

Powering Past “Peak Passive”? Insights on the Active-Passive Balance from the Literature on Market Efficiency

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Abstract

When will the market reach “peak passive”? This paper reviews the literature on the relationship between index-based investing and market efficiency to shed light on the prospects for achieving a balance between active and passive investing. The research suggests that index inclusion benefits companies in the index. In addition, the research finds that increased passive investing is associated with decreased market efficiency. However, passive investing is not the sole determinant of the level of market efficiency. Therefore, reaching active-passive equilibrium will be more difficult than the traditional theory implies, suggesting that the market could well power past “peak passive.”

Keywords: active investing, passive investing, indexing, peak passive, index addition, benchmark inclusion, cost of capital, market efficiency, stock price informativeness, comovement, cost of capital

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When will the market reach “peak passive”? It’s a question that’s being asked with increasing urgency as the influence of passive investing continues to grow.

That influence is already substantial. By the end of 2023 assets in equity index funds had surpassed those in actively managed funds. In addition, many institutions have indexed at least a segment of their portfolios, and many active managers use portfolio construction techniques that are heavily dependent on index weightings. Adding these index-linked portfolios together with index funds, a recent study estimates that total passive ownership of the U.S. stock market was 33.5% in 2021.

Yet despite its already large presence, passive investing continues to gain share at the expense of active management. This unstoppable growth has raised questions – and even concerns -- about the imminence of “peak passive,” the popular term for the future point when passive’s market share stops increasing and a sustainable balance between passive and active is achieved.

In the world of traditional theory, active/passive equilibrium will result from a tension between the lower cost of passive investing and the potentially greater returns of active management. Passive investing is attractive to investors because it’s cheaper, and it’s cheaper because it doesn’t require research to assess the prospects of the businesses it invests in and to make judgments about how those prospects relate to market valuations. Active management is attractive to investors because it has the potential to earn higher returns, and it has that potential because research enables active investors to assess whether there’s a gap between business reality and market valuation, creating the potential for earning more by trading on that gap.

In traditional theory, market efficiency is the mechanism that keeps active and passive in balance. If there’s too much passive investing, there will be too little research on businesses. As a result, markets will be less efficient, meaning that there will be greater deviations between fundamental prospects and market valuations. This greater inefficiency may be evidenced by greater positive correlation of securities (often referred to as “comovement”), a decrease in price efficiency (meaning that security prices are less connected to underlying issuer fundamentals), and increased volatility of securities prices that is not driven by fundamental changes.

On the other hand, if there is too much active investing, there will be too many actively managed dollars trying to profit from any misalignment between business prospects and valuations. The competition for additional return will tend to decrease the number and magnitude of misvaluations, leading to greater market efficiency.

In 1980, Grossman and Stiglitz (1980) theorized that the market shares of active and passive will equilibrate when there is just enough market efficiency to allow active managers to make enough excess profits to offset their fees. In the Grossman-Stiglitz world, continued growth of passive investing means that there’s still too much active management performing too much research to too little effect. In other words, there’s still too much market efficiency, so that there’s still room for more investors to benefit from the lower costs of passive investing.

The Grossman-Stiglitz equilibrium summarizes the classic thinking on the interplay of active, passive, and market efficiency, but more recent theories have challenged this traditional view.

One set of theories suggests that increased passive ownership does not reduce – or can even improve -- market efficiency. Some theorists note that trading activity – not asset size – drives market efficiency; they argue that, since passively managed funds have very low turnover rates and account for only a small proportion of total market trading volume, assets in passively managed funds can increase significantly before their trading begins to affect market efficiency. Another theorist suggests that passive investing is less synchronized with activities of other investors, resulting in a market efficiency benefit that outweighs the loss caused by the decrease in investment research. Others argue that an increase in passive ownership encourages companies to take more risk, which gives active managers more incentive to research stocks, thereby increasing market efficiency. (Companies take more risk because there is no penalty for doing so, since index investors will continue to buy even if the company’s risk increases.)

An opposing set of theories suggests that increased passive investing leads to reduced market efficiency in a way that advantages the securities in the index, an advantage that Kashyap et al. (2021) call the “benchmark inclusion subsidy.” These theories emphasize that passive investors have a relatively inelastic demand for securities, since they have little discretion about buying when their portfolios are underweighted in a security, even if the security is significantly overvalued. This inelastic demand creates market inefficiency, because securities within the index will have higher valuations compared to securities that are not in the index, all else being equal. In one particularly negative extrapolation of these theories, passive investing creates its own microclimate: index inclusion leads to higher valuations, which makes it harder for active managers to earn excess returns, which drives more assets into passive investing, which leads to even higher valuations for index securities, etc.

In other words, both of the newer sets of theories suggest that market inefficiency will not act as a mechanism for establishing a balance between active and passive. Both also imply that “peak passive” will occur at a higher level of passive investing than in the traditional Grossman-Stiglitz equilibrium.

To assess the validity of these differing theories, I reviewed the literature examining the relationship between passive investing and market efficiency.

Previous reviews of the studies have generally focused on short-term price and volume effects of index inclusion, commonly known as the “index effect.” Yet the studies also provide extensive insights on other longer-term impacts of inclusion or increased passive ownership, though these other effects have received less attention. My review focused on market efficiency effects under normal market conditions; I did not consider the systemic risk issues resulting from stressed market conditions, including those related to ETF structure and trading.

Overview of the Literature

The relationship between passive investing and market efficiency has attracted significant attention in the literature; over the past 40 years, more than 175 papers, including four literature reviews, have been published on the topic. Virtually all of these studies look at the equity markets, with only two addressing fixed income.

The studies fall into three categories:

Index inclusion studies. The first group of studies examine the consequences of a security being included in an index. This is the oldest and largest group of studies, with over 135 studies dating back to 1986. Most of the studies in this group examine the “index effect,” which occurs when the price of a stock and its trading volume go up when it is added to an index and down when is removed. The presence of an index effect could be an indicator of greater inelasticity in the demand for stocks, and, therefore, an indicator that passive investing decreases market efficiency. Roughly half of these studies look at the U.S. markets, with an emphasis on the S&P 500; the other half either look at non-U.S. markets, with an emphasis on developed markets.

Studies of assets and flows. The second group of studies looks at the connection between market efficiency and the assets in and/or flows into passive and active funds. There are 29 studies in this group. Roughly two-thirds of the studies look at ownership by and flows into index funds and ETFs, either alone or in combination. The remainder of the studies examine hedge funds, actively managed funds, active share, institutional investments, or benchmark-based funds more broadly. Most are focused on the U.S. stock market.

Index weighting studies. The third group of studies considers the impact of changes in index weightings. All but one of these studies look at the Russell 2000 and Russell 1000 indexes, which are constructed considering market capitalization alone. Most focus on the stocks that are most heavily weighted in the smaller-capitalization Russell 2000 and least heavily weighted in the larger capitalization Russell 1000. This is a small group of only 11 studies and is the newest of the three groups.

Summary of findings. The research suggests that index inclusion benefits companies in the index. In addition, the research finds that increased passive investing is associated with increased market inefficiency; however, passive investing is not the sole determinant of the level of market efficiency. The evidence for these conclusions is summarized in the following two sections.

Index Inclusion Benefits Companies in the Index

The first broad conclusion from the research is that index inclusion benefits companies in the index. While short-term increases in stock price and trading volume after index addition, a phenomenon known as the “index effect,” are most visible, index inclusion also has longer-term consequences.

Index effect. Most of the early studies on the impact of passive investing focused on the “index effect,” seeking to confirm anecdotal observations that prices and trading volumes tended to go up when stocks were added to an index and tended to go down when stocks were deleted.

The research often finds that the index effect is asymmetrical: most notably, the magnitude and duration of the effect can be quite different for additions versus deletions. Asymmetries have also been observed for stocks added to an index for the first time versus stocks that have previously been in the index or a related index.

The magnitude of the effect has varied over time. The consensus of the literature is that, in the U.S. market, the index effect was small in the early 1970s when index investing

was limited but increased through the 1990s as the level of indexing grew. The peak in the index effect was reached around the year 2000, despite continued growth in index investing after that time. By the mid-2010s, the index effect had become much less significant in the U.S. market, with some researchers concluding that it had largely disappeared.

The conclusions of the most recent studies of the index effect in U.S. markets are mixed. Some researchers find an inverse index effect for stocks moving into the S&P 500 from the S&P 400, meaning that they decline in value upon addition. Conversely, another recent study finds a measurable index effect over the past decade.

The magnitude of the index effect has also varied across markets. Researchers have generally found that it is more significant in markets outside the United States, though it follows a pattern similar to the U.S. market with regard to decline over time.

Many of the studies of the index effect consider whether it is a quickly reversed phenomenon resulting from short-term market liquidity constraints, dubbed “price pressure.” The conclusions are mixed. Some studies find that the index effect is fully or partly reversed within 60 days or less, while some studies find that the price and/or volume changes persist.

However, the diminution of the index effect over time lends strong support to the price pressure hypothesis. A recent study concludes that a key factor leading to the diminution of the index effect for the S&P 500 was the market’s improved ability to provide liquidity for the trading that results from index reconstitutions. In other words, the market became better able to offset the liquidity constraints that resulted in price pressure.

Investor awareness. The index inclusion studies often explored factors other than short-term price pressure that could cause the index effect.

For example, an increase in investor awareness could explain the index effect. Investors may be willing to assign a higher valuation to stocks of companies that they are familiar with, because that familiarity reduces their assessment of the risk of investing in those companies.

The research findings are consistent: more than 25 studies – published throughout a 35-year period – find that index inclusion leads to increased investor awareness, as measured by analyst coverage, greater media exposure, number of shareholders, and inclusion in web searches. There is only one finding that index inclusion has no impact on awareness.

Increased investor awareness can lead to changes in corporate behavior that are attractive to many investors and that may lead those investors to assign higher valuations to a company’s stock. Studies have found that being added to an index causes companies to decrease discretionary accruals and improve earnings quality, to enhance their governance practices, and revise their investment and payout policies.

Higher index weightings are also linked to increased institutional ownership, which is associated with other changes in corporate behavior and operating performance that are often applauded by investors. Researchers have found that companies with higher levels of institutional ownership are more likely to have better earnings quality, higher levels

of disclosure, greater investment in human capital, greater managerial efficiency, and a reduction in negative corporate social responsibility issues.

The research also suggests that increased investor awareness drives higher stock prices through mechanisms other than revaluation after a reassessment of risk. A number of researchers have observed that analyst forecasts of earnings per share increase after index inclusion, supporting higher stock prices. However, there is some disagreement about the effect of index addition or increased passive ownership on the accuracy of analyst forecasts.

Cost of capital. Another possible driver of the index effect is the cost of capital. If index inclusion lowers a company's cost of capital, companies in the index might have a competitive advantage compared to companies outside the index, which would support a higher stock price.

One driver of a firm's cost of capital is the liquidity of its stock. More than 15 studies find that index inclusion or increased index weighting increases liquidity as measured by bid/ask spread, turnover, illiquidity ratio (daily return to volume), and/or the zero returns ratio (percentage of days with zero returns), generally in conjunction with trading volume.

In addition, a number of researchers find that index inclusion or increased passive ownership decreases the cost of capital by raising equity valuations. A related finding from one study is that the share prices of firms not in the index are negatively affected when their rivals are added to the S&P 500, raising their cost of capital.

Other studies conclude that the cost of debt financing declines after index addition or if passive ownership increases, through an increase in bond prices, a decrease in spreads, lower spreads for credit default swaps, and/or higher credit ratings. Conversely, bond yields rise for firms deleted from the index.

In total, over 25 studies – published throughout the past 30 years – conclude that index inclusion leads to a lower cost of capital.

There are some contradictory findings. A few studies find that index inclusion or increased passive ownership has no impact on liquidity, while a few find a negative effect on liquidity, and one older study finds that index inclusion has no impact on stock valuations.

Looking at operational impacts, a lower cost of capital increases the net present value of proposed investment projects. Therefore, if the cost of capital decreases for companies added to an index, levels of investment should increase for those companies, and four studies find that capital expenditures, acquisitions, and/or research activities do indeed increase for index additions. However, these studies draw differing conclusions about the shareholder impact of this increased investment. One study finds that increased passive ownership increases the sensitivity of investment to stock price.

Several researchers examine how index inclusion affects the capital structure, though there is no consensus on its impact. Some studies observe changes in the mix of debt and equity financing or in the level of equity issuance while others do not.

Operating performance. Researchers have explored whether operating performance is affected by index inclusion or the level of passive ownership. There is no consensus; some studies find that it declines, while others find that it improves, and some see no effect.

Long-term stock performance. Neither is there agreement on the impact of index inclusion on long-term stock performance. Some studies find that performance improves after a stock is added to an index, while others observe that it declines. Two studies find that stocks deleted from indexes subsequently outperform.

