MSCI REBALANCES – Emerging Market (EM) Index.

Shares are added and deleted from the Emerging Market Index (EM) during the quarterly (QIR) and semi-annual index reviews (SAIR). This paper examines the index rebalances for inclusions and deletions at closing prices. The quarterly (QIR) and semi-annual index (SAIR) rebalancing of the Morgan Stanley Capital International (MSCI) Emerging Market (EM) Index will be the focus of this dissertation and the period covered will be between 2016 to 2020.

This 60-credit thesis is a requirement for Master of Commerce degree specialising in Finance in the field of Corporate Finance and Valuations

Prepared by:

Karlene Macminn

(PTTKAR001)

Supervisor:

A/Prof Glen Holman

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CHAPTER 1: INTRODUCTION

Companies can track the performance of the indices. These companies diversify their portfolios by means of investing in index funds that follow these indices. Passive or index funds must own the index in its entirety. There is no attempt to "beat the market" or employ active management tactics to make predictions on specific equities with index funds. The goal of such funds is to minimise the gap between the portfolio's returns and the specified market index's returns. The discrepancy is referred to as a tracking error, and it is often reduced in reality by the index fund owning all of the shares in the index being tracked, (i.e., the fund replicates the index's composition in its holdings). The first index fund was launched in the United States in the mid-1970s by John Clifton Bogle, who made a name for himself on Wall Street by allowing ordinary people to invest in index funds. When he first presented it, he was initially mocked, but since then index funds have exploded in popularity. Warren Buffett remains well-known for his brilliant share-picking career and maintains that investors would be better served by investing in index funds. Many mutual funds that are actively managed compare their returns to the Standard and Poor’s 500 (S&P 500) Index to offer investors an idea of how much more or less money the managers will be making than if they would have been part of an index fund. In comparison to an active managed fund, passive index funds provide greater returns at lower costs and with very less effort.

Active management's performance against benchmarks has been poor, especially after fees have been removed. Most active fund managers normally follow a share-picking strategy rather than tracking an index. The inference is that active managers will continue to perform poorly when compared to their passive counterparts. For years, S&P 500 has functioned as the “unofficial referee”, exposing active managers' poor record of accomplishment. Wermers' report is the most detailed scrutiny of mutual fund performance. The empirical literature on active management capacity has yielded a mixed bag of findings. Active managers, according to Jensen (1968), Malkiel (1995), Gruber (1996), and Carhart (1997), do not surpass passive benchmark portfolios and in many circumstances, underperform against passive indexes, even before fees. The findings of active management overhead and transaction costs, show that active managers deplete value, implying that investors would be better off investing in broad market indices. However, another view of literature (Svanberg and Karlsson, 2018) suggests that active managers do possess some share-picking ability. Grinblatt and Titman (1989, 1993), Grinblatt, Titman, and Wermers (1995), Daniel et al. (1997), and Wermers (1997) all find that mutual funds choose equities that can beat a wide market index while also outperforming passive indexes of shares with similar structures.

For more than 20 years, Warren Buffet, who invested through a holding company (Berkshire Hathaway), has been the only individual that was able to surpass the markets consistently. For about 15-20 years, the mutual funds of Peter Lynch and his successors (Magellan Fund) and Bill Miller (Legg Mason Value Trust) were quite successful, but then their fortunes changed, and their funds underperformed substantially. According to a study by "Barras, Scailant, and Werners," only 1% of US mutual funds were able to surpass their benchmarks on a risk-adjusted basis between 1975 to 2006. The transition from actively managed funds to index funds has caused notable change in asset management.

The move from active to passive investing techniques appears to be raising some risks while decreasing others, according to Anadu, Kruttli, & McCabe (2020). The passive methods increase market volatility, and the transition has increased industry concentration, but it has reduced liquidity and redemption concerns. The findings by Anadu, Kruttli & McCabe (2020) on the relationship between indexing and the co-shift of asset returns and liquidity is mixed. The key reason for this capital shift is that index funds are less expensive than actively managed funds, while providing similar returns

MSCI adjusts its index at the end of each quarter, with a one-month notice of inclusions and deletions. Announcements are made at the beginning of the month and implemented on an effective date which is normally the last working day of the month. The adjustments, known as quarterly index reviews (QIR) and semi-annual index review (SAIR), occur at regular and predictable intervals (February, May, August & November). MSCI index changes are announced two weeks before they take effect. With index rebalancing, shares are added and deleted from the index during the quarterly and semi-annual reviews. MSCI emerging market index does not contain a defined number of shares, so any inclusion does not immediately indicate or correspond to a deletion (J Bender, R Nagori, M Tank 2019, Simons, Merilin J).

The index fund must sell all its holdings in the shares that have been removed from the index on the effective date and must buy all its holdings in new entrants on that same day. The typical trading volume is a small fraction of the volumes required for rebalancing share positions. Since index funds are compelled to trade all shares at the closing price, the situation can become worse than expected. Due to an order imbalance (when one side of a trade buy/sell dominates the other), these occurrences frequently occur after the end of trading. A considerable imbalance in one direction will inevitably affect the price of a security because of supply and demand.

MSCI index rebalancing modification plans are made available long before the actual revision date. There are abnormal returns around the MSCI review announcement and implementation dates, with a significant concentration in the trading days preceding implementation. Most crucially, the MSCI anomalous returns were shown to be connected with trading volume, implying that the bulk of asset managers adjust their holdings at the last minute to minimize tracking error.

This paper observes the use of indices, the index rebalances at closing price and why the index rebalance will have profound effects on the Morgan Stanley Capital International (MSCI) Emerging Market (EM) Index over quarterly and semi-annual reviews. There is a requirement to understand the importance of the closing price, as the index will have a number of shares at closing price e.g. on 31st of March 2021, and will have to sell everything out of the index on 31st of March and buy a completely different number of shares on 1st of April due to the rebalance. If the index fund is going to track the index then they will have to add all those shares in the final day and the final print can differ significantly. Anything other than closing price will means that there will be tracking error.

This paper further scrutinizes the effects of index rebalancing on shares that have entered or exited the market. If there was a large and predicted price fluctuation as a result of concurrent transactions on the rebalancing date, it concludes that inclusions/deletions experience reduced/higher returns on the rebalance date. This is subsequently as a result of substantial and predicted increases in volume transacted for those equities where passive managers become compelled to buy and sell everything out of the index due to the rebalancing.

This paper examines if there was a price effect when a share enters or exits the MSCI Emerging Market index. This study covered shares that were added and removed from the

MSCI Emerging Market index as a result of quarterly and semi-annual index reviews for period of February 2016 to February 2020. The window period spans twelve days (12) preceding inclusion (deletions) from the index.

The sample selection consists of 329 emerging market shares that have been added (168) and deleted (161) from MSCI Emerging market index since the announcement start date of February 2016. The index period after 3 March 2020 was affected by the COVID19 pandemic, so any data after the March date will be inconsistent, and a decision was made to exclude any quarterly or semi-annual reviews after February 2020.

1.1 Background of Study

The Morgan Stanley Capital International (MSCI) Emerging Markets index and other indices (i.e., S&P 500 & Russel 2000) serve as indexes for specific shares. As a result, indices are incredibly significant in the financial market because they are relied on by many investors. The incorporation or omission of a company from such an index may have a direct impact on the company's share price. The structure of the various indices varies to reflect shifts in the underlying investing domain. The universe varies depending on the index i.e., for example, the S&P 500 contains 500 of the biggest company traded on the NYSE (New York Share Exchange), while the Russell 2000 includes 2000 small cap shares. Index fluctuations can be caused by a variety of factors, such as the acquisition of a company that is listed in an index, changes in the number of shares outstanding or inclusions or deletions to the index. For global equity holders, emerging markets have created prospects for return enhancement and risk diversification. Emerging markets have seen volatile results as an effect of monetary policy reforms and foreign trading relations worsening. The emergence of emerging markets as a distinct share class can be traced back to 1987 with the introduction of the MSCI Emerging Markets Index. At the time, the index represented 10 countries accounting for less than 1% of the global share market (Morgan Stanley, 2023).

An accumulation of political and economic developments, including the end of apartheid in South Africa and the dissolution of the Soviet Union, resulted in the rapid growth of emerging markets during the 1990s. Emerging share markets began to draw foreign investment in the 1990s, when many emerging economies liberalised and removed global entry limits. By 1992, the MSCI Emerging Markets index had expanded to 13 countries. As a result, economies became more accessible to international buyers, and significant amounts of global money poured into these markets and shares. Capital inflows rose steadily in the first half of the decade, peaking in 1997, but began to decline in the second half as a result of several emerging market crises, beginning with the Mexican crisis in 1994. Emerging markets have always been synonymous with high returns as well as elevated risk, offering significant diversification opportunities to foreign investors (Brenner 2009 and White 2012). There are several methods to capitalize on emerging markets' rapid growth rates and prospects. The best option is to invest in an emerging market fund. Many emerging funds either track or attempt to outperform the MSCI Index.

Investors save time by not having to investigate overseas business and economic policies. It also mitigates the risk by spreading your investment across a range of emerging markets. Not all developing markets are equal in terms of investment potential. Ever since 2008 financial crisis, several nations have used increased commodity prices to boost their economies (Altman, 2009). Instead of growing the economy, they used the extra cash to fund subsidies and the establishment of positions in government. As a result, their economies flourished rapidly as their people consumed a large volume of imported commodities. Inflation quickly became an issue (Rena and Msoni, 2014). The nations include South Africa, Russia, Turkey etc.

As a result of its people not saving, there was very little money available for banks to offer to assist company develop. By lowering interest rates, the government encouraged overseas investment (Obstfeld and Rogoff, 2009). Although this contributed to inflationary pressures, it was worthwhile as the nation saw tremendous economic development as a result commodity prices decreasing in 2013. As a result of the exorbitant price of a product, these countries were forced to reduce their assistance or to raise their credit to overseas countries. Overseas investment plummeted as the debt-to-GDP ratio grew. Forex investors began liquidating their assets in 2014 (Obstfeld and Rogoff, 2009). As currency prices plunged, it sparked a huge crisis, resulting in a massive sale of currencies and assets. Others have used their profits to invest in the infrastructure and worker education. There was plenty of cash to fuel new company since their people are saving. They were equipped when the next disaster erupted in 2014. These countries included China, South Korea, Taiwan, and Indonesia, among others.

Over the last three decades, emerging economies have seen rapid growth and change. The opening of the Chinese domestic share market and its penetration into foreign markets is having a disruptive impact on the emerging markets equity sector. MSCI added domestic Chinese share (A shares) to the MSCI Emerging Markets Index at a lower weight in June 2018. Chinese equities listed in mainland China and Hong Kong now account for 30% of the Index. The growing importance of China in emerging markets increases the possibility of investors make specific allocations to China.

1.2 Problem Statement

Alterations in the index's composition provide a unique chance to investigate the price and volume patterns for company that were added to and removed from the index. The inclusion or deletion of a company from a benchmark index impacts not only the share price and number of shares traded, but also discloses a wealth of inclusion information about the company. The effect of index changes on the company is referred to as the "index effect".

MSCI Emerging Markets Index is a benchmark commonly used by hedge funds. The MSCI indexes are the most important group of international share indices that international fund managers watch. Shares that are added to major equity indexes typically lift their trading value as well as their returns. Deletions are sure to reduce returns. This pattern has received a great deal of attention in the financial world.

MSCI adjusts its index at the end of each quarter, with a one-month notice of inclusions or deletions. Announcements are made at the beginning of the month and implemented on the effective date which is normally the last working day of the month. The adjustments are known as quarterly rebalancing reviews and occur at regular and predictable intervals (February, May, August & November). MSCI index changes are announced two weeks before they take effect. With index rebalancing, shares are added and deleted from the index during the quarterly and semi-annual reviews. MSCI emerging market index does not contain a defined number of shares, so any inclusion does not immediately indicate or correspond to a deletion.

The index fund must sell all its holdings in shares that have been removed from the index on the rebalance date at the end of the quarter and buy all its holdings in entrants on the same day. The typical trading volume is a small fraction of the volumes required for rebalancing share positions. Since index funds are compelled to trade all shares at the closing price, the situation becomes worse than expected. Due to an order imbalance (when one side of a trade buy/sell dominates the other), these occurrences frequently occur after the end of trading. A considerable imbalance in one direction will inevitably affect the price of a security because of supply and demand.

This paper examines the use of indices, the index rebalances at closing price and the impact of rebalancing on the Morgan Stanley Capital International (MSCI) Emerging Market (EM) Index over quarterly and semi-annual reviews. There is a need to understand why closing price is so important, as the index will have number of shares at closing price e.g. on 31st of March 2021 (must sell everything out of the index on 31st of March) and will have a completely different number of shares on 1st of April due to the rebalance. If the index fund is going to track the index then they will have to add all those share numbers in the final day and the final print can differ significantly. Anything but closing price means that there will be tracking error.

1.3 Research Aims and Objectives

On a quarterly basis, the MSCI Emerging Market index committee evaluates the index's components and determines whether the company in the index fit the selection criteria. If any of the stocks fail to meet the standard, they will be replaced with new stocks, which will be revealed at least two weeks before they take into effect. When the index's composition changes, investors often buy the new shares and sell the old ones within a few days after the announcement. The index funds' actions will cause demand to alter. This research tries to address the following objectives below.

The overarching objective of this study is to investigate the market impact on MSCI Emerging market index rebalances from the date of the announcement to the effective date (which is normally the last day of the month. The objective will be realised through the following sub-objectives:

i. To identify the time-period when the rebalance occurs (timeline of announcement date to effective date)
ii. To identify and estimate the Price and Volume movements on rebalance (timeline of announcement date to effective date)
iii. To analyse the effects of changes in both inclusion and deletions of shares in MSCI Emerging Market Index during the period from February 2016 to February 2020.

1.4 Organisation of the study

This study is arranged as follows. The first chapter will cover the introduction to MSCI rebalances with a background to this study and the problem statement. Chapter two will cover the existing literature on various aspects of rebalances and chapter three will state the research methodology used. The data used in this study and its analysis will be covered in chapter four. Chapter five will give the conclusion of the study and providing recommendations for further research.

1.5 Period of the study

To analyse the effects of changes in both inclusion and deletions of companies in the MSCI Emerging Market Index during the period from February 2016 to February 2020.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Charles Dow pioneered the use of indices in 1884 (Wurgler, 2010). Originally, the indices were intended to track market trends. Since then, the use of indices has grown in importance among investment industry participants. The literature review is going to examine the shift to indices and will look at the history of the Morgan Stanley Capital International (MSCI) indices and how they have evolved over time to establish the MSCI Emerging Markets index. The Emerging Market index was developed from the MSCI Developed Market Indexes (DM) and was segmented out of the international index since it became an asset class in itself. The MSCI Emerging Market Index will be the focus of this dissertation (https://www.msci.com).

2.1.1 History of the MSCI indices

Morgan Stanley Capital International (MSCI) is well known for its share indices, which totals over 160 000 indexes. (Morgan Stanley, 2023). Their focus is on various geographic locations and asset classes such as small-caps, mid-caps, and large-caps (Morgan Stanley (2023). MSCI launched the first Capital International Indexes in 1968 and these were the first indices covering markets wider than the United States. In 1969 the MSCI Developed Market Indexes (DM) was released with the MSCI Emerging Markets Index (EM) only being released almost 20 years later in 1987. The MSCI All Country Indexes (DM & EM) was released in 1996 with these indexes covering developing and emerging markets (Morgan Stanley, 2023). In 1999 MSCI jointly created the global industry classification standard (GICS) to provide a global standard for categorising company into sectors and industries. GICS was created in response to the global financial community's need for a unified, consistent set of global sector and industry definitions, allowing asset owners, asset managers, and investment research specialists to compare companies, sectors, and industries across countries, regions and globally (Morgan Stanley, 2023). MSCI improved its standard index methodology by shifting from a sampled multi-cap approach to one that aims for extensive coverage with non-overlapping size and style segments. The MSCI standard and small cap indexes, as well as other MSCI equity indexes, adopted the global investable market indexes (GIMI) methodology in 2007 (Morgan Stanley, 2023). MSCI factor indexes were created in 2007 with the goal of capturing the return of factors that have traditionally outperformed the market in the long run. These transparent, rule-based indexes seek equities with favourable factor characteristics such as volatility, yield, and quality etc. (Morgan Stanley, 2023). In 2007, MISC introduced the MSCI global Islamic indexes. They are sharia-compliant investing indices that exclude dividends. The MSCI global Islamic indices are based on the MSCI country indices. The MSCI Islamic index series methodology examines the stocks in the MSCI country indices in relation to specific business activities and financial measures (Morgan Stanley, 2023). The MSCI global ESG indices, introduced in 2010 are market capitalization weighted indices designed to provide exposure to companies with strong Environmental, Social, and Governance success. To minimise the systematic risk imposed by the ESG selection process, the MSCI Global ESG Indices attempt to target sector weights that mirror the relative sector weights of the underlying indices (Morgan Stanley, 2023). The MSCI economic exposure indices, created in 2012, represent the performance of Company that have a strong economic exposure to specific regions and nations. The MSCI Economic Exposure Indices were created with the goal of striking a balance between significant exposure to the target location and acceptable market cap coverage (Morgan Stanley, 2023). MSCI's multi-factor indexes, announced in 2013, offered a foundation for executing index-based multi-factor strategies in a transparent and cost-effective manner. Multi-factor indexes track the performance of components that have traditionally generated a consistent premium over extended periods of time. The MSCI diversified multi-factor indexes methodology, established in 2015, was a methodology intended at representing strong exposure to four variables, namely value, momentum, small size, and quality, while retaining market risk exposure equivalent to the underlying parent index (Morgan Stanley, 2023). The MSCI sustainable impact index, launched in 2016, seeks to identify companies that generated at least 50% of their income from products and services that support environmental, social, and governance (ESG) issues (Morgan Stanley, 2023). The MSCI ESG universal indexes, which were launched in 2017, aims to represent the effectiveness of the investment strategy by re-weighting market cap weights based on certain ESG metrics, to increase exposure to company that have both a robust ESG profile and a positive trend in improving that profile, while minimizing deletions from the parent index (Morgan Stanley, 2023).

The introduction of A-shares in the MSCI indices in 2018 was intended to increase foreign institutional investor involvement. MSCI announced the inclusion of 234 locally-listed Chinese company on June 1, 2018. As a result, all exchange-traded funds that follow the MSCI index had to include such shares. In the medium to long term, this aided the A-share market in becoming more sophisticated with improved liquidity (Morgan Stanley, 2023).

