University of Arkansas, Fayetteville

ScholarWorks@UARK

5-2023

Outperforming the Stock Market Using Market Anomalies

Brett Bennett
University of Arkansas, Fayetteville

Follow this and additional works at: https://scholarworks.uark.edu/finnuht

Part of the Finance and Financial Management Commons, and the Portfolio and Security Analysis Commons

**Outperforming the Stock Market Using
Market Anomalies**

by

Brett Howard Bennett

Advisor: Dr. Craig Rennie

**An Honors Thesis in partial fulfillment of the requirements for the degree Bachelor of
Science in Business Administration in Finance and Accounting.**

**Sam M. Walton College of Business
University of Arkansas
Fayetteville, Arkansas**

May 13, 2023

Table of Contents

Abstract

The objective of this study is to explore the use of well-researched market anomalies to generate higher risk-adjusted returns than the overall stock market. Four specific market anomalies are examined: the small-firm effect; price reversals; the January effect; and the momentum effect. It focuses on historical evidence, anomaly characteristics, and potential risks. This study also explores the use of anomaly detection techniques, such as machine learning, in identifying market mispricings. It finds that a selective approach, combining market anomalies with traditional investment strategies, is crucial for effective implementation. This study provides insights for investors seeking to capitalize on market anomalies to achieve higher risk-adjusted returns.

Executive Summary

The goal of this paper is to explore the use of market anomalies to generate higher risk-adjusted returns than the overall stock market. The study is in five sections, four of which explore a specific market anomaly that is identified through empirical evidence and academic research. These anomalies include: the small-firm effect; price reversals; the January effect; and the momentum effect. The fifth and final section explores detection of stock market anomalies and how investors can use machine learning to identify mispricings in the market and make prudent investment decisions.

The small-firm effect is an anomaly that states small firms generate higher average returns than large firms over both the long term and short term. The effect occurs because of several factors, including that small firms are higher risk and that there is greater information asymmetry associated with smaller companies, partly due to the fact they are less followed by analysts. Small firms are also more likely to be targets of acquisitions rather than act as value-destroying serial acquiring firms. The small-firm effect is a valuable tool for investors wanting to generate high returns, since it has been observed for decades across various markets and asset classes.

The price reversal effect suggests assets that have experienced negative returns in the short term are likely to experience positive returns in the long term, and vice versa. This can be attributed to various factors. Most likely, when a stock performs well, it becomes overvalued when momentum causes it to overshoot to the upside. When a stock performs poorly, it becomes undervalued quickly.

The January effect is an anomaly that suggests the stock market and individual stocks tend to perform well during the month of January. This effect has been observed in various markets and is usually due to tax-loss harvesting during the end of the year, and investors eager to reinvest cash at the beginning of the year in hopes of a rebound in the stock. This works if the fundamentals are good for the company, and an investor uses the January effect to time their entry.

The momentum effect suggests stocks that experienced positive returns in the recent past are more likely to experience positive returns in the future, and vice versa. The momentum effect has been attributed to several factors, including overconfidence, confirmation bias, and herding behavior. This effect has the potential to create bubbles in the market, specific sectors, or individual stocks. Therefore, it should be used by investors with caution.

The final section of this thesis explores the use of anomaly detection techniques in identifying market anomalies. Anomaly detection identifies and analyzes unusual patterns in the stock market to identify market manipulation, insider trading, and/or other abnormal patterns in

trading data. It is useful for investors to identify mispricings in the market and reasons the shares are mispriced.

A plethora of market anomalies exist that can provide investors with opportunities to generate returns in excess of those of the overall market. The small-firm effect, the price reversal effect, the January effect, and the momentum effect have all demonstrated proven and historical evidence of their existence and unique characteristics. The incorporation of advanced technologies, including machine learning and data analysis, has enabled us to uncover these anomalies better than before and use this information to our advantage when making investment decisions.

It is imperative to note that when dealing with market anomalies, a well-rounded approach is crucial. The best way to accomplish this is to combine the use of these anomalies with traditional investment strategies like value investing and fundamental analysis. Investors must apply a selective approach in stock-picking with these anomalies, since combining the use of market anomalies with choosing only strong companies fundamentally as well, has proven to be a great investing strategy historically.

We must keep in mind not all market anomalies are created equal, and beliefs differ on which ones are worth pursuing. It is recommended that investors study and focus on one or two strategies they believe in rather than chasing every anomaly. Market anomalies provide a means for investors to generate much higher returns than the market. This paper concludes, investors can effectively utilize market anomalies to achieve higher risk-adjusted returns.