Some researchers have suggested that corporate performance, rather than index inclusion per se, is the driver of any superior performance after addition to the index. Supporting this theory, two studies observe stock price outperformance or large earnings increases prior to inclusion.

In a similar vein, a few researchers have argued that, for indexes with subjective criteria for inclusion, index inclusion signals the index provider's positive assessment of the firm's future prospects. However, this view is not universal, with one study concluding that index changes in the S&P 500 are made to improve the representativeness of the index. Two older studies question the value of the index provider's assessments, finding that buy-and-hold index portfolios outperform the updated index over long periods.

Conclusions. Index inclusion or deletion can have a short-term effect on stock price and trading volume, though this "index effect" varies over time and across markets.

The research consistently finds that index inclusion leads to greater investor awareness, as indicated by the level of analyst coverage and media exposure, the number of shareholders, and the degree of institutional ownership. The weight of the evidence also suggests that index inclusion reduces a firm's cost of capital, by increasing the liquidity of its stock, raising its equity valuation, or reducing the cost of debt financing.

The findings on the cost of capital are likely linked to the findings on investor awareness. Many researchers find that increased investor awareness leads to changes in corporate behavior which include higher levels of disclosure, a decrease in discretionary accruals, and improvements in governance. These types of changes tend to be popular with investors, which can lead to higher stock valuations, meaning that greater investor awareness helps to lower the cost of capital.

There is no consensus on how index inclusion affects operating or longer-term stock performance, most likely because index inclusion is only one of many factors affecting performance.

Overall, the research suggests that there could be a "benchmark inclusion subsidy" that favors stocks in the index over those that are excluded resulting from an increase in investor awareness and a decrease in the cost of capital. However, many other factors affect operating performance and longer-term stock price performance, factors that may counteract the impact of the inclusion subsidy.

Increased Passive Investing is Associated with Decreased Market Efficiency

The second broad conclusion from the research is increased passive investing is associated with decreased market efficiency. There are multiple measures of market efficiency, with studies finding that the level of passive investing has more of an impact on some of these measures than others.

Comovement. The degree to which securities prices move together, or the positive correlation of returns, is often called “comovement.” An increase in comovement can be an indicator of reduced market efficiency because it suggests that changes in securities prices are driven by changes in the prices of other securities rather than by changes in fundamentals. An increase in comovement makes it more difficult for investors to reduce risk through diversification.

Over the past 30 years, researchers have consistently found that increased passive investing is associated with increased comovement in both U.S. and non-U.S. markets, while increased active investing is associated with decreased comovement.

With regard to contrary findings, there is only one study that finds no connection between comovement and the level of passive investing, while another finds that the effect has diminished over time. There is disagreement about the duration of the effect.

Price efficiency. Price efficiency, or price informativeness, is achieved when securities prices accurately reflect all available information and respond quickly to changes in that information. A decrease in price efficiency is an indicator of a decrease in market efficiency.

The weight of the evidence over the past 20 years suggests that increased passive investing is associated with decreased price efficiency in the U.S. markets while increased active investing is associated with increased price efficiency.

One recent study characterizes the effect as small, and there are a few contradictory findings. Notably, a few studies find that flows into industry/sector ETFs increase price efficiency (with more mixed conclusions with regard to broad market ETFs). In addition, there is a consensus that passive investing supports greater price efficiency by facilitating short selling.

Volatility. An increase in volatility can also be an indicator of reduced market efficiency if the increase is not driven by company fundamentals.

A relatively small number of studies look at volatility under normal market conditions and outside the context of ETF trading. There is no consensus on how indexing has affected volatility in these circumstances.

Conclusions. The research consistently finds that higher levels of passive investing are associated with decreased market efficiency, as measured by comovement and price efficiency.

Passive Investing is Not the Sole Determinant of the Level of Market Efficiency

However, passive investing is not the sole determinant of the level of market efficiency.

Outside the body literature related to active and passive investing, researchers have identified many factors that play a role in determining the level of market efficiency. These include:

- Macro factors: national income levels, state of the business cycle, investor sentiment, investor sentiment, TED spread, international macroeconomic policy stability
- Disclosure standards: accounting rules, level of disclosure, level of transparency, transparency of financial statements, auditor quality
- Trading-related factors: market liquidity, short selling, trading activity, cross listing, algorithmic trading, nature of transaction (purchase or sale)
- Company factors: size, type of owner, pre-inclusion performance
- Investor awareness: institutional ownership, analyst coverage

Some of these factors are intertwined with the level of passive investing: notably, analyst coverage and institutional ownership. As discussed, an increased level of passive investing tends to increase both analyst coverage and institutional ownership. There is no consensus with regard to how analyst coverage affects market efficiency. With regard to institutional ownership, studies agree that institutional ownership leads to increased comovement, thereby decreasing market efficiency. By contrast, they also generally conclude that increased institutional ownership leads to greater market efficiency through enhanced price efficiency, though there is one older contradictory finding.

In other words, an increase in passive investing is likely to push the market toward greater inefficiency. But the effect of the increase in passive investing may be counterbalanced by the influence of other factors, such as the state of the business cycle, that drive market efficiency, with the net result being no change or even greater market efficiency.

So, an increase in passive investing might actually be accompanied by no change – or even an improvement -- in market efficiency depending on the trends in other factors. But if there is no increase in inefficiency, there will be no increased advantage for active investing, and, therefore, no trigger encouraging investors to reallocate toward active investing.

Complicating the picture still further, other studies suggest that market efficiency may not be a direct driver of active managers' performance. The few studies that have looked at the relationship between price efficiency or volatility and active management performance reach mixed conclusions. In fact, studies identify return dispersion, which is the degree of the differential in performance, as the factor that is most closely associated with active management performance, though dispersion appears to interact with correlation; this suggests that the magnitude of the efficiency effect may be important.

Implications of the Findings

The first finding – that index inclusion benefits companies in the index -- suggests that there is a benchmark inclusion subsidy, the result of increased investor awareness and lower cost of capital for stocks in the index. All else being equal, this subsidy will lead to higher valuations for index stocks compared to non-index stocks.

The studies on the effect of increased index weightings suggest that the subsidy will be larger for stocks that are more heavily weighted in the index. Therefore, there is some evidence that index inclusion is self-reinforcing, with higher weightings leading to a greater subsidy leading to higher weightings, etc. As a result, the research suggests that index investing may be one factor contributing to the recent increase in stock market concentration.

Of course, index inclusion is not the only factor determining the valuation of index stocks. Fundamental and market factors continue to play a role, and, if negative, they could well outweigh the index inclusion effect. Yet even if other factors play a role, indexing appears to be creating a headwind for active managers.

The findings on index inclusion also raise questions about how indexing may be influencing the long-term effects of the factors influencing individual stock performance. In the Fama-French model, only the market and profitability factors have consistently performed well. The investment, value, and size factors have (at best) not added value over the past 20 years, while all have been negative over the past decade; this is a significant change in trend, since all were significantly positive in the previous 40 years.

Index inclusion may be one factor contributing to the change in the contribution of the factors. For example, focusing on the investment factor, the consensus of the research is that index inclusion lowers the cost of capital for companies, and some studies have also concluded that the lower cost of capital leads to higher levels of investment. The consensus is also that index inclusion leads to higher stock valuations. Linking the two findings suggests that the level of investment and stock returns are more likely to be positively related when the growth of index funds has been strong and more likely to be negative under other circumstances.

The second broad finding from the literature – that increased passive investing is associated with decreased market efficiency -- suggests that the growth of indexing will not continue indefinitely; instead, increased indexing will lead to less efficiency which will create a more favorable environment for active management which, in turn, will ultimately entice investors back into active strategies.

However, other research suggests that the chain of causality may not be so clear because there are many factors that influence the level of efficiency. Factors other than the level of passive investing play a role in establishing the level of market efficiency, while small changes in market efficiency may not have much effect on the success of active investing.

In general, the relationship between market efficiency and active management performance is an area that may merit additional exploration. There has been relatively

little academic research in this area, despite (or perhaps because of) the complexities of measuring market efficiency and of the avenues of interaction between efficiency and active management.

To summarize, indexing appears to provide a benefit for stocks included in the index (though other factors come into play), while the mechanism for counteracting the benefit of this subsidy may not operate smoothly. Combined, these findings imply that reaching an active-passive equilibrium will be more difficult than the traditional theory implies and that any equilibrium reached may be more tilted toward passive investing than would be the case under the traditional theory.

To date, regulators have sought to encourage passive investing given its lower cost, which provides a clear benefit for passive investors, and given regulators' concerns that the investment industry has incentive to promote active investing, despite (or even because of) its higher cost.

However, the benchmark inclusion subsidy may already provide passive investing with a clear advantage. In the United States, such a subsidy would only add to the advantage that passive investing enjoys in taxable accounts. Taxation on realization of capital gains has more of impact on actively managed portfolios, which trade to respond to changing opportunities, than on index funds which generally change portfolio composition only as a result of index reconstitutions. In non-taxable accounts in the United States, the current litigation environment favors passive investment options in defined contribution plans, since plan fiduciaries are more likely to be the subject of excessive fee lawsuits if they include actively managed investment options in a plan when lower-cost passive options are available.

This analysis suggests that passive investing may need little regulatory protection or encouragement. In fact, some authors have suggested that it is active investing that needs encouragement.

Unfortunately, there has been little theoretical work done on the net welfare effect of increased levels of passive investing – and no empirical investigation. Clearly, any empirical study would be challenging. The primary advantage of passive investing (i.e., its lower cost) is easy to measure and provides benefit to a concentrated group (i.e., passive investors). But its costs are borne by the market and economy at large and are difficult to estimate. And a complete analysis would consider not only the competitive and market efficiency effects reviewed in this literature but also the governance issues that have been voiced. Overall, the review of the literature raises the possibility that passive investing may have diminishing returns from a total investor welfare perspective.

Striking a welfare-maximizing balance between active and passive investing may be difficult given the complexity of the interaction between market efficiency and active manager performance. As result, given the benefits that index inclusion provides to index companies, the market could well power past “peak passive” as it is envisioned in the traditional theory.

Sources and Notes

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total passive ownership Chincio and Sammon (2024)

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trading activity – not asset size – drives market efficiency Novick et al. (2017); Ganti and Lazzara (2018)

passive investing is less synchronized Weissensteiner (2019)

passive ownership encourages companies to take more risk Buss and Sundaresan (2023)

an opposing set of theories Basak and Pavlova (2013); Breugem and Buss (2019); Kashyap et al. (2021); Baruch and Zhang (2022); Buffa, Vayanos, and Woolley (2022)

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reached around the year 2000 Petajisto (2011); Kamal et al. (2012)

index effect had become much less significant Kamal et al. (2012); Kim, Li, and Perry (2017); Kappou (2018); Schnitzler (2018); Bender, Nagori, and Tank (2019); Bennett, Stulz, and Wang (2020); Renshaw (2020); Preston and Soe (2021)

largely disappeared Kim, Li, and Perry (2017)

some researchers find an inverse index effect Vjih and Wang (2022)

recent study finds a measurable index effect Hendrix, Liu, and Roberts (2024)

more significant in markets outside the United States Gerke and Fleischer (2002); Soe and Dash (2008); Bender, Nagori, and Tank (2019); Goyal, Urban, and Zhao (2022)

key factor leading to the diminution Greenwood and Sammon (2022). This study also concludes that the other key factor driving a decline in the index effect was an increase in the proportion of stocks added to the S&P 500 that were being moved out of the S&P MidCap Index. With midcap funds selling as the S&P 500 funds were buying, the net demand for additions to the S&P 500 was generally lower than in previous periods.

more than 25 studies Pruitt and Wei (1989); Beneish and Gardner (1995); Chung and Kryzanowski (1998); Hegde and McDermott (2003); Biktimirov, Cowan, and Jordan (2004); Chen, Noronha, and Singal (2004); Gregoriou and Ioannidis (2006); Shankar and Miller (2006); Zhang, Lin, and Shin (2010); Liu (2011); Baran and King (2012); Daya, Mazouz, and Freeman (2012); Chan, Kot, and Tang (2013); Wang, Lee, and Singh (2013); Biktimirov and Li (2014); Kot, Leung, and Tang (2015); Ravi and Hong (2015); Bena, et al. (2017); Xie (2017); Chen and Lin (2018); Biktimirov and Xu (2019a); Biktimirov and Xu (2019b); Cao, Gustafson, and Velthuis (2019); Kacperczyk,