2.1.2 MSCI Developed Market Index (DM) (MSCI World Index - 1969)

The MSCI World Index is global equity index that includes shares from various countries and industries. The index assesses the market performance of big and mid-cap companies with a worldwide footprint. It is a large global share index representing high and mid-cap equity representation in 23 established markets. Approximately eighty-five per cent of the free float market capitalization of each country is protected. The MSCI World Index only contains shares in established markets (for example, the US, Western Europe, Japan, Canada, Australia, etc.), while the MSCI All Country Weighted Index (ACWI) includes shares of both established and emerging markets (for example, China, India, Brazil, etc.) The exact assets under management amount are not known, however estimates are in the region of greater than 3.6 trillion US dollars (January 2021).

2.1.3 MSCI Emerging Markets Index (EM) (1987)

The MSCI Emerging Markets (EM) Index is a share index developed by the global index provider Morgan Stanley Capital International (MSCI) to capture large and mid-cap companies across twenty-seven emerging market nations. The MSCI Emerging Markets index is an index to measure share market performance in global emerging markets. In 1988, the MSCI Emerging Markets (EM) Index was launched, comprising 10 nations inside the MSCI ACWI Index with a weight of around 0.9 percent. Since 1988, the connectivity environment of emerging markets has shifted significantly, with EM defining itself as a distinct and competitive asset class. Over the years, MSCI have introduced and excluded countries based on the MSCI business classification system that assesses economic growth, scale and liquidity, and market usability. Argentina, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Qatar, Russia, Saudi Arabia, South

Africa, Taiwan, Thailand, Turkey, and the United Arab Emirates were amongst the twenty-seven countries covered**.**

2.1.4 MSCI All Country Weighted Index (DM & EM) (1996)

The MSCI All Country Weighted Index (ACWI), MSCI's flagship global equity index, was intended to represent the output of the entire opportunity range of high and mid-cap shares across 23 established and 27 emerging markets, MSCI ACWI Index 2021. It includes markets from the MSCI World Index as well as the MSCI Emerging Markets Index. The index, which has more than 2900 constituents, covers 85 percent of the global investable equity opportunity range, MSCI ACWI Index 2021. The exact assets under management amount are not known, however estimates range from more than 4.1 trillion US dollars. As at 31 January 2022 the index covered 1422 constituents and accounted for 85% of the free float market capitalization. The exact assets under management amount were not known, however estimates were in excess of 1.9 trillion US dollars, MSCI Emerging Market Index 2021.

2.1.5 MSCI Index Methodology (GIMI)

In order to assess the success of emerging markets, MSCI Emerging markets (EM) is widely recognized and used by both foreign investors and academics. Built according to the MSCI Global Investable Market Index (GIMI) framework, the MSCI EM Index is structured to dynamically represent the emergence of emerging market opportunities and to help investors fulfil global and regional asset allocation needs. MSCI improved its Standard Index methodology by switching from a sampled multi-cap approach to a detailed coverage approach with non-overlapping segments of scale and design. The MSCI Standard and MSCI Small Cap Indexes, along with the other MSCI-based share indexes, have migrated to the Global Investable Market Index (GIMI) approach. A more detailed definition can be found in the MSCI Global Investable Market Indexes (GIMI) Methodology Book.

2.1.6 Index Calculation

MSCI maintains and measures daily prices for two kinds of indexes namely MSCI Price Indices and MSCI Total Return Indices. MSCI equity Indexes (country and regional) are measured in local currency as well as in US dollars, with price, gross and net returns. Indexes are determined 5 days a week, from Monday to Friday, except for the set of indexes required for Sunday calculations. The Price Index calculates market success only by measuring the amount of the free float-weighted market capitalization returns of all its components on a given day. It is just the measure of the Price performance which does not adjust for the payment of dividends. Total Return Indexes assess share performance, including price performance and dividend pay-out profits. The Regular Total Return (DTR) technique of MSCI reinvests dividends in indices on the day the security is quoted ex-dividend.

2.2. MSCI Rebalances

The MSCI Indexes are rebalanced on the last business day of each month, with updates taking effect on the first day of the next month, according to the GIMI methodology. The pro-forma results of the rebalancing are announced during the first 10 business days. The MSCI Emerging Markets Index is revalued and reviewed four times a year. With an index rebalancing, shares are added and deleted from the index during the quarterly and semi-annual reviews. The adjustments, known as quarterly rebalancing, occur at regular and predictable intervals (February, May, August & November). MSCI index changes are announced two weeks before they take effect and implemented on the effective date which is normally the last working day of the month. MSCI emerging market index does not contain a defined number of shares, so any inclusion does not immediately indicate or correspond to a deletion. MSCI adjusts its index at the end of each quarter, with a one-month notice of inclusions or deletions. The index fund must sell all its holdings in shares that have been removed from the index on the rebalance date at the end of the quarter and buy all its holdings in entrants on the same day. The typical trading volume is a small fraction of the volumes required for rebalancing share positions. Since index funds are compelled to trade all shares at the closing price, the situation becomes worse than expected. Due to an order imbalance (when one side of a trade buy/sell dominates the other), these occurrences frequently occur after the end of trading. A considerable imbalance in one direction will inevitably affect the price of a security because of supply and demand. MSCI index rebalancing modification plans are made available well before the actual revision date, sparking speculation. There are evident aberrant returns around the MSCI review announcement and implementation dates, with a significant concentration in the trading days preceding implementation. Most crucially, the MSCI anomalous returns were shown to be connected with trading volume, implying that the bulk of asset managers adjust their holdings at the last minute to minimize tracking error. There is a need to understand why closing price is so important, as the index will have a number of shares at closing price e.g. on 31^{st} of March 2021 (must sell everything out of the index on 31^{st} of March) and will have a completely different number of shares on 1^{st} of April due to the rebalance. If the index fund is going to track the index then they will have to add all those share numbers in the final day and the final print can differ significantly. Anything but closing price means that there will be tracking error.

2.3. Efficient market hypothesis (EMH) & Hypothesis Theories

The efficient market hypothesis (EMH) (Hacibedel and van Bommel, 2006), states that because current share prices are considered to represent all publicly accessible information, no investor can continuously generate returns above the market average. This argument implies that active portfolio management is impractical, because it is theoretically impossible to consistently time the market and benefit from mispriced equities. As a result, there has been a move in recent years toward passive investment techniques, notably index investing, which allows investors to earn close to the market average while avoiding hefty trading expenses and commissions. The Efficient market hypothesis is a supporting principle that claims that one price is compatible within a given knowledge package. (Hacibedel and van Bommel, 2006). According to Beneish and Whaley, 1996 (S & P game), the unexpected return is 3.1 percent after the announcement and 4.1 percent on the real date (Beneish and Whaley, 1996). As a result, financial managers who rebalance their portfolios near the real index revision date incur a higher liquidity premium (7.2 percent). Lynch and Mendenhall (1996) estimated that trading turnover was 30% higher than normal following the announcement (Lynch and Mendenhall,1996). Theories have been established as to why the index movement of a share may have an impact on its price and on its returns (Hacibedel and van Bommel, 2006). Firstly, both the price and trading volume impacts are analysed, allowing for the core of the trading activities to be established around the events to assist with unravelling of the competitive hypothesis. Secondly, we analyse the inclusions and deletions, providing perhaps more precise proof of inclusions and deletions movements and thus a more comprehensive representation of the impacts of adjustments to the index. Lastly most of the movements to the MSCI emerging market index only takes place during the semi-annual and quarterly review process (Hacibedel and van Bommel, 2006). Conflicting hypotheses (Hacibedel, 2018) have been suggested in the literature to shed some light on adjustments and if they are merely added to or removed from the inventory of shares listed in the indices. There are four types of hypotheses (Huang, Chakrabarti, Jayaraman and Lee, 2015) that was suggested in the literature namely:

Price pressure hypothesis is due to downward sloping short run demand curve (DSDC) discusses the rise in a share price as a result of a major share selling or acquisition that does not result in a change in publicly accessible knowledge (Harris and Gurel, 1986). The central tenet of this theory is that the effect is transient, and the price effect is not irreversible. This hypothesis forecasts a momentary shift in the price of a new share. If index funds conclude their rebalancing, share markets will revert to their state of balance and hence the losses will be reversed. The Price Pressure Hypothesis (PPH), first proposed by Scholes (1972), contends that in the immediate term, shares have a "downward sloping demand curve" instead of a "horizontal demand curve". Harris and Gurel (1986) find that there is a full price reversal afterwards. conclude that demand curves are downward-sloped in the short run and are horizontal in the long run. Large mass trades, according to Elliot (2006), might cause a departure from the price level for the share being added, as a result of the exploration costs associated with index-funds acquiring the shares in order to imitate a specific index (Elliot (2006). Prices appeared to return to what it was before the announcement and pre-inclusion norms after the demand is fulfilled. Trading volumes increased temporarily for the period around the event, according to Woolridge and Ghosh (1986). Price rises for inclusions and price drops for deletions were both considerable and lasted for 4 weeks after the event, according to Arnott and Vincent (1986), but they couldn't say with confidence that the Price Pressure Hypothesis held.

Imperfect substitute's hypothesis is due to downward sloping long run demand curve (DSDC), (Dhillon and Johnson,1991, Beneish and Whaley, 1996 and Kaul et al.,2000). This theory suggests a permanent shift in prices and states that as soon as one of the two identical shares is introduced to the index, they are no longer close replacements for each other. According to this theory, shares that are included in the index are no longer appropriate alternates for shares that are not included to the index. As a result, assuming the incomplete replacements theorem holds true and the company stays in the index, the price rise would be irreversible. Studies from Dhillon and Johnson (1991), Beneish and Whaley (1996), and Kaul et al. (2000) confirms that the increase appears to be permanent. This suggests that investors consider a disparity in company worth dependent purely on index participation. According to Shleifer (1986), the downward sloping form of stock curves signals a rightward shift owing to increased demand by index-linked funds, which permanently drives up the cost of inclusions. Harris and Gurel (1986) claim that a price pressure effect exists, in which massive simultaneous rebalancing of index-linked funds produce a temporary price pressure for rebalancing stocks. Investors who can offer inclusions (deletions) on the rebalancing date in particular, are proven to receive a premium. This impact, will be ephemeral, with a price adjustment following (Gowri Shankar and Miller (2006)).

Information cost/liquidity hypothesis states that share prices are expected to increase or decrease in response to an increase or decrease in liquidity (Hegde and McDermott, 2003) According to this theory, shares applied to an index should be less costly for investors to exchange as liquidity increases (Bildik and Gulay, 2008). It can be explained in part by the market pressure effect, which occurs when trade volume rises dramatically after the announcement (Madhavan and Ming, 2002). Since more information was readily accessible, the rise in supply decreased the time consumed looking for information on a share. Chen (2006) demonstrates that the imperfect substitutes hypothesis accounts for the vast majority of the rebalancing impact observed in the Russell 1000 index. According to Chen, Noronha, and Singal (2004), increased investor knowledge leads to a permanent price increase for stocks added.

Lastly **Information signalling hypothesis** states that investor has superior knowledge when a share is added to the index and that the price shift is permanent. The adjustment in a company's share price is as a result of facts contained in the signalling of an inclusion/deletions. It increases its worth and more investors become aware of its presence. The rate of return could decline due to the decrease in non-systematic risk and therefore the impact of the results is deemed to be long-lasting. According to Jain (1987), the inclusion of shares in indexes can transmit favourable information about a company.

Platikanova (2008) and Denis et al. (2003) find support for the positive information effects supporting persistent positive price adjustments.

The four theories offer various interpretations for the reported shifts in the return and value of shares introduced or removed from the index. Increasing foreign portfolio investments in emerging markets is critical for economic development and growth. Attracting foreign investment in capital markets is not a major concern in the developed markets, but it is a major concern in the emerging markets.

2.4. Literature review around Impact of index inclusions/deletions

The literature by Shleifer (1986), Chen et al., (2006), Cai (2008), Liu (2009), Petajisto (2011) and Afego (2017) has become the gold standard for index inclusions and deletions. Shleifer (1986) argued that his findings through analysing inclusions and deletions from Standard and Poor's (S&P500) index between 1976 and 1983 and discover that new inclusions earn anomalous returns on the day of announcement, and that the (abnormal) returns persist for up to 20 days following the announcement (Shleifer, 1986). This supports an imperfect substitute i.e., downward sloping demand curve (DSDC) hypothesis (refer 2.3) in the long run. Shleifer (1986) infers that the demand curve inclines downward, and the notification of index inclusion moves the curve out, thus resulting in a long-term share price gain. Harris and Gurel’s (1986) findings that analysed inclusions and deletions from Standard and Poor's (S&P) 500 index over the 1973-1983 period find that, despite a significant anomalous return in the run-up window (between the announcement and the index change date), there is a complete price reversal i.e. inclusions and deletions have a symmetric price reaction). According to Harris and Gurel (1986), shares gain more than 3% in anomalous returns after being included to the S&P500 index, but that this upsurge is fully overturned within the two weeks that followed, thus supporting the temporary price-pressure hypothesis (Refer 2.3), which involves a rise in prices followed by a decrease in prices. The pricing effect, unlike the permanent volume effect, is found to be reversible over time (Harris and Gurel, 1986). According to finding from Amihud and Mendelson (1986), the abnormal returns, persists well beyond the effective date since predicted returns are linked to higher liquidity for equities projected to be added to the index. The results from analysing inclusions and deletions support the information cost/liquidity hypothesis (refer 2.3) (Amihud and Mendelson, 1986). Index matching techniques that does not transact between the announcement date and the effective date, reduces price pressure on the effective date and improves returns on inclusions (Beneish & Whaley, 1996 and Blume & Edelen, 2002). Woolridge and Ghosh (1986) discovered that trade volumes momentarily surged in the period around the occurrence. Arnott and Vincent (1986) discovered price increases for inclusions and price declines for deletions. Findings of Jain (1987) analysing inclusions and deletions from Standard and Poor's (S & P) 500 Index over the period 1977-1983, uncovered no evidence of either imperfect substitutes or price-pressure hypothesis (refer 2.3) and accredit the price effect to information released about the future prospects of the company. Lamoureux and Wansley (1987), Lynch and Mendenhall (1997) and Malkiel and Radisich (2001) discovered large "price pops" following inclusion but no longer-term price impacts. The findings of Dhillon and Johnson (1991) that analysed inclusions and deletions from Standard and Poor's (S&P500) Index over the 1978-1988 period were inconsistent with the price pressure hypothesis (refer 2.3), but consistent with both imperfect substitutes (refer 2.3) and the information signalling hypothesis (refer 2.3). Dhillon and Johnson (1991) utilises share and option information to demonstrate that options for inclusions approved on the announcement date rather than on the effective date. The findings of Beneish & Gardner (1995) that analysed inclusions and deletions for Dow Jones Industrial Average (DJIA) over the 1929-1988 period, is that the price impact of the Dow Jones Industrial Average (DJIA) results in losses for shareholders of deleted DJIA companies, and does not affect the added companies. Beneish & Gardner (1995) find a small effect on the share price and trading volume for the companies added, but that the deleted companies experienced substantial negative excess returns at the time of the announcement and their trading activity decreased. The findings are consistent with the information cost/liquidity hypothesis (refer 2.3). The results of Beneish et al (1995) for DJIA challenge the S&P500 findings of Chen et al (2004). The results of Beneish and Whaley (1996) after analysing inclusions and deletions from Standard and Poor's (S&P500) Index covering the period 1986-1994, indicates that an abnormal price increase exists from the announcement date to effective date and is consistent with the imperfect substitutes hypothesis (refer 2.3). The results are that the surplus return should be of a permanent nature. According to the findings of Beneish and Whaley (1996), the trading activity of the S&P500 inclusions tends to increase substantially. Beneish and Whaley (1996) discover a 2.2 percent price reversal in the days after an inclusion, which they attribute to arbitrageurs "front running" the index funds.

The trade activity is quite high between both the announcement date and listing date, indicating that the liquidity increase has already happened.

Lynch and Mendenhall (1997) analyse both inclusions and deletions from Standard and Poor's S&P500 Index over 1976-1995 period and find substantial positive/negative irregular returns after announcement of the inclusion/deletion, which was only partly reversed again. The price reversal after inclusion clearly implies the presence of a permanent price effect after the notice of insertion, caused by the change in the structure of the S&P500. In inclusion, the trading volumes are substantially higher from the date of announcement and are especially enormous on the day before the effective date. Lynch and Mendenhall's results indicate in short run downward sloping demand curve (DSDC) hypothesis and the price pressure hypothesis (refer 2.3). Companies that were removed from the index disclosed a big post-announcement shift and a price reversal. Lynch and Mendenhall (1997) establish evidence of price increases of up to 7% when a share enters the S&P 500. Erwin and Miller (1998) reported a long-term (30 days after index inclusion) drop in daily quoted spreads on new shares using a sample of 109 inclusions from 1984 to 1988. Some suggest that a company's inclusion in the S&P 500 signifies "positive information" regarding the company's long-term potential. This contradicts the S&P500's argument that inclusions are not dependent on the assessment of a company's future earnings (Boss and Ruotolo 2000). Since these foundational theories explain the permanent price increase, they do not explain the sequence of the original rise in prices accompanied by an ensuing price adjustment. Deininger, Kaserer, and Roos (2000) observed a significant anomalous price impact on the day of the index change announcement. According to Deininger, Kaserer and Roos (2000), shares in the index increased with 1.72 percent on the announcement day, while shares removed from the index declined by 1.19 percent. The evidence here does not support the pricing pressure hypothesis (refer 2.3). Masse et al. (2000) investigated inclusions and deletions from 1984 to 1994. Following 1988, an announcement was made five days before the inclusion date, comparable to the S&P. According to Masse et al. (2000), the market reacted favourably to inclusions and adversely to deletions. Masse et al. (2000) finds comparable findings on the Canadian market for inclusions and negligible results for deletions. The index outperformed the market on the day of announcement, with a total anomalous return of 4.75 percent Masse et al. (2000), Masse's findings corroborate Shleifer's (1986) notion that actual indexing causes demand to rise due to buying by index managers who must adhere to a tracking error. Furthermore, Masse et al. (2000) argue that the surge occurs prior to actual inclusion, which is to be considered given that arbitrageurs have prior warning of which adjustments would occur. The findings do not support the hypothesis that when a share is removed from the index (as a consequence of transactions from index fund managers), the price would drop. It also does not support the information hypothesis (refer 2.3), which holds that the market reacts adversely to unfavourable news, such as index deletions. Masse et al. (2000) conclusion is that the actual deletion has no effect, regardless of when the announcement occurs. On the Japanese market, Liu (2000) and Haneda & Sarita (2001) published similar findings on the US and Canadian markets. Liu (2000) results show that the price of shares usually increases or decreases dramatically as shares are added or removed from the Nikkei 500. The permanent price impacts are a refutation of the price-pressure hypothesis (refer 2.3), while the long-term volume impact, along with event-day price impacts, negate the liquidity hypothesis (refer 2.3). Furthermore, Dash (2002) observes brief price reductions for shares that are removed from the index. According to Beneish and Whaley (2002), there are an effect on the share price and trading volume when companies are added to or removed from the S&P 500 index over the period from January 1996 to December 2001. Cooper and Woglom (2003) discovered that the original price increase following a notification is favourable. The price reversal pattern is more variable, but it is considerable and statistically relevant. The inclusion of companies to the S&P 500 does not result in a lasting price increase. Cooper and Woglom (2003) reveal that a company's inclusion in the S&P 500 causes a lasting rise in the volatility of the share price and the magnitude of the shift appears to be increasing with time. The evidence clearly implies that the S&P 500 announcement's price hike includes both permanent pricing impacts and momentary trading impacts. Denis, McConnell, Ovtchinnikov, & Yu (2003) findings from analysing inclusions and deletions for the period 1987-1999 support the information signalling hypothesis. Denis, McConnell, Ovtchinnikov, & Yu (2003) state that the announcement of a share's participation in the S&P500 index may include information about the company's future prospects and show that analysts adjust their profit projections for companies that are part of the S&P indexes. Hegde, and McDermott (2003) revealed a link between the "abnormal returns associated with a share's added to an index" and the reported "decrease in effective spread" as well as the "direct cost of trading". Shares removed from the index, in contrast to index inclusions, have negative anomalous returns and their market liquidity decreases for three months after they are removed. There is a perpetual price increase for shares added to the S&P500, but no corresponding decrease for those excluded from the index (Chen, Noronha

