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Does sustainable competitive advantage make a difference in stock performance during the Covid-19 pandemic?

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ABSTRACT

Although firms with sustainable competitive advantage do not yield superior returns in regular years, these firms significantly outperform others during the Covid-19 pandemic. Empirical evidence shows that wide-moat is positively priced by the stock market during the pandemic, which is not the case in the pre-pandemic period. Furthermore, wide-moat firms can generate positive cumulative abnormal returns after the advent of the Covid-19 pandemic. However, the magnitude wanes down as time expands into the future.

1. Introduction

The eruption of Covid-19 pandemic caused significant disruptions to the financial markets across the globe. The U.S. stock market represented by the S&P500 and Dow Jones Industrial Average lost more than one third of its value in the first quarter of 2020. Recent studies such as Baker et al. (2020), Phan and Narayan (2020), Yu (2020), Harjoto et al. (2020), Mazur et al. (2021), and Contessi and Pace (2021) collectively show that stock markets experienced huge volatilities with respect to the development of the pandemic. In the meanwhile, markets also re-adjusted and re-balanced as new information flowed in. Although the pandemic had a general wide-spreading impact on the market, the degree of influence varied among different sectors. He et al. (2020), Mazur et al. (2021), and Narayan et al. (2022) find that during the Covid-19 outbreak sectors such as manufacturing, food, healthcare, and information technology garnered high positive returns. While, sectors such as transportation, entertainment, and hospitality firms suffered sizeable losses. Also, stocks exhibited asymmetric volatility that correlates with stock returns. Their evidence indicates that certain types of companies benefited from the economic change caused by the pandemic and others took the negative impact. For example, firms in the information technology sector that provide resources for remote working performed very well during the pandemic, as the economy shifted to the teleworking style. However, firms in the transportation sector took a huge hit because of reduced business and personal travel. The non-uniform impact of the Covid-19 pandemic implies that investors may have changed their investing behaviors and re-allocated their investments to companies that are more defensive and can be isolated or even benefit from the pandemic. Previous literature provides a consistent view for this argument. Caballero and Krishnamurthy (2008), Marsh and Pfleiderer (2013), and Rösch and Kaserer (2014) indicate that, during the financial crisis, investors actively change their investment portfolio and tend to put more weights on high quality stocks which have solid businesses and sound financial positions, a practice known as flight to quality. Since Covid-19 pandemic generates a financial crisis, high quality firms tend to be overweighted, while low quality firms tend to be underweighted. Therefore, firm’s quality is hypothesized to be positively priced by the market, which is expected to yield noticeable

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1 The Dow reached the bottom at the level of 18,591.93 on March 23, 2020, a loss of 36.32% since the 1st Covid-19 case was reported in the United States.
performance differences during the pandemic.

Although firm’s quality can be assessed by various metrics, the sustainable competitive advantage, i.e., economic moat, is considered a measurement of the overall quality rating of a firm’s strength and defensive power. According to Morningstar, for those stocks it covers, there are three possible ratings: wide-moat, narrow-moat, and no-moat. A wide-moat rating means that the company possesses a high degree of competitive advantage over its competitors, which is expected to generate returns on capital much greater than the cost of capital in the long-term. The main attributes to the economic moat are: network effect, intangible assets, cost advantage, switching costs, and efficient scale.\(^2\) Boyd (2005) and Boyd and Quinn (2006) find that wide-moat firms benefit from their structural advantages which create values for the shareholders. The historical superior performance of wide-moat firms in terms of earnings, stability, and price appreciation is observed. Kanuri and McLeod (2016) support this claim by providing evidence that wide-moat firms can build a barrier to guard them from outside competitions. Therefore, those firms can secure and maintain high profitability, hence outperforming the market. Moreover, Piotroski (2000), Mohanram (2005), Novy-Marx (2013), Ball et al. (2015), and Asness et al. (2019) collectively support the argument that firms with higher gross profitability, greater earnings quality, and better operational performance would obtain higher cross-sectional average returns. Since firms with higher sustainable competitive advantage normally maintain a high profitability, these studies imply that wide-moat firms tend to be winners.