Sundaresan, and Wang (2021); Goyal, Urban, and Zhao (2022); Bennett, Stulz, and Wang (2023); Liu and Wen (2023)

no impact on awareness Chang, Hong, and Liskovich (2015). Coles, Heath, and Ringgenberg (2022) find that Google search volume, the number of EDGAR page views, and the number of buy-side analyst reports decline when stocks are moved into the Russell 2000 to the Russell 1000, even though index weightings increase as a result. This finding is more likely to reflect investor assessment about the “demotion” to the Russell 2000 based on market capitalization rather than an inverse finding suggesting that higher index weights (in the same index) reduce investor awareness.

being added to an index causes companies to Platikanova (2008) – decrease discretionary accruals leading to higher earnings quality; Bena et al. (2017) – increase investment; Antoniou et al. (2023) – lower payout ratios; Bennett, Stulz, and Wang (2023) – change investment and payout policies; Liu and Wen (2023) – improve corporate social responsibility performance

companies with higher levels of institutional ownership are more likely to Velury and Jenkins (2006) – have higher earnings quality (unless institutional ownership is concentrated); Boone and White (2015) – increase disclosure and forecasts, have more precise and timely forecasts; Bird and Karolyi (2016) – increase disclosure and forecasts; Crane, Michenaud, and Weston (2016) – pay higher dividends; Khan, Srinivasan, and Tan (2017) – have greater tax savings; Baghdadi et al. (2018) – have greater managerial efficiency; Lin, Mao, and Wang (2018) – increase disclosure and forecasts; Chen et al. (2019) – have greater tax savings; Chen, Dong, and Lin (2020) – reduce certain negative corporate social responsibility issues

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forecasts of earnings per share increase Chung and Kryzanowski (1998); Denis et al. (2003); Yun and Kim (2010); Baran and King (2014); Chan and Zhao (2018); Bennett, Stulz, and Wang (2020)

there is some disagreement Wang, Lee, and Singh (2013) – accuracy improves after addition; Baran and King (2014) – accuracy improves after addition; Kothari et al. (2023) – increased ownership by sector ETFs (but not broad market ETFs) improves accuracy; Zhang, Lin, and Shin (2010) – forecasts become less accurate after addition

one driver of a firm’s cost of capital is the liquidity of its stock Amihud and Mendelson (1986); Saad and Samet (2017)

more than 15 studies Edmister, Graham, and Pirie (1996); Erwin and Miller (1998); Hegde and McDermott (2003); Gassen and Kaltofen (2005); Becker-Blease and Paul (2006); Gregoriou and Ioannidis (2006); Li and Sadeghi (2010); Baran and King (2012); Daya, Mazouz, and Freeman (2012); Chan, Kot, and Tang (2013); Biktimirov and Li (2014); Boone and White (2015); Ravi and Hong (2015); Ahmed and Bassiouny (2018); Chen and Lin (2018); Biktimirov and Xu (2019a); Biktimirov and Xu (2019b); Cao, Gustafson, and Velthuis (2019); Kacperczyk, Sundaresan, and Wang (2021)

illiquidity ratio Goyal, Subrahmanyam, and Swaminatham (2023) question the use of the illiquidity measure for assessing liquidity

decreases the cost of capital by raising equity valuations Morck and Yang (2001); Baran and King (2012); Belasco, Finke, and Nanigian (2012); Kacperczyk, Sundaresan, and Wang (2021)

related finding from one study Chen and Lin (2018)

cost of debt financing declines Dhillon and Johnson (1991); Dannhauser (2017); Baran et al. (2018); Cao, Gustafson, and Velthius (2019); Bennett, Stulz, and Wang (2020); Goyal, Urban, and Zhao (2022)

bond yields rise Chan and Zhao (2018)

no impact on liquidity Kaul, Mehrotra, and Morck (2000); Kamal et al. (2012); Kamal (2014); Dannhauser (2017) – for high yield bonds

negative effect on liquidity Kot, Leung, and Tang (2015); Dannhauser (2017) – for investment grade bonds; Höfler, Schlag, and Schmeling (2023)

index inclusion has no impact on stock valuations Malkiel and Radisich (2001)

capital expenditures, acquisitions, and/or research activities do indeed increase Massa, Peyer and Tong (2005), Becker-Blease and Paul (2006), Chen and Lin (2018); Kacperczyk, Sundaresan, and Wang (2021)

draw differing conclusions Massa, Peyer, and Tong (2005) – negative abnormal returns; Becker-Blease and Paul (2006) – shareholders benefit; Chen and Lin (2018) -- competitive advantage that leads to market share gains

sensitivity of investment to stock price Antoniou et al. (2023)

affects the capital structure Chen, Noronha, and Singal (2004) – no change in equity issuance; Massa, Peyer, and Tong (2005) – equity issuance increases; Bena et al. (2017) – more likely to rely on internal financing after inclusion; Cao, Gustafson, and Velthius (2019) – equity issuance increases; Goyal, Urban, and Zhao (2022) – rely more heavily on debt financing after inclusion because they can more easily issue equity in periods of distress; Antoniou et al. (2023) -- increased sector ETF ownership is associated with reduced equity issuance but no change in debt issuance

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some studies find that it declines Chan, Kot, and Tang (2013); Kot, Leung, and Tang (2015); Bennett, Stulz, and Wang (2020); Bennett, Stulz, and Wang (2023)

others find that it improves Beneish and Gardner (1995); Denis et al. (2003); Kappou and Oikonomou (2016)

some see no effect Brooks et al. (2013); Chan and Zhao (2018); Glosten, Nallareddy, and Zou (2021); Antoniou et al. (2023)

performance improves after a stock is added to an index Chan, Kot, and Tang (2013); Ben-David, Franzoni, and Moussawi (2018) – with higher risk; Kacperczyk, Sundaresan, and Wang (2021)

others observe that it declines Massa, Peyer, and Tong (2005) – under certain circumstances; Bennett, Stulz, and Wang (2023)

stocks deleted from indexes subsequently outperform Chan, Kot, and Tang (2013); Arnott and Henslee (2024)

outperformance or large earnings increases prior to inclusion Edmister, Graham, and Pirie (1994); Kash and Sarkar (2011)

positive assessment of the firm's future prospects Chung and Kryzanowski (1998); Denis et al. (2003); Cai (2007)

improve the representativeness of the index Geppert, Ivanov, and Karels (2011a)

buy-and-hold index portfolios outperform Siegel and Schwartz (2006); Cai and Houge (2008)

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associated with increased comovement Vijh (1994); Barberis, Shleifer, and Wurgler (2005); Greenwood and Sosner (2007); Coakley, Kougoulis, and Nankervis (2008); Greenwood (2008); Mase (2008); Geppert, Ivanov, and Karels (2011b); Kasch and Sarkar (2011); Sullivan and Xiong (2012); Coakley, Kougoulis, and Nankervis (2014); Chang, Hong, and Liskovich (2015); Bolla, Kohler, and Wittig (2016); Chen, Singal, and Whitelaw (2016); Da and Shive (2017); DeLisle, French, and Schutte (2017); Baltussen, van Bekkum, and Da (2018); Lynch et al. (2019); Bennett, Stulz, and Wang. (2020); Grégoire (2020); Glosten, Nallareddy, and Zou (2021); Coles, Heath, and Ringgenberg (2022); Goyal, Urban, and Zhao (2022)

increased active investing is associated with decreased comovement Ye (2012); Buffa and Hodor (2023)

no connection between comovement and the level of passive investing Brooks et al. (2013)

diminished over time Chang, Hong, and Liskovich (2015)

disagreement about the duration Greenwood and Sosner (2007) -- largely reverses within a few days; Geppert, Ivanov, and Karels (2011b) -- disappears within five years

passive investing is associated with decreased price efficiency Goetzmann and Massa (2003); Belasco, Finke, and Nanigian (2012); Qin and Singal (2015); DeLisle, French, and Schutte (2017); Israeli, Lee, and Sridharan (2017); Baltussen, van Bekkum, and Da (2018); Ben-David, Franzoni, and Moussawi (2018); Bennett, Stulz, and Wang (2020); Glosten, Nallareddy, and Zou (2021); Kacperczyk, Sundaresan, and Wang (2021); Höfler, Schlag, and Schmeling (2023); Koijen, Richmond, and Yogo (2023); Morck and Yavuz (2023); Pavlova and Sikorskaya (2023); Sammon (2023)

active investing is associated with increased price efficiency Akbas, et al. (2015); Cao et al. (2018); Lee and Zhu (2019); Kacperczyk, Sundaresan, and Wang (2021)

characterizes the effect as small Koijen, Richmond, and Yogo (2023)

a few contradictory findings Liu (2009) -- price efficiency improves after inclusion; Daya, Mazouz, and Freeman (2012) – price efficiency improves after inclusion; Glosten, Nallareddy, and Zou (2021) -- flows into ETFs lead to greater price efficiency for small companies with low analyst coverage; Coles, Heath, and Ringgenberg (2022) – increase in passive investing has no effect; Goyal, Urban, and Zhao (2022) -- no change in after index inclusion

flows into industry/sector ETFs Bhojraj, Mohanram, and Zhang (2020); Huang, O'Hara, and Zhong (2021); Antoniou et al. (2023)

facilitating short selling Chang, Hong, and Liskovich (2015); Porras Prado, Saffi, and Sturgess (2016); Glosten, Nallareddy, and Zou (2021); Coles, Heath, and Ringgenberg (2022); Palia and Sokolinski (2023)

no consensus on how indexing has affected volatility Bessembinder and Seguin (1992) – higher volatility; Kappou, Brooks, and Ward (2008) – no effect; Yun and Kim (2010) – lower volatility; Liu (2011) – lower volatility; Chang, Hong, and Liskovich (2015) – no effect; Ben-David, Franzoni, and Moussawi (2018) – higher volatility; Goyal, Nallareddy, and Zou (2022) – lower volatility

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macro factors Morck, Yeung, and Yu (2000) – national income levels; Brockman, Liebenberg, and Schutte (2010) – state of the business cycle; Ben-Rephael, Kandel, and Wohl (2012) – investor sentiment; Rösch, Subrahmanyam, and van Dijk (2017) – algorithmic trading, TED spread; Madhavan and Morillo (2018) – macro factors; Parsley and Popper (2020) – international macroeconomic policy stability

disclosure standards Collins et al. (1994) – accounting rules; Fox et al. (2003) – level of disclosure; Jin and Myers (2006) – level of transparency; Haggard, Martin, and Pereira (2008) – level of disclosure; Hutton, Marcus, and Tehranian (2009) – transparency of financial statements; Brockman, Liebenberg, and Schutte (2010) – accounting rules; Gul, Kim, and Qiu (2010) – auditor quality

trading-related factors Pástor and Stambaugh (2003) – market liquidity; Bris, Goetzmann, and Zhu (2007) – short selling; Chordia, Roll, and Subrahmanyam (2008) – market liquidity; Chordia, Roll, and Subrahmanyam (2011) – trading activity; Foucault and Frésard (2012) – cross-listing; Rösch, Subrahmanyam, and van Dijk (2017) – algorithmic trading; Weller (2018) – algorithmic trading; Li et al. (2019) – nature of transaction (purchase or sale)

company factors Pindyck and Rotemberg (1993) – company size; Gul, Kim, and Qiu (2010) – type of owner; Kasch and Sarkar (2011) – pre-inclusion performance; Chen, Singal, and Whitelaw (2016) – pre-inclusion performance; Li et al. (2019) – type of owner; Farboodi et al. (2022) – company size

investor awareness Pindyck and Rotemberg (1993) – institutional ownership; Sias and Starks (1997) – institutional ownership; Chan and Hameed (2006) – analyst coverage; Boehmer and Kelley (2009) – institutional ownership; Schutte and Unlu (2009) – analyst coverage; Kamara, Lou, and Sadka (2010) – institutional ownership; Crawford, Roulstone, and So (2012) – analyst coverage; Bai, Philippon, and Savov (2016) –

institutional ownership; Ben-David et al. (2016) – institutional ownership; Ben-Rephael, Da, and Israelsen (2017) – institutional ownership; Kacperczyk, Sundaresan, and Wang (2021) – institutional ownership

how analyst coverage affects market efficiency Chan and Hameed (2006) – increased comovement; Schutte and Unlu (2009) – increases efficiency; Crawford, Roulstone, and So (2012) – increases comovement if no prior coverage, but decreases comovement if existing coverage

institutional ownership leads to increased comovement Pindyck and Rotemberg (1993), Kamara, Lou, and Sadka (2010), Ben-David et al. (2016)

but increased price efficiency Boehmer and Kelley (2009) – even when institutional investors are passive; Bai, Philippon, and Savov (2016); Ben-Rephael, Da, and Israelsen (2017); Kacperczyk, Sundaresan, and Wang (2021)

contradictory finding Sias and Starks (1997)

reach mixed conclusions Mand, and Verma (2021) -- increased correlations make it easier for active managers to outperform; Chan and Lazzara (2022) -- no connection between correlation and active performance, low volatility helps active manager performance, while low beta hurts

factor most likely to drive active management outperformance is return dispersion Parikh and Fabozzi (2018); Parikh, McQuiston, and Zhi (2018); Chan and Lazzara (2022)