& Singal, 2004). Chen, Noronha & Singal, 2004 suggest that as investors learn more about it, there is an unbalanced re-activity of added shares but a very slight decrease in knowledge of shares excluded from the index. There is asymmetry in the price effect for inclusions and deletions during 1962-2000 period. Inclusions produce irreversible price effects, whereas abnormal deletions-related returns are reversed. The authors (Chen, Noronha & Singal) of this research discover that inclusions have a permanent price effect (raise), whilst deletions have a transitory price effect (reduction). The findings of Chen, Noronha & Singal support imperfect substitute hypothesis (refer 2.3). Elliott and Warr (2003) investigated the price impact of "non-information" linked market volatility using inclusions from NYSE and Nasdaq-listed companies from the S&P 500 between 1989 and 2000. After adjusting for company's characteristics, index fund growth, and arbitrage risk, they conclude that NYSE stocks have less significant price impacts on the day they are added to the index than the Nasdaq shares. This impact is instantly reversed for NYSE shares, but it takes several days for Nasdaq shares to reverse. Chakrabarti et al. (2004) discovered positive anomalous returns and favourable rises for the MSCI Standard Country indices. Chakrabarti et al. (2004) observed a cumulative return of 5.3 percent in the ten days after the announcement, and a cumulative return of -7.5 percent for companies that were removed (Chakrabarti et al, 2004). Price fluctuations in emerging market equities are minor as a result of inclusions and deletions (Chari and Henry,2004). Findings from Blume and Edelen (2004) revealed that S&P500 index funds that are traded on the day when S&P 500 revisions are announced, improve their overall investment returns. Chen et al. (2004) suggest that there tends to be some imbalance in the price impacts for inclusions compared to deletions in the S&P 500. Concerning volume impacts, (Chen et al. 2004; Wang et al. 2015) employ estimates of anomalous transaction volume to calculate the effect on the trading volume for shares that are added or removed from an index. The results show that shares added to an index have higher transaction volumes, but shares withdrawn from an index have lower transaction volumes in some circumstances (Chen et al. 2004 and Wang et al. 2015). Biktimirov (2004) findings after analysing the inclusions and deletions indicate that the share price shifts are permanent and that the evidence favours the downward sloping demand curve (DSDC) hypothesis in long run. For the 20 days preceding reconstruction, Biktimirov et al. (2004) find a cumulative abnormal return of 1.89 percent for companies added, and a cumulative abnormal return of -3.47 percent for companies removed. These aberrant returns are neutralised in both circumstances in the days following the reconstruction. The results of Biktimirov, Cowan & Jordan (2004) from analysing the inclusions and deletions for period 1991 to 2000 suggest that share prices increase are brief and that shares added or excluded from the Russell 2000 index are subject to significant price adjustments. Opong and Hamill (2004) present scientific findings on the FTSE 100 index amendments for short term and the long-term price movements and trading volume impacts. Opong and Hamill (2004) discover an immediate downward price shift in the time before inclusion or deletions of a share, which is consistent with the expectations of the price unpredictability. Following the actual index amendment date, there is a considerable price adjustment in the index. Overall, the Opong and Hamill (2004) research provides substantial support for the hypothesis that adding a share to an index has a statistically significant positive influence on its price and trading volume, whereas deletions have a negative influence on the prices and, to a lesser degree, trading volume. Bechmann (2004) investigates the price effect of an index change notification for deleted stocks that had an anomalous return of minus 13 percent in the six months preceding the deletion, as well as a fall in trading volume and share price efficiency following the deletion, Bechmann (2004). The average abnormal return for new shares was 8%, and there was no notable change in trading volume or efficiency. The findings of Chakrabarti, Huang, Jayaraman & Lee (2005) analysed inclusions and deletions over the 1998-2001 period, were similar to those found by Lynch and Mendenhall (1997) in the United States company. Chakrabarti et al. (2005) discover that equities added to or removed from developed-country indexes have substantial price rises (decreases) the next day after the notice. Findings from Hacibedel and van Bommel (2006) after analysing inclusions and deletions from MSCI Emerging Market Index over the period of 1996-2004 indicates a permanent price impact when shares are added and an impermanent price impact when shares are deleted from the index. The price impacts cannot be explained purely on the grounds of a downward sloping demand curve. In the short term, the price reaction to inclusions and deletions is asymmetric, however overall, there is a permanent price impact with a minor adjustment (Hacibedel and Van Bommel, 2006). Shankar and Miller (2006) findings analysed from inclusions and deletions over the period of 1995-2002, confirm that price and volume impacts are temporary and are removed within 60 days. Company included or deleted from the S&P600 index undergo major price changes or reductions at announcement date. The results reinforce the temporary price pressure hypothesis (refer 2.3). Mase (2007) findings in UK from analysing inclusions and deletions from FTSE 100 covering the period of 1992-2005 suggests that there is no proof of a persistent downward trend in demand arising from a permanent price impact. Mase

(2007) findings support price pressure hypothesis (refer 2.3). Both inclusions and deletions result in substantial gains in trade volume. Findings from Mase (2007) also reports that changes in anomalous trading volume happen for FTSE 100 inclusions but not deletions. Hacibedel and Bommel (2007) discover that the reported price increases of around 2% were slightly lesser in size than what was been reported in the US. Bildik and Gulay (2008) demonstrated that shares included or excluded from an index display large positive or negative anomalous returns on announcement date, and that the event affects trading volume. The price increase of inclusions to the S&P 500 and Russell 2000 indexes has represented 8.8 percent and 4.7 percent, respectively, whereas deletions have totalled 15.1 percent and 4.6 percent. (Petajisto, 2011). The findings of the Selvam, Indhumathi, and Lydia (2012) confirm that there is no long-term effects on share prices. This study also discovered that the NSE reacted negatively to the inclusion and deletion of shares, and that it is impossible to generate any extra profits regardless of whether the shares are included or omitted from the index (Selvam, Indhumathi, and Lydia, 2012). Findings from Kruger and Toerien (2013) after analysing inclusions and deletions from the Johannesburg Share Exchange (JSE) Top 40 index for the period covering 2002-2013, indicate a downward sloping demand curve hypothesis. These irregular returns are reversed over the period. Kruger and Toerien (2013) find that anticipatory trading for both inclusions and deletions began well in advance of the announcement day. This holds for deletions from the Top 40 index but are not highly important for inclusions to the index prior to the announcement day. Rahman and Rajib (2014)'s findings support that the inclusion of shares had a considerable rise in price and volume on the effective date, whereas the removed stocks experienced significant volume, but insignificant price levels. As a result, the study of Rahman & Rajib (2014) shows support for the Price pressure hypothesis (refer 2.3). The findings of Chakrabarti, Huang, Jayaraman, and Lee (2015) examined inclusions and deletions from MSCI Standard Country Indices for 29 countries between 1998 and 2001, and show that share prices and volumes exhibit "index effects" in international markets. The prices of the shares added to the indexes increase significantly following the announcement and further rise throughout the immediately prior the actual change, however some of the increase is lost after the implementing change date. Shares that are removed from the indexes, see a persistent and significant decrease in their prices. After the modification date for the new equities, trading volumes increase dramatically and remain strong (Chakrabarti, Huang, Jayaraman and Lee, 2015). Miller and Ward (2015) using data from Johannesburg share exchange investigate the price impacts of index adjustments for inclusions and deletions.

Miller and Ward (2015) discover large price rises or decreases for index inclusions or deletions 70 days prior to the index reconstruction period. Immediately following the index reconstruction day, price gains and losses tend to quickly reverse, with deletions overtaking inclusions. Miller and Ward (2015) observation is quite remarkable in that it suggests that a large majority of the market reactions take place several months before index inclusions and deletions. Wang, Murgulov, and Haman (2015) reveal that, on average, CSI 300 Index inclusions (deletions) lead to significant price hikes (declines), accompanied by post-event price reversals. These price movements are normally lower than evidenced for the S&P 500 Index. In the short run, trading volume increases dramatically for both CSI 300 Index inclusions and deletions. Following that, trading volume returns to its original levels for index inclusions but tends to be higher for index deletions. Wang, Murgulov, and Haman (2015) findings support the price pressure hypothesis. Yildiz and Dia-Eddine (2016) use the event study method to examine the effect of index inclusions (deletions) on the share price and trading volume of Turkey's participation-30 Index from April 2011 to June 2015. During Yildiz and Dia-Eddine (2016) research periods, share prices generally reacted negatively to index inclusions and favourably to index deletions. The trading volumes of newly added and deleted shares are affected positively on the announcement day, while the effective date demonstrates the absolute reverse (Yildiz and Dia-Eddine, 2016). According to Huij and Kyosev (2016)'s research, the cumulative abnormal return from announcement to effective day is 1.07 percent for new inclusions and -0.91 percent for new deletions, with approximately two-thirds of this effect being permanent. Huij and Kyosev (2016) discover a "direct relationship" between the severity of abnormal returns and the abnormal trade volume of index funds. Hung and Shiu (2016) investigated market reactions to inclusions and deletions in the MSCI Taiwan Index constituents. They discover that abnormal returns for inclusions are highly favourable and unfavourable for deletions. Lin (2018) investigated the impact of the Dow Jones Industrial Average (DJIA) Index and demonstrate that index inclusions (deletions) causes temporary rises (declines) in share prices after the announcement. The abnormal returns associated with the announcements are both statistically relevant. Furthermore, both inclusions and deletions cause temporary unusual trading volume rises in the post-announcement time frame. However, share prices and trading activity return to normal after a few days of trading. The substantiated abnormal returns and trading activity are not permanent and Lin (2018) findings support the price pressure hypothesis.

Biktimirov and Xu (2019) examine the period of 1990 to 2015 and discover that announcements of adjustments in the DJIA index have a considerable impact on the share market. Inclusions and deletions in particular enjoy a permanent benefit or loss. These substantial anomalous returns are followed by substantial hike in trading volume on the announcement date, i.e. two days before and on the effective day. Chen, Shiu, and Wei (2019) investigate MSCI Standard Index movements across 38 countries from 2000 to 2015. Their findings indicated that excess return for MSCI Index inclusions were both favourable and lasting. The negative anomalous results for deletions was just temporary. Katzke and Van Tiddens (2019), inclusions experience reduced earnings and deletions experience greater earnings on rebalancing date. Chen, Shiu, and Wei's (2019) research results verify that inclusions have favourable abnormal returns on the announcement date and deletions have negative abnormal returns. The findings of Chen, Shiu, and Wei (2019) show that positive abnormal returns on inclusions. The findings of Widyawati and Wibowo (2021) were a positive and large abnormal return around the date of index inclusions and deletions announcement in the shares included in the MSCI Index. The equities eliminated from the MSCI Index had negative abnormal returns on the date of the index change announcements. The trading volume for companies added and deleted from the MSCI Index had a major effect on the trading volume on the day of the announcement. (Widyawati and Wibowo, 2021)

CHAPTER 3: RESEARCH & DATA METHODOLOGY

The announcements of MSCI emerging market under consideration is period of February 2016 to February 2020. MSCI's update notices comes from Geneva and are often staggered throughout the day. Some countries' markets may not be accessible at the time of the release, depending on their location and the time of the update. Particularly in the Far East, especially Japan, where trading would have already ended for the day. When the information is released, the United states still has a few hours of trade left. Since MSCI Quarterly Index Review (QIR) updates take place after 8 p.m. GMT, when Euro and Asian markets have already shutdown, the actual announcement date is the day after the announcement. As a result of this, the consequences of this decision will be mirrored in markets the next day.

3.1 Introduction

The share price of the company reflects all accessible information about the company. We can assess how certain events affect the future of a company by calculating the impact of the event on the share price. To conduct this form of research, an event study approach can be used. Anticipated return models are used in the event study approach. The most generally used anticipated return model is the market model, that is based on a benchmark of the overall market's actual returns.

The approach used in this analysis is an event study approach. The event study method was appropriate for investigating the abnormal returns seen between announcement and effective dates (Qiu & Pinfold, 2007). The majority of studies (Shleifer, 1986; Chen et al., 2006) recommended event study methodology, which has since become the standard for recent studies on index inclusions and deletions (Miller & Ward, 2015:88). The event research methodology was recommended by Liu (2009) because it permits smaller sample sizes and a shortened window period than other methods. The causal link was used to figure out the direction of the market's response, which was in line with the primary goal of determining the link for both the inclusion or deletion and share prices (Saunders, Lewis & Thornhill, 2009).

The research used a quantitative methodology. The average abnormal returns (AAR) and cumulative average abnormal returns (CAAR) managed to capture the impact of the event (Liu, 2011, Petajisto, 2009). Excess returns are determine using a market model as a preliminary test. We only include business days but exclude weekends and public holidays. Public holidays are defined as days when no shares in the index trade. The event study can be defined as the movement of the changes in the company's share price that exceed expectations i.e., abnormal returns, and this is usually over time, which refer to the occurrence period. Event studies are used to evaluate a semi-strong kind of market efficiency and to see if freely accessible information is instantly integrated into asset values. The inclusion and deletions of companies from the MSCI Emerging Markets index is the central focus point of this thesis.

3.2 Research Methodology

The very first task in our method is to find new share inclusions and deletions. The first day a share is inside or outside of the portfolio, it is presumed to be newly added or deleted. Day = 12 is designated to be the actual effective day (AED) (normally the last day of each month). Seeing as MSCI adds shares at close prices, a share is successfully in the holdings at market open at AED, implying that index trackers must purchase the stock at AED-1.

Timeline: Event Activity window

09 February 2017	AD-1	Announcement date	(announcement takes place after 8pm GMT when stock markets are closed on 9th Feb)
10 February 2017	AAD	Actual Announcement date	This is when the index changes (additions & deletions) is announced
13 February 2017	1	Business days	
14 February 2017	2	Business days	
15 February 2017	3	Business days	
16 February 2017	4	Business days	
17 February 2017	5	Business days	
20 February 2017	6	Business days	10 Business days
21 February 2017	7	Business days	
22 February 2017	8	Business days	
23 February 2017	9	Business days	
24 February 2017	0	Public holiday	
27 February 2017	10	Business days	
28 February 2017	AED	Actual Effective date	This is when the index changes (additions & deletions) are done
01 March 2017	AED+1	One day after effective date	

3.2.1 Event window

MSCI's update notices comes from Geneva and are often staggered throughout the day. Some countries' markets may not be accessible at the time of the release, depending on their location and the time of the update. Particularly in the Far East, especially Japan, where trading would have already ended for the day. When the information is released, the United states still has a few hours of trade left. Since MSCI Quarterly Index Review (QIR) updates take place after 8 p.m. GMT, when Euro and Asian markets have already shutdown, the actual announcement date is the day after the announcement. As a result of this, the consequences of this decision will be mirrored in markets the next day.

Figure A

1. **AAD – 1 = This is the Actual Announcement Date minus 1**.
   It is the actual announcement date, **= -1** but announcement takes place after 8pm GMT time when European & Asian markets are already closed.
2. **AAD** = **This is the Actual Announcement date.**
   This is event **day =1** which is the day after the actual announcement date when the index inclusions and deletions are announced.
3. **AED** = **The Actual Effective Date.**
   This is where the index changes have taken place for inclusions and deletion, which is normally the last working day in the month **day=12**.
4. **Business days**= **Refer to actual business days** and exclude public holidays and weekends

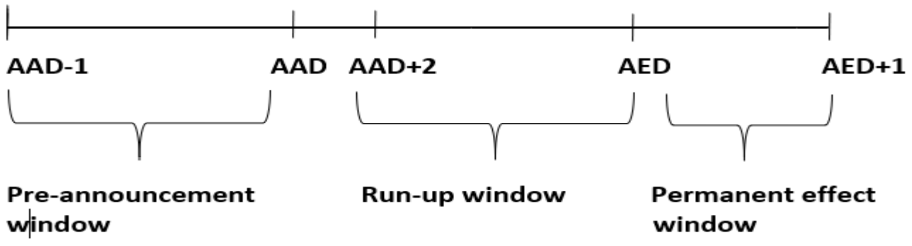

Table 10 – Multiple Windows

A multiple event-window approach was used to analyse price changes related to inclusions and deletions, as recommended by Lynch and Mendenhall (1997). As a result, the event window, which begins two days before the announcement and ends one day after the index change, is divided into smaller windows. The primary emphasis is on price changes on two major event dates: the actual announcement date (AAD) and the actual effective date (AED).

Since the announcement occurs after 8 p.m. GMT, the time window begins with the announcement date AAD-1(*Pre-announcement window*), which is the day before the actual announcement. The run-up period lasts two days after the announcement day (AAD + 2) until the actual effective date (AED). The *run-up* window begins with the post-AED *permanent effect window* and ends 1 day after the change day (AED + 1), i.e. one day after the effective date. The values and shifts in the excess returns and excessive volumes on AAD and AAD + 1 will provide us with a sense of the possible "announcement effect", whereas those during the "run-up window" could represent the effect of fund portfolio rebalancing. The windows for post-AED permanent effects will help us determine if these effects are temporary or lasting. The "total permanent effect window" calculates the total magnitude of CAR's associated with index inclusion or deletion.

The windows are used to determine whether there is any expectation of the announcement based on ARs. The run-up window's cumulative average abnormal returns (CARs) allow us to see if there is any significant price drift between the announcement and the actual change. The final window is used to investigate the temporary and permanent price changes caused by index changes.

Kruger & Toerien (2013) used the Thompson technique in their paper to evaluate the importance of the CARs (1985). The index saw several inclusions or deletions in five of the sample's quarters. Due to this, they were not unable to evaluate the statistical significance of the firm's CARs using the distribution of individual firm CARs around the mean (Mase, 2007).