However, economic moat is intangible and more than a fundamental factor that could be easily measured. If wide-moat firms are truly safer investment vehicles for risk-averse investors, then these firms should have higher valuations and lower future returns, as investors would post a relatively low discount rate in calculating their values. In general, wide-moat firms have larger size and lower book-to-market ratio than narrow-moat and no-moat firms. Prior literature such as Fama and French (1992, 1995, 2006, 2015) provides with ample empirical evidence that firms with smaller size and higher book-to-market ratio can generate higher average returns. The primary reason is that smaller size and higher book-to-market ratio represent higher risk levels. If this risk-based explanation prevails, then narrow-moat and no-moat firms should outperform wide-moat firms.

Using a dataset comprised of firms with available moat ratings from January 2013 to December 2020, this study finds that firms with a high degree of sustainable competitive advantage, i.e., wide-moat, earned lower average returns than narrow-moat and no-moat firms in regular years. However, wide-moat firms significantly outperformed narrow-moat and no-moat firms during the Covid-19 pandemic. Empirical evidence from regression analysis shows that wide-moat was significantly positively priced by the market in the mid-pandemic period, which was not the case in the time period before the pandemic. Furthermore, wide-moat firms can generate positive cumulative abnormal returns after the market was hit by the Covid-19 pandemic.

The rest of the paper is structured into three sections: Section 2 describes data and methodology. Section 3 presents empirical results and related discussions. Section 4 concludes this paper.

2. Data and methodology

The sample of this study covers from January 2013 to December 2020. The pre-pandemic period ranges from 2013 to 2019, and 2020 is the mid-pandemic period.\(^3\) The pre-pandemic period tracks the bull market which was fully recovered from the Great Recession and entered into a significant expansion phase.\(^4\) Firm’s economic moat ratings are obtained from the Morningstar database. Company stock return data is obtained from Center of Research in Security Prices (CRSP) and then matched with fundamental data obtained from COMPUSTAT database. Auxiliary data for calculating abnormal returns are garnered from the Fama and French Data Library US Research Returns. Corporate board data is retrieved from the BoardEx database. Financial and utility firms (4-digit SIC 6000–6999 and 4900–4999) are excluded, since these firms are in highly regulated industries. To mitigate noise and potential bias, 252 observations with insufficient data entries are removed, approximately 2.32 percent of the sample size. The finalized dataset includes a total number of 10,615 observations.

For testing of factor pricing, the classic Fama-Macbeth regression (Fama and MacBeth, 1973) is utilized as shown in Eq. (1). The Fama-MacBeth regression involves a two-stage process. The first stage runs cross-sectional regressions with firm’s stock return as the dependent variable. The second stage calculates the time-series averages of the estimated coefficients obtained from the cross-sectional regressions and the associated t-statistics. The standard errors are adjusted for cross-sectional dependence. All variables are measured at the end of the previous fiscal year. As shown in Eq. (2), this study uses a multiple regression model to test the cumulative abnormal returns\(^5\) for various windows. Industry fixed effects are controlled and standard errors are clustered at the firm level. All variable definitions are presented and explained in Table A1 of the Appendix.

\(^2\) Network effect refers to the notion that the value of a firm’s service increases for both new and existing users when more people use the service. Intangible assets refer to patents, brands, regulatory licenses, etc., which will build a barrier for competitors to imitate. Cost advantage refers to the notion that a firm can enjoy a higher margin when charging its products and services at the market price level. Switching costs refer to the notion that the customers of the company will incur high cost and experience of difficulty if they choose other companies. Efficient scale refers to the notion that a niche market is dominated by one or a few companies which have certain degrees of monopolistic power for scale.

\(^3\) Although the Covid-19 pandemic was expanding around the world, the first official Covid-19 case was reported on January 21, 2020 in the United States.

\(^4\) After the 2007-2009 Great Recession, U.S stock market, represented by the S&P500 index, took about 3.03 years to recover the losses suffered during the market downturn.