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recent increase in stock market concentration Mauboussina and Callahan (2024); Wolfstetter and Born (2024)

complexities of measuring market efficiency Griffin, Kelly, and Nardari (2010)

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active investing that needs encouragement Libson and Parchomovsky (2021)

little theoretical work Schmalz and Zane (2022) – reduces overall investor welfare by decreasing returns; Bond and García (2022) -- increases investor welfare

governance issues that have been raised Coates (2023)

References

Index Inclusion Studies

- Ahmed, Neveen, and Aliaa Bassiouny. 2018. "The Effects of Index Changes on Stock Trading: Evidence from the EGX." *Review of Economics and Finance* 11: 55–66. <http://www.bapress.ca/ref/ref-article/1923-7529-2018-01-55-12.pdf>.
- Arnott, Rob, and Forrest Henslee. 2024. "Nixed: The Upside of Getting Dumped." Research Affiliates. <https://www.researchaffiliates.com/content/dam/ra/publications/pdf/1043-nixed-the-upside-of-getting-dumped.pdf>.
- Arnott, Robert D. and Stephen J. Vincent. 1986. "S&P Additions and Deletions: A Market Anomaly." *Journal of Portfolio Management* 13 (1): 29-33. <https://doi.org/10.3905/jpm.1986.29>.
- Azevedo, Alcino, Mohamad Karim, Andros Gregoriou, and Mark Rhodes. 2014. "Stock Price and Volume Effects Associated with Changes in the Composition of the FTSE Bursa Malaysian KLCI." *Journal of International Financial Markets, Institutions and Money* 28: 20–35. <https://doi.org/10.1016/j.intfin.2013.10.001>.
- Baran, L. C., and T. H. D. King. 2014. "S&P 500 Index Reconstitutions and Information Asymmetry." *Applied Financial Economics* 24 (11): 777–91. <https://doi.org/10.1080/09603107.2014.904489>.
- Baran, Lindsay, and Tao-Hsien Dolly King. 2012. "Cost of Equity and S&P 500 Index Revisions." *Financial Management* 41 (2): 457–81. <https://doi.org/10.1111/j.1755-053X.2012.01186.x>.
- Baran, Lindsay, Ying Li, Chang Liu, Zilong Liu, and Xiaoling Pu. 2018. "S&P 500 Index Revisions and Credit Spreads." *Review of Financial Economics* 36 (4): 348–63. <https://doi.org/10.1016/j.rfe.2017.12.001>.
- Barberis, Nicholas, Andrei Shleifer, and Jeffrey Wurgler. 2005. "Comovement." *Journal of Financial Economics* 75 (2): 283–317. <https://doi.org/10.1016/J.JFINECO.2004.04.003>.
- Bechmann, Ken L. 2004. "Price and Volume Effects Associated with Changes in the Danish Blue-Chip Index: The KFX Index." *Multinational Finance Journal* 8 (1 & 2): 3-34. <https://doi.org/10.17578/8-1/2-1>.
- Becker-Blease, John R. and Donna L. Paul. 2006. "Stock Liquidity and Investment Opportunities: Evidence from Index Additions." *Financial Management* 35 (3): 35-51. <https://doi.org/10.1111/j.1755-053X.2006.tb00146.x>.
- Bena, Jan, Miguel A Ferreira, Pedro Matos, and Pedro Pires. 2017. "Are Foreign Investors Locusts? The Long-Term Effects of Foreign Institutional Ownership." *Journal of Financial Economics* 126 (1): 122–46. <https://doi.org/10.1016/j.jfineco.2017.07.005>.
- Bender, Jennifer, Rohit Nagori, and Mitesh Tank. 2019. "The Past, Present, and Future of the Index Effect." *Journal of Beta Investment Strategies* 10 (3): 15–37. <https://jii.pm-research.com/content/10/3/15>.
- Beneish, Messod D. and John C. Gardner. 1995. "Information Costs and Liquidity Effects from Changes in the Dow Jones Industrial Average List." *Journal of Financial and Quantitative Analysis* 30 (1): 135-157. <https://doi.org/10.2307/2331257>.
- Beneish, Messod D., and Robert E. Whaley. 1996. "An Anatomy of the 'S&P Game': The Effects of Changing the Rules." *Journal of Finance* 51 (5): 1909–30. <https://doi.org/10.1111/j.1540-6261.1996.tb05231.x>.
- Beneish, Messod D., and Robert E. Whaley. 1997. "A Scorecard from the S&P Game." *Journal of Portfolio Management* 23 (2): 16-23. <https://doi.org/10.3905/jpm.23.2.16>.
- Beneish, Messod D., and Robert E. Whaley. 2002. "S&P 500 Index Replacements." *Journal of Portfolio Management* 29 (1): 51–60. <https://doi.org/10.3905/jpm.2002.319863>.

- Bennett, Benjamin, René M. Stulz, and Zexi Wang. 2020. "Does Joining the S&P 500 Index Hurt Firms?". National Bureau of Economic Research Working Paper Series 27593. <https://doi.org/10.3386/w27593>.
- Bennett, Benjamin, René M. Stulz, and Zexi Wang. 2023. "Does Greater Public Scrutiny Hurt a Firm's Performance?" European Corporate Governance Institute Working Paper Series in Finance 873/2023. https://www.ecgi.global/sites/default/files/working_papers/documents/doesgreaterpublicscrutinyhurtfirmperformanceecgi.pdf.
- Biktimirov, Ernest N. 2004. "The Effect of Demand on Stock Prices: Evidence from Index Fund Rebalancing." *Financial Review* 39 (3): 455–72. <https://doi.org/10.1111/j.0732-8516.2004.00084.x>.
- Biktimirov, Ernest N., Arnold R. Cowan, and Bradford D. Jordan. 2004. "Do Demand Curves for Small Stocks Slope Down?" *Journal of Financial Research* 27 (2): 161–178. <https://doi.org/10.1111/j.1475-6803.2004.t01-1-00077.x>.
- Biktimirov, Ernest N., and Boya Li. 2014. "Asymmetric Stock Price and Liquidity Responses to Changes in the FTSE SmallCap Index." *Review of Quantitative Finance and Accounting* 42 (1): 95–122. <https://doi.org/10.1007/s11156-012-0335-7>.
- Biktimirov, Ernest N., and Yuanbin Xu. 2019a. "Market Reactions to Changes in the Dow Jones Industrial Average Index." *International Journal of Managerial Finance* 15 (5): 792–812. <https://doi.org/10.1108/IJMF-10-2017-0226>.
- Biktimirov, Ernest N., and Yuanbin Xu. 2019b. "Asymmetric Stock Price and Investor Awareness Reactions to Changes in the Nasdaq 100 Index." *Journal of Asset Management* 20 (2): 134–45. <https://doi.org/10.1057/s41260-019-00108-6>.
- Bildik, Recep, and Güzhan Gülay. 2008. "The Effects of Changes in Index Composition on Stock Prices and Volume: Evidence from the Istanbul Stock Exchange." *International Review of Financial Analysis* 17 (1): 178–97. <https://doi.org/10.1016/j.irfa.2006.10.002>.
- Brooks, Chris, Konstantina Kappou, Simon Stevenson, and Charles Ward. 2013. "The Performance Effects of Composition Changes on Sector Specific Stock Indices: The Case of European Listed Real Estate." *International Review of Financial Analysis* 29: 132–42. <https://doi.org/10.1016/j.irfa.2013.04.002>.
- Cai, Jie. 2007. "What's in the News? Information Content of S&P 500 Additions." *Financial Management* 36 (3): 113–24. <https://doi.org/10.1111/j.1755-053X.2007.tb00083.x>.
- Cai, Jie, and Todd Houge, CFA. 2008. "Long-Term Impact of Russell 2000 Index Rebalancing." *Financial Analysts Journal* 64 (4): 76–91. <https://doi.org/10.2469/faj.v64.n4.7>.
- Cao, Charles, Matthew Gustafson, and Raisa Velthuis. 2019. "Index Membership and Small Firm Financing." *Management Science* 65 (9): 4156–78. <https://doi.org/10.1287/mnsc.2017.2975>.
- Chakrabarti, Rajesh, Wei Huang, Narayanan Jayaraman, and Jinsoo Lee. 2005. "Price and volume effects of changes in MSCI indices -- nature and causes." *Journal of Banking and Finance* 29 (5): 1237–64. <https://doi.org/10.1016/j.jbankfin.2004.04.002>.
- Chan, Howard W.H., and Peter F. Howard. 2002. "Additions to and Deletions from an Open-Ended Market Index: Evidence from the Australian All Ordinaries." *Australian Journal of Management* 27 (1): 45–74. <https://doi.org/10.1177/031289620202700103>.
- Chan, Keith, and Ruoyun Zhao. 2018. "Do the S&P 500 Index Revisions Affect Corporate Bonds and Earnings Performance?" *Managerial Finance* 44 (10): 1237–49. <https://doi.org/10.1108/MF-11-2017-0446>.
- Chan, Kalok, Hung Wan Kot, and Gordon Y. N. Tang. 2013. "A Comprehensive Long-Term Analysis of S&P 500 Index Additions and Deletions." *Journal of Banking and Finance* 37 (12): 4920–30. <https://doi.org/10.1016/j.jbankfin.2013.08.027>.

- Chang, Yen-Cheng, Harrison Hong, and Inessa Liskovich. 2015. "Regression Discontinuity and the Price Effects of Stock Market Indexing." *Review of Financial Studies* 28 (1): 212–46. <https://doi.org/10.1093/rfs/hhu041>.
- Chen, Honghui, Gregory Noronha, and Vijay Singal. 2004. "The Price Response to S&P 500 Index Additions and Deletions: Evidence of Asymmetry and a New Explanation." *Journal of Finance* 59 (4): 1901–30. <https://doi.org/10.1111/j.1540-6261.2004.00683.x>.
- Chen, Honghui, Gregory Noronha, and Vijay Singal. 2006. "Index Changes and Losses to Index Fund Investors." *Financial Analysts Journal* 62 (4): 31-47. <https://doi.org/10.2469/faj.v62.n4.4185>.
- Chen, Hsiu-Lang. 2006. "On Russell Index Reconstitution." *Review of Quantitative Finance and Accounting* 26 (4): 409–30. <https://doi.org/10.1007/s11156-006-7441-3>.
- Chen, Sheng-Syan, and Yueh-Hsiang Lin. 2018. "The Competitive Effects of S&P 500 Index Revisions." *Journal of Business Finance and Accounting* 45 (7): 997–1027. <https://doi.org/10.1111/jbfa.12312>.
- Chen, Honghui, Vijay Singal, and Robert F. Whitelaw. 2016. "Comovement Revisited." *Journal of Financial Economics* 121 (3): 624–44. <https://doi.org/10.1016/J.JFINECO.2016.05.007>.
- Chu, Gang, John W. Goodell, Xiao Li, and Yongjie Zhang. 2021. "Long-Term Impacts of Index Reconstitutions: Evidence from the CSI 300 Additions and Deletions." *Pacific-Basin Finance Journal* 69: 101651. <https://doi.org/10.1016/j.pacfin.2021.101651>.
- Chung, Richard and Lawrence Kryzanowski. 1998. "Are the Market Effects Associated with Revisions to the TSE300 Index Robust?" *Multinational Finance Journal* 2 (1): 1-37. <https://doi.org/10.17578/2-1-1>.
- Coakley, J., P. Kougoulis, and J. C. Nankervis. 2008. "The MSCI-Canada Index Rebalancing and Excess Comovement." *Applied Financial Economics* 18 (16): 1277–87. <https://doi.org/10.1080/09603100701537722>.
- Coakley, Jerry, Periklis Kougoulis, and John C. Nankervis. 2014. "Comovement and FTSE 100 Index Changes." *International Journal of Behavioural Accounting and Finance* 4 (2): 93. <https://doi.org/10.1504/IJBAF.2014.061440>.
- Collins, M. Cary, James W. Wansley, and Breck Robinson. 1995. "Price and Volume Effects Associated with the Creation of Standard & Poor's Midcap Index." *Journal of Financial Research* 18 (3): 329–50. <https://doi.org/10.1111/j.1475-6803.1995.tb00570.x>.
- Cusick, Philip A. 2002. "Price Effects of Addition or Deletion from the Standard & Poor's 500 Index." *Financial Markets, Institutions and Instruments* 11 (4): 349–83. <https://doi.org/10.1093/rfs/hhwo12>.
- Dash, Srikant, and Berlinda Liu. 2009. "Capturing the Index Effect via Options | Portfolio Management Research." *Journal of Trading* 4 (2): 72–78. <https://doi.org/10.3905/jot.2009.4.2.072>.
- Daya, Wael, Khelifa Mazouz, and Mark Freeman. 2012. "Information Efficiency Changes Following FTSE 100 Index Revisions." *Journal of International Financial Markets, Institutions and Money* 22 (4): 1054–69. <https://doi.org/10.1016/j.intfin.2012.01.002>.
- Deininger, Claus, Christoph Kaserer, and Stephanie Roos. 2002. "Der Indexeffekt Am Deutschen Aktienmarkt Und Seine Ursachen." *Zeitschrift Für Bankrecht Und Bankwirtschaft* 14 (4): 262–79. <https://doi.org/10.15375/zbb-2002-0402>.
- Denis, Diane K., John J. McConnell, Alexei V. Ovtchinnikov, and Yun Yu. 2003. "S&P 500 Index Additions and Earnings Expectations." *Journal of Finance* 58 (5): 1821–40. <https://doi.org/10.1111/1540-6261.00589>.
- Dhillon, Upinder, and Herb Johnson. 1991. "Changes in the Standard and Poor's 500 List." *Journal of Business* 64 (1): 75–85. <http://www.jstor.org/stable/2353073>.
- Dick-Nielsen, Jens, and Marco Rossi. 2019. "The Cost of Immediacy for Corporate Bonds." *Review of Financial Studies* 32 (1): 1–41. <https://doi.org/10.1093/rfs/hhy080>.