Small-Firm Effect

The small-firm effect is a well-known market anomaly by professional investors in finance and was first formally identified by Reinganum (1981) and Banz (1981), who find that small firms generate higher average returns than large firms, both in the long-term and short-run, such as in a swing trading environment or a holding period for stocks of one year or less. These higher average returns exist even after controlling for relevant factors such as market risk and the value of the firm. Since Reinganum and Banz studied this phenomenon, many other studies find the effects of small firms on risk-adjusted returns to be much more important than previously thought.

We can explain this effect through several factors. First, the performance of small firms is, more often than not, based on the longer growth runway that smaller firms have compared to larger ones. Specifically, smaller firms have more room for growth since they start from a small base and are aiming for triple-digit growth. A company, take Apple (AAPL) for example, having a 2022 fiscal year revenue of $394 billion would need an extra $30-50 billion in revenue to grow 15 percent, while a smaller company may need only $50-100 million in sales to achieve this same growth rate. Accordingly, smaller firms can grow much faster than larger companies, especially when they are successful at creating value for the shareholder.

Smaller firms are also often undervalued by investors. This is partly because they are less well-known to the investor than larger ones, and this includes even professional investors on the buy-side that should be aiming for higher risk-adjusted returns. Small firms are less followed by analysts, so there is less professional research data on these companies. When a stock is receiving less attention from the finance community and demand is low, this creates opportunities for value investors to fundamentally invest based on the intrinsic value of a stock. This effect can be further capitalized on by investors finding opportunities to invest in these

companies in times of economic turmoil, since in bear markets, smaller stocks decline harder than the overall market.

Investing during these times pays off well, however. A company I have personal experience with through a portfolio management course at the Sam M. Walton College of Business is Matador Resources Co. (MTDR). Shares declined over 90 percent during the 2020 COVID-19 bear market. The portfolio management class of that year and their professor researched the company and stock, created advanced financial models to value the company and its reserves, vet the qualifications of the company's management, and saw through the use of the Bloomberg terminal that insiders were heavily investing in the stock throughout the bear market. There was also a misunderstanding of the industry by Wall Street, which was further undervaluing the stock. The class began purchasing shares from a fundamental value standpoint and after heavy due diligence, and since MTDR's March 2020 low of $1.72, the stock has gained 3027.3 percent as of February 28, 2023, putting the stock's price at $53.79. (Figure 1) This is, of course, an extreme example, but shows the possibilities when investing in smaller firms due to the small-firm effect market anomaly when they are undervalued because of lack of attention from the investment community.

There are numerous examples of the small-firm effect throughout decades of market research. One example known to many professional investors is the Small Minus Big (SMB) factor in the Fama-French stock pricing model (1993). The Small Minus Big (SMB) factor says smaller companies outperform larger ones over the long-term. The Fama-French model was developed in the 1990s by Eugene Fama and Kenneth French, two prominent economists, as an extension of the Capital Asset Pricing Model (CAPM), which the pair criticized for only considering market risk to value a company. Fama and French agree with my statement before about smaller stocks declining more in bear markets than other stocks, stating that smaller stocks are more volatile and have higher idiosyncratic risk compared to large-cap stocks. The pair also agree with my notion that investing during these periods pays off, as it did in the case of MTDR. The SMB factor has shown to have a positive relationship with stocks over time, both before Fama and French released their study, and in the three decades succeeding their study. Portfolios of small-cap stocks have generated higher returns compared to large-cap portfolios. The effect extends beyond the U.S. market as well, being observed in the markets of other countries as well, notably Europe and Japan.

To exploit this market anomaly, use market scanners and resources to identify displacements in the value of small stocks and open a position in those that are fundamentally sound. This can create opportunities for astute investors to profit by investing in these companies before the market realizes their fundamental value. Those with a less active approach to investment management can invest in small-cap value index funds, such as the Vanguard Small-Cap ETF (VB). Investors conducting their own fundamental analysis of small-cap stocks, though, will likely achieve the most benefit from the small-firm effect and will be rewarded for performing the proper due diligence on each company in their portfolio.

Price Reversals/Mean Reversion Effect

The price reversal market anomaly is also referred to as the mean reversion effect and refers to the tendency of stocks that have performed well in the past to underperform in the future, and the tendency of stocks that have underperformed in the past to outperform in the future.