In light of previous research done by Kruger and Toerien, 2013 the reversal effects for both inclusions and deletions seem to terminate at day +1. Share returns are calculated for inclusions and deletions during period of February 2016 and February 2020. To get dummy coefficients measuring the aberrant returns over particular sub-periods of the entire event window, regression is used.

$$R_{it} = \alpha_i + \beta_i R_{mt} + \sum_{j=1}^{4} \gamma_{ij} D_{ijt} + \varepsilon_{it},$$

where:

> R*it* and R*mt* are the returns to portfolio i and the market on day t;
>
> Di1t is a dummy variable with the value for the event day (AD -1 to actual announcement date AAD);
>
> Di2t is a dummy variable with the value for the event days (actual announcement date (AAD) to AAD+10;
>
> and Di3t is a dummy variable with the value for the event days 0 (actual effective date AED);
>
> Di4t is dummy variable with the value for the post-event CAR's for event day AED +1.

The aberrant returns over various time periods inside the event window are captured by the four dummy variables. The second and third dummy variables reflect the price effects between the actual announcement date (AAD) and actual effective date (AED), while Di1t represents the CAR's during the pre-announcement period. The post-event CAR's is represented by Di4t.

The event study methodology was used in this index change study. Since the inclusion or deletions from an index is an event that impacts the share price, event study methodology is used. The event study method was appropriate for investigating the abnormal returns seen between announcement and effective dates (Qiu & Pinfold, 2007). The majority of studies (Shleifer, 1986; Chen et al., 2006) recommended event study methodology, which has since become the standard for recent studies on index inclusions and deletions (Miller & Ward, 2015:88). The event research methodology was recommended by Liu (2009) because it permits smaller sample sizes and a shortened window period than other methods. The causal link was used to figure out the direction of the market's response, which was in line with the primary goal of determining the link for both the inclusion or deletion and share prices (Saunders, Lewis & Thornhill, 2009).

The research used a quantitative methodology. The average abnormal returns (AAR) and cumulative average abnormal returns (CAAR) managed to capture the impact of the event (Liu, 2011, Petajisto, 2009). Excess returns are determine using a market model as a preliminary test. We only include business days but exclude weekends and public holidays. Public holidays are defined as days when no shares in the index trade. The event study can be defined as the movement of the changes in the company's share price that exceed expectations i.e., abnormal returns, and this is usually over time, which refer to the occurrence period. Event studies are used to evaluate a semi-strong kind of market efficiency and to see if freely accessible information is instantly integrated into asset values. The inclusion and deletions of companies from the MSCI Emerging Markets index is the central focus point of this thesis.

As a result, the index's rebalancing occasions serve as event dates, and share returns serve as performance measures for these events. The use of rebalancing moments as event dates is due to the fact that the announcement date is a fixed number of days before the rebalancing, making it easy to see the prospective announcement impact. The event study for the MSCI EM index was conducted using the entire sample from 2016 to 2020. The only distinction is between inclusions and deletions, since deletions are not expected to have the same impact as inclusions. Constructing an event study on the inclusions and deletions that occur during an index review can provide information on price changes. Return performance can be calculated and analysed by creating different timelines. Event studies provide insight into the price development of shares in the aftermath of these review events.

The event study methodology is divided into three major steps. The first step is to define the return generation process for individual shares using the estimation window data. The ARs for the event window are determined in the second step. These are the variations between expected and actual returns. The third and final step is to determine the significance of the ARs and, as a result, the event impact. The event dates for all shares are interconnected, and ARs are consolidated. For the result, the tests use daily average returns (ARs) and cumulative returns (CARs). The local market-adjusted returns are used to determine abnormal returns. The data provides us with two different dates. First one is date of announcement and the second one is date of index change or effective date, which is normally on the last business day of the month.

3.2.2 Abnormal Returns

The event study methodology is used to analyse index changes. As a result, the results rely on daily average abnormal returns (ARs) and cumulative abnormal returns (CARs). The local market-adjusted returns are used to calculate abnormal returns. This is coherent with the differences in asset pricing in emerging markets. This methodology calculates what the impacted company's typical share market return should be on the day of the announcement, as well as many days before and after the announcement, based on the predicted "window" period prior to the event. This approach subtracts the "normal" returns from the "actual" returns to obtain the "abnormal" returns (AR) related to the event. The single abnormal returns can then be added together to form an average abnormal return (AAR) to quantify the overall impact over a given time-period. All average abnormal returns (AAR) are then consolidated to determine the cumulative average abnormal returns (CAAR) over the given window period. The anomalous return on the day for an individual share from a country is defined as the difference between the share's pure return and the market return. The relevant market for a share is reflected by an index of the country in which it is heavily weighted.

The Abnormal Returns (AR) are calculated as follows:

$$AR_{i,t} = R_{i,t} - \bar{R}_{M,t}$$

Market-adjusted ARs are computed as the abnormal returns on share *i* for the local market index on day *t*, where R_{mt} is the return on the local market index on day *t*. We use these ARs to generate the abnormal returns (AR) for day t (event day being t=0) and the average abnormal returns (AAR) to examine the significance of ARs in each sub-event window.
The Average Abnormal Returns (AAR) are the total of all abnormal returns calculated over a specific time period. The AAR's will be calculated 12 days prior to the actual index change date. The compounded daily anomalous returns are demonstrated using the AAR's.

The Cumulative Abnormal Return (CAR) can be calculated by using the AR data. The CAR is calculated as below:

$$CAR_{(t1,t2)} = \sum_{t=t1}^{t2} AR_t$$

- AR_t stands for abnormal return on day t.

-$CAR_{(t1,t2)}$ stands for cumulative abnormal return on day t1 and t2. CAR_t is the sum of AR_{t-1+t}.

Continued the average abnormal return (AAR) is calculated.

$$AAR_{t=} \frac{1}{N} \sum_{i=1}^{N} AR_{i,t}$$

3.2.3 Trading Volume

The market-adjusted volume ratio approach, as used by Harris and Gurel (1986) and Shleifer (1986), was employed to estimate the volume effects. The evaluation and event windows are (-2 to +12) respectively. The following is an estimate of the daily company abnormal volume (AV) is as follows:

$$AVit = \left. \frac{Vit/Vi}{Vmt/Vm} \right\} -1$$

where Vit is the trading volume of share I on day t as a percentage of its shares outstanding on the same day, Vmt is the trading volume for the market index on day t, Vi is the mean trading volume for the market in the same estimation period, and Vm is the average trading volume for the industry in the same estimation period. As a result, abnormal volume is a standardised measure of trading volume that accounts for changes in both shares outstanding and market volume. Trading volume for the MSCI review's inclusions and deletions was typically four times more on effective date than it was on regular days of trading.

Looking at the trading volumes for the inclusions and deletions over the event timeframe, with the exception of days AAD -2 and AAD-1, there is evidence of positive atypical volumes for the inclusions across the whole window, with the majority of these volumes clustered around the actual effective date (AED), especially around days AAD +10 (day 12) to AED+1. The evidence of abnormal volumes for the deletions show similar trends.

Calculated for inclusions to the Emerging Market Index from February 2016 to September 2020 are mean daily abnormal volumes. To look for indications of anticipatory trading and/or pattern reversals, the study looks at the CARs for a period of 12 days surrounding the announcement and event dates (days -2 and +10).

Mean daily anomalous volumes are calculated for inclusions to the Emerging Market Index from February 2016 to February 2020. The study examines the CARs for a period of 12 days surrounding the announcement and event dates (days -2 and +10) to search for signs of anticipatory trading and/or pattern reversals.

$$V_{it} = \alpha_i + V_i R_{mt} + \sum_{j=1}^{4} \gamma_{it} D_{ijt}\, \varepsilon_{it}$$

3.3 Data analysis

3.3.1 Sample

The sample is made up from Morgan Stanley Capital International's Emerging Markets (MSCI EM) index's inclusions and deletions. This is a widely recognized and monitored index that is used as a yardstick for emerging share markets by both experts and researchers. MSCI had a share of the market of more than 75% in the international equity index industry by 2005, with over USD 3 trillion in equity assets measured to its indices. MSCI EM is part of the MSCI Standard index family, and is consequently built using MSCI standard index methodology. During the period 1996-2008, it aims to capture 85 percent of total free float market capitalization in 27 emerging markets, including Argentina, Czech Republic, Philippines, Chile, China, Egypt, Indonesia, Hungary, Russia, Israel, Jordan, Brazil, Korea, Thailand, Malaysia, Morocco, Pakistan, Poland, South Africa, Taiwan, Columbia, India, Mexico, Turkey, Peru and Venezuela. For foreign investors, its constituent countries and share prices depict an alternative investment emerging markets universe.

The index is maintained by different types of reviews i.e. yearly full index reviews, quarterly index reviews (QIRs), semi-annual index reviews (SAIR) and ongoing event-related inclusions and deletions, such as any other regular MSCI index. The focus of this research is on QIRs and SAIR’s which occur every year at predefined dates during the year. These occur at the end of February, May, August, and November's business days. The QIRs are released at least two weeks (10 days) ahead of time.

QIRs have announced a number of changes to the standard indices in order to ensure an accurate representation of the dynamic market place, as well as to prevent serious under- and over-representation of any industry in an Emerging market index. The timing of the event is a topic that frequently arises in the index inclusion literature. In this regard, MSCI does not have any dominant criteria such as size. Instead, the decision is based on a variety of factors, with a focus on market portrayal. As a result, there are no noticeable characteristics, but rather a mix of share characteristics, none of which appear to dominate. Inclusions in QIRs occur for a variety of reasons. Adjustments in share size (free float adjusted), under-illustration of one or more industries as a result of mergers, acquisitions, restructuring, and other major market events affecting that industry, as well as changes in industry sector classification are examples of these. MSCI differs from the S&P500 in a variety of ways. To begin with, the number of shares in the index is not limited, so there is no need to exclude a share if a new one is added. Furthermore, because the index is more recent than the S&P500 and has been subject to a greater amount of changes during the sample period, it is possible to examine a high proportion of inclusions and deletions. According to the selection criteria, it appears to be more difficult to predict changes to MSCI EM, because factors such as market depiction play a significant role.

The day-to-day price and volume data were collected for each share in order to analyse the market variations for the same shares around the event period. The day-to-day share price information on inclusions and deletions was supplied by Satrix Investments. Sanlam owns Satrix Investments, which is a leading supplier of passive investing products in South Africa, with more than R50 billion in assets under management. The volume information was collected from Bloomberg to investigate the variations in demand for a given share around the index change date.

The data sample consists of shares added and deleted from MSCI Emerging Market (EM) index based on quarterly and semi-annual index rebalancing announcements. The sample selection consists of 329 emerging market shares (refer **Table 1 below**) that have been added (168) and deleted (161) from MSCI Emerging market index since the announcement start date of February 2016 through to February 2020. The index period after 3 March 2020 was affected by the COVID19 pandemic, so any data after the March date will be inconsistent, and a decision was made to exclude any quarterly or semi-annual reviews after February 2020.

The clean data set comprises of 315 companies' daily total return data. In this sample, 159 companies were added to the index and 156 were removed from it. The remaining 14 (9 inclusions and 5 deletions) SAIR & QIR sample had inadequate daily total return data and were not utilised in this study.

SAIR & QIR = 315

Data set = 329

Removed due to incomplete data = 14

Index Review period	Duration	Date of Change	Co added	Co deleted	Sample Total	EXCL	Final Total
February 2016 Index Review	Quarterly Index Review (QIR)	01 March 2016	1	1	**2**		**2**
May 2016 Index Review	Semi-Annual Index Review (SAIR)	01 June 2016	7	10	**17**	**-1**	**16**
November 2016 Index Review	Semi-Annual Index Review (SAIR)	30 November 2016	11	19	**30**	**-1**	**29**
February 2017 Index Review	Quarterly Index Review (QIR)	01 March 2017	1	0	**1**		**1**
May 2017 Index Review	Semi-Annual Index Review (SAIR)	01 June 2017	20	7	**27**	**-3**	**24**
August 2017 Index Review	Quarterly Index Review (QIR)	01 September 2017	1	1	**2**		**2**
November 2017 Index Review	Semi-Annual Index Review (SAIR)	30 November 2017	24	18	**42**	**-3**	**39**
February 2018 Index Review	Quarterly Index Review (QIR)	01 March 2018	1	1	**2**		**2**
May 2018 Index Review	Semi-Annual Index Review (SAIR)	01 June 2018	21	22	**43**	**-1**	**42**
August 2018 Index Review	Quarterly Index Review (QIR)	01 September 2018	4	3	**7**		**7**
November 2018 Index Review	Semi-Annual Index Review (SAIR)	30 November 2018	11	37	**48**	**-2**	**46**
February 2019 Index Review	Quarterly Index Review (QIR)	01 March 2019	2	0	**2**	**-1**	**1**
May 2019 Index Review	Semi-Annual Index Review (SAIR)	01 June 2019	32	14	**46**	**-1**	**45**
August 2019 Index Review	Quarterly Index Review (QIR)	01 September 2019	1	0	**1**		**1**
November 2019 Index Review	Semi-Annual Index Review (SAIR)	30 November 2019	24	27	**51**		**51**
February 2020 Index Review	Quarterly Index Review (QIR)	01 March 2020	7	1	**8**	**-1**	**7**
TOTAL			**168**	**161**	**329**	**-14**	**315**

Table 1 - Index reviews over 5-year period

Over the 5-year period, multiple changes were announced (in either February, May, August and November). On 7th of November 2019, fifty-one changes were announced with the November 2019 Index review (Semi-Annual Index Review- SAIR). On 13th of November 2018, forty-six changes were announced with the November 2018 Index review (Semi-Annual Index Review- SAIR). On 13th of May 2019, forty-five changes were announced with the May 2019 Index review (Semi-Annual Index Review- SAIR).

Changes	Net Firms added	Net Firms deleted	Net Sample Total	%
Semi-Annual Index Review	18	7	**25**	**8%**
Quarterly Index Review	150	154	**304**	***92%***
TOTAL	**168**	**161**	**329**	**100%**

Table 2 - Index changes

Based on total inclusions and deletions (table 2) over the 5-year period, 92% of the index changes took place with the Quarterly Index Review (QIR).

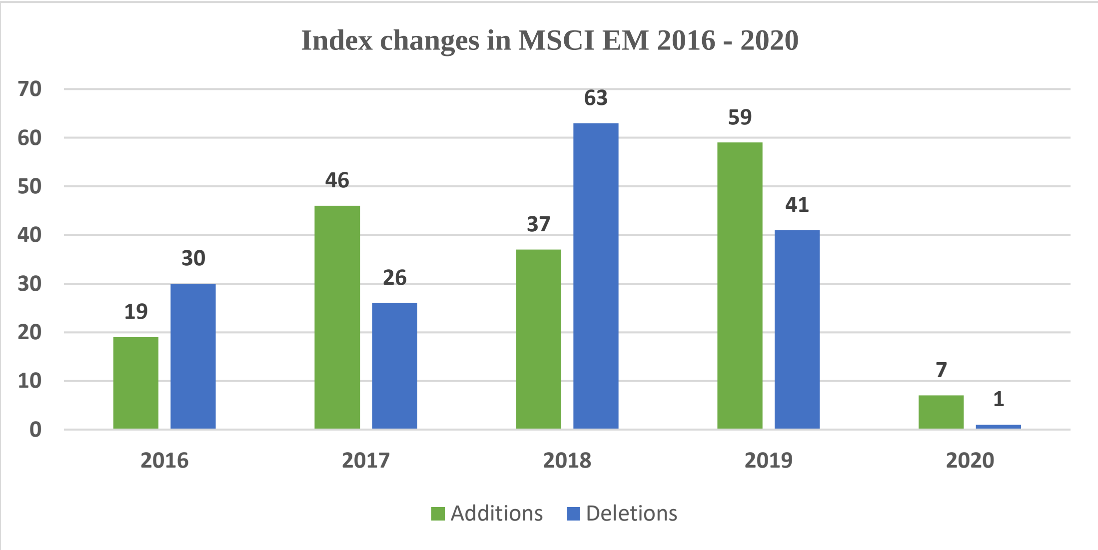

Figure 1 - Index changes MSCI EM 2016-2020 - Inclusions & Deletions

Changes in the MSCI EM 2016–2020					
Year	**Inclusions**	**Deletions**	**Changes**	**Adjustment**	**Changes after adjustments**
2016	19	30	**49**	2	**47**
2017	46	26	**72**	6	**66**
2018	37	63	**100**	3	**97**
2019	59	41	**100**	2	**98**
2020	7	1	**8**	1	**7**
Total	**168**	**161**	**329**	**14**	**315**

Table 3 - Changes in MSCI EM 2016 – 2020 - Inclusions & Deletions

Figure 1 and Table 3 displays that there were 315 events involving companies added or deleted from the MSCI Emerging Market Index over the years from 2016 to 2020.

The maximum movement for inclusions into the index was with 59 in 2019 and 46 inclusions in 2017. The lowest movement for inclusions was 7 in 2020 and 19 in 2016. The 2018 and 2019 appear to monopolise index revisions. The maximum movement for deletions out of the index was with 63 in 2018 and 41 deletions in 2019. The lowest movement for deletions was 1 in 2020 and 26 in 2017. The 2018 and 2019 years appear to monopolise index revisions.

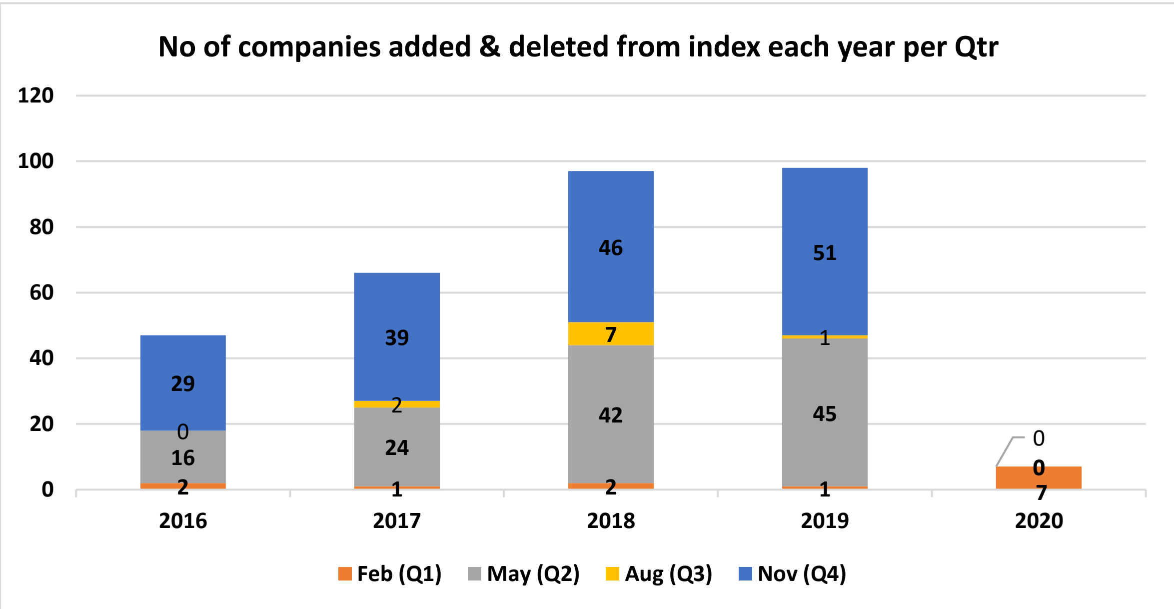

Figure 2 - MSCI EM 2016-2020 – No of companies added & deleted from Index per Qtr

The number of companies added and deleted from the index each year					
Year	Qtr. 1	Qtr. 2	Qtr. 3	Qtr. 4	Total
	Feb	May	Aug	Nov	
2016	2	16	0	29	47
2017	1	24	2	39	66
2018	2	42	7	46	97
2019	1	45	1	51	98
2020	7	0	0	0	7
Total	13	127	10	165	315

Table 4 - No of companies added and deleted from Index per year

Table 4 shows that there were 315 events involving companies added or deleted from the MSCI Emerging Market Index from February 2016 to February 2020. The maximum movements in and out of the index over the period was 98 times in 2019 and 97 in 2018, and the lowest was seven times in 2020. The second and fourth quarters appear to monopolise index revisions, with 127 and 165 times, respectively.