- Docking, Diane Scott, and Richard J. Downen. 2006. "Evidence on Stock Price Effects Associated with Changes in the S&P 600 SmallCap Index." *Quarterly Journal of Business and Economics* 45 (1/2): 89–114. <https://www.jstor.org/stable/40473416>.
- Doeswijk, Ronald Q. 2005 "The Index Revision Party." *International Review of Financial Analysis* 14 (1): 93–112. <https://doi.org/10.1016/j.irfa.2004.06.006>.
- Edmister, Robert O., A. Steven Graham, and Wendy L. Pirie. 1994. "Excess Returns of Index Replacement Stocks: Evidence of Liquidity and Substitutability." *Journal of Financial Research* 17 (3): 333–46. <https://doi.org/10.1111/j.1475-6803.1994.tb00196.x>.
- Edmister, Robert O., A. Steven Graham, and Wendy L. Pirie. 1996. "Trading Cost Expectations: Evidence from S&P 500 Index Replacement Stock Announcements." *Journal of Economics and Finance* 20 (2): 75–85. <https://doi.org/10.1007/BF02920893>.
- Elliott, William B., and Richard S. Warr. 2003. "Price Pressure on the NYSE and Nasdaq: Evidence from S&P 500 Index Changes." *Financial Management* 32 (3): 85–99. <https://www.jstor.org/stable/3666385>.
- Erwin, Gayle R. and James M. Miller. 1998. "The liquidity effects associated with addition of a stock to the S&P 500 index: evidence from bid/ask spreads." *Financial Review* 33 (1): 131-146. <https://doi.org/10.1111/j.1540-6288.1998.tb01612.x>.
- Fernandes, Marcelo, and João Mergulhão. 2016. "Anticipatory Effects in the FTSE 100 Index Revisions." *Journal of Empirical Finance* 37: 79–90. <https://doi.org/10.1016/j.jempfin.2016.02.009>.
- Gassen, Joachim, and Daniel Kaltofen. 2005. "Das 'Qualitätssegment' SMAX: Eine Analyse Der Liquiditätswirkung Und Des Einführungseffektes." *Schmalenbachs Zeitschrift Für Betriebswirtschaftliche Forschung* 57 (5): 423–52.
- George, Roji. 2009. "Price Reactions to Index Reorganization Announcements: Indian Evidence." *Paradigm* 13 (2): 88–97. <https://doi.org/10.1177/0971890720090212>.
- Geppert, John M., Stoyu I. Ivanov, and Gordon V. Karels. 2011a. "An Analysis of the Importance of S&P 500 Discretionary Constituent Changes." *Review of Quantitative Finance and Accounting* 37 (1): 21–34. <https://doi.org/10.1007/s11156-010-0193-0>.
- Geppert, John M., Stoyu I. Ivanov, and Gordon V. Karels. 2011b. "An Examination of the Information Content of S&P 500 Index Changes: Analysis of Systematic Risk." *Review of Accounting and Finance* 10 (4): 411–26. <https://doi.org/10.1108/14757701111185353>.
- Gerke, Wolfgang, Stefan Arneht, and Jörg Fleischer. 2001. "Kursgewinne bei Aufnahmen in den DAX 100, Verluste bei Entnahmen: Indexeffekt am deutschen Kapitalmarkt." *Journal of Business Economics* 71 (1): 45-66.
- Gerke, Wolfgang, and Jörg Fleischer. 2003. "Kurseffekte Bei Veränderungen in Der Zusammensetzung Des MDAX." *Die Betriebswirtschaft* 63 6 (3): 655–71.
- Goetzmann, William N. and Mark Garry. 1986. "Does Delisting from the S&P 500 Affect Stock Price?" *Financial Analysts Journal* 42 (2): 64–69. <https://doi.org/10.2469/faj.v42.n2.64>.
- Goyal, Vidhan K., Daniel Urban, and Wenting Zhao. 2022. "Index Creation, Benchmarking, and External Finance." Working paper. <https://doi.org/10.2139/ssrn.3060392>.
- Graham, A. Steven, and Wendy L. Pirie. 1994. "Index Fund Rebalancing and Market Efficiency." *Journal of Economics and Finance* 18 (2): 219–29. <https://doi.org/10.1007/BF02920524>.
- Greenwood, Robin, and Marco C. Sammon. 2022. "The Disappearing Index Effect." National Bureau of Economic Research Working Paper Series 30748. <https://doi.org/10.3386/w30748>.
- Greenwood, Robin M., and Nathan Sosner. 2007. "Trading Patterns and Excess Comovement of Stock Returns." *Financial Analysts Journal* 63 (5): 69–81. <https://doi.org/10.2469/faj.v63.n5.4841>.

- Gregoriou, Andros, and Christos Ioannidis. 2006. "Information costs and liquidity effects from changes in the FTSE 100 list." *European Journal of Finance* 12 (4): 347-360. <https://doi.org/10.1080/13518470500249340>.
- Gygax, André F., and Isaac Otchere. 2010. "Index Composition Changes and the Cost of Incumbency." *Journal of Banking and Finance* 34 (10): 2500–2509. <https://doi.org/10.1016/j.jbankfin.2010.04.007>.
- Hanaeda, Hideki and Toshio Serita. 2003. "Price and volume effects associated with a change in the Nikkei 225 Index list: New evidence from the big change on April 2000." *International Finance Review* 4: 199-225. [https://doi.org/10.1016/S1569-3767\(03\)04010-X](https://doi.org/10.1016/S1569-3767(03)04010-X).
- Harijono, A. 2003. "Price and Volume Effects Associated with Changes in the LQ 45 Index and the MASCI Equity Index Lists." *Gadjah Mada International Journal of Business* 5 (3). <https://journal.ugm.ac.id/gamajb/article/view/5631/4604>.
- Harris, Lawrence, and Eitan Gurel. 1986. "Price and Volume Effects Associated with Changes in the S&P 500 List: New Evidence for the Existence of Price Pressures." *Journal of Finance* 41 (4): 815–29. <https://doi.org/10.1111/j.1540-6261.1986.tb04550.x>.
- Hegde, Shantaram P., and John B. McDermott. 2003. "The Liquidity Effects of Revisions to the S&P 500 Index: An Empirical Analysis." *Journal of Financial Markets* 6 (3): 413–59. [https://doi.org/10.1016/S1386-4181\(02\)00046-0](https://doi.org/10.1016/S1386-4181(02)00046-0).
- Hendrix, Kaitlin, Jerry Liu, and Roberts. 2024. "Index Reconstitution Costs Continue to Add Up for Index Strategies." Dimensional. <https://www.dimensional.com/us-en/insights/index-reconstitution-costs-continue-to-add-up-for-index-strategies>.
- Hyland, David C., and Steve Swidler. 2002. "Trading Behaviour of Stocks Added to New Zealand's NZSE40 Index." *Applied Economics Letters* 9 (5): 301–4. <https://doi.org/10.1080/13504850110065867>.
- Jain, Prem C. 1987. "The Effect on Stock Price of Inclusion in or Exclusion from the S&P 500." *Financial Analysts Journal* 43 (1), 58-65. <https://doi.org/10.2469/faj.v43.n1.58>.
- Joshiyura, Mayank, and Sundaram Janakiraman. 2015. "Price and Volume Effects Associated with Scheduled Changes in Constituents of Index: Study of NIFTY Index in India." *Afro-Asian Journal of Finance and Accounting* 5 (1): 21–36. <https://doi.org/10.1504/AAJFA.2015.067824>.
- Kacperczyk, Marcin, Savitar Sundaresan, and Tianyu Wang. 2021. "Do Foreign Institutional Investors Improve Price Efficiency?" *Review of Financial Studies* 34 (3): 1317–67. <https://doi.org/10.1093/rfs/hhaa076>.
- Kamal, Rashika. 2014. "New Evidence from S&P 500 Index Deletions." *International Journal of Business and Finance Research* 8 (2): 1–10. <https://www.theibfr.com/the-international-journal-of-business-and-finance-research-past-issues/#2719-2752-ijbfr-v8n2-2014-p1>.
- Kamal, Rashika, Edward R. Lawrence, George McCabe, and Arun J. Prakash. 2012. "Additions to S&P 500 Index: Not so Informative Any More." *Managerial Finance* 38 (4): 380–402. <https://doi.org/10.1108/03074351211207536>.
- Kappou, Konstantina. 2018. "The Diminished Effect of Index Rebalances." *Journal of Asset Management* 19 (4): 235–44. <https://doi.org/10.1057/s41260-018-0077-8>.
- Kappou, Konstantina, Chris Brooks, and Charles W. R. Ward. 2008. "A Re-Examination of the Index Effect: Gambling on Additions to and Deletions from the S&P 500's 'Gold Seal.'" *Research in International Business and Finance* 22 (3): 325–50. <https://doi.org/10.1016/j.ribaf.2007.12.001>.
- Kappou, Konstantina, and Ioannis Oikonomou. 2016. "Is There a Gold Social Seal? The Financial Effects of Additions to and Deletions from Social Stock Indices." *Journal of Business Ethics* 133 (3): 533–52. <https://doi.org/10.1007/s10551-014-2409-z>.

- Kasch, Maria, and Asani Sarkar. 2011. "Is There an S&P 500 Index Effect?" *Federal Reserve Bank of New York Staff Reports* 484. https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr484.pdf.
- Katzke, Nico, and Charlotte van Tiddens. 2019. "FTSE/JSE Index Migration: Testing for a Tradeable Index Effect." *Investment Analysts Journal* 48 (4): 298–317. <https://doi.org/10.1080/10293523.2019.1687131>.
- Kaul, Aditya, Vikas Mehrotra, and Randall Morck. 2000. "Demand Curves for Stocks Do Slope down: New Evidence from an Index Weights Adjustment." *Journal of Finance* 55 (2): 893–912. <https://doi.org/10.1111/0022-1082.00230>.
- Kim, Chan Wung, Xiao Li, and Timothy T. Perry. 2017. "Adaptation of the S&P 500 Index Effect." *Journal of Beta Investment Strategies* 8 (1): 29–36. <https://doi.org/10.3905/jii.2017.8.1.029>.
- Kot, Hung Wan, Harry K. M. Leung, and Gordon Y. N. Tang. 2015. "The Long-Term Performance of Index Additions and Deletions: Evidence from the Hang Seng Index." *International Review of Financial Analysis* 42 (December 1): 407–20. <https://doi.org/10.1016/j.irfa.2015.09.006>.
- Lamoureux, Christopher G. and James W. Wansley. 1987. "Market Effects of Changes in the Standard & Poor's 500 Index." *Financial Review* 22 (1): 53–69. <https://doi.org/10.1111/j.1540-6288.1987.tb00318.x>.
- Lee, Chun I., Kimberly C. Gleason, and Jeff Madura. 2008. "Intraday and Night Index Arbitrage." *Quarterly Journal of Finance and Accounting* 47 (2): 3–16. <https://www.jstor.org/stable/40473453>.
- Li, Yuelin, and Mehdi Sadeghi. 2010. "Price Performance and Liquidity Effects of Index Additions and Deletions: Evidence from Chinese Equity Markets." *Asian Journal of Finance and Accounting* 1 (2). <https://doi.org/10.5296/ajfa.v1i2.193>.
- Liu, Fang, and Wen Wen. 2023. "Stock Index Constituent Adjustments and Corporate Social Responsibility: Evidence from a Quasi-Natural Experiment of CSI 300 Index Adjustments." *China Journal of Accounting Studies* 11 (2): 300–331. <https://doi.org/10.1080/21697213.2023.2239662>.
- Liu, Shinhua. 2000. "Changes in the Nikkei 500: New Evidence for Downward Sloping Demand Curves for Stocks." *International Review of Finance* 1: 245–267. <https://doi.org/10.1111/1468-2443.00018>.
- Liu, Shinhua. 2006. "The Impacts of Index Rebalancing and Their Implications: Some New Evidence from Japan." *Journal of International Financial Markets, Institutions and Money* 16 (3): 246–69. <https://doi.org/10.1016/j.intfin.2005.02.006>.
- Liu, Shinhua. 2009. "Index Membership and Predictability of Stock Returns: The Case of the Nikkei 225." *Pacific-Basin Finance Journal* 17 (3): 338–51. <https://doi.org/10.1016/j.pacfin.2008.07.001>.
- Liu, Shinhua. 2011. "The Price Effects of Index Additions: A New Explanation." *Journal of Economics and Business* 63 (2): 152–65. <https://doi.org/10.1016/j.jeconbus.2010.09.001>.
- Lynch, Anthony W., and Richard R. Mendenhall. 1997. "New Evidence on Stock Price Effects Associated with Changes in the S&P 500 Index." *Journal of Business* 70 (3): 351–83. <https://doi.org/10.1086/209722>.
- Madhavan, Ananth. 2003. "The Russell Reconstitution Effect." *Financial Analysts Journal* 59 (4): 51–64. <https://doi.org/10.2469/faj.v59.n4.2545>.
- Madhavan, Ananth N., and Kewei Ming. 2003. "The Hidden Costs of Index Rebalancing." *Journal of Investing* 12 (3): 29–35. <https://doi.org/10.3905/joi.2003.319551>.
- Malkiel, Burton G., and Aleksander Radisich. 2001. "The Growth of Index Funds and the Pricing of Equity Securities." *Journal of Portfolio Management* 27 (2): 9–21. <https://doi.org/10.3905/jpm.2001.319788>.
- Mase, Bryan. 2006. "Investor Awareness and the Long-Term Impact of FTSE 100 Index Redefinitions." *Applied Financial Economics* 16 (15): 1113–18. <https://doi.org/10.1080/096031005000447479>.