\(^5\) Company daily abnormal return is calculated based on Fama and French (1993) three-factor model: \(R_{i,t} - R_{f,t} = \alpha_i + \beta_i (R_{m,t} - R_{f,t}) + \beta_i S_{M} + \beta_i S_{M} + \beta_i HML + \epsilon_{i,t}\), where \(\alpha_i\) is the abnormal return for company \(i\) at time \(t\) (\(AR_{i,t}\)). Hence, for a given company, the \(\text{CAR}_{(t_1, t_2)} = \sum_{t_{1}}^{t_{2}} AR_{i,t} - R_{f,t}\).
To investigate the characteristics of companies with different economic moat ratings, as shown in Table 1, three equal-weighted portfolios (wide-moat portfolio, narrow-moat portfolio, and no-moat portfolio) are constructed on the first trading day of each year based on firms’ economic moat ratings at the end of December in the previous year. The holding period is one year and the relevant characteristics are calculated accordingly. On the first trading day of the following year, all portfolios are rebalanced so that three new equal-weighted portfolios are constructed. This process repeats itself throughout the sample period. From 2013 to 2019, portfolio’s annual stock return is the monthly compounded returns of the twelve months in a given year. 2020 is the unique year as it is considered the mid-pandemic period. Market bottom refers to the date of March 23, 2020 since both the S&P500 and the Dow hit the lowest level during the Covid-19 pandemic. Portfolio’s “2020 pre-market bottom” return refers to the daily compounded returns for the holding period from January 1, 2020 to March 23, 2020. Portfolio’s “2020 post-market bottom” return refers to the daily compounded returns for the holding period from March 24, 2020 to December 31, 2020.

3. Empirical results and discussion

3.1. Stock characteristics and historical performance by economic moat

Fig. 1. shows the average annual stock returns by economic moat. Although a wide-moat portfolio represents a high degree of sustainable competitive advantage, for most years, no-moat firms largely outperform wide-moat firms. For the pre-pandemic period from 2013 to 2019, the average annual stock return of no-moat firms is 32.50%. While, the average annual stock return of wide-moat firms is only 14.51%, with narrow-moat firms in between (15.46%). The largest return gap (15.73%) happened in 2013, as no-moat firms earned an average annual stock return of 38.05% and wide-moat firms garnered an average annual return of merely 22.32%. This phenomenon turns to the complete opposite after the Covid-19 pandemic hit the market. For the period of 2020 pre-market bottom (holding period from January 1, 2020 to March 23, 2020), no-moat firms on average lost about 44.06% of their values. However, wide-moat firms on average only dropped about one third (−33.56%) of their values. Similar situation happened for the period of 2020 post-market bottom (holding period from March 24, 2020 to December 31, 2020), during which wide-moat firms on average outperformed no-moat firms by 9.60% (58.18% vs. 48.58%). This evidence suggests that during the pandemic wide-moat firms had not only smaller value losses but also faster and greater value recovery after the market was bottomed out. Conforming to the literature on investors’ flight to quality (Caballero and Krishnamurthy, 2008; Marsh and Pfleiderer, 2013; Rösch and Kaserer, 2014), no-moat firms were significantly sold off during the pandemic, as investors re-allocated their assets to high quality firms that are considered safe investments. Consequently, wide-moat firms were significantly overweighted by investors, since these companies have larger size, higher profitability, more stable cash flows, and solid businesses. In summary, although no-moat firms obtained higher returns than wide-moat firms during regular years, wide-moat firms performed much better after the market was hit by the Covid-19 pandemic.

Table 1 presents portfolio characteristics by economic moat. As shown in the table, wide-moat portfolio has lower systematic risk than narrow-moat and no-moat portfolios. On average, wide-moat portfolio has a beta of 0.98 which is very close to the risk level of the market. However, the average portfolio betas are 1.11 and 1.7 for narrow-moat and no-moat portfolios respectively, indicating greater market risk exposures for companies with weak or no sustainable competitive advantage. Portfolio standard deviation shows that wide-moat portfolio (25.29%) has lower return fluctuations than narrow-moat (26.06%) and no-moat (38.71%) portfolios.

Although no-moat portfolio has the highest average portfolio return in the pre-pandemic period and the highest market risk (beta) and idiosyncratic risk (standard deviation), it doesn’t stand out in terms of Sharpe ratio and Treynor ratio. Table 1 shows that wide-moat portfolio has an average Sharpe ratio of 0.62 and an average Treynor ratio of 0.16. While, the two ratios of narrow-moat and no-moat portfolios are very similar. Therefore, the evidence suggests that the high return of no-moat portfolio is probably due to its high risk level. This evidence leads to the examination of two traditional risk factors: size and book-to-market ratio. Banz (1981), Chan et al. (1985), Zarowin (1990), and Fama and French (1992, 1995, 2006, 2015) well documented that small size firms in terms of market cap, on average, outperform large size firms. These studies claim that although size itself may not be responsible for the effect it generally