The number of companies added and deleted from the index each quarter					
All Years	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
	Feb	May	Aug	Nov	
Inclusions	10	76	6	67	159
Deletions	3	51	4	98	156
Total	13	127	10	165	315

Table 5 - No of companies added and deleted from Index each Qtr.

The table 5 above shows that 159 inclusions and 156 deletions occurred during the window. The imbalance of the inclusions and deletions (159 and 156, respectively) was induced by some companies' dual listing of equity instruments.

MSCI provided information on these changes, as well as a list of companies that were added or removed in each case. The announcement of the changes is made in the middle of each month, and the index change is implemented on the 10th trading day after the official announcement date, which is usually the last trading day of the month.

There are 315 inclusions and deletions from 27 countries for the 17 index reviews.

- India (26 inclusions and 15 deletions),
- South Korea (17 inclusions and 13 deletions),
- Saudi Arabia (16 inclusions and 0 deletions),
- Taiwan (14 inclusions and 13 deletions),
- Brazil (17 inclusions and 13 deletions),

- Thailand (12 inclusions and 7 deletions),
- Malaysia (10 inclusions and 13 deletions),
- Argentina (7 inclusions and 4 deletions),
- Indonesia (6 inclusions and 10 deletions),
- Montenegro (6 inclusions and 6 deletions),
- Pakistan (6 inclusions and 0 deletions),
- South Africa (5 inclusions and 8 deletions),
- Russia (5 inclusions and 3 deletions),
- Poland (4 inclusions and 6 deletions),
- UAE (4 inclusions and 3 deletions),
- Greece (3 inclusions and 5 deletions),
- Egypt (3 inclusions and 3 deletions),
- Chile (2 inclusions and 7 deletions),
- Columbia (2 inclusions and 6 deletions),
- Qatar (2 inclusions and 3 deletions),
- Philippines (2 inclusions and 2 deletions),
- Turkey (1 inclusion and 11 deletions),
- Hong Kong (1 inclusion and 1 deletions),
- Switzerland (1 inclusion and 1 deletions),
- Panama (0 inclusions and 3 deletions),
- Peru (0 inclusions and 2 deletions), and
- Czech Republic (0 inclusions and 1 deletions).

3.3.2 Inclusions

For the period of 2016 to 2020, (refer to **Table 6 below)** that shows a breakdown of all inclusions (A) and deletions (D) for all MSCI Emerging Markets per Country. Furthermore, the table shows the percentage of data, on a country level for inclusions and deletions that have been eliminated from the sample selected for this study.

According Table 6 below, the countries impacted with the most inclusions and deletions over the period selected was India, South Korea, Saudi Arabia, Taiwan, Brazil, Thailand and Malaysia. The least impacted countries are listed at the far bottom of table 6.

On the same day in 2016, 2017, 2018, 2019, and 2020, multiple changes are announced (in either February, May, August and November). On 7th of November 2019, for example, fifty-one changes were announced. As a result, if several sample companies are from the same countries, the issue of clustering may be relevant. The final inclusion and deletion sample discover that companies added to index comes from 24 different countries, while companies deleted from the index come from 25 countries.

Overview Inclusions and Deletions per Country	**2016**		**2017**		**2018**		**2019**		**2020**		**TOTAL**		**Deletions**		**REVISED TOTAL**	
	A	**D**	**A**	**D**	**A**	**D**	**A**	**D**	**A**	**D**	**A**	**D**	**A**	**D**	**A**	**D**
India	5	1	6	2	5	7	10	5			**26**	**15**			**26**	**15**
Korea , Republic Of (South)	1		6	1	9	7	1	5			**17**	**13**	1		**16**	**13**
Saudi Arabia							16				**16**	**0**			**16**	**0**
Taiwan	2	2	7	5	2	5	3	1			**14**	**13**	1		**13**	**13**
Brazil	3	5	2	5	3	4	4	1	1		**13**	**15**	2	2	**11**	**13**
Thailand	2	2		1	3	2	7	2			**12**	**7**			**12**	**7**
Malaysia	1	1	5	2	4	6		4			**10**	**13**	2		**8**	**13**
Argentina		1					6	3	1		**7**	**4**			**7**	**4**
Indonesia	1		1	3	2	4	2	2		1	**6**	**10**			**6**	**10**
Montenegro	1	4			2	2	1		2		**6**	**6**	1	1	**5**	**5**
Pakistan			6								**6**	**0**			**6**	**0**
South Africa						2	5	6			**5**	**8**	1	1	**4**	**7**
Russia			3	2	2	1					**5**	**3**			**5**	**3**
Poland			3	1		3	1	2			**4**	**6**	1	1	**3**	**5**
United Arab Emirates	1		2		1	1		2			**4**	**3**			**4**	**3**
Greece		1			2	4	1				**3**	**5**			**3**	**5**
Egypt			1	1	2	2					**3**	**3**			**3**	**3**
Chile		7							2		**2**	**7**			**2**	**7**
Colombia		3	1	1				2	1		**2**	**6**			**2**	**6**
Qatar						2	2	1			**2**	**3**			**2**	**3**
Philippines	1		1					2			**2**	**2**			**2**	**2**
Turkey		1	1			7		3			**1**	**11**			**1**	**11**
Hong Kong			1	1							**1**	**1**			**1**	**1**
Switzerland	1					1					**1**	**1**			**1**	**1**
Panama				1		2					**0**	**3**			**0**	**3**
Peru		2									**0**	**2**			**0**	**2**
Czech Republic						1					**0**	**1**			**0**	**1**
Total	**19**	**30**	**46**	**26**	**37**	**63**	**59**	**41**	**7**	**1**	**168**	**161**	9	5	**159**	**156**

Table 6 - Inclusions & Deletions per Country

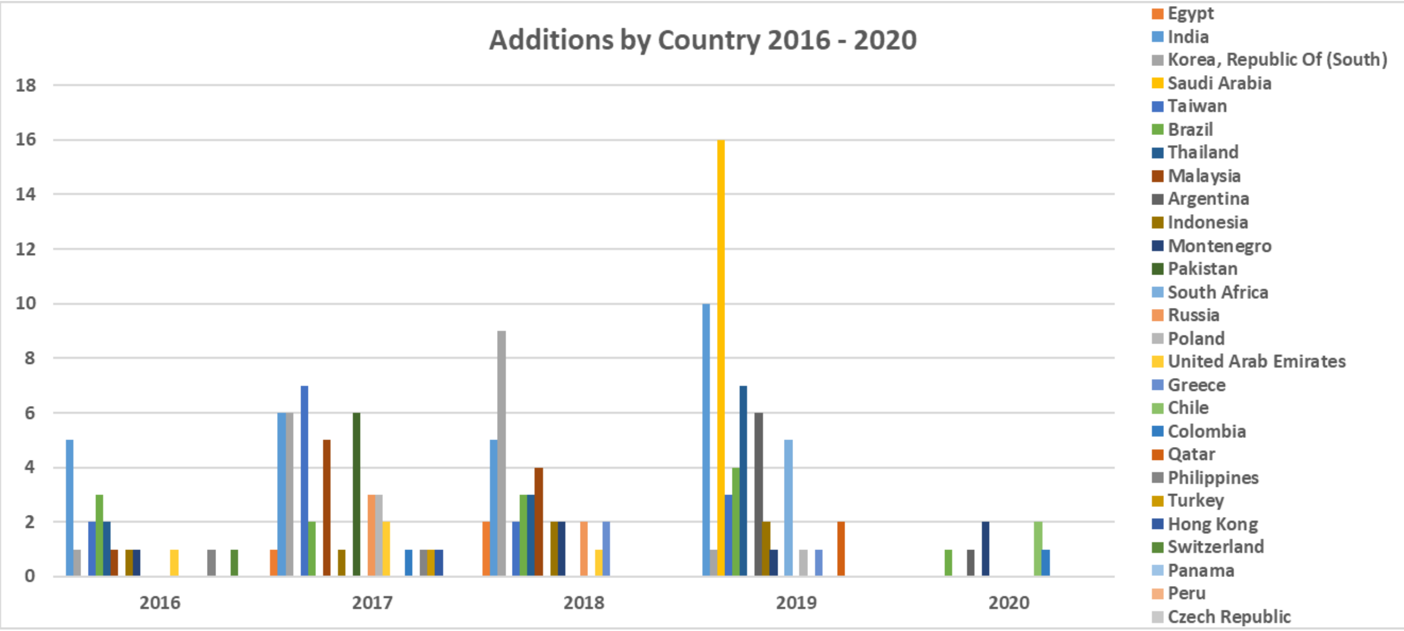

Figure 3 - Inclusions by Country over years

Inclusions by Country	**2016**	**2017**	**2018**	**2019**	**2020**	**Total 2016-2020**
India	5	6	5	10	0	**26**
Korea, Republic Of (South)	1	6	9	1	0	**17**
Saudi Arabia	0	0	0	16	0	**16**
Taiwan	2	7	2	3	0	**14**
Brazil	3	2	3	4	1	**13**
Thailand	2	0	3	7	0	**12**
Malaysia	1	5	4	0	0	**10**
Argentina	0	0	0	6	1	**7**
Indonesia	1	1	2	2	0	**6**
Montenegro	1	0	2	1	2	**6**
Pakistan	0	6	0	0	0	**6**
South Africa	0	0	0	5	0	**5**
Russia	0	3	2	0	0	**5**
Poland	0	3	0	1	0	**4**
United Arab Emirates	1	2	1	0	0	**4**
Greece	0	0	2	1	0	**3**
Egypt	0	1	2	0	0	**3**
Chile	0	0	0	0	2	**2**
Colombia	0	1	0	0	1	**2**
Qatar	0	0	0	2	0	**2**
Philippines	1	1	0	0	0	**2**
Turkey	0	1	0	0	0	**1**
Hong Kong	0	1	0	0	0	**1**
Switzerland	1	0	0	0	0	**1**
Panama	0	0	0	0	0	**0**
Peru	0	0	0	0	0	**0**
Czech Republic	0	0	0	0	0	**0**
Total	**19**	**46**	**37**	**59**	**7**	**168**

Table 7 – Inclusions by Country per year

Figure 3 and Table 7 displays by country the 168 events involving companies added to the MSCI Emerging Market Index over the years from February 2016 to February 2020. The maximum movement by country for inclusions into the index was for Saudi Arabia with 16 inclusions in 2019 followed by India with 10 inclusions in 2019.

The maximum movement by country for inclusions over the years from 2016 – 2020 into the index was India with 26 inclusions over the 5 years followed by South Korea (17), Saudi Arabia (16), Taiwan (14), Brazil (13), Thailand (12) and Malaysia with 10 inclusions.

3.3.2.1 Inclusions –AAR & CAAR

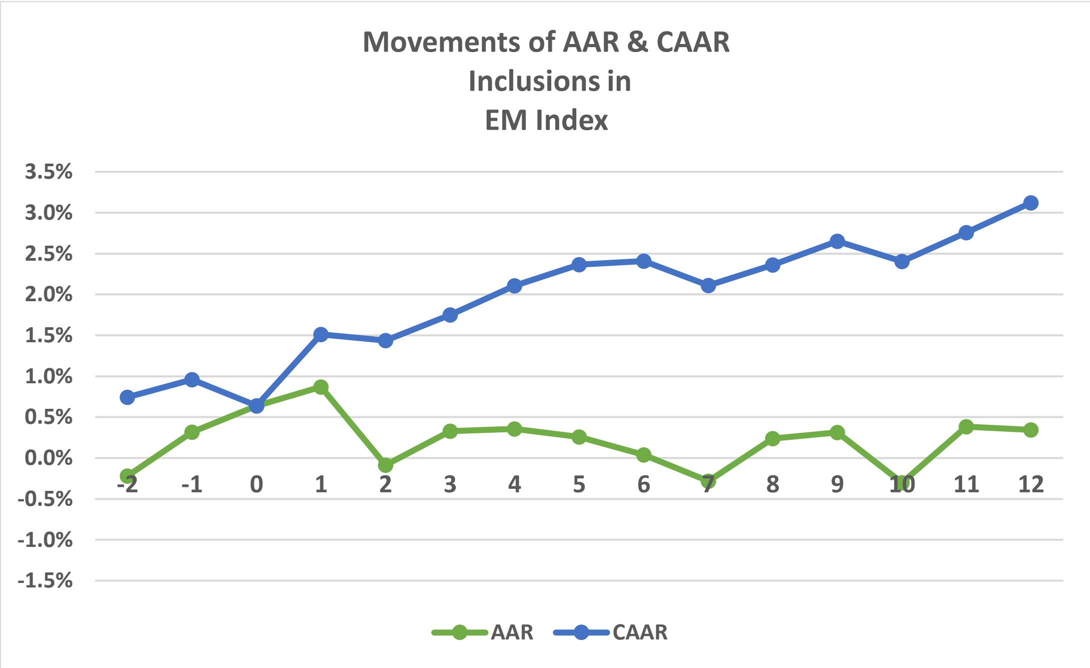

Figure 4 (Inclusions – AAR & CAAR)

	Inclusions														
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
AAR	**-0.2%**	**0.3%**	**0.6%**	**0.9%**	**-0.1%**	**0.3%**	**0.4%**	**0.3%**	**0.0%**	**-0.3%**	**0.2%**	**0.3%**	**-0.3%**	**0.4%**	**0.3%**
CAAR	**0.7%**	**1.0%**	**0.6%**	**1.5%**	**1.4%**	**1.8%**	**2.1%**	**2.4%**	**2.4%**	**2.1%**	**2.4%**	**2.7%**	**2.4%**	**2.8%**	**3.1%**

Table 8 – Inclusions – AAR & CAAR

The total picture, as shown in Figure 6, reveals that the price rise around the event date and the subsequent CAAR’s then increase following the announcement and until the actual inclusions into the index. Following the adjustment (actual effective date), the price remains at the new level, as indicated by the CAAR.

On the day of the announcement, there is a substantial average abnormal return (AAR) of 0.87 percent for inclusions on this day. The CAARs in the run-up period are substantial, contributing to a 3.12 percent increase in overall prices for inclusions. The price growth on the day of the index change is 0.36 percent, which is substantially smaller than the price increase on the announcement day (0.87 percent). Despite a 2.41 percent increase in the ten days preceding the inclusion, the ultimate increase was 3.12 percent.

3.3.3 Deletions

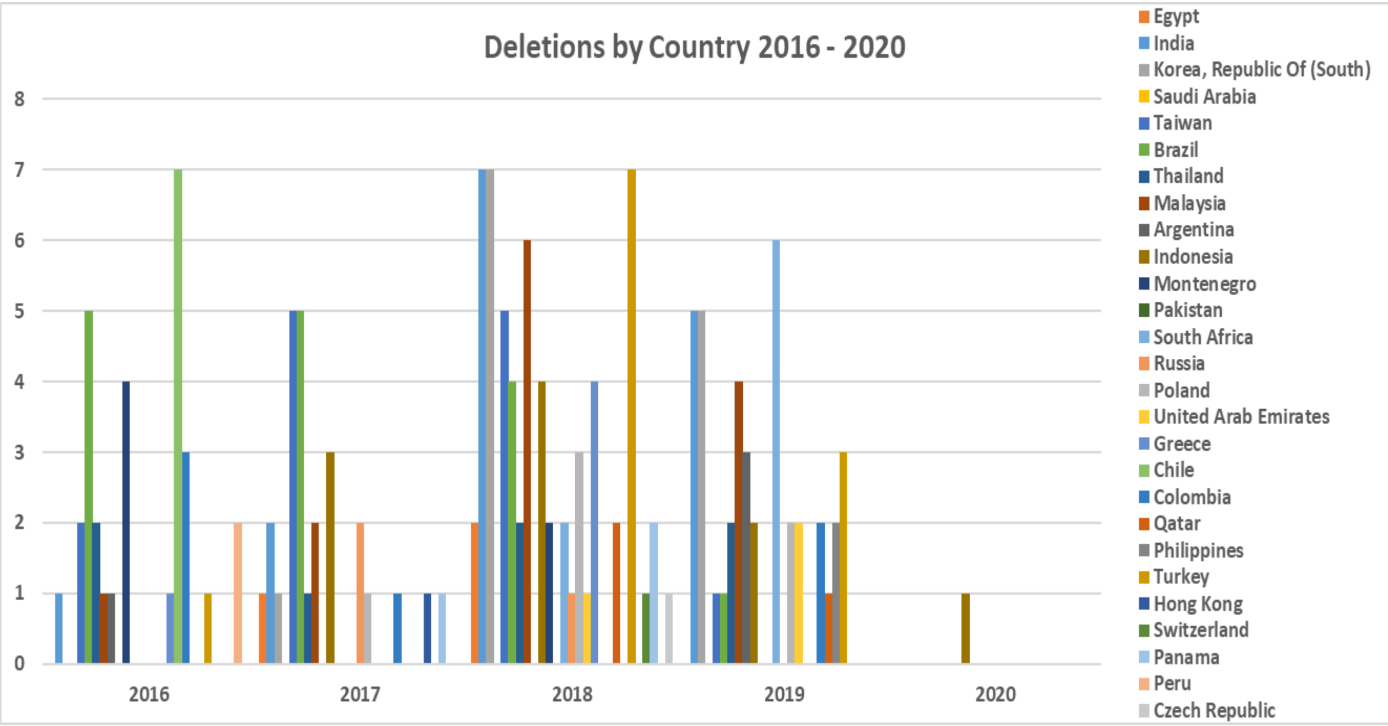

Figure 5 – Deletions by Country over years

Figure 4 and Table 8 displays by country the 161 events involving companies deleted from the MSCI Emerging Market Index over the years from February 2016 to February 2020.

