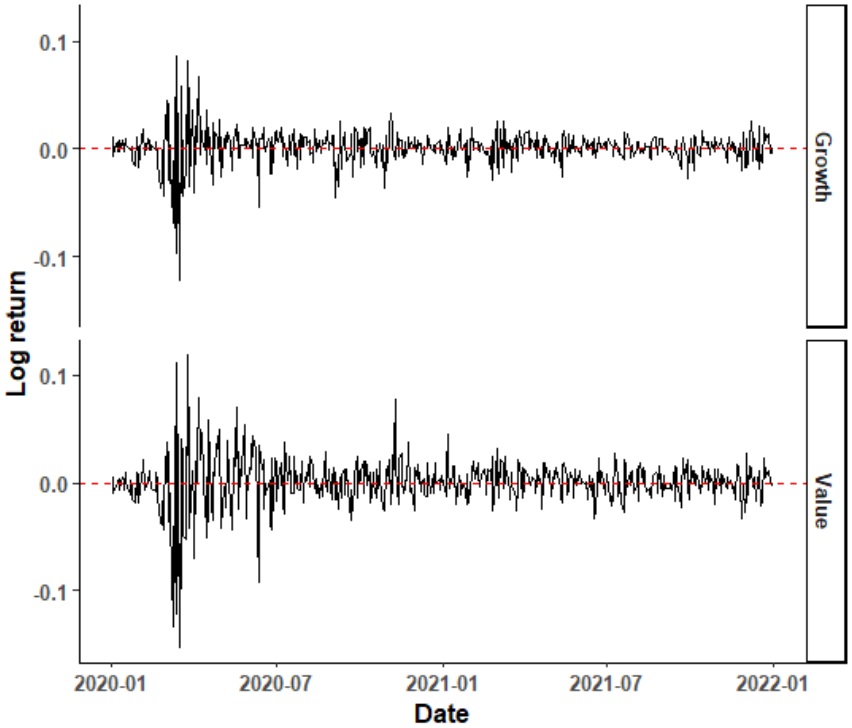

Fig. 2. Daily log returns for the period of 01/2020-12/2021. Own elaboration based on data from Kenneth French Data Library.

Return distribution characteristics

A fundamental task in the analysis of the response of the growth and value portfolio to the pandemic is to characterize the location and variability of their returns' distribution, which is feasible via inspection of skewness and kurtosis. The value of each statistic per portfolio and for the respective subperiod is shown in Table 3 and Table 4.

In the pre-Covid period, the skewness values suggest that returns' distribution is approximately symmetric. Although the value portfolio experiences greater negative skewness compared to growth, the breach of symmetry is practically negligible, as the absolute value of observed skewness remains smaller than 0.5. The growth portfolio

Table 3. Third and fourth moment for the period of 01/2010-12/2019.

Portfolio	N	Skewness	Kurtosis
Growth	2,516	-0.462	3.985
Value	2,516	-0.479	4.601

Source: Own elaboration based on data from Kenneth French Data Library.

Reaches higher values of kurtosis compared to value portfolio too. Its values above 3[5] are recognized as the presence of heavy tails relative to the normal distribution, which is the case in both portfolios. These findings are in line with the stylized features of financial returns[6]. Much stronger deviations from the normal distribution are identified in the Covid period. Kurtosis being more than doubled in value portfolio and almost tripled in growth

[5] The kurtosis of any univariate normal distribution is 3.
[6] The whole set of stylized facts for financial returns can be found in Cont (2002).

portfolio, relative to its pre-Covid values, implies that the tail risk associated with both portfolios has increased considerably. Its large values indicate higher probabilities of extremely large and extremely small returns.

Table 4. Third and fourth moment for the period of 01/2020-12/2021.

Portfolio	N	Skewness	Kurtosis
Growth	505	-0.906	11.755
Value	505	-0.824	9.516

Source: Own elaboration based on data from Kenneth French Data Library.

A noticeable development has also occurred in the level of skewness. Both portfolios become moderately negatively skewed, reflecting the fact that the downturns of financial markets were much steeper than the upward movements in the observed period. As a result, investors in such portfolios may expect frequent small gains and a few large losses, since more values in the returns' distribution are concentrated on the right tail of the distribution graph while the left tail of the distribution graph is longer.