\[
R_{it} = \beta_i + \beta_{i,\text{WideMoat}} \gamma_{i,\text{WideMoat}} + \beta_{i,\text{NarrowMoat}} \gamma_{i,\text{NarrowMoat}} + \beta_{i,\text{NoMoat}} \gamma_{i,\text{NoMoat}} + \beta_{i,\text{Beta}} \gamma_{i,\text{Beta}} + \beta_{i,\text{Ln(ME)}} \gamma_{i,\text{Ln(ME)}} + \beta_{i,\text{Assets}} \gamma_{i,\text{Assets}} + \beta_{i,\text{Price}} \gamma_{i,\text{Price}} + \beta_{i,\text{Earnings}} \gamma_{i,\text{Earnings}} + \beta_{i,\text{Market}} \gamma_{i,\text{Market}} + \beta_{i,\text{Book}} \gamma_{i,\text{Book}} + \beta_{i,\text{Sales}} \gamma_{i,\text{Sales}} + \beta_{i,\text{Dividend}} \gamma_{i,\text{Dividend}} + \beta_{i,\text{Earnings Dummy}} \gamma_{i,\text{Earnings Dummy}} + \epsilon_{it}
\]

\[
\text{CAR}_{i,t} = \gamma_{0} + \gamma_{1,\text{WideMoat}} + \gamma_{2,\text{NarrowMoat}} + \gamma_{3,\text{NarrowMoat}} + \gamma_{4,\text{MB}} + \gamma_{5,\text{ROA}} + \gamma_{6,\text{SALE}} + \gamma_{7,\text{LEV}} + \gamma_{8,\text{RET}} + \gamma_{9,\text{CASH}} + \gamma_{10,\text{FARE}} + \gamma_{11,\text{IRATIO}} + \gamma_{12,\text{R&D}} + \mu_{t} + \epsilon_{t}
\]
**Table 1**

|                      | Pre-Pandemic | Mid-Pandemic |
|----------------------|--------------|--------------|
|                      | 2013 14 15 16 17 18 19 | Pre-Pandemic Arithmetic Average | Pre-Pandemic Moving Average | Mid-Pandemic 2020 Pre-Market Bottom | Mid-Pandemic 2020 Post-Market Bottom |
| **Wide-Moat Portfolio** | 22.32% 9.95% -1.32% 32.12% 17.82% -8.87% 29.56% 14.51% | 15.01% | -33.56% | 58.18% |
| **Market Return**     | 0.99 0.93 0.91 1.01 0.96 1.05 0.97 0.98 | 0.97 | 1.16 | 1.20 |
| **Standard Deviation** | 20.6% 29.0% 33.5% 32.4% 18.3% 21.4% 21.8% 25.29% | 25.33% | 48.12% | 51.35% |
| **Size (in millions)** | 35,183 47,603 47,589 49,619 54,664 53,324 61,471 51,351 | 49,469 | 52,200 | 59,439 |
| **Sharp ratio**       | 1.06 0.33 -0.4 1.19 0.83 -0.48 1.46 0.62 | 0.64 | -0.70 | 1.27 |
| **Treyer ratio**      | 0.23 0.09 -0.07 0.34 0.22 -0.08 0.39 0.16 | 0.16 | -0.29 | 0.54 |
| **Narrow-Moat Portfolio** | 26.47% 12.85% 3.13% 22.76% 15.46% | 33.78% | 15.46% | 16.00% | 38.86% | 52.35% |
| **Market Beta**       | 1.13 1.13 1.17 1.07 1.07 1.05 1.15 1.11 | 1.11 | 1.29 | 1.31 |
| **Standard Deviation** | 25.6% 30.0% 20.2% 25.0% 34.7% 22.0% 24.9% 26.06% | 26.40% | 52.81% | 57.82% |
| **Size (in millions)** | 15,889 17,266 17,074 18,348 20,140 19,430 21,984 18,590 | 17,874 | 18,972 | 21,837 |
| **Sharp ratio**       | 1.02 0.42 0.13 1.33 0.50 -0.23 1.47 0.66 | 0.66 | -0.74 | 1.28 |
| **Treyer ratio**      | 0.22 0.08 0.06 0.31 0.20 -0.08 0.29 0.15 | 0.16 | -0.30 | 0.57 |
| **No-Moat Portfolio** | 38.05% 16.87% 3.87% 17.19% 33.27% 0.15% 48.10% 22.50% | 22.84% | -44.06% | 48.58% |
| **Market Return**     | 1.74 1.83 1.67 1.90 1.94 1.73 1.70 1.79 | 1.79 | 1.98 | 1.96 |
| **Standard Deviation** | 46.4% 36.7% 30.1% 42.7% 40.7% 40.1% 34.3% 38.71% | 39.94% | 61.32% | 68.61% |
| **Size (in millions)** | 5218 5599 5563 5787 6161 6025 6932 5898 | 5824 | 6861 | 8267 |
| **Sharp ratio**       | 0.63 0.62 0.65 0.57 0.61 0.68 0.59 0.62 | 0.62 | 0.72 | 0.68 |
| **Treyer ratio**      | 0.72 0.57 0.32 0.91 0.69 -0.11 1.20 0.61 | 0.60 | -0.72 | 1.25 |
| **Market Performance** | 29.60% 11.39% -0.73% 9.54% 19.42% -6.24% 28.88% 13.12% | 14.46% | -30.75% | 67.88% |
| **S&P 500 Index**     | 32.40% 13.60% 1.39% 11.78% 21.99% -4.55% 31.39% 15.43% | 16.84% | -30.12% | 70.08% |
| **CRSP Value-Weighted Market Portfolio** | 36.41% 14.39% -2.37% 15.24% 18.64% -7.75% 30.12% 14.95% | 17.13% | -38.48% | 85.74% |