- Mase, Bryan. 2007. "The Impact of Changes in the FTSE 100 Index." *Financial Review* 42 (3): 461–84. <https://doi.org/10.1111/j.1540-6288.2007.00179.x>.
- Mase, Bryan. 2008. "Comovement in the FTSE 100 Index." *Applied Financial Economics Letters* 4 (1): 9–12. <https://doi.org/10.1080/17446540701222425>.
- Massa, Massimo, Urs Peyer, and Zhenxu Tong. 2005. 'Limits of Arbitrage and Corporate Financial Policy', CEPR Discussion Paper 4829. <https://cepr.org/publications/dp4829>
- Masse, Isidore, Robert Hanrahan, Joseph Kushner, and Felice Martinello. 2000. "The Effect of Additions to or Deletions from the TSE 300 Index on Canadian Share Prices." *Canadian Journal of Economics / Revue Canadienne d'Economie* 33 (2): 341–59. <https://doi.org/10.1111/0008-4085.00019>.
- Mazouz, Khelifa, and Brahim Saadouni. 2007. "The Price Effects of FTSE 100 Index Revision: What Drives the Long-Term Abnormal Return Reversal?" *Applied Financial Economics* 17 (6): 501–10. <https://doi.org/10.1080/09603100600690085>.
- Miller, Craig, and Michael Ward. 2015. "The Market Impact on Shares Entering or Leaving JSE Indices." *Investment Analysts Journal* 44 (1): 84–101. <https://doi.org/10.1080/10293523.2015.994450>.
- Morck, Randall, and Fan Yang. 2001. "The Mysterious Growing Value of S&P 500 Membership." National Bureau of Economic Research Working Paper Series 8654. <https://doi.org/10.3386/w8654>.
- Morck, Randall, and M. Deniz Yavuz. 2023. "Indexing and the Incorporation of Exogenous Information Shocks to Stock Prices." National Bureau of Economic Research Working Paper Series 31975. <https://www.nber.org/papers/w31975>.
- Okada, Katsuhiko, Nobuyuki Isagawa, and Kenya Fujiwara. 2006. "Addition to the Nikkei 225 Index and Japanese market response: Temporary demand effect of index arbitrageurs." *Pacific-Basin Finance Journal* 14 (4): 395–409. <https://doi.org/10.1016/j.pacfin.2006.01.004>.
- Parthasarathy, Srikanth. 2011. "Price and Volume Effects Associated with Index Additions: Evidence from the Indian Stock Market." *Asian Journal of Finance and Accounting* 2 (2). <https://doi.org/10.5296/ajfa.v2i2.469>.
- Petajisto, Antti. 2011. "The Index Premium and Its Hidden Cost for Index Funds." *Journal of Empirical Finance* 18 (2): 271–88. <https://doi.org/10.1016/j.jempfin.2010.10.002>.
- Platikanova, Petya. 2008. "Long-Term Price Effect of S&P 500 Addition and Earnings Quality." *Financial Analysts Journal* 64 (5): 62–76. <https://doi.org/10.2469/faj.v64.n5.7>.
- Polonchek, John, and Tim Krehbiel. 1994. "Price and Volume Effects Associated with Changes in the Dow Jones Averages." *Quarterly Review of Economics and Finance* 34 (4): 305–16. [https://doi.org/10.1016/1062-9769\(94\)90016-7](https://doi.org/10.1016/1062-9769(94)90016-7).
- Preston, Hamish, and Aya Soe. 2021. "What Happened to the Index Effect? A Look at Three Decades of S&P 500 Adds and Drops." S&P Dow Jones Indices. <https://www.spglobal.com/spdji/en/research/article/returns-values-and-outcomes-a-counterfactual-history>.
- Pruitt, Stephen W., and K. C. John Wei. 1989. "Institutional Ownership and Changes in the S&P 500." *Journal of Finance* 44 (2): 509–13. <https://doi.org/10.2307/2328603>.
- Qiu, Mei, and John Pinfold. 2008. "Price and Trading Volume Reactions to Index Constitution Changes: The Australian Evidence." Edited by Ajay Samant. *Managerial Finance* 34 (1): 53–69. <https://doi.org/10.1108/03074350810838226>.
- Rahman, Abdul, and Prabina Rajib. 2014. "Associated Effects of Index Composition Changes: An Evidence from the S&P CNX Nifty 50 Index." *Managerial Finance* 40 (4): 376–94. <https://doi.org/10.1108/MF-01-2013-0010>.
- Ravi, Rahul, and Youna Hong. 2015. "Information Asymmetry around S&P 500 Index Changes." *Review of Accounting and Finance* 14 (2): 106–27. <https://doi.org/10.1108/RAF-04-2014-0046>.

- Renshaw, Anthony A. 2020. "The Weakening Index Effect." *Journal of Beta Investment Strategies* 11 (1): 17–31. <https://doi.org/10.3905/jii.2020.1.086>.
- Schnitzler, Jan. 2018. "S&P 500 Inclusions and Stock Supply." *Journal of Empirical Finance* 48 (September 1): 341–56. <https://doi.org/10.1016/j.jempfin.2018.07.004>.
- Shankar, S. Gowri, and James M. Miller. 2006. "Market Reaction to Changes in the S&P SmallCap 600 Index." *Financial Review* 41 (3): 339–60. <https://doi.org/10.1111/j.1540-6288.2006.00146.x>.
- Shleifer, Andrei. 1986. "Do Demand Curves for Stocks Slope Down?" *Journal of Finance* 41 (3): 579–90. <https://doi.wiley.com/10.1111/j.1540-6261.1986.tb04518.x>.
- Siegel, Jeremy J., and Jeremy D. Schwartz. 2006. "Long-Term Returns on the Original S&P 500 Companies." *Financial Analysts Journal* 62 (1): 18–31. <https://doi.org/10.2469/faj.v62.n1.4055>.
- Soe, Aye M., and Srikant Dash. "The Shrinking Index Effect: A Global Perspective." Standard & Poort's. Rochester, NY, November 1, 2008. <https://doi.org/10.2139/ssrn.1568122>.
- Steiner, Manfred and Volker G. Heinke. 1997. "Preis- und Volumeneffekte bei Einführung des MDAX." *Finanzmarkt und Portfolio Management* 11 (4): 432–59. https://fmpm.ch/wpfd_file/steiner-heinke-1997-preis-und-volumeneffekte-bei-einfuehrung-des-mdax/.
- Sui, Libo. 2006. "The Addition and Deletion Effects of the Standard & Poor's 500 Index and Its Dynamic Evolvement from 1990 to 2002: Demand Curves, Market Efficiency, Information, Volume and Return." *Investment Management and Financial Innovations* 3 (4). <https://www.businessperspectives.org/index.php/journals/investment-management-and-financial-innovations/issue-65/the-addition-and-deletion-effects-of-the-standard-poor-s-500-index-and-its-dynamic-evolvement-from-1990-to-2002-demand-curves-market-efficiency-information-volume-and-return>.
- Vespro, Cristina. 2006. "Stock Price and Volume Effects Associated with Compositional Changes in European Stock Indices." *European Financial Management* 12 (1): 103–27. <https://doi.org/10.1111/j.1354-7798.2006.00312.x>.
- Vijh, Anand M. 1994. "S&P 500 Trading Strategies and Stock Betas." *Review of Financial Studies* 7 (1): 215–51. <https://doi.org/10.1093/rfs/7.1.215>.
- Vijh, Anand M., and Jiawei (Brooke) Wang. 2022. "Negative Returns on Addition to the S&P 500 Index and Positive Returns on Deletion? New Evidence on the Attractiveness of S&P 500 versus S&P 400 Indexes." *Financial Management* 51 (4): 1127–64. <https://doi.org/10.1111/fima.12391>.
- Wang, Chuan, Zoltan Murgulov, and Janto Haman. 2015. "Impact of Changes in the CSI 300 Index Constituents." *Emerging Markets Review* 24: 13–33. <https://doi.org/10.1016/j.ememar.2015.05.005>.
- Wang, Qin, Hei Wai Lee, and Vivek Singh. 2013. "S&P 500 Index Revisions And Analyst Coverage." *Journal of Applied Business Research* 29 (4): 1199–1208. <https://doi.org/10.19030/jabr.v29i4.7926>.
- Wilkens, Sascha, and Jens Wimschulte. 2005. "Price and Volume Effects Associated with 2003's Major Reorganization of German Stock Indices." *Financial Markets and Portfolio Management* 19, (1): 61–98. <https://doi.org/10.1007/s11408-005-2298-3>.
- Woolridge, J. Randall and Chinmoy Ghosh. 1986. "Institutional Trading and Security Prices: The Case of Changes in the Composition of the S&P 500 Index." *Journal of Financial Research* 9 (1): 13–24. <https://doi.org/10.1111/j.1475-6803.1986.tb00432.x>.
- Wurgler, Jeffrey, and Ekaterina Zhuravskaya. 2002. "Does Arbitrage Flatten Demand Curves for Stocks?" *Journal of Business* 75 (4): 583–608. <https://doi.org/10.1086/341636>.
- Xie, Wenjuan. 2017. "Media Coverage, Analyst Recommendation Upgrade and Information Content of Inclusions into S&P Indexes." *Investment Management and Financial Innovations* 10 (1). <https://www.businessperspectives.org/index.php/journals/investment-management-and-financial-innovations/issue-90/media-coverage-analyst-recommendation-upgrade-and-information-content-of-inclusions-into-s-p-indexes>.

Yun, Jooyoung, and Tong S. Kim. “The Effect of Changes in Index Constitution: Evidence from the Korean Stock Market.” *International Review of Financial Analysis* 19 (4): 258–69. <https://doi.org/10.1016/j.irfa.2010.08.003>.

Zhang, Jin, Eric C. Lin, and Haeyoung Shin. 2010. “S&P 500 Index Inclusions and Analysts’ Forecast Optimism.” *Journal of Investing* 19 (4): 50–57. <https://doi.org/10.3905/joi.2010.19.4.050>.

Studies on Assets and Flows

Akbas, Ferhat, Will J. Armstrong, Sorin Sorescu, and Avanidhar Subrahmanyam. 2015. “Smart Money, Dumb Money, and Capital Market Anomalies.” *Journal of Financial Economics* 118 (2). <https://doi.org/10.1016/j.jfineco.2015.07.003>.

Antoniou, Constantinos, Frank Weikai Li, Xuewen Liu, Avanidhar Subrahmanyam, and Chengzhu Sun. 2023. “Exchange-Traded Funds and Real Investment.” *Review of Financial Studies* 36 (3): 1043–93. <https://doi.org/10.1093/rfs/hhaco43>.