One explanation for this anomaly is that it is driven by many of the same market inefficiencies as other anomalies. When a stock has performed well over the span of the last 1-5 years, it likely becomes overvalued compared to its fundamentals, and/or the rest of the market. This leads investors to sell shares and the stock price tends to decline. Conversely, when a stock has underperformed but fundamentals are still strong, it leads the stock to become undervalued and causes investors to buy, which causes the stock price to rise. Depending on the extent of the under/overvaluation of the shares and the consequential price movement, this anomaly can result in a self-fulfilling prophecy, so it is important to pay attention to the fundamentals as opposed to making investment decisions based solely on the past performance of a stock.

Another explanation is related to investor psychology and behavioral finance and can be used to explain short-term price movements. It suggests that investors are prone to overreact to short-term news and events. For example, when a company announces a positive earnings report that beats expectations, investors quickly want to purchase shares. They may become overly optimistic about the company or stock and raise its price by too much. Once this enthusiasm lessens, investors may sell shares causing the stock to experience a price reversal. This phenomenon can occur with negative earnings reports as well when investors rush to sell or short a stock based on a negative report. This research is more beneficial to day or swing trading investors as opposed to those making long-term decisions based on fundamentals. However, it can still be helpful to supplement an investing strategy based on fundamental analysis when managing a portfolio.

Research shows that price reversals can occur across different time frames, ranging from intraday to multi-year horizons. Many of these reversals are related to several different explanations and are stronger in small-cap stocks and markets with high volatility. Both factors may contribute to a price reversal an investor can use to generate higher returns. Several studies have found evidence of the price reversal effect, ranging across all markets. Zhang (2006) found that the price reversal effect was present in 23 international stock markets. Asness, Moskowitz, and Pederson (2013) found that the effect was also present in commodity futures markets.

An example of price reversals that tech investors know all too well due to events in the past three years is the surge in technology names as the market rebounded from the COVID-19 pandemic. Many reached all-time highs and high valuations made these stocks expensive, which had a hand in leading to a reversal in their prices. According to the price reversal anomaly, stocks that experienced significant gains are more likely to underperform in the future, which occurred as these stocks fell sharply in 2022. (Figure 2) Stocks in large-cap tech names declined, some losing 70 percent or more. Not all of the bubble in tech resulted from price anomalies, as some of the cause is from other factors like rising rates, but the price reversal anomaly provides an interesting lens through which to view the performance of these stocks.

Investors can use this market anomaly to beat the market by using a few different trading and investing strategies. One strategy is to sell high-performing stocks and buy low-performing stocks, in hopes that the trend will reverse. An investor should only initiate long or short positions in specific stocks after doing proper due diligence through fundamental analysis. Otherwise, you risk either "catching a falling knife," or selling a high-performing stock only to have its price continue to rise due to a good management team, strong fundamentals, or the stock simply still being undervalued even though it has performed well in the past.

January Effect

The January effect has been observed for many years and has proved to be a statistically significant market anomaly. It is the idea that stocks that have underperformed in the fourth quarter of the previous year tend to outperform the market in January. The main explanation for the January effect comes from the idea of tax-loss harvesting.

In the fourth quarter of the year, and more so December, many experienced investors sell their underperforming stocks to offset capital gains they would have otherwise realized on overperforming stocks they sold throughout the tax year. If large groups of investors tax-loss harvest with the same stock, it further decreases the stock price. Other investors that would like to invest in these stocks generally wait until after the first of the year to invest, not wanting to get caught up in tax-loss selling. Not only are there large groups of sellers but few buyers, further contributing to the decline in share price.

After January 1st, there becomes excess buying pressure, as normal buyers are more willing to purchase a stock without fear of price decline due to tax-loss harvesting, and with those who tax-loss harvested, for example, in October, November, or December, of the past year, but still believe in the management and fundamentals of the company, wanting to reinvest to eventually realize a gain on the stock. One important caveat is the wash-sale rule, an IRS rule that disallows an investor from buying the same investment they realized a loss on within a 61-day window surrounding the sale date. This rule can be avoided if an investor waits out this period, so it does not have much of a bearing on the January effect, especially since most investors who tax-loss harvest are aware of this rule and time their trades with awareness to this rule, but it is important to mention when dealing with the January effect.

There have been several studies that have explored the January effect. One of which supports many of the other research we have seen with other market anomalies: that they are more present in the returns of small-cap stocks. Keim and Stambaugh (1984) found evidence of the January effect in the rate of return in small firms but not in large firms.