This table displays portfolio characteristics by economic moat. For each year, according to Morningstar moat ratings, three equal-weighted portfolios are constructed: wide-moat portfolio, narrow-moat portfolio, and no-moat portfolio. All portfolios are constructed on the first trading day of each year based on firms’ moat ratings in the December of the previous year. From 2013 to 2019, the table exhibits portfolios’ annual characteristics and performance. For the period of “2020 Pre-Market Bottom”, the table exhibits portfolios’ characteristics and performance for the holding period from January 1, 2020 to March 23, 2020. For the period of “2020 Post-Market Bottom”, the table exhibits portfolios’ characteristics and performance for the holding period from March 24, 2020 to December 31, 2020.
represents a type of risk. On the other hand, Fama and French (1992, 1995, 2006, 2015) and Griffin and Lemmon (2002) find that high book-to-market firms, on average, have higher returns than low book-to-market firms. Book-to-market ratio is considered a measure of firm’s distress risk, which brings a return premium for high book-to-market firms. Drew (2003) claims that size and book-to-market are better than beta in describing cross-sectional stock returns, since these two factors capture risk well. Firm’s sustainable competitive advantage is developed over time, during which a company would gain market shares, consolidate suppliers, build economic scales, form entry barriers, and differentiate the products and services. As a result, wide-moat firms tend to have larger size and lower book-to-market ratio. Table 1 shows that the average size of wide-moat firms is $51,351 million. However, the average size of narrow-moat firms is only $18,590 million and it drops to merely $5898 million for no-moat firms. Similar traits are also captured by the book-to-market ratio. Wide-moat firms show a significant value cumulation with an average book-to-market ratio of only 0.34, implying that most of them are growth firms. In contrast, the average book-to-market ratios are 0.43 for narrow-moat firms and 0.62 for no-moat firms. Hence, value firms are likely to have a rating of narrow-moat or no-moat. Consistent with prior literature on risk and return, to a great extent, higher average annual returns earned by narrow-moat and no-moat firms before the Covid-19 pandemic can be explained by their smaller size and higher book-to-market ratio.

3.2. The pricing of economic moat

As evidenced by prior literature, during the financial crisis, investors actively re-allocate their investments to safer stocks, a behavior known as flight to quality. High quality firms tend to be overweighted and low quality firms are likely to be underweighted (Caballero and Krishnamurthy, 2008; Marsh and Pfeiderer, 2013; Rösch and Kaserer, 2014). Since economic moat is considered a measure of a firm’s overall quality (Boyd, 2005; Boyd and Quinn, 2006). It is hypothesized to be positively priced by the market during the Covid-19 pandemic.