The maximum movement by country for inclusions into the index was for India, South Korea, Turkey with 7 deletions in 2018 followed by Chile with 7 deletions in 2016.

Deletions by Country	2016	2017	2018	2019	2020	Total 2016-2020
India	1	2	7	5	0	**15**
Korea, Republic Of (South)	0	1	7	5	0	**13**
Saudi Arabia	0	0	0	0	0	**0**
Taiwan	2	5	5	1	0	**13**
Brazil	5	5	4	1	0	**15**
Thailand	2	1	2	2	0	**7**
Malaysia	1	2	6	4	0	**13**
Argentina	1	0	0	3	0	**4**
Indonesia	0	3	4	2	1	**10**
Montenegro	4	0	2	0	0	**6**
Pakistan	0	0	0	0	0	**0**
South Africa	0	0	2	6	0	**8**
Russia	0	2	1	0	0	**3**
Poland	0	1	3	2	0	**6**
United Arab Emirates	0	0	1	2	0	**3**
Greece	1	0	4	0	0	**5**
Egypt	0	1	2	0	0	**3**
Chile	7	0	0	0	0	**7**
Colombia	3	1	0	2	0	**6**
Qatar	0	0	2	1	0	**3**
Philippines	0	0	0	2	0	**2**
Turkey	1	0	7	3	0	**11**
Hong Kong	0	1	0	0	0	**1**
Switzerland	0	0	1	0	0	**1**
Panama	0	1	2	0	0	**3**
Peru	2	0	0	0	0	**2**
Czech Republic	0	0	1	0	0	**1**
Total	**30**	**26**	**63**	**41**	**1**	**161**

Table 9 – Deletions by Country per year

The maximum movement by country for deletions over the years from 2016 – 2020 from the index was India with 15 deletions over the 5 years followed by Brazil (15), South Korea, Taiwan and Malaysia with 13 deletions. They are followed by Turkey (11) and Indonesia with 10 deletions.

3.3.3.1 Deletions – AAR & CAAR

When a share is excluded from the MSCI Emerging Market Index, its share price decreases slightly following the announcement. After the announcement, there is a small price decrease in CAAR's around the event date but subsequent CAAR's then increase steadily over time. On the day of the announcement, there is an average abnormal return (AAR) of (-0.2) percent for deletions. The CAARs in the run-up period is a (-2.8) percent decrease overall for deletions. The price reduction on the day of the index change is (-0.5) percent, which is substantially larger than the price decrease on the announcement day. Despite a

(-2.4) percent decrease in the ten days preceding the deletion, the ultimate decrease was (-2.8) percent.

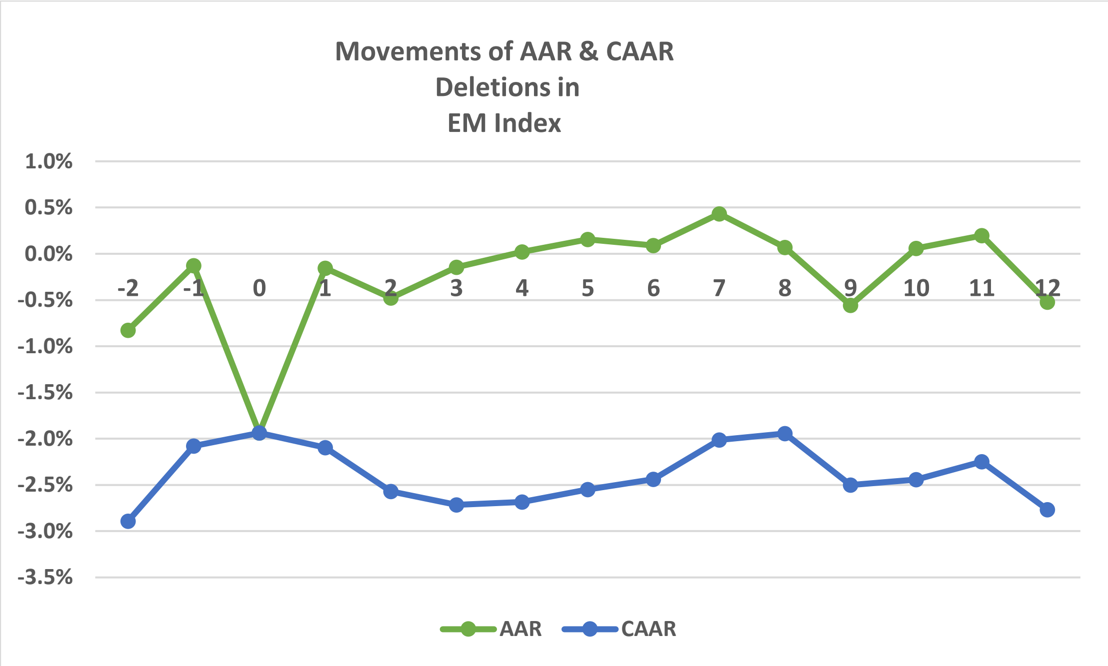

Figure 6 (Deletions – AAR & CAAR)

	Deletions														
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
AAR	**-0.8%**	**-0.1%**	**-1.9%**	**-0.2%**	**-0.5%**	**-0.1%**	**0.0%**	**0.2%**	**0.1%**	**0.4%**	**0.1%**	**-0.6%**	**0.1%**	**0.2%**	**-0.5%**
CAAR	**-2.9%**	**-2.1%**	**-1.9%**	**-2.1%**	**-2.6%**	**-2.7%**	**-2.7%**	**-2.5%**	**-2.4%**	**-2.0%**	**-1.9%**	**-2.5%**	**-2.4%**	**-2.2%**	**-2.8%**

Table 10 – Deletions – AAR & CAAR

The total picture, as shown in Figure 7, reveals that the share price drops dramatically following the announcement and until the actual deletions into the index. Following the modification (actual effective date), the price reduces to the new level, as indicated by the CAAR.

There is no evidence that the announcement was anticipated. Though unfavourable, CAARs previous to the announcement are not substantial. The returns are negative but insignificant on the day of the announcement. From the announcement date to the withdrawal from the index date the share prices fall. The price decrease continues through the index adjustment, dropping on the effective date. Both CARs in the run-up window and AARs on the index change day are determined to be massively crucial. In the ten days following the deletion, there is no notable price reversal.

The data reveal that the average price variations around inclusions and deletions vary. The price begins to rise gradually following the announcement of inclusion, and then settles at a higher level after it is actually added to the index. The price reaction for deletions, on the other hand, is stronger and greater following the deletions news.

The table below displays the outcomes of the statistical significance

	Inclusions		Deletions	
Variable	**Mean**	**T-stat**	**Mean**	**T-stat**
α	0.020	1.265	-0.024	-1.518
β	0.816	12.641	0.657	7.774
AAD-1 to AAD-2 (My1)	0.009	0.360	-0.050	-3.464
AAD to AAD +2 (My2)	0.012	1.073	-0.066	-4.573
AAD + 3 to AAD + 10 (My3)	0.023	1.455	-0.027	-1.708
AED (My4)	0.028	1.771	-0.022	-1.391
AED+1 (My4)	0.031	1.860	-0.028	-1.771
Pre-event Window (AAD-1 & AAD-2)	0.009	0.360	-0.050	-3.464
Post announcement event Window (AAD to AAD+10)	0.035	1.980	-0.093	-5.882
Complete event Window	0.102	6.451	-0.193	-7.180

Table 11 (Statistical significance Inclusions & deletions)

The corresponding test statistic is:

$$t = {}^{M\gamma_j}/_{SE\ (\overline{\gamma_j})},$$

where SE (γ j) is the cross-sectional standard error of the respective regression coefficients. The CAR's across the Pre-event window (AAD-1 to AAD-2) is the sum of AAD -1 to AAD-2. The average is the mean CAR return across the pre-event window. The sum AAD to AAD +10 is the Post announcement Window CAR's, whereas the sum of all four dummies yields the CAR for the Complete event Window (AAD-1 through to AED +1).

The pre-event window CARs for the inclusions are found to be insignificant (0.009), but the increases in CARs between the announcement and effective dates, as well as the subsequent reversal from the effective date until day AED +1, are seen to be important. The pre-event window CARs for deletions are found to be significant (-0.05), but the increases in CARs between the announcement and effective dates, as well as the subsequent reversal from the effective date until day AED +1, are seen to be important.

The post-announcement event window CARs for the inclusions are found to be insignificant (0.035), but the increases in CARs between the announcement and effective dates, as well as the subsequent reversal from the effective date until day AED +1, are seen to be important. The post-announcement event window CARs for the deletions are found to be insignificant (0.093), but the increases in CARs between the announcement and effective dates, as well as the subsequent reversal from the effective date until day AED +1, are seen to be important.

These results substantially reflect the inferences made from the analysis of the CARs and are consistent with the analysis performed by Mase (2007) on the UK's FTSE 100. The results of this study suggest that anticipatory trading prior to the announcement date was fleeting and reversed before the announcement date, in contrast to Mase's findings from 2007 that anticipatory trading for the inclusions in the UK sample began well before the announcement date and persisted until the effective date.

Lynch and Mendenhall (1997) in a related study on the S&P500 discovered negative pre-announcement CARs for companies added and positive pre-announcement CARs for companies removed. Mase (2007) said that this might be the result of anticipatory trading before the announcement or a change in the rebalancing techniques applied to the US and UK indices.

3.3.4 Trading Volume

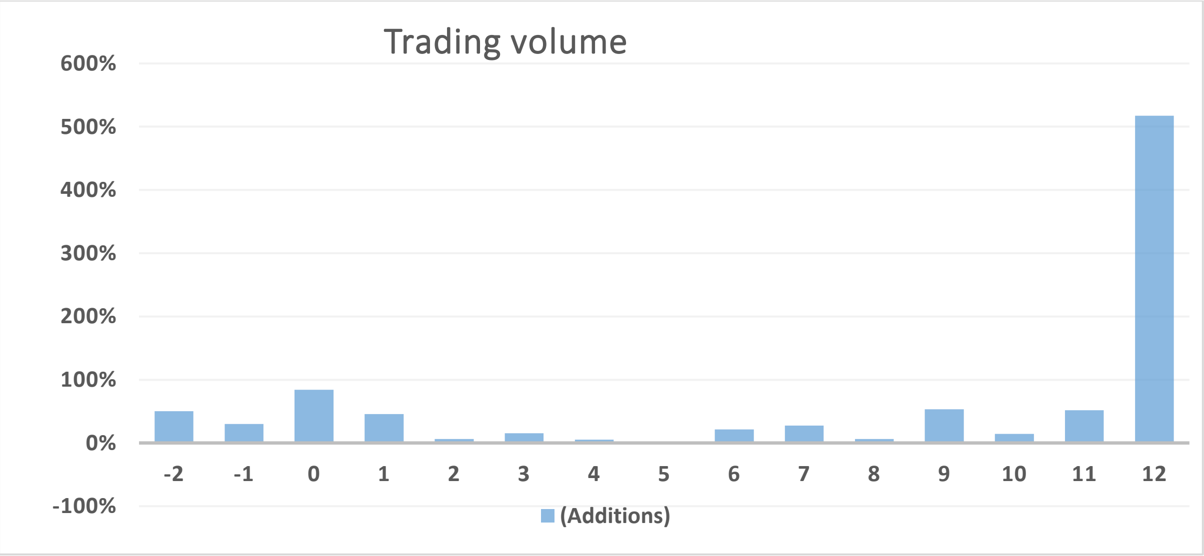

Figure 7 (Trading Volume–Inclusions)

Time (t)	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12
Inclusions	**50.1%**	**30.2%**	**84.1%**	**45.8%**	**6.5%**	**15.5%**	**5.4%**	**-2.0%**	**21.6%**	**27.4%**	**6.4%**	**53.2%**	**14.4%**	**51.9%**	**517.6%**

Table 12 – Trading Volume–Inclusions

Consistent with the findings for the CARs, the graphs demonstrate the relevance of the aberrant trading volumes for the Inclusions for all sub-periods other than the pre-announcement window. This would imply that increased trade volumes accompany the anomalous gains observed after the announcement date for Inclusions and continue until the reversal that occurs after the implementation date (i.e. after day 12).

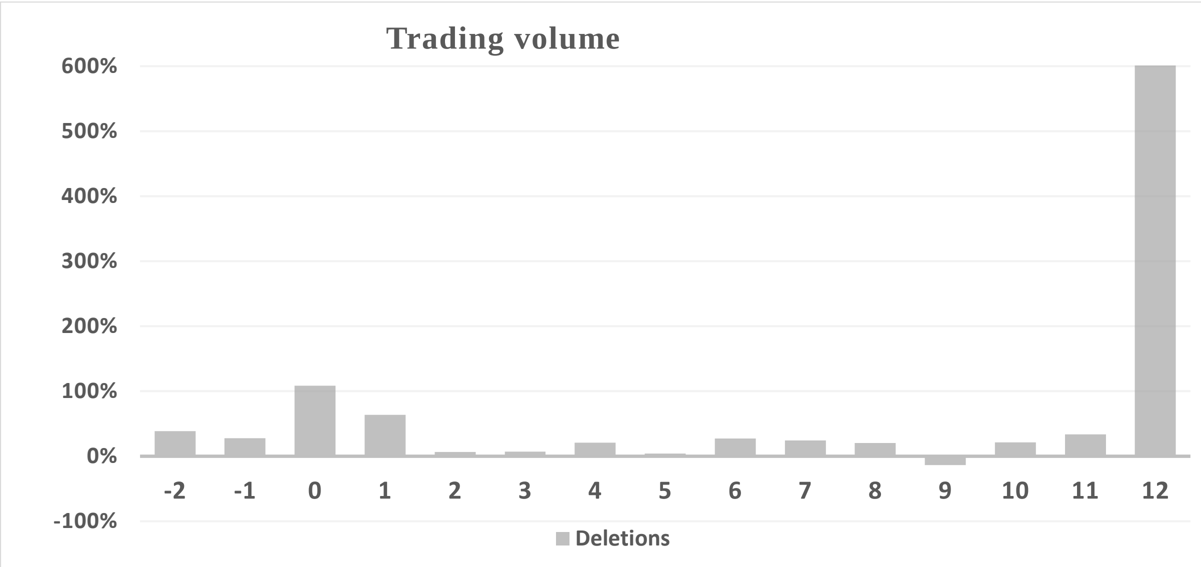

Figure 8 (Trading Volume–Deletions)

Time (t)	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12
Deletions	**38.4%**	**27.7%**	**108.4%**	**63.6%**	**6.5%**	**7.1%**	**21.1%**	**4.3%**	**27.4%**	**24.1%**	**20.5%**	**-13.7%**	**21.5%**	**33.5%**	**607.7%**

Table 13 – Trading Volume–Deletions

Consistent with the findings for the CARs, the graphs demonstrate the relevance of the aberrant trading volumes for the Inclusions for all sub-periods other than the pre-announcement window. This would imply that increased trade volumes accompany the anomalous gains observed after the announcement date for deletions and continue until the reversal that occurs after the implementation date (i.e. after day 12). The aberrant trading volumes for the deletions, follow the same trend as Inclusions.

3.3.4.1 Inclusions & Deletions Trading Volume

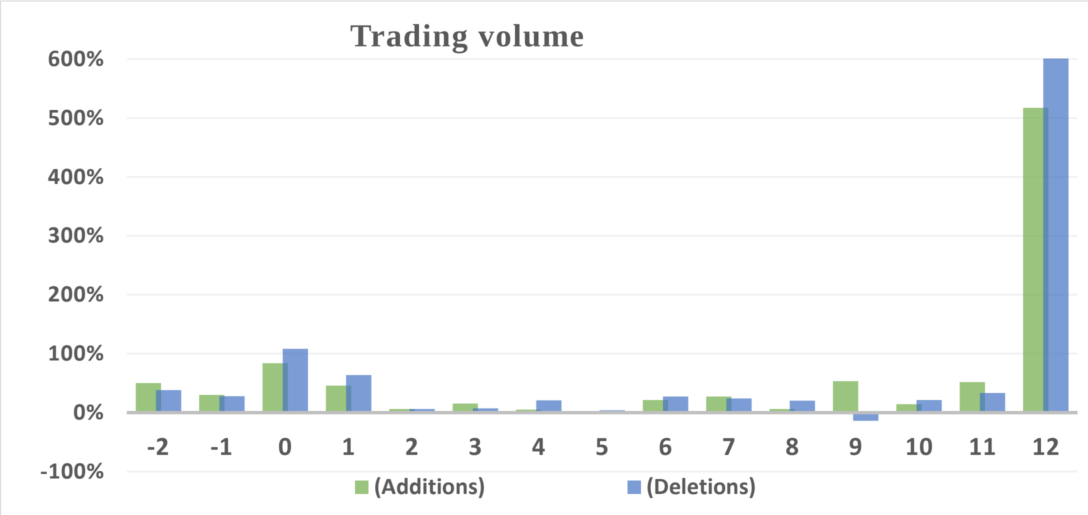

Figure 9 (Inclusions & Deletions Trading Volume)

	Trading Volume														
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Inclusions	50.1%	30.2%	84.1%	45.8%	6.5%	15.5%	5.4%	-2.0%	21.6%	27.4%	6.4%	53.2%	14.4%	51.9%	517.6%
Deletions	38.4%	27.7%	108.4%	63.6%	6.5%	7.1%	21.1%	4.3%	27.4%	24.1%	20.5%	-13.7%	21.5%	33.5%	607.7%

Table 14 – Inclusions & Deletions Trading Volume

The trading volume of shares added to the index increases relative to the market during the event month. While the trading volumes increase temporarily with the inclusions on the actual effective date (day 12). The inclusion into an index also has a direct impact on trade volume. The changes in the trading volume reveal that the volume peaks shortly on the day of the announcement and the day of inclusion. Following the inclusion into the index, the volume returns to levels before the announcement. Deletions has a bigger and more noticeable effect on volumes. Deletions therefore has a greater and more significant impact on volume than inclusions. The highest volume is noticed on the day of the index change.

3.3.5 Countries impacted with most inclusion and deletions

The countries impacted with the most inclusions and deletions over the period selected were India, Korea (Republic of South), Saudi Arabia, Taiwan, Brazil, Thailand, and Malaysia. The least impacted countries are listed at the bottom end of the table. South

Africa has been added as an inclusion country to understand the impact of inclusions and deletions.