Baltussen, Guido, Sjoerd van Bekkum, and Zhi Da. 2018. “Indexing and Stock Market Serial Dependence around the World.” *Journal of Financial Economics* 132 (1): 26–48. <https://doi.org/10.1016/J.JFINECO.2018.07.016>.

Belasco, Eric, Michael S. Finke, and David Nanigian. 2012. “The Impact of Passive Investing on Corporate Valuations.” *Managerial Finance* 38 (11): 1067–84. <https://doi.org/10.1108/03074351211266793>.

Ben-David, Itzhak, Francesco Franzoni, and Rabih Moussawi. 2018. “Do ETFs Increase Volatility?” *Journal of Finance* 73 (6): 2471–2535. <https://doi.org/10.1111/jofi.12727>.

Bessembinder, Hendrik, and Paul J. Seguin. 1992. “Futures-Trading Activity and Stock Price Volatility.” *Journal of Finance* 47 (5): 2015–34. <https://doi.org/10.1111/j.1540-6261.1992.tb04695.x>.

Bhojraj, Sanjeev, Partha Mohanram, and Suning Zhang. 2020. “ETFs and Information Transfer across Firms.” *Journal of Accounting and Economics* 70 (2): 101336. <https://doi.org/10.1016/j.jacceco.2020.101336>.

Bolla, Lidia, Alexander Kohler, and Hagen Wittig. 2016. “Index-Linked Investing— A Curse for the Stability of Financial Markets around the Globe?” *Journal of Portfolio Management* 42 (3): 26–43. <https://doi.org/10.3905/jpm.2016.42.3.026>.

Buffa, Andrea M., and Idan Hodor. 2023. “Institutional Investors, Heterogeneous Benchmarks and the Comovement of Asset Prices.” *Journal of Financial Economics* 147 (2): 352–81. <https://doi.org/10.1016/j.jfineco.2022.11.002>.

Cao, Charles, Bing Liang, Andrew W Lo, and Lubomir Petrusek. 2018. “Hedge Fund Holdings and Stock Market Efficiency.” *Review of Asset Pricing Studies* 8 (1): 77–116. <https://doi.org/10.1093/rapstu/rax015>.

Da, Zhi, and Sophie Shive. 2017. “Exchange Traded Funds and Asset Return Correlations.” *European Financial Management* 24 (1): 136–68. <https://doi.org/10.1111/eufm.12137>.

Dannhauser, Caitlin D. 2017. “The Impact of Innovation: Evidence from Corporate Bond Exchange-Traded Funds (ETFs).” *Journal of Financial Economics* 125 (3): 537–60. <https://doi.org/10.1016/j.jfineco.2017.06.002>.

DeLisle, R. Jared, Dan W. French, and Maria Gabriela Schutte. 2017. “Passive Institutional Ownership, R2 Trends, and Price Informativeness.” *Financial Review* 52 (4): 627–59. <https://doi.org/10.1111/fire.12132>.

Glosten, Lawrence, Suresh Nallareddy, and Yuan Zou. 2021. “ETF Activity and Informational Efficiency of Underlying Securities.” *Management Science* 67 (1): 22–47. <https://doi.org/10.1287/mnsc.2019.3427>.

Goetzmann, William N., and Massimo Massa. 2003. “Index Funds and Stock Market Growth.” *Journal of Business* 76 (1): 1–28. <https://doi.org/10.1086/344111>.

- Grégoire, Vincent. 2020. "The Rise of Passive Investing and Index-Linked Comovement." *North American Journal of Economics and Finance* 51 (101059). <https://doi.org/10.1016/j.najef.2019.101059>.
- Höfler, Philipp, Christian Schlag, and Maik Schmeling. 2023. "Passive Investing and Market Quality." Working paper. <https://doi.org/10.2139/ssrn.4567751>.
- Huang, Shiyang, Maureen O'Hara, and Zhuo Zhong. 2021. "Innovation and Informed Trading: Evidence from Industry ETFs." *Review of Financial Studies* 34 (3): 1280–1316. <https://doi.org/10.1093/rfs/hhaa077>.
- Israeli, Doron, Charles M. C. Lee, and Suhas Sridharan. 2017. "Is There a Dark Side to Exchange Traded Funds (ETFs)? An Information Perspective." *Review of Accounting Studies* 22. <https://doi.org/10.1007/s11142-017-9400-8>.
- Koijen, Ralph S. J., Robert J. Richmond, and Motohiro Yogo. 2023. "Which Investors Matter for Equity Valuations and Expected Returns?" *Review of Economic Studies* rdado83. <https://doi.org/10.1093/restud/rdado83>.
- Kothari, S. P., Jing Li, Xu Li, and Mei Sheng. 2023. "ETF Activities and Analysts' Forecasts." Working paper. <https://doi.org/10.2139/ssrn.4398547>.
- Lynch, Hailey, Sébastien Page, Robert A. Panariello, James A. Tzitzouris Jr., and David Giroux. 2019. "The Revenge of the Stock Pickers." *Financial Analysts Journal* 75 (2): 34–43. <https://doi.org/10.1080/0015198X.2019.1572358>.
- Madhavan, Ananth, and Daniel Morillo. 2018. "The Impact of Flows into Exchange-Traded Funds: Volumes and Correlations." *Journal of Portfolio Management* 44 (7): 96–107. <https://doi.org/10.3905/jpm.2018.44.7.096>.
- Palia, Darius, and Stanislav Sokolinski. 2024. "Strategic Borrowing from Passive Investors." *Review of Finance* rfae012. <https://doi.org/10.1093/rof/rfae012>.
- Porras Prado, Melissa, Pedro A. C. Saffi, and Jason Sturgess. 2016. "Ownership Structure, Limits to Arbitrage, and Stock Returns: Evidence from Equity Lending Markets." *Review of Financial Studies* 29 (12): 3211–44. <https://doi.org/10.1093/rfs/hhw058>.
- Qin, Nan, and Vijay Singal. 2015. "Indexing and Stock Price Efficiency." *Financial Management* 44 (4): 875–904. <https://doi.org/10.1111/fima.12102>.
- Sammon, Marco. 2023. "Passive Ownership and Price Informativeness." Working paper. <https://doi.org/10.2139/ssrn.3243910>.
- Sullivan, Rodney N., and James X. Xiong. 2012. "How Index Trading Increases Market Vulnerability." *Financial Analysts Journal* 68 (2): 70–84. <https://doi.org/10.2469/faj.v68.n2.7>.
- Ye, Pengfei. 2012. "The Value of Active Investing: Can Active Institutional Investors Remove Excess Comovement of Stock Returns?" *Journal of Financial and Quantitative Analysis* 47 (3): 667–88. <https://doi.org/10.1017/S0022109012000099>.

Index Weighting Studies

- Baghdadi, Ghasan A., Ishaq M. Bhatti, Lily H. G. Nguyen, and Edward J. Podolski. 2018. "Skill or Effort? Institutional Ownership and Managerial Efficiency." *Journal of Banking and Finance* 91 (June 2018): 19–33. <https://doi.org/10.1016/j.jbankfin.2018.04.002>.
- Bird, Andrew, and Stephen A. Karolyi. 2016. "Do Institutional Investors Demand Public Disclosure?" *Review of Financial Studies* 29 (12): 3245–77. <https://doi.org/10.1093/rfs/hhw062>.
- Boone, Audra L., and Joshua T. White. 2015. "The Effect of Institutional Ownership on Firm Transparency and Information Production." *Journal of Financial Economics* 117 (3): 508–33. <https://doi.org/10.1016/j.jfineco.2015.05.008>.

- Chen, Shuping, Ying Huang, Ningzhong Li, and Terry Shevlin. 2019. “How Does Quasi-Indexer Ownership Affect Corporate Tax Planning?” *Journal of Accounting and Economics* 67 (2): 278–96. <https://doi.org/10.1016/j.jacceco.2018.01.001>.
- Chen, Tao, Hui Dong, and Chen Lin. 2020. “Institutional Shareholders and Corporate Social Responsibility.” *Journal of Financial Economics* 135 (2): 483–504. <https://doi.org/10.1016/j.jfineco.2019.06.007>.
- Coles, Jeffrey L., Davidson Heath, and Matthew C. Ringgenberg. 2022. “On Index Investing.” *Journal of Financial Economics* 145 (3): 665–83. <https://doi.org/10.1016/j.jfineco.2022.05.007>.
- Crane, Alan D., Sébastien Michenaud, and James P. Weston. 2016. “The Effect of Institutional Ownership on Payout Policy: Evidence from Index Thresholds.” *Review of Financial Studies* 29 (6): 1377–1408. <https://www.jstor.org/stable/43866055>.
- Greenwood, Robin. 2008. “Excess Comovement of Stock Returns: Evidence from Cross-Sectional Variation in Nikkei 225 Weights.” *Review of Financial Studies* 21 (3): 1153–86. <https://doi.org/10.1093/rfs/hhm052>.
- Khan, Mozaffar, Suraj Srinivasan, and Liang Tan. 2017. “Institutional Ownership and Corporate Tax Avoidance: New Evidence.” *Accounting Review* 92 (2): 101–22. <https://doi.org/10.2308/accr-51529>.
- Lin, Yupeng, Ying Mao, and Zheng Wang. 2018. “Institutional Ownership, Peer Pressure, and Voluntary Disclosures.” *Accounting Review* 93 (4): 283–308. <https://doi.org/10.2308/accr-51945>.
- Pavlova, Anna, and Taisiya Sikorskaya. 2023. “Benchmarking Intensity.” *Review of Financial Studies* 36 (3): 859–903. <https://doi.org/10.1093/rfs/hhac055>.

Literature Reviews

- Afego, Pyemo N. 2017. “Effects of changes in stock index compositions: A literature survey.” *International Review of Financial Analysis* 52 (July): 228–239. <https://doi.org/10.1016/j.irfa.2017.06.004>.
- Anadu, Kenekwaku, Mathias Kruttli, Patrick McCabe, and Emilio Osambela. 2020. “The Shift from Active to Passive Investing: Risks to Financial Stability?” *Financial Analysts Journal* 76 (4): 1. <https://doi.org/10.1080/0015198X.2020.1779498>.
- Elliott, William B., Bonnie F. van Ness, Mark D. Walker, and Richard S. Warr. 2006. “What Drives the S&P 500 Inclusion Effect? An Analytical Survey.” *Financial Management* 35 (4): 31–48. <https://doi.org/10.1111/j.1755-053X.2006.tb00158.x>.
- Wurgler, Jeffrey. 2010. “On the Economic Consequences of Index-Linked Investing.” National Bureau of Economic Research Working Paper Series 16376. <https://doi.org/10.3386/w16376>.

Theory

- Amihud, Yakov, and Haim Mendelson. 1986. “Asset Pricing and the Bid-Ask Spread.” *Journal of Financial Economics* 17 (2): 223–49. [https://doi.org/10.1016/0304-405X\(86\)90065-6](https://doi.org/10.1016/0304-405X(86)90065-6).
- Baruch, Shmuel, and Xiaodi Zhang. 2022. “The Distortion in Prices Due to Passive Investing.” *Management Science* 68 (8): 6219–34. <https://doi.org/10.1287/mnsc.2021.4114>.
- Basak, Suleyman, and Anna Pavlova. 2013. “Asset Prices and Institutional Investors.” *American Economic Review* 103 (5): 1728–58. <https://doi.org/10.2139/ssrn.1572342>.
- Bond, Philip, and Diego García. 2022. “The Equilibrium Consequences of Indexing.” Edited by Stijn Van Nieuwerburgh. *Review of Financial Studies* 35, (7): 3175–3230. <https://doi.org/10.1093/rfs/hhab106>.
- Breugem, Matthijs, and Adrian Buss. 2019. “Institutional Investors and Information Acquisition: Implications for Asset Prices and Informational Efficiency.” *Review of Financial Studies* 32 (6): 2260–2301. <https://doi.org/10.1093/rfs/hhy103>.