The visual representation of these finding is provided in a Quantile- Quantile (Q-Q) plot in Fig. 3, which compares the returns' distribution of both portfolios to normal distribution. The coloured line represents the normal distribution. If the black line lies along it, it means that the returns come from the same distribution. For the pre-Covid period, the existence of small tails demonstrates the kurtosis higher than typical for normal distribution mostly for the value portfolio. The overall symmetry in tails confirms the mild skewness as calculated in Table 3.

In the Covid period, the plots for both portfolios obviously change and show serious deviations from the normal distribution. They clearly display heavy tails on both sides of the distribution, which is the sign of extremely high kurtosis visible mainly in the growth portfolio. As the calculated skewness suggests, the left tail is much more pronounced, in both portfolios. This signals the incidence of extraordinary losses, rather than extraordinary gains, a typical behaviour in market downturns.

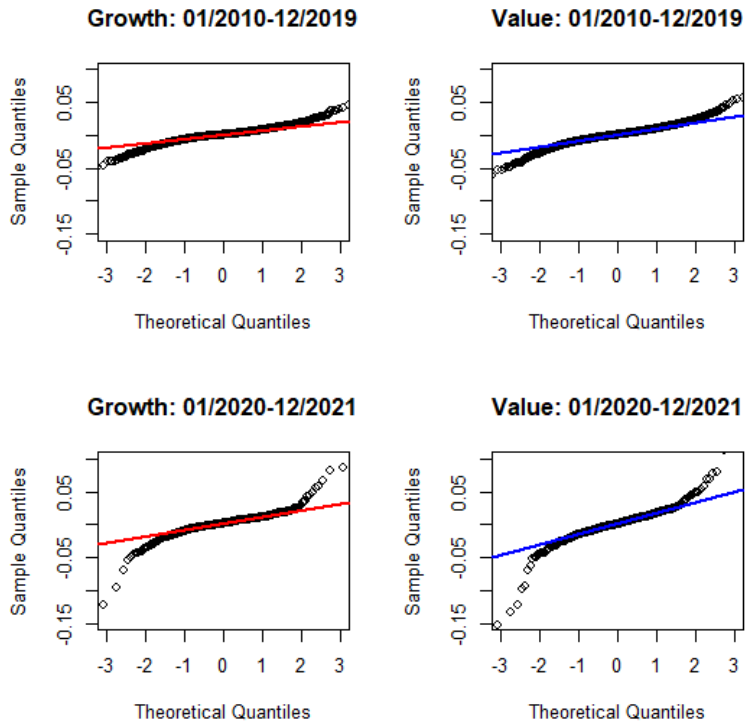

Fig. 3. Q-Q plot per portfolio and subperiod. Own elaboration based on data from Kenneth French Data Library.

Losses quantification

Since it was discovered that both portfolios experienced intense losses caused by the Covid outbreak, it is favourable to evaluate some of the statistical quantities describing the conditional or unconditional loss distribution in more detail. Especially VaR and ES are suitable for the precise quantification of losses occurred. The estimates of both risk measures for individual portfolios and both subperiods are depicted in Fig. 4 and Fig. 5. The two figures portray histograms of log returns overlaid with a density curve. VaR and ES are highlighted with the dashed and dotted line, respectively.

The estimates of VaR for the pre-Covid period of the growth portfolio imply that for the whole duration of the

subperiod and given confidence level[7], the worst loss should not exceed 1.5%. ES, interpreted as the expected loss that is incurred in the event that VaR is exceeded, amounts to 2.3%. As acknowledged in previous subsections,