This study uses the well-acknowledged Fama-Macbeth regression to formally test the pricing of economic moat. Table 2 exhibits the second stage results of the Fama-Macbeth regressions. The dependent variable is firm’s stock return of the correspondingly time period and independent variables are defined in Table A1 of the Appendix. Model 1 provides empirical evidence for the return mean-difference among stocks with different ratings of sustainable competitive advantage for the pre-pandemic period. Although not significant, WideMoat and NarrowMoat both bear a negative estimated coefficient (−0.67 and −0.55 respectively). It suggests that, comparing to no-moat firms, wide-moat firms on average underperform by 0.67% monthly (8.04% annually) and narrow-moat firms on average underperform by 0.55% monthly (6.6% annually). This evidence is consistent with the results exhibited in Table 1, as no-moat firms garnered much higher average returns than wide-moat and narrow-moat firms before the advent of the Covid-19 pandemic. However, as shown in Models 2 to 4, when
Table 2
Fama-Macbeth regressions of stock returns on economic moat and other financial factors.

|                                | Pre-Pandemic (monthly regressions) | Mid-Pandemic Pre-Market Bottom (daily regressions) | Mid-Pandemic Post-Market Bottom (daily regressions) |
|--------------------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------|
|                                | (1)                                | (2)                                               | (3)                                           |
| WideMoat                       | -0.67                              | 0.19                                              | 0.36                                          |
|                                | (-1.12)                            | (0.76)                                            | (0.98)                                        |
| NarrowMoat                     | -0.55                              | 0.12                                              | 0.26                                          |
|                                | (-0.71)                            | (0.66)                                            | (0.88)                                        |
| Beta                           | 0.21                               | (0.17)                                            | (0.17)                                        |
| Ln(ME)                         | -0.35***                           | -0.26***                                          | -0.28***                                      |
|                                | (-2.36)                            | (-2.72)                                           | (-3.22)                                       |
| Ln(Book-to-Market)             | 0.21**                            | 0.22*                                             | 0.09*                                         |
|                                | (1.98)                             | (1.73)                                            | (1.75)                                        |
| Earnings-to-Price              | -0.61                              | -0.32                                             | -0.13                                         |
|                                | (-0.61)                            | (-0.32)                                           | (0.52)                                        |
| EarningsDummy                  | -0.13                              | -0.05                                             | -0.56                                         |
|                                | (0.52)                             | (0.56)                                            | (0.56)                                        |
| Ln(Asset-to-Book)             | 0.27                               | 0.07                                              | 0.07                                          |
|                                | (0.73)                             | (0.33)                                            | (0.33)                                        |

This table exhibits the results of Fama-Macbeth regressions of stock returns on economic moat. The “Pre-Pandemic” period is from 2013 to 2019. Cross-sectional regressions are run every month from January 2013 to December 2019 with firm’s monthly return as the dependent variable for a total of 84 monthly regressions. The “Mid-Pandemic Pre-Market Bottom” period is from January 1, 2020 to March 23, 2020. Cross-sectional regressions are run every trading day of the period with firm’s daily return as the dependent variable for a total of 56 daily regressions. The “Mid-Pandemic Post-Market Bottom” period is from March 24, 2020 to December 31, 2020. Cross-sectional regressions are run every trading day of the period with firm’s daily return as the dependent variable for a total of 197 daily regressions. The reported coefficients are calculated based on the time-series average of the coefficients obtained from the cross-sectional regressions. WideMoat is a dummy variable, which equals to 1 if a firm is categorized as a wide-moat firm, and 0 otherwise; NarrowMoat is a dummy variable, which equals to 1 if a firm is categorized as a narrow-moat firm, and 0 otherwise; Beta is firm’s market beta, calculated using return data one year prior to the formation of the moat portfolio. Ln(ME) is the natural logarithm of firm’s market value of common equity; Ln(Book-to-Market) is the natural logarithm of firm’s book value of common equity to the market value of common equity; Earnings-to-Price is the ratio of annual earnings to market value of common equity if earnings are positive, and 0 otherwise; EarningsDummy is a dummy variable, which equals to 1 if firm’s annual earnings are negative, and 0 otherwise; Ln(Asset-to-Book) is the natural logarithm of firm’s total assets to book value of common equity. The associated t-statistic is reported in the parenthesis. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively.
Table 3
Effects of economic moat on firm’s cumulative abnormal returns.