- Buffa, Andrea M., Dimitri Vayanos, and Paul Woolley. 2022. "Asset Management Contracts and Equilibrium Prices." *Journal of Political Economy* 130 (12): 3146–3201. <https://doi.org/10.1086/720515>.
- Buss, Adrian, and Savitar Sundaresan. 2023. "More Risk, More Information: How Passive Ownership Can Improve Informational Efficiency." *Review of Financial Studies* 36 (12): 4713–58. <https://doi.org/10.1093/rfs/hhado46>.
- Ganti, Anu R., and Craig J. Lazzara. 2018. "The Slings and Arrows of Passive Fortune." S&P Dow Jones Indices. <https://www.spglobal.com/spdji/en/documents/research/research-the-slings-and-arrows-of-passive-fortune.pdf>.
- Grossman, Sanford, and Joseph E. Stiglitz. 1980. "On the Impossibility of Informationally Efficient Markets." *American Economic Review* 70, (3). <https://www.jstor.org/stable/1805228>.
- Jaquart, Patrick, Marvin Motz, Lutz Köhler, and Christof Weinhardt. 2023. "The Impact of Active and Passive Investment on Market Efficiency: A Simulation Study." *Journal of Applied Economics* 26 (1): 2188634. <https://doi.org/10.1080/15140326.2023.2188634>.
- Kashyap, Anil K, Natalia Kovrijnykh, Jian Li, and Anna Pavlova. 2021. "The Benchmark Inclusion Subsidy." *Journal of Financial Economics* 142 (2): 756–74. <https://doi.org/10.1016/j.jfineco.2021.04.021>.
- Novick, Barbara, Samara Cohen, Ananth Madhavan, Theodore Bunzel, Jasmin Sethi, and Sarah Matthews. 2017 "Index Investing Supports Vibrant Capital Markets." *BlackRock Viewpoint*. <https://www.blackrock.com/corporate/literature/whitepaper/viewpoint-index-investing-supports-vibrant-capital-markets-oct-2017.pdf>.
- Schmalz, Martin C., and William R. Zame. 2022. "Index Funds, Asset Prices and the Welfare of Investors." Working paper. <https://papers.ssrn.com/abstract=4246321>.
- Weissensteiner, Alex. 2019. "Correlated Noise: Why Passive Investment Might Improve Market Efficiency." *Journal of Economic Behavior and Organization* 158: 158–72. <https://doi.org/10.1016/j.jebo.2018.11.017>.
- Other*
- Bai, Jennie, Thomas Philippon, and Alexi Savov. 2016. "Have Financial Markets Become More Informative?" *Journal of Financial Economics* 122 (3): 625–54. <https://doi.org/10.1016/J.JFINECO.2016.08.005>.
- Ben-David, Itzhak, Francesco Franzoni, Rabih Moussawi, and John Sedunov. 2016. "The Granular Nature of Large Institutional Investors." National Bureau of Economic Research Working Paper Series 22247. <https://doi.org/10.3386/w22247>.
- Ben-Rephael, Azi, Zhi Da, and Ryan D. Israelsen. 2017. "It Depends on Where You Search: Institutional Investor Attention and Underreaction to News." *Review of Financial Studies* 30 (9): 3009–47. <https://doi.org/10.1093/rfs/hhx031>.
- Ben-Rephael, Azi, Shmuel Kandel, and Avi Wohl. 2012. "Measuring Investor Sentiment with Mutual Fund Flows." *Journal of Financial Economics* 104 (2): 363–82. <https://doi.org/10.1016/j.jfineco.2010.08.018>.
- Boehmer, Ekkehart, and Eric K. Kelley. "Institutional Investors and the Informational Efficiency of Prices." *Review of Financial Studies* 22, no. 9 (September 1, 2009): 3563–94. <https://doi.org/10.1093/rfs/hhp028>.
- Bris, Arturo, William N. Goetzmann, and Ning Zhu. 2007. "Efficiency and the Bear: Short Sales and Markets Around the World." *Journal of Finance* 62 (3): 1029–79. <https://doi.org/10.1111/j.1540-6261.2007.01230.x>.

- Brockman, Paul, Ivonne Liebenberg, and Maria Schutte. 2010. "Comovement, Information Production, and the Business Cycle." *Journal of Financial Economics* 97 (1): 107–29. <https://doi.org/10.1016/j.jfineco.2010.03.008>.
- Chan, Fei Mei, and Craig J. Lazzara. 2016. "The Dispersion-Correlation Map." S&P Dow Jones Indices, <https://www.spglobal.com/spdji/en/documents/research/research-the-dispersion-correlation-map.pdf>.
- Chan, Fei Mai, and Craig J. Lazzara. 2022. "Degrees of Difficulty: Indications of Active Success." S&P Dow Jones Indices. <https://www.spglobal.com/spdji/en/documents/research/research-degrees-of-difficulty-indications-of-active-success.pdf>.
- Chan, Kalok, and Allaudeen Hameed. 2006. "Stock Price Synchronicity and Analyst Coverage in Emerging Markets." *Journal of Financial Economics* 80 (1): 115–47. <https://doi.org/10.1016/j.jfineco.2005.03.010>.
- Chinco, Alex, and Marco Sammon. 2024. "The Passive Ownership Share Is Double What You Think It Is." *Journal of Financial Economics* 157 (July 2024): 103860. <https://doi.org/10.1016/j.jfineco.2024.103860>.
- Chordia, Tarun, Richard Roll, and Avanidhar Subrahmanyam. 2008. "Liquidity and Market Efficiency." *Journal of Financial Economics* 87 (2): 249–68. <https://doi.org/10.1016/J.JFINECO.2007.03.005>.
- Chordia, Tarun, Richard Roll, and Avanidhar Subrahmanyam. 2011. "Recent Trends in Trading Activity and Market Quality." *Journal of Financial Economics* 101 (2): 243–63. <https://doi.org/10.1016/J.JFINECO.2011.03.008>.
- Coates, John. 2023. *The Problem of Twelve: When a Few Financial Institutions Control Everything*. New York: Columbia Global Reports.
- Collins, Daniel W., S. P. Kothari, Jay Shanken, and Richard G. Sloan. 1994. "Lack of Timeliness and Noise as Explanations for the Low Contemporaneous Return-Earnings Association." *Journal of Accounting and Economics* 18 (3): 289–324. [https://doi.org/10.1016/0165-4101\(94\)90024-8](https://doi.org/10.1016/0165-4101(94)90024-8).
- Crawford, Steven S., Darren T. Roulstone, and Eric C. So. 2012. "Analyst Initiations of Coverage and Stock Return Synchronicity." *Accounting Review* 87 (5): 1527–53. <https://doi.org/10.2308/accr-50186>.
- Farboodi, Maryam, Adrien Matray, Laura Veldkamp, and Venky Venkateswaran. 2022. "Where Has All the Data Gone?" *Review of Financial Studies* 35 (7): 3101–38. <https://doi.org/10.1093/rfs/hhab110>.
- Foucault, Thierry, and Laurent Frésard. 2012. "Cross-Listing, Investment Sensitivity to Stock Price, and the Learning Hypothesis." *Review of Financial Studies* 25 (11): 3305–50. <https://doi.org/10.1093/rfs/hhs093>.
- Fox, Merritt, Randall Morck, Bernard Yeung, and Artyom Durnev. 2003. "Law, Share Price Accuracy, and Economic Performance: The New Evidence." *Michigan Law Review* 102 (3): 331–86. <https://repository.law.umich.edu/mlr/vol102/iss3/1/>.
- Griffin, John M., Patrick J. Kelly, and Federico Nardari. 2010. "Do Market Efficiency Measures Yield Correct Inferences? A Comparison of Developed and Emerging Markets." *Review of Financial Studies* 23 (8): 3225–77. <https://doi.org/10.1093/rfs/hhq044>.
- Goyal, Amit, Avanidhar Subrahmanyam, and Bhaskaran Swaminathan. 2023. "Illiquidity and the Cost of Equity Capital: Evidence from Actual Estimates of Capital Cost for U.S. Data." *Review of Financial Economics* 41 (4): 364–91. <https://doi.org/10.1002/rfe.1179>.
- Gul, Ferdinand A., Jeong-Bon Kim, and Annie A. Qiu. 2009. "Ownership Concentration, Foreign Shareholding, Audit Quality, and Stock Price Synchronicity: Evidence from China." *Journal of Financial Economics* 95 (3): 425–42. <https://doi.org/10.1016/j.jfineco.2009.11.005>.
- Haggard, K. Stephen, Xiumin Martin, and Raynolde Pereira. 2008. "Does Voluntary Disclosure Improve Stock Price Informativeness?" *Financial Management* 37 (4): 747–68. <https://doi.org/10.1111/j.1755-053X.2008.00033.x>.

- Hutton, Amy P., Alan J. Marcus, and Hassan Tehranian. 2009. "Opaque Financial Reports, R2, and Crash Risk." *Journal of Financial Economics* 94 (1): 67–86. <https://doi.org/10.1016/j.jfineco.2008.10.003>.
- Jin, Li, and Stewart C. Myers. 2006. "R2 around the World: New Theory and New Tests." *Journal of Financial Economics* 79 (2): 257–92. <https://doi.org/10.1016/j.jfineco.2004.11.003>.
- Kamara, Avraham, Xiaoxia Lou, and Ronnie Sadka. 2010. "Has the U.S. Stock Market Become More Vulnerable over Time?" *Financial Analysts Journal* 66 (1): 41–52. <https://doi.org/10.2469/faj.v66.n1.4>.
- Lee, Charles M. C., and Christina Zhu. 2022. "Active Funds and Bundled News." *Accounting Review* 97 (1): 315–39. <https://doi.org/10.2308/TAR-2018-0380>.
- Li, Jie, Yongjie Zhang, Xu Feng, and Yahui An. 2019. "Which Kind of Investor Causes Comovement?" *Journal of International Financial Markets, Institutions and Money* 61: 1–15. <https://doi.org/10.1016/j.intfin.2019.01.004>.
- Libson, Adi, and Gideon Parchomovsky. 2021. "Reversing the Fortunes of Active Funds." *Texas Law Review* 99 (3): 581. <https://texaslawreview.org/reversing-the-fortunes-of-active-funds/>.
- Mauboussin, Michael J., and Dan Callahan. 2024. "Stock Market Concentration: How Much Is Too Much?" Morgan Stanley. <https://www.morganstanley.com/im/en-us/individual-investor/insights/articles/stock-market-concentration.html>.
- Morck, Randall, Bernard Yeung, and Wayne Yu. 2000. "The Information Content of Stock Markets: Why Do Emerging Markets Have Synchronous Stock Price Movements?" *Journal of Financial Economics* (1): 215–60. [https://doi.org/10.1016/S0304-405X\(00\)00071-4](https://doi.org/10.1016/S0304-405X(00)00071-4).
- Parikh, Harsh, and Frank J. Fabozzi. 2017. "The Impact of Market Conditions on Bond Fund Managers." *Journal of Fixed Income* 27 (3): 6–22. <https://doi.org/10.3905/jfi.2018.27.3.006>.
- Parikh, Harsh, Karen McQuiston, and Sujian Zhi. 2017. "The Impact of Market Conditions on Active Equity Management." *Journal of Portfolio Management* 44 (3): 89–101. <https://doi.org/10.3905/jpm.2017.1.076>.
- Parsley, David, and Helen Popper. 2020. "Return Comovement." *Journal of Banking and Finance* 112 (105223). <https://doi.org/10.1016/j.jbankfin.2017.09.019>.
- Pástor, Luboš, and Robert F. Stambaugh. 2003. "Liquidity Risk and Expected Stock Returns." *Journal of Political Economy* 111 (3): 642–85. <https://doi.org/10.1086/374184>.
- Pindyck, Robert S., and Julio J. Rotemberg. 1993. "The Comovement of Stock Prices." *Quarterly Journal of Economics* 108 (4): 1073–1104. <https://doi.org/10.2307/2118460>.
- Rösch, Dominik M., Avanidhar Subrahmanyam, and Mathijs A. van Dijk. 2017. "The Dynamics of Market Efficiency." *Review of Financial Studies* 30 (4): 1151–87. <https://doi.org/10.1093/rfs/hhwo85>.
- Saad, Mohsen, and Anis Samet. 2017. "Liquidity and the Implied Cost of Equity Capital." *Journal of International Financial Markets, Institutions and Money* 51: 15–38. <https://doi.org/10.1016/j.intfin.2017.08.007>.
- Schutte, Maria, and Emre Unlu. 2009. "Do Security Analysts Reduce Noise?" *Financial Analysts Journal* 65 (3): 40–54. <https://doi.org/10.2469/faj.v65.n3.7>.
- Sias, Richard W., and Laura T. Starks. 1997. "Return Autocorrelation and Institutional Investors." *Journal of Financial Economics* 46 (1): 103–31. [https://doi.org/10.1016/S0304-405X\(97\)00026-3](https://doi.org/10.1016/S0304-405X(97)00026-3).
- Velury, Uma, and David S. Jenkins. 2006. "Institutional Ownership and the Quality of Earnings." *Journal of Business Research* 59 (9): 1043–51. <https://doi.org/10.1016/j.jbusres.2006.05.001>.
- Weller, Brian M. 2018. "Does Algorithmic Trading Reduce Information Acquisition?" *Review of Financial Studies* 31 (6): 2184–2226. <https://www.jstor.org/stable/48615701>.

Wolfstetter, Natalia, and Michael Born. 2024, "Concentration in the European Equity Market: And What It Means for Europe-Equity Funds." Morningstar. <https://www.morningstar.com/en-uk/lp/concentration-european-equity-market>.