Eight countries were selected to obtain a sense of how the pricing effect differed by country namely:

I. India
II. Korea (Republic of South)
III. Saudi Arabia
IV. Taiwan
V. Brazil
VI. Thailand
VII. Malaysia
VIII. South Africa

I. INDIA

a) Inclusions

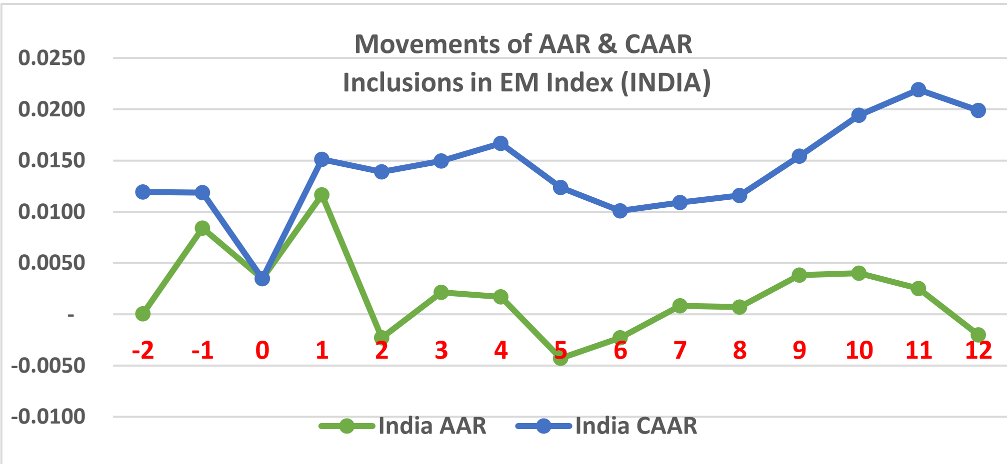

Figure 10 (Inclusions – AAR & CAAR India)

Inclusions (India)															
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
AAR	**0.0%**	**0.8%**	**0.3%**	**1.2%**	**-0.2%**	**0.2%**	**0.2%**	**-0.4%**	**-0.2%**	**0.1%**	**0.1%**	**0.4%**	**0.4%**	**0.2%**	**-0.2%**
CAAR	**1.2%**	**1.2%**	**0.3%**	**1.5%**	**1.4%**	**1.5%**	**1.7%**	**1.2%**	**1.0%**	**1.1%**	**1.2%**	**1.5%**	**1.9%**	**2.2%**	**2.0%**

Table 15 – Inclusions – AAR & CAAR India

On the day of the announcement, there is an average abnormal return (AAR) of 1.16% for inclusions for India. Following the announcement, the share price fluctuates, resulting in a cyclical trend until the actual inclusion. The outcomes of inclusions to the MSCI EM Index for India in the time preceding their inclusion in the index show a cumulative average abnormal return of 2.19 percent. Following the modification (actual effective date), the price remains at the new level, as indicated by the CAAR.

b) Deletions

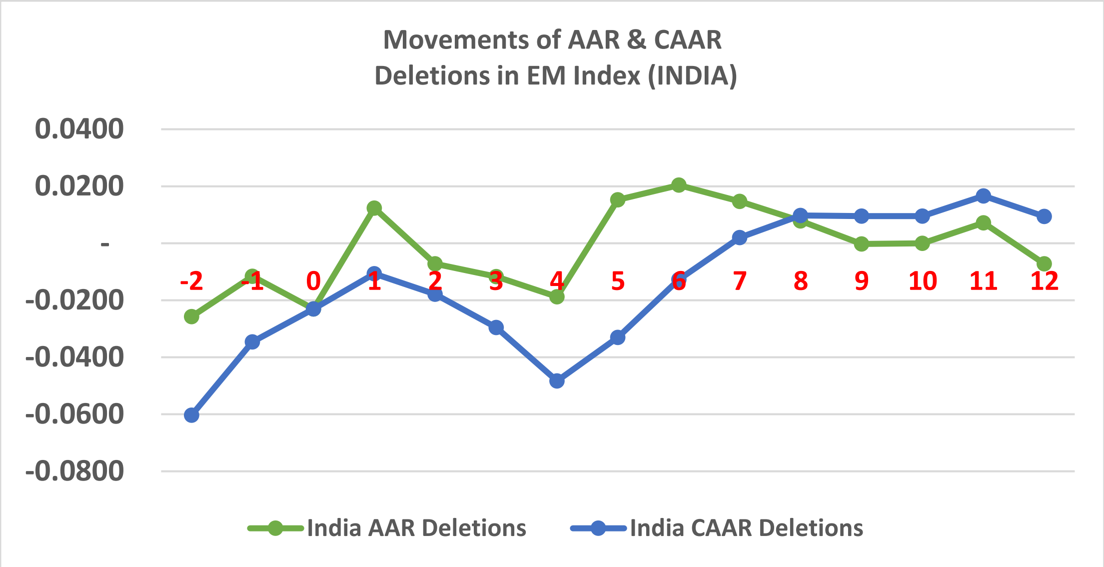

Figure 11 (Deletions – AAR & CAAR India)

Deletions (India)															
Time (t)	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12
AAR	-2.6%	-1.2%	-2.3%	1.2%	-0.7%	-1.2%	-1.9%	1.5%	2.0%	1.5%	0.8%	0.0%	0.0%	0.7%	-0.7%
CAAR	-6.0%	-3.5%	-2.3%	-1.1%	-1.8%	-3.0%	-4.8%	-3.3%	-1.3%	0.2%	1.0%	1.0%	0.9%	1.7%	0.9%

Table 16 – Deletions – AAR & CAAR India

On the day of the announcement, there is an average abnormal return (AAR) of 1.24 percent for deletions for India. Following the announcement, the share price fluctuates, resulting in a recurring drift until the actual deletion. The CAARs in the run-up period is 1.66 percent for deletions. When the share is deleted in MSCI EM for India, its price reduces. The price decrease that occurs as a result of the announcement of deletion is discovered to be permanent.

c) Trading Volume

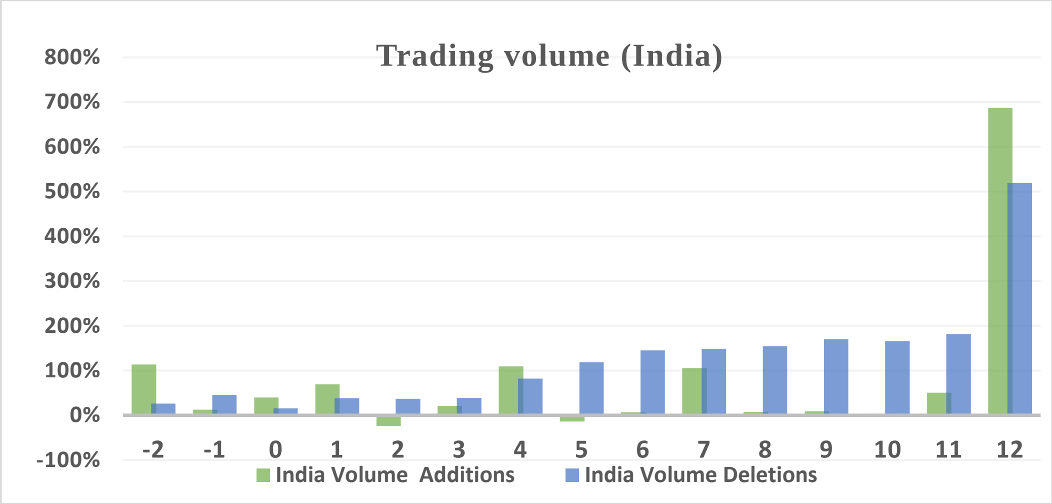

Figure 12 (Inclusions & Deletions Trading Volume - India)

Volume (INDIA)															
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Inclusions	113.8%	12.5%	40.1%	69.4%	-24.2%	20.7%	109.0%	-14.0%	7.1%	105.9%	7.1%	9.3%	3.1%	50.7%	687.1%
Deletions	-19.1%	30.5%	15.0%	23.4%	-1.8%	2.7%	42.9%	36.3%	26.2%	4.2%	5.1%	15.7%	-3.9%	16.0%	337.0%

Table 17 – Inclusions & Deletions Trading Volume - India

The trading volume of shares added to the EM index for India increases during the event month. While the trading volumes increase temporarily with the inclusions on the actual effective date (day 12). The inclusion into an index also has a direct impact on trade volume. The changes in the trading volume reveal that the volume peaks shortly on the day of the announcement and the day of actual inclusion. Following the inclusion into the index, the volume returns to levels before the announcement date. Inclusions for India has a bigger and more noticeable effect on volumes than deletions. The highest volume is noticed on the day of the index change (day 12).

II. KOREA (Republic of South)

a) Inclusions

On the day of the announcement, there is an average abnormal return (AAR) of 2.1% for inclusions. Following the announcement, the share price fluctuates, resulting in a cyclic drift until the actual inclusion. The outcomes of inclusions to the MSCI EM Index for Korea in the time preceding their inclusion in the index show a cumulative average abnormal return of 6.07 percent. Following the modification (actual effective date), the price remains at the new level, as indicated by the CAAR.

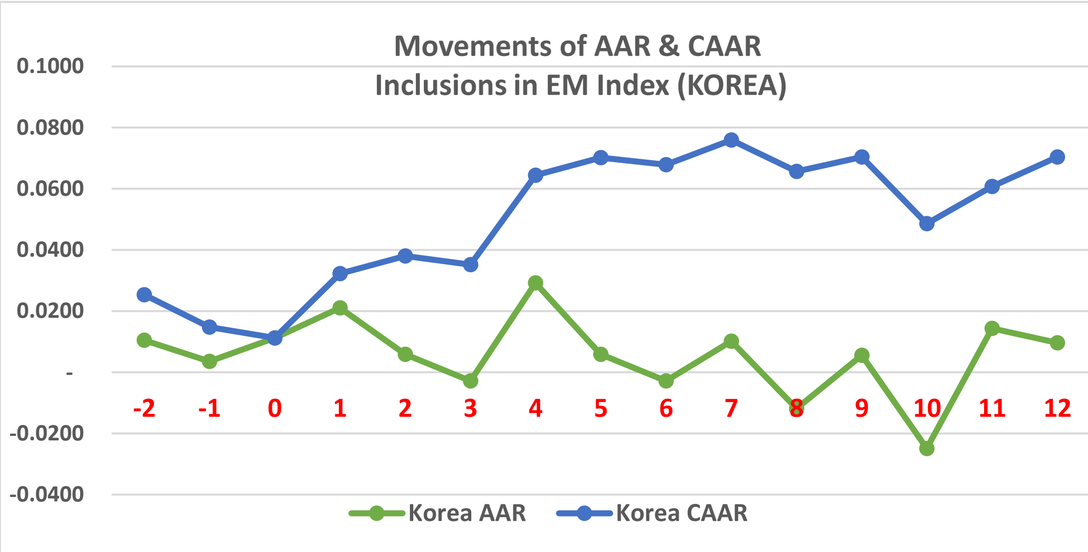

Figure 13 (Inclusions – AAR & CAAR Korea)

Inclusions (Korea)															
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
AAR	**1.0%**	**0.4%**	**1.1%**	**2.1%**	**0.6%**	**-0.3%**	**2.9%**	**0.6%**	**-0.3%**	**1.0%**	**-1.2%**	**0.6%**	**-2.5%**	**1.4%**	**1.0%**
CAAR	**2.5%**	**1.5%**	**1.1%**	**3.2%**	**3.8%**	**3.5%**	**6.4%**	**7.0%**	**6.8%**	**7.6%**	**6.6%**	**7.0%**	**4.9%**	**6.1%**	**7.0%**

Table 18 - Inclusions – AAR & CAAR Korea

b) Deletions

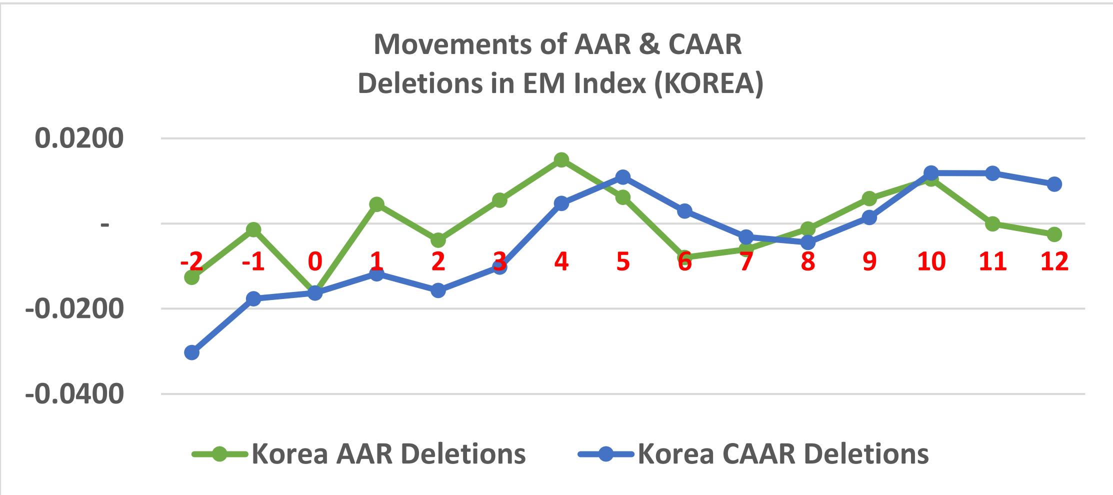

Figure 14 (Deletions – AAR & CAAR Korea)

Deletions (Korea)														
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
AAR	-1.3%	-0.1%	-1.6%	0.4%	-0.4%	0.5%	1.5%	0.6%	-0.8%	-0.6%	-0.1%	0.6%	1.0%	0.0%	-0.3%
CAAR	-3.0%	-1.8%	-1.6%	-1.2%	-1.6%	-1.0%	0.5%	1.1%	0.3%	-0.3%	-0.4%	0.1%	1.2%	1.2%	0.9%

Table 19 - Inclusions – Deletions – AAR & CAAR Korea

On the day of the announcement, there is an average abnormal return (AAR) of 4.50 percent for deletions for Korea. Following the announcement, the share price fluctuates, resulting in a recurring drift until the actual deletion. The CAARs in the run-up period are 1.18 percent for deletions. When the share is deleted in MSCI EM for Korea, its price reduces. The price decrease that occurs as a result of the announcement of deletion is discovered to be permanent.

c) Trading Volume

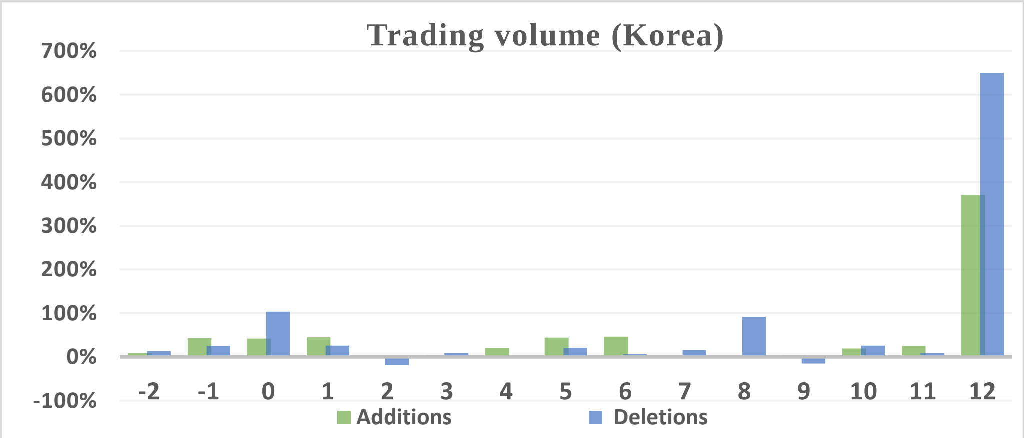

Figure 15 (Inclusions & Deletions Trading Volume - Korea)

Trading Volume (KOREA)															
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Inclusions	9.1%	42.6%	42.4%	45.1%	-0.1%	3.7%	20.2%	44.4%	46.2%	3.4%	1.3%	3.8%	19.4%	25.5%	370.8%
Deletions	13.8%	25.5%	103.6%	26.1%	-18.6%	9.2%	3.4%	20.5%	6.4%	15.3%	91.6%	-15.2%	25.8%	9.0%	650.1%

Table 20 - Inclusions – Deletions – Trading Volume - Korea

The trading volume of shares added to the EM index for Korea increases during the event month. While the trading volumes increases temporarily with the inclusions on the actual effective date (day 12). The inclusion into an index also has a direct impact on trade volume. The changes in the trading volume reveal that the volume peaks shortly on the day of announcement and the day of actual inclusion. Following the inclusion into the index, the volume returns to levels before the announcement date. Deletions has a bigger and more noticeable effect on volumes than inclusions for Korea. The highest volume is noticed on the day of the index change (day 12).

III. SAUDI ARABIA

a) Inclusions

On the day of the announcement, there is an average abnormal return (AAR) of 0.84% for inclusions. Following the announcement, the share price fluctuates, resulting in a cyclic drift until the actual inclusion. The outcomes of inclusions to the MSCI EM Index for Saudi Arabia in the time preceding their inclusion in the index show a cumulative average abnormal return of 1.70 percent. Following the modification (actual effective date), the price remains at the new level, as indicated by the CAAR.