|            | Pre-Event Window | Event Window | Post-Event Window | Post-Event Window |
|------------|------------------|--------------|-------------------|-------------------|
|            | (1)              | (2)          | (3)               | (4)               |
| **WideMoat** |                  |              |                   |                   |
| CAR       | –0.16            | 2.86**       | 3.12***           | 2.65*             |
|           | (–0.56)          | (2.31)       | (2.12)            | (1.72)            |
| **NarrowMoat** |               |              |                   |                   |
| CAR       | –0.11            | 0.37         | 0.33              | 0.26              |
|           | (–0.38)          | (1.39)       | (1.12)            | (0.98)            |
| **SIZE**  | 0.21*            | 0.35**       | 0.38**            | 0.32**            |
|           | (1.68)           | (2.12)       | (2.01)            | (1.98)            |
| **MB**    | 0.11             | 0.15*        | 0.21*             | 0.19*             |
|           | (1.35)           | (1.68)       | (1.86)            | (1.92)            |
| **ROA**   | 0.05             | 0.08         | 0.07              | 0.07              |
|           | (0.87)           | (0.66)       | (0.71)            | (0.56)            |
| **GSALE** | 0.02             | 0.03         | 0.05              | 0.05              |
|           | (0.48)           | (0.72)       | (0.55)            | (0.59)            |
| **LEV**   | –0.53            | –0.66*       | –0.59*            | –0.57             |
|           | (–1.33)          | (–1.66)      | (–1.72)           | (–1.27)           |
| **RET**   | 0.12             | 0.18         | 0.17              | 0.13              |
|           | (0.23)           | (0.31)       | (0.42)            | (0.48)            |
| **CASH**  | 0.23*            | 0.37**       | 0.33**            | 0.32**            |
|           | (1.75)           | (2.33)       | (2.12)            | (1.56)            |
| **FAGE**  | 0.16             | 0.13         | 0.15              | 0.17              |
|           | (0.66)           | (0.91)       | (1.02)            | (0.72)            |
| **IRATIO**| 0.06             | 0.08         | 0.08              | 0.07              |
|           | (0.45)           | (0.69)       | (0.58)            | (0.63)            |
| **R&D**   | 0.006            | 0.007        | 0.006             | 0.007             |
|           | (0.18)           | (0.23)       | (0.21)            | (0.15)            |
| Industry Fixed Effects | Yes | Yes | Yes | Yes |
| Adj. R-Squared | 0.29 | 0.36 | 0.37 | 0.33 |

This table exhibits regression results of economic moat on firm’s cumulative abnormal returns. Firm fundamentals are controlled for all models. Company daily abnormal return is calculated based on Fama and French (1993) three-factor model: $R_{it} = \alpha_i + \beta_i \left( R_{mt} - R_{ft} \right) + \beta_{SMB} \Delta SMB_i + \beta_{HML} \Delta HML_i + \epsilon_{it}$. Four regression windows are identified: pre-event window, event window, and two post-event windows. The event date is January 21, 2020 which was the date that the first official Covid-19 case was reported in the United States. “CAR” is the cumulative abnormal returns based on the length of each regression window. **WideMoat** is a dummy variable, which equals to 1 if a firm is categorized as a wide-moat firm, and 0 otherwise; **NarrowMoat** is a dummy variable, which equals to 1 if a firm is categorized as a narrow-moat firm, and 0 otherwise; **SIZE** is the natural logarithm of firm’s total assets; **MB** is the natural logarithm of firm’s market value divided by total assets; **ROA** is firm’s earnings before interests and tax divided by total assets; **GSALE** is firm’s sales growth rate; **LEV** is firm’s financial leverage which is calculated as long-term debt divided by total assets; **RET** is firm’s retained earnings divided by total common equity; **CASH** is calculated as the sum of cash and current investment divided by total assets; **FAGE** is the number of years that the firm has data available in the Compustat database; **IRATIO** is the ratio of independent directors to total number of directors on the board; **R&D** is natural logarithm of firm’s research and development expenses. Standard errors are clustered at the firm level. The associated t-statistic is reported in the parenthesis. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively.

3.3. Does economic moat make a difference during the Covid-19 pandemic?

The transition of economic moat’s insignificant pricing to significantly positive pricing, as presented in Table 2, provides evidence...
for investors’ flight to quality behavior during the Covid-19 pandemic. This motivates the investigation of the economic moat’s effect on firm’s abnormal returns, since investors tend to overweight high quality firms and underweight low quality firms during a financial crisis (Caballero and Krishnamurthy, 2008; Marsh and Pfleiderer, 2013; Rösch and Kaserer, 2014).

Table 3 reports the regression results of the effect of economic moat on firm’s cumulative abnormal returns. The dependent variable “CAR” is the summation of daily abnormal returns calculated based on Fama and French (1993) three-factor model. Independent variables are defined in Table A1 of the Appendix. For each model, standard errors are clustered at the firm level. The event date is January 21, 2020 which was the date that the first official Covid-19 case was reported in the United States. Four different windows are derived accordingly. The pre-event window is (−20, −9) and the event window is (−3, 3). There are two post-event windows. Window (9,20) is symmetric to the pre-event window (−20, −9), and window (44, 55) is a distant window that further expands into the future with the same length as the two non-event windows.