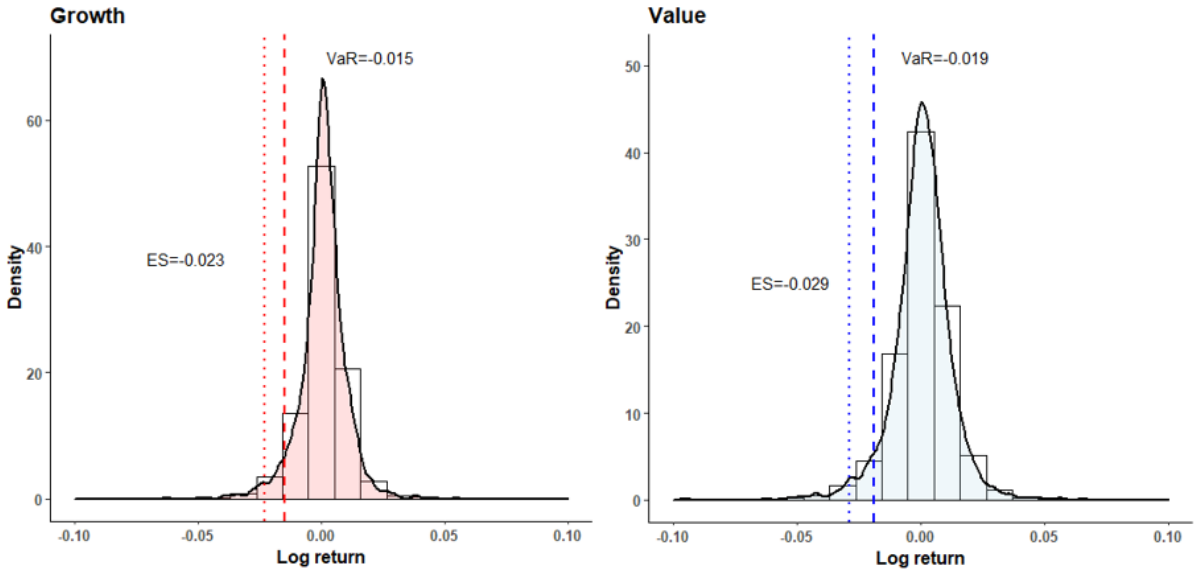

Fig. 4. VaR and ES estimates for the period of 01/2010-12/2019. Own elaboration based on data from Kenneth French Data Library.

the range of returns for the value portfolio is remarkably bigger. With its minimum being approximately 50% smaller than in growth portfolio, the calculated VaR and ES are shifted to the left. The former is expressing a possible loss of 1.9% with a given probability. The latter informs that the average loss beyond the VaR level sums up to 2.9%. Both of the calculated statistics are more than 25% higher for the value portfolio than for the growth portfolio.

The major shifts that arose in the Covid period are demonstrated in Fig. 5. Both risk measures' estimates mirror the elevated riskiness of portfolios. The VaR of the growth portfolio experiences a surge of more than 50% compared to its pre-Covid level. Even more significant is the shift in ES, which increased by more than 75%, confirming the sharp jump in kurtosis and associated more frequent occurrence of extreme losses. The analysis of the value portfolio reveals even more critical sensitivity to the pandemic. While the risk of loss measured by VaR increased by more than 70%, the expected loss in the worst 5% of cases has doubled. The pair of histograms also exhibit the copious rise in negative skewness, as the left tail is visibly longer in both portfolios.