A study by Cooper et al. (1999) found that the January effect has weakened since the previous studies and was no longer a significant market anomaly. Some investors state this is because of the growing popularity of tax-advantaged accounts. However, most investors using tax-advantaged accounts as their primary way to invest are less experienced and have less capital to invest compared to experienced investors managing large funds. The more experienced and professional investors are much more likely to tax-loss harvest, and these are the ones with more potential to move stock prices.

Despite the controversy surrounding the January effect and disagreement about the studies proving or disproving the effect, there is market evidence that shows the market at the beginning of the year has the potential to outperform compared to other months. Since 1938, 29 out of 30 years of gains seen in January and February resulted in average S&P 500 advances of 20 percent, suggesting that the January effect can potentially predict stock performance over the rest of the year. Over the past 30 years, January gains have occurred 57 percent of the time (17 of those years).

If an investor does believe the January effect is real and would like to capitalize on it, there are a few ways to do so. A passive investor can simply invest in a small-cap value fund during the first week of January and hold it either throughout the month and into February, or as long as their time horizon allows, knowing they likely bought at the right time. An active investor can screen stocks for excess selling throughout Q4 of the year and have a list of names they would like to purchase into January, based on fundamental analysis and on whether the 4Q selling is warranted, or just an effect of selling due to tax-loss harvesting.

Momentum Effect

The momentum effect is a very well-known market anomaly. The phenomenon suggests that stocks that have shown a strong past performance continue to outperform in the future. One of the main caveats of the efficient market hypothesis (EMH) is that past performance is not indicative of future returns. However, the momentum effect has been studied to be an important aspect to consider when investing. It is a persistent anomaly and documented throughout decades of stock market and individual stock performance.

There are many potential explanations for the momentum effect, including overconfidence, confirmation bias, and herding behavior. When a stock outperforms, investors who own the stock tend to become confident in their decision and incorrectly believe they know more than others about the market. They often start buying even more shares and large groups of investors doing this further increases the stock price. Confirmation bias also occurs. If a group of five professionals is discussing a stock on a television program and only one of them like the stock an individual owns, the individual will almost always listen to the one person confirming his decision and disregard the other four. Investors also develop an emotional attachment to the stock after it has increased their portfolio in size by a certain amount. They no longer consider the stock based on fundamentals, but purely based on a company that has made them large amounts of money, perhaps even haven materially improved their lifestyle. Large groups become unwilling to sell their shares, further driving them up in price.

Bubbles can be started this way, and this behavior contributed to the bubble in many large tech names during late 2021, which has since popped. Cathie Wood manages the ARK Innovation ETF (ARKK) and is the CEO of ARK Invest. According to her website, ARK aims to deliver capital appreciation by investing in the leaders of disruptive innovation. ARKK is her flagship fund and includes names like Block Inc. (formerly known as Square) (SQ), Coinbase (COIN), and Roku (ROKU). From its COVID lows in March 2020, shares in the ETF rose by over 300 percent until its peak in February 2021, rising from a share price of $37.85 to $156.58. Since then, shares have fallen around 75 percent as of the end of February 2023 to just slightly above their March 2020 low, at $39.62. (Figure 3) I bring this investment story up to show how the contribution of an emotional attachment to certain stocks, overconfidence, and herding behavior can all combine to culminate into a very bad situation. A February 2021 Bloomberg article is titled, "Cathie Wood Amasses $50 Billion and a New Nickname: 'Money Tree'." (Bloomberg, 2021) The article speaks about how in South Korea, retail investors were widely nicknaming Cathie Wood, "Money Tree." In 2021 alone, by the February 5 date of publication of the article, investors had added another $11 billion to Wood's family of funds. Ark Invest had also recently released a line of merchandise, even with a baby onesie reading, "Invest in the Future." The Bloomberg article was published just seven days before ARKK's peak in February 2021.

The performance led to inflows in the case of ARKK, and the fund became wildly overvalued. Only time will tell how it ends for ARKK and the others of ARK Invest's funds, but this is a classic case of momentum driving stock prices toward unsustainable valuations. This is a recent story, but the momentum market anomaly can be studied historically, too. Jegadeesh and Titman (1993) examined stock returns from 1965 to 1989 and found strong evidence of the momentum effect in the U.S. stock market. Six years later, Moskowitz and Grinblatt (1999) found evidence of the momentum effect anomaly in the U.K. stock market. Fama and French (2012) found evidence of the effect in commodity futures, and Menkhoff et al. (2012) found similar evidence in the currency markets.