Model 1 suggests that economic moats, both wide-moat and narrow-moat, have an insignificant effect on firm’s cumulative abnormal returns before the pandemic. The outcome indicates that, though returns can be different, holding a diversified portfolio with a high degree of sustainable competitive advantage is not likely to generate superior risk-adjusted returns in regular times. However, the results of the event window, as shown in Model 2, suggest that wide-moat firms can generate an average of 2.86% (0.41% daily) cumulative abnormal returns around the event date (−3, 3). Furthermore, the results of the post-event window (9, 20), as shown in Model 3, exhibit that wide-moat is also significant on firm’s cumulative abnormal returns shortly after the event is observed by the market. The average CAR for wide-moat firms during this period is 3.12% (0.26% daily). Lastly, Model 4 specifies another post-event window (44, 55) that further expands into the future. WideMoat is still significant on the CAR with a rate of 2.65% (0.22% daily) for the period. It is worth noting that although WideMoat is significant in Models 2 to 4 the level of significance and the magnitude of the estimated coefficients wane down notably. This evidence suggests that firms with a high degree of sustainable competitive advantage, i.e., wide-moat firms, can generate higher risk-adjusted returns after the Covid-19 pandemic hit the market. However, the power of wide-moat gradually phased out as the market readjusted and balanced.

4. Conclusion

This study finds that firms with a high degree of sustainable competitive advantage, i.e., wide-moat, earned lower average annual returns than no-moat firms in regular years. However, this phenomenon turned to the opposite during the Covid-19 pandemic, as wide-moat firms significantly outperformed others, which is supported by investors’ flight to quality behavior. Although wide-moat firms had lower risk assessments in terms of market beta and standard deviation, they didn’t have higher risk-adjusted measures as comparing to narrow-moat and no-moat firms. Moreover, empirical evidence shows that wide-moat was significantly positively priced by the market during the mid-pandemic period, which was not the case in the period before the Covid-19 pandemic. Further evidence presented in this study indicates that firms with a high degree of sustainable competitive advantage can generate positive cumulative abnormal returns after the market was hit by the Covid-19 pandemic. However, the significance and magnitude associated with wide-moat on cumulative abnormal returns waned down as time expanded into the future.

CRediT authorship contribution statement

Huaibing Yu: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Appendix

Table A1

| Variable Name          | Format | Definition                                                                 |
|------------------------|--------|---------------------------------------------------------------------------|
| WideMoat               | Dummy  | Equals to 1 if a firm is categorized as a wide-moat firm, and 0 otherwise. |
| NarrowMoat             | Dummy  | Equals to 1 if a firm is categorized as a narrow-moat firm, and 0 otherwise. |
| Beta                   | Continuous | Firm’s market beta, which is calculated using previous year’s return data. |
| Ln(ME)                 | Continuous | Natural logarithm of firm’s market value of common equity. |
| Ln(Book-to-Market)     | Continuous | Natural logarithm of firm’s book value of common equity to the market value of common equity. |
| Earnings-to-Price      | Ratio  | Ratio of annual earnings to market value of common equity if earnings are positive, and 0 otherwise. |
| EarningsDummy          | Dummy  | Equals to 1 if firm’s annual earnings are negative, and 0 otherwise. |
| Ln(Asset-to-Book)      | Continuous | Natural logarithm of firm’s total assets to book value of common equity. |
| SIZE                   | Continuous | Natural logarithm of firm’s total assets. |
| MB                     | Continuous | Natural logarithm of firm’s market value divided by total assets. |
| ROA                    | Ratio  | Firm’s earnings before interests and tax divided by total assets. |
| GAUSE                  | Ratio  | Firm’s sales growth rate. |
| LEV                    | Ratio  | Firm’s financial leverage is calculated as long-term debt divided by total assets. |
| RET                    | Ratio  | Firm’s retained earnings divided by total common equity. |
| CASH                   | Ratio  | Firm’s cash holding is calculated as the sum of cash and current investment divided by total assets. |
| FAGE                   | Continuous | The number of years that the firm has data available in the Compustat database. |
| IRATIO                 | Ratio  | The ratio of independent directors to total number of directors on the board. |
| R&D                    | Continuous | Natural logarithm of firm’s research and development expenses. |
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