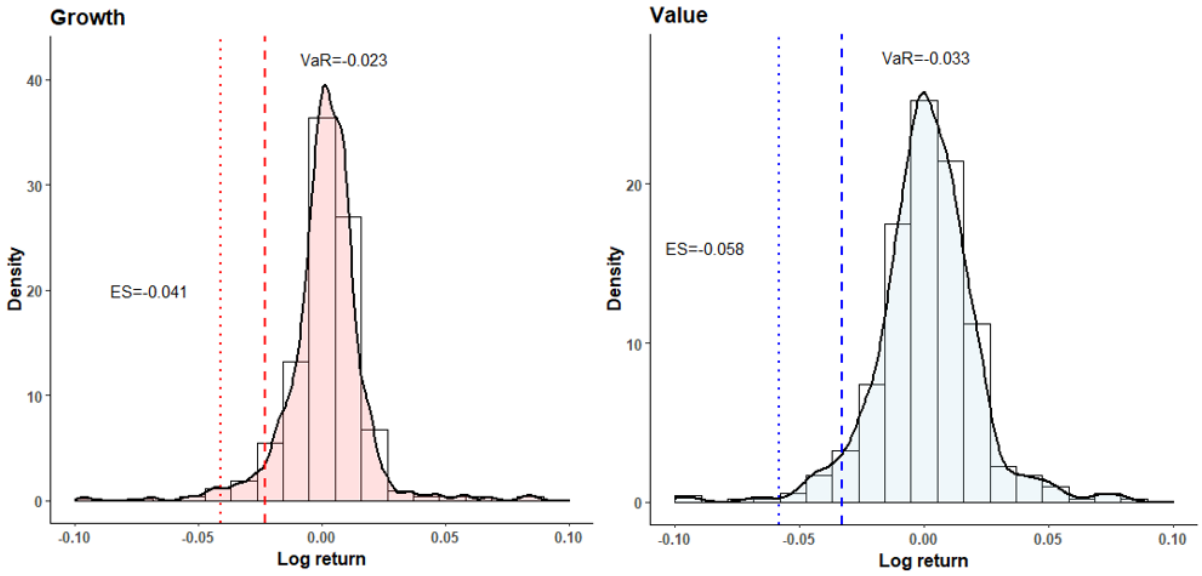

Fig 5. VaR and ES estimates for the period of 01/2020-12/2021. Own elaboration based on data from Kenneth French Data Library.

Discussion

Results collected for the pandemic preceding period indicate more than two times higher average returns and lower

[7] All estimates presented in Fig. 4 and Fig. 5 are calculated with 95% level of confidence.

volatility in the growth portfolio, which is in line with the most recent research (DiCiurcio et al., 2021). The subsequent analysis reveals a slightly negative skewness in both portfolios, although the deviations from the normal distribution are only minor. The calculated kurtosis suggests the presence of somewhat heavier tails compared to the normal distribution, which is in line with the stylized features of financial returns (Cont, 2002). The deviations from normality in both moments are more pronounced in value portfolio. Estimates of VaR signal that the worst loss should not exceed 1.5% in growth portfolio and 1.9% in value portfolio. Calculated ES shows that the expected loss in the worst 5% of cases is 2.3% and 2.9%, respectively. Taking everything into account, it can be concluded that in the pre-Covid period the value portfolio not only underperformed the growth one, but it also experienced higher tail risk and expected loss.

In the Covid period both portfolios were subject to critical changes and their returns experienced greater fluctuations. Consequently, the volatility of both portfolios surged, even doubled in the value portfolio. Major shifts are observed in the symmetry of returns distribution too. Although both portfolios became moderately negatively skewed, the impact on the growth portfolio is slightly more significant. This demonstrates the fact that declines in financial markets were much more pronounced than the upward movements in the Covid period. The increase in the riskiness of portfolios is supported by calculated kurtosis, which is more than doubled in both portfolios. This is the reflection of heavier tails and thus dramatically higher probability of extreme returns.

The steep market downturns during the pandemic resulted in noticeable developments in the loss distribution. The VaR of the growth portfolio encountered a surge of more than 50%. Even more significant is the switch in ES, which rose by more than 75%, supporting the sharp jump in kurtosis and associated frequent incidence of extreme losses. The analysis of the value portfolio shows even more substantial responsiveness to the pandemic. While the risk of loss measured by VaR increased by more than 70%, the expected loss in the worst 5% of cases has doubled and reached 5.8%.

Conclusion

As one of the most recent and significant phenomena, the Covid-19 pandemic has affected the stock markets all around the world severely. Considering this, the goal of the present paper is to analyse the differences in the effect of the pandemic on growth and value stocks in particular. With that objective in mind, the daily portfolio returns formed on B/M ratio from Kenneth French Data Library are evaluated for the period of January 2010 to December, 2021 with the two subperiods: pre-Covid and Covid. The breakpoint is the first official case of Covid-19 in Wuhan city reported to the WHO on December 31st, 2019. In the empirical analysis the emphasis is put on the study of return and loss distribution via calculation of summary statistics, visualization of Q-Q plots and employment of risk measures such as VaR and ES.

Overall, results provide evidence that the pandemic had a profound impact on the performance and riskiness of both portfolios. The initial analysis reveals that the impact on the returns' distribution in terms of the skewness and kurtosis is somewhat greater in the growth portfolio. However, the careful investigation of the loss distribution and tail risk reveals the pattern of higher sensitivity to the pandemic in the value portfolio in terms of higher volatility, frequency of extreme losses and average loss in the value portfolio, which confirms the findings of prior research (Frazier, 2021).