The momentum effect is one of the most robust and well-documented phenomena in finance, so many investors like to study it and use it as part of their investment strategy. One way to do this is to use a momentum investing approach. This approach leads an investor to buy stocks that have shown strong past performance and to sell those with poor past performance. We would identify these stocks by looking at their price and volume charts over a period of time, such as a year, and use technical analysis tools such as moving averages or relative strength indicators (RSIs) to identify these stocks. A tool like the Bloomberg terminal is helpful for this strategy, but anyone can use a free tool to view the same statistics and charts. It is also helpful to use the momentum effect with other investment strategies. It is a good idea to combine momentum investing with value investing. An investor would accomplish this by opening positions in stocks that have risen in value over the selected time period but are still undervalued based on fundamentals. This would give an investor confidence since even if the momentum strategy does not work out, the company is still sound. More likely, though, it will generate even higher returns because of the tailwind of the momentum while also being sound fundamentally. The momentum effect can work in companies that also may not fundamentally sound, like in the case of some stocks in the ARKK fund. The effect worked for a while, then did not, so it is important to set parameters for exiting a trade before opening the position.

Another strategy would be to implement a sector rotation strategy, investing in sectors that have shown strong past performance and avoiding those that have underperformed. This strategy could be helpful in a bear market or times of economic uncertainty, as certain sectors tend to perform better in specific economic conditions. Combining information about how a sector has performed in recent months and up to the past two years with data about the historical performance of sectors across the business cycle, would be a great way to combine momentum investing with historical data. (Figure 4)

Stock Market Anomaly Detection

Stock market anomalies occur not always, but more often than not. These anomalies are more helpful to the investor when we can identify and analyze them. Stock market anomaly detection is the process of identifying and analyzing unusual patterns in the behavior of stocks in the stock market that cannot be explained by traditional market theories like the efficient market hypothesis (EMH). One of the most common techniques in anomaly detection is data mining, which involves analyzing large volumes of data which deviate from a trend or pattern. Some investors use machine learning algorithms as well to identify unusual behavior and develop models based on the anomaly to anticipate movement in a stock price.

Anomaly detection helps investors by identifying mispricings in the market that can become successful investment opportunities. Anomaly detection algorithms can also be used to detect any market manipulation, which can distort the stock price to create misleading appearances concerning the stock of a company. This is a major concern for investors and makes it difficult to make informed decisions. Allen and Gale (1992) classified market manipulation into three categories: action-based manipulation, information-based manipulation, and trade-based manipulation. Trade-based manipulation is the one closest related to anomaly detection and is created through actual trading orders. Tick-by-tick data is collected to identify this activity and is searched through to detect any outliers. Unusual trading activity can suggest manipulation and require future evidence. Machine learning algorithms are aware of and trained on historical data to detect any unusual trading patterns that suggest manipulation. Outlier detection can also

be used to identify illegal insider trading that is not showing up on an insider trading transaction data list.

Having this information and being able to detect market anomalies and understand how and why a security is mispriced can help investors have a more accurate picture of stock values and potential risk. Investors can avoid investing in securities that are artificially inflated or deflated unless this is part of their strategy. In cases where it is part of their strategy, the data is helpful here too since the investor is aware of the mispricing and making decisions with correct data. Detecting activity about anomalies, and even insider trading is helpful also because it can keep investors from initiating trades, or being on the wrong side of the trade, in stocks that might experience a sudden change in value the investor is not prepared for. Anomaly detection and machine learning provide an investor with valuable tools for identifying and mitigating risks in the market, leading to higher than market returns.

Conclusion

There are several market anomalies in existence that can potentially help investors generate higher returns than the market. The small-firm effect, price reversals, the January effect, and the momentum effect all have their unique characteristics, and more importantly, historical evidence supporting their validity. The use of machine learning and data analysis has also allowed us to identify anomalies, detect market manipulation, and use those to our advantage when making investment decisions. This adds another layer of information that makes utilizing market anomalies in an investment strategy even more beneficial to an experienced investor.

However, is essential to combine these anomalies with traditional investment strategies such as value investing and fundamental analysis to ensure any investment decisions are based on a well-rounded approach. For example, with the small-firm effect, we only want to invest in companies that are strong fundamentally and have great management. The same is true with the price reversals and momentum effect. For the January effect, a prudent investor would likely only use information about that anomaly to time the entry into a position he already planned to purchase.

It is critical to acknowledge not all market anomalies are created equally and investors will have different beliefs about which are worth pursuing. It is likely a good idea for the average investor to focus on one or two market anomalies that they have studied and believe in, as opposed to playing all sides to try to generate an exceptionally higher return but having to take on more risk. Anomalies can also be caused by various things in different periods of the markets. They can be a result of investor behavior, liquidity constraints, or a combination of temporary factors that can disappear over time.

Market anomalies can provide valuable insights and opportunities for investors to generate higher returns than the market. However, they must be approached with caution and only by those with experience in the markets. Combining multiple strategies that are not all related to market anomalies is essential to a market anomaly investing strategy and diversifies an investor when he owns a stock not purely because of the underlying anomaly strategy.

Appendix

Figure 1. Matador Resources (MTDR) Chart 1/2/20-2/28/23 (Bloomberg)

Figure 2. Invesco QQQ (QQQ) (Nasdaq 100) Chart 1/2/20-2/28/23 (Bloomberg)

Figure 3. ARK Innovation Fund (ARKK) Chart 1/2/20-2/28/23 (Bloomberg)

Figure 4. Business Cycle Chart with Sector Weighting Recommendations (Fidelity)

Sector	Early Rebounds	Mid Peaks	Late Moderates	Recession Contracts
Financials	+			
Real Estate	++			– –
Consumer Discretionary	+	–	– –	
Technology	+	+	– –	– –
Industrials	++			– –
Materials	+	– –	++	
Consumer Staples			++	++
Health Care	– –		++	++
Energy	– –		++	
Communication Services		+		–
Utilities	– –	–	+	++

Economically sensitive sectors may tend to outperform, while more defensive sectors have tended to underperform.	Making marginal portfolio allocation changes to manage drawdown risk with sectors may enhance risk-adjusted returns during this cycle.	Defensive and inflation-resistant sectors tend to perform better, while more cyclical sectors underperform.	Since performance is generally negative in recessions, investors should focus on the most defensive, historically stable sectors.

Works Cited

Allen, F., & Gale, D. (1992). Stock-price manipulation. Review of Financial Studies, 5(3), 503-529. doi: 10.1093/rfs/5.3.503

Asness, C. S., Moskowitz, T. J., & Pedersen, L. H. (2013). Value and momentum everywhere. Journal of Finance, 68(3), 929-985.

Banz, R. W. (1981). The relationship between return and market value of common stocks. Journal of Financial Economics, 9(1), 3-18.

Bloomberg News. (2021, February 5). Cathie Wood Amasses $50 Billion and a New Nickname: Money Tree. Bloomberg. Retrieved from https://www.bloomberg.com/news/articles/2021-02-05/cathie-wood-amasses-50-billion-and-a-new-nickname-money-tree

Cooper, M. J., Gutierrez Jr, R. C., & Hameed, A. (1999). Market states and momentum. Journal of Finance, 54(6), 2103-2130.

Fama, E. F. and French, K. R. (1993), "Common Risk Factors in the Returns on Stocks and Bonds," Journal of Financial Economics, 33: 3-56.

Fama, E. F., & French, K. R. (2012). Size, value, and momentum in international stock returns. Journal of Financial Economics, 105(3), 457-472.

Jegadeesh, N., & Titman, S. (1993). Returns to buying winners and selling losers: Implications for stock market efficiency. The Journal of Finance, 48(1), 65-91.

Keim, D. B., & Stambaugh, R. F. (1984). A further investigation of the weekend effect in stock returns. The Journal of Finance, 39(3), 819-835.

Lakonishok, J., & Smidt, S. (1988). Are seasonal anomalies real? A ninety-year perspective. The Review of Financial Studies, 1(4), 403-425.

Menkhoff, L., Sarno, L., Schmeling, M., & Schrimpf, A. (2012). Carry trades and global foreign exchange volatility. Journal of Finance, 67(2), 681-718.

Moskowitz, T. J., & Grinblatt, M. (1999). Do industries explain momentum? Journal of Finance, 54(4), 1249-1290.

Reinganum, M. R. (1981). Misspecification of capital asset pricing: empirical anomalies based on earnings' yields and market values. Journal of Financial Economics, 9(1), 19-46.

Zhang, X. F. (2006). Information uncertainty and stock returns. Journal of Finance, 61(1), 105-137.