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References

Artzner, P., Delbaen, F., Eber, J., & Heath, D. (1999). Coherent measures of risk. *Mathematical Finance*, 9(3), 203-228. https://doi.org/10.1111/1467-9965.00068.

Basu, S. (1977). Investment performance of common stocks in relation to their price-earnings ratios: A test of the efficient market hypothesis. *The Journal of Finance*, 32(3), 663-682. https://doi.org/10.1111/j.1540-6261.1977.tb01979.x.

Bourguignon, F., & Jong, M. D. (2003). Value versus growth. *The Journal of Portfolio Management*, 29(4), 71-79. https://doi.org/10.3905/jpm.2003.319896.

Capaul, C., Rowley, I., & Sharpe, W. F. (1993). International Value and Growth Stock Returns. *Financial Analysts Journal*, 49(1), 27-36. https://doi.org/10.2469/faj.v49.n1.27.

Chan, L. K., & Lakonishok, J. (2004). Value and growth investing: Review and update. *Financial Analysts Journal*, 60(1), 71-86. https://doi.org/10.2469/faj.v60.n1.2593.

Chen, N., & Zhang, F. (1998). Risk and return of value stocks. *The Journal of Business*, 71(4), 501-535. https://doi.org/10.1086/209755.

Cont, Rama. (2002). Empirical Properties of Asset Returns: Stylized Facts and Statistical Issues. *Quantitative Finance,* 1. 223-236. https://doi.org/10.1088/1469-7688/1/2/304.

DiCiurcio, K., Lepigina, O., Kresnak, I., & Davis, J. (2021). Value versus growth stocks: The coming reversal of fortunes. Retrieved February 24, 2022. Available at: https://www.vanguard.be/documents/value-versus-growth-

stocks_EU_EN_Pro.pdf

Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance*, 47(2), 427-465. https://doi.org/10.1111/j.1540-6261.1992.tb04398.x.

Fama, E. F., & French, K. R. (1998). Value versus growth: The International Evidence. *The Journal of Finance*, 53(6), 1975-1999. https://doi.org/10.1111/0022-1082.00080.

Folkinshteyn, D., Meric, G., & Meric, I. (2017). Value and growth stock price behavior during stock market declines. *The Journal of Investing*, 26(4), 41-52. https://doi.org/10.3905/joi.2017.26.4.041.

Frazier, E. (2021). Value vs. Growth: Where Do We Go from Here? (Rep.). Marquette Associates.

Graham, B., & Dodd, D. L. (1934). Security analysis: Principles and technique. McGraw-Hill Book Company, New York and London.

Hillier, D., Ross, S.A., Westerfield, R.W., Jaffe, J. & Jordan, B.D. (2010). Corporate Finance: European Edition, McGraw-Hill - Higher Education, New York, NY, United States.

Lakonishok, J., Shleifer, A., & Vishny, R. W. (1994). Contrarian investment, extrapolation, and risk. *The Journal of Finance*, 49(5), 1541-1578. https://doi.org/10.1111/j.1540-6261.1994.tb04772.x.

McNeil, A. J., Frey, R., & Embrechts, P. (2015). Quantitative risk management: Concepts, techniques and tools. Princeton: Princeton University Press.

Saji, T. (2012). Does value outperform growth in a downturn? *IOSR Journal of Business and Management*, 4(6), 11-17. https://doi.org/10.9790/487x-0461117.

Singh, B., Dhall, R., Narang, S., & Rawat, S. (2020). The outbreak of covid-19 and stock market responses: An event study and panel data analysis for G-20 countries. *Global Business Review*, ahead-of-print. https://doi.org/10.1177/0972150920957274.

Vassalou, M., & Xing, Y. (2002). Default risk in equity returns. *Journal of Finance*, 59(2), 831-868. https://doi.org/10.2139/ssrn.297319.

Yamai, Yasuhiro & Yoshiba, Toshinao. (2002). Comparative Analyses of Expected Shortfall and Value-at-Risk (3): Their Validity under Market Stress. *Monetary and Economic Studies,* 20. 181-237.

Zhang, D., Hu, M., & Ji, Q. (2020). Financial Markets under the global pandemic of covid-19. *Finance Research Letters*, 36, 101528. https://doi.org/10.1016/j.frl.2020.101528.