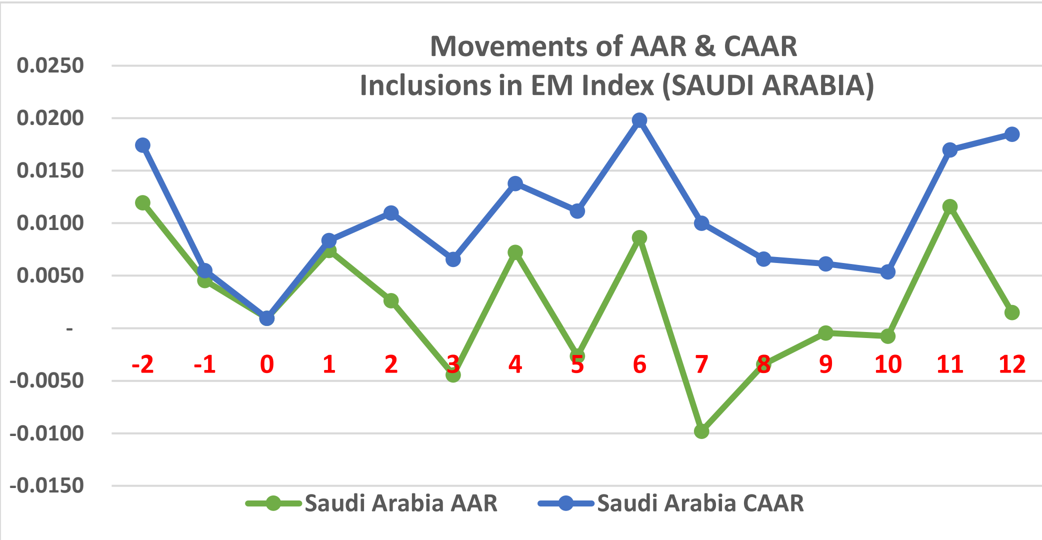

Figure 16 (Inclusions – AAR & CAAR Saudi Arabia)

Inclusions (SAUDI ARABIA)															
Time (t)	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12
AAR	1.2%	0.5%	0.1%	0.7%	0.3%	-0.4%	0.7%	-0.3%	0.9%	-1.0%	-0.3%	0.0%	-0.1%	1.2%	0.2%
CAAR	1.7%	0.5%	0.1%	0.8%	1.1%	0.7%	1.4%	1.1%	2.0%	1.0%	0.7%	0.6%	0.5%	1.7%	1.8%

Table 21 - Inclusions – AAR & CAAR Saudi Arabia

b) Deletions

There are no deletions for Saudi Arabia.

c) Trading Volume

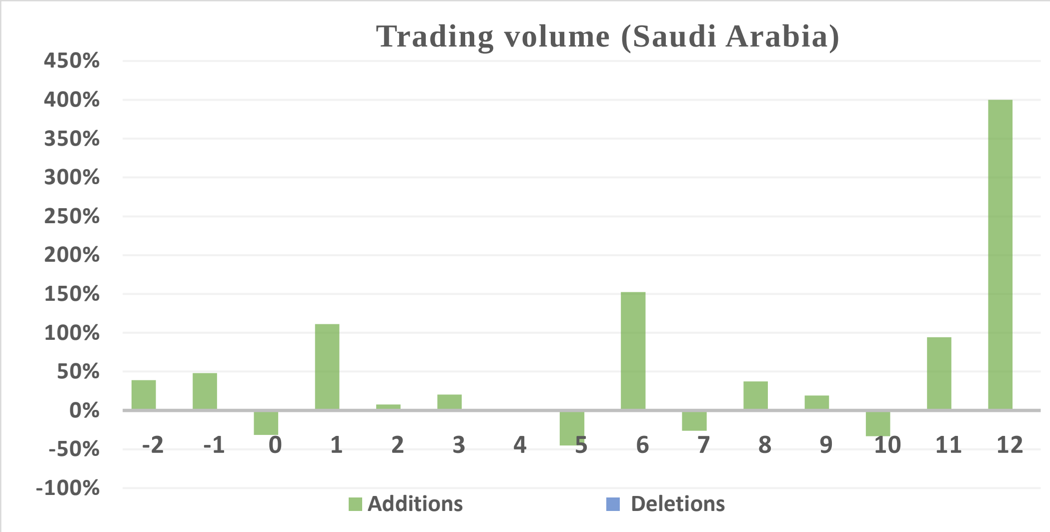

Figure 17 (Inclusions Trading Volume – Saudi Arabia)

The trading volume of shares added to the EM index for Saudi Arabia increases during the event month. While the trading volumes increases temporarily with the inclusions on the actual effective date (day 12). The inclusion into an index also has a direct impact on trade volume. The changes in the trading volume reveal that the volume peaks shortly on the day of announcement and the day of actual inclusion. Following the inclusion into the index, the volume returns to levels before the announcement date. Inclusions has a bigger and more noticeable effect on volumes for Saudi Arabia. The highest volume is noticed on the day of the index change (day 12).

Trading Volume (SAUDI ARABIA)															
Time (t)	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12
Inclusions	39.1%	48.0%	-31.5%	111.1%	7.8%	20.3%	1.5%	-45.1%	152.4%	-26.3%	37.5%	19.3%	-33.2%	94.3%	400.1%
Deletions	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table 22 - Inclusions Trading Volume – Saudi Arabia

IV. TAIWAN

a) Inclusions

On the day of the announcement, there is an average abnormal return (AAR) for Taiwan of 0.60% for inclusions. Following the announcement, the share price fluctuates, resulting in an apparent cyclical drift until the actual inclusion. The outcomes of inclusions to the

MSCI EM Index for India in the time preceding their inclusion in the index show a cumulative average abnormal return of 6.54 percent. Following the modification (actual effective date), the price remains at the new level, as indicated by the CAAR.

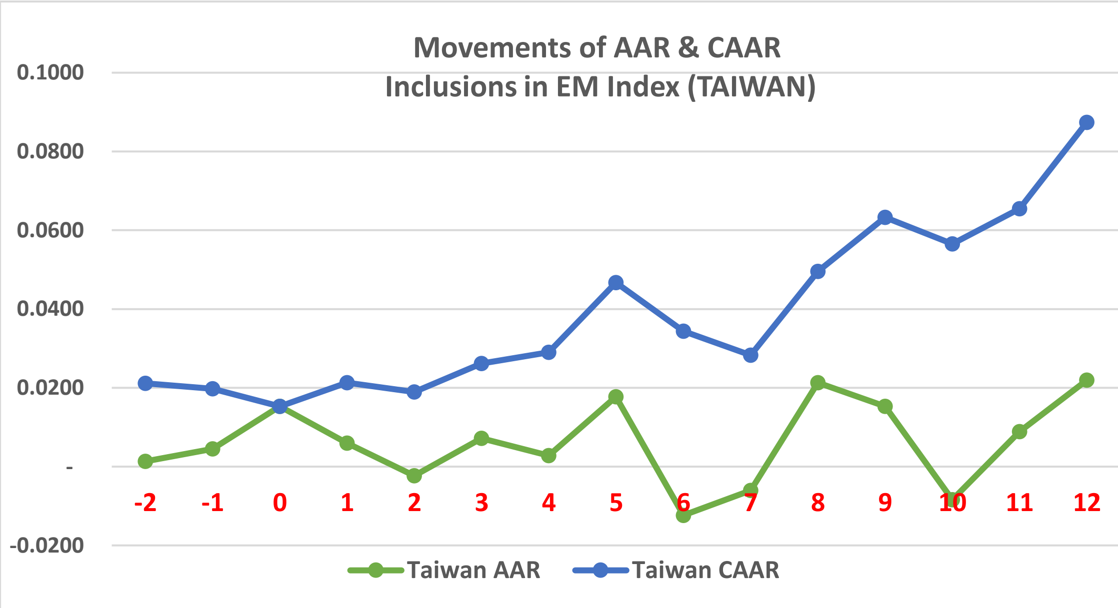

Figure 18 (Inclusions – AAR & CAAR Taiwan)

Inclusions (Taiwan)															
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
AAR	**0.1%**	**0.5%**	**1.5%**	**0.6%**	**-0.2%**	**0.7%**	**0.3%**	**1.8%**	**-1.2%**	**-0.6%**	**2.1%**	**1.5%**	**-0.8%**	**0.9%**	**2.2%**
CAAR	**2.1%**	**2.0%**	**1.5%**	**2.1%**	**1.9%**	**2.6%**	**2.9%**	**4.7%**	**3.4%**	**2.8%**	**5.0%**	**6.3%**	**5.7%**	**6.5%**	**8.7%**

Table 23 - Inclusions – AAR & CAAR Taiwan

b) Deletions

On the day of the announcement there is an average abnormal return (AAR) of 2.50 percent for deletions for Taiwan. Following the announcement, the share price fluctuates, resulting in a recurring drift until the actual deletion. The CAARs in the run-up period is 1.38 percent for deletions. When the share is deleted in MSCI EM for Taiwan, its price reduces. The price decrease that occurs as a result of the announcement of deletion is discovered to be permanent.

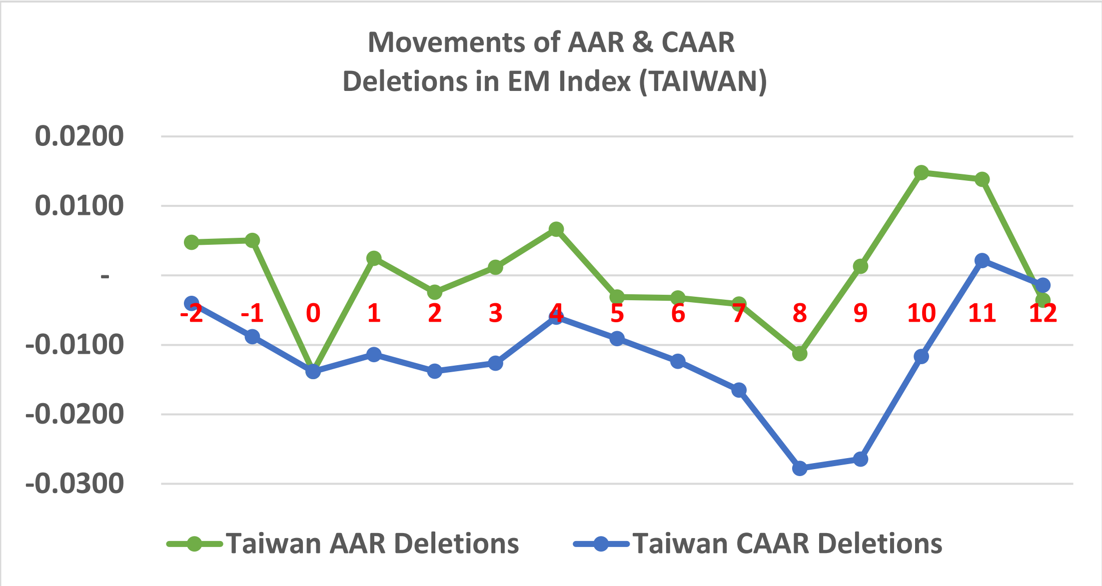

Figure 19 (Deletions – AAR & CAAR Taiwan)

Deletions (Taiwan)															
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
AAR	**0.5%**	**0.5%**	**-1.4%**	**0.2%**	**-0.2%**	**0.1%**	**0.7%**	**-0.3%**	**-0.3%**	**-0.4%**	**-1.1%**	**0.1%**	**1.5%**	**1.4%**	**-0.4%**
CAAR	**-0.4%**	**-0.9%**	**-1.4%**	**-1.1%**	**-1.4%**	**-1.3%**	**-0.6%**	**-0.9%**	**-1.2%**	**-1.7%**	**-2.8%**	**-2.6%**	**-1.2%**	**0.2%**	**-0.1%**

Table 24 - Deletions – AAR & CAAR Taiwan

c) Trading Volume

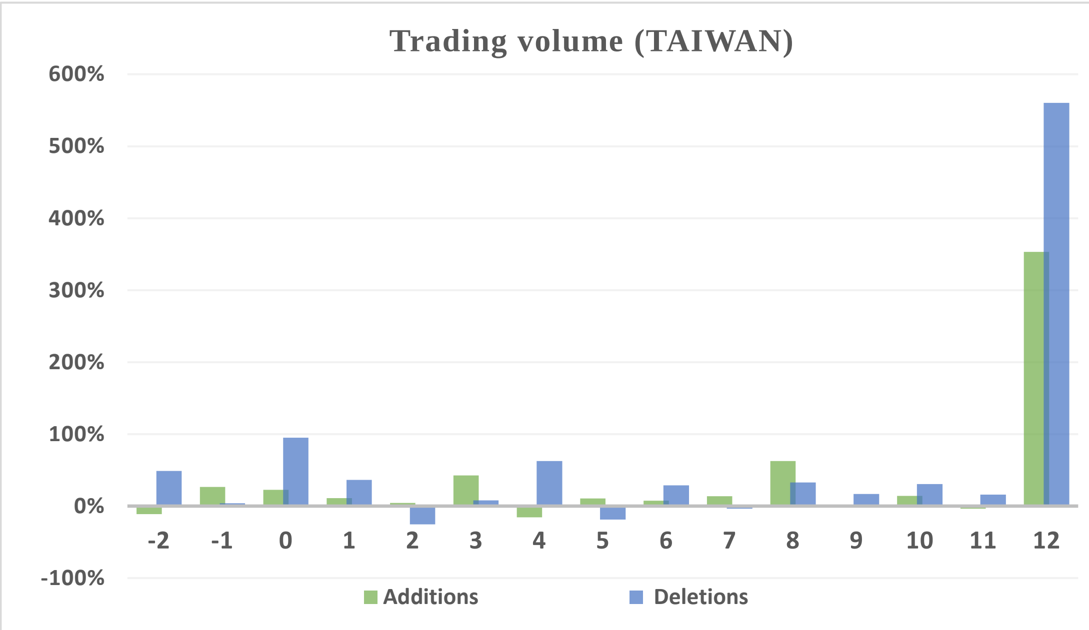

Figure 20 (Inclusions & Deletions Trading Volume - Taiwan)

Trading Volume (Taiwan)														
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Inclusions	**-11.1%**	**26.5%**	**22.5%**	**11.1%**	**4.3%**	**42.4%**	**-15.8%**	**10.6%**	**7.7%**	**13.6%**	**62.6%**	**0.8%**	**14.1%**	**-3.4%**	**353.2%**
Deletions	**48.6%**	**3.9%**	**95.0%**	**36.4%**	**-25.5%**	**8.0%**	**62.6%**	**-18.7%**	**29.0%**	**-3.6%**	**32.6%**	**16.7%**	**30.6%**	**15.9%**	**560.5%**

Table 25 - Inclusions & Deletions Trading Volume - Taiwan

The trading volume of shares added to the EM index for Taiwan increases during the event month. While the trading volumes increases temporarily with the inclusions on the actual effective date (day 12). The inclusion into an index also has a direct impact on trade volume. The changes in the trading volume reveal that the volume peaks shortly on the day of announcement and the day of actual inclusion. Following the inclusion into the index, the volume returns to levels before the announcement date. Deletions has a bigger and more noticeable effect on volumes for Taiwan than deletions. The highest volume is noticed on the day of the index change (day 12).

V. BRAZIL

a) Inclusions

On the day of the announcement, there is an average abnormal return (AAR) for Brazil of 0.89% for inclusions. Following the announcement, the share price fluctuates, resulting in an apparent cyclical drift until the actual inclusion. The outcomes of inclusions to the MSCI EM Index for Brazil in the time preceding their inclusion in the index show a cumulative average abnormal return of 2.74 percent.

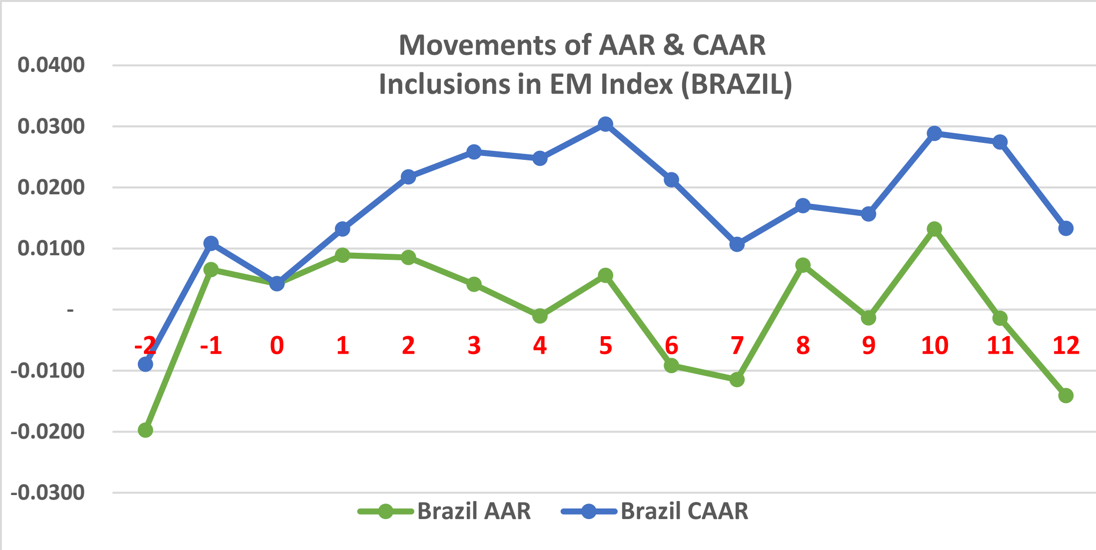

Figure 21 (Inclusions – AAR & CAAR Brazil)

Inclusions (Brazil)															
Time (t)	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12
AAR	-2.0%	0.7%	0.4%	0.9%	0.9%	0.4%	-0.1%	0.6%	-0.9%	-1.1%	0.7%	-0.1%	1.3%	-0.1%	-1.4%
CAAR	-0.9%	1.1%	0.4%	1.3%	2.2%	2.6%	2.5%	3.0%	2.1%	1.1%	1.7%	1.6%	2.9%	2.7%	1.3%

Table 26 - Inclusions – AAR & CAAR Brazil

b) Deletions

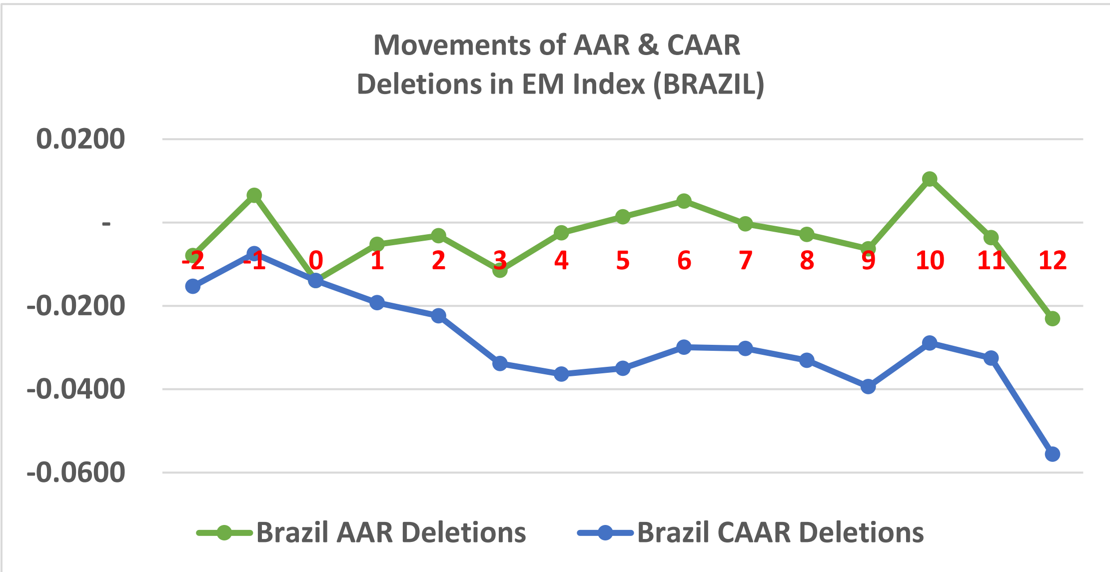

Figure 22 (Deletions – AAR & CAAR Brazil)

Deletions (Brazil)															
Time (t)	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12
AAR	-0.8%	0.7%	-1.4%	-0.5%	-0.3%	-1.1%	-0.3%	0.1%	0.5%	0.0%	-0.3%	-0.6%	1.0%	-0.4%	-2.3%
CAAR	-1.5%	-0.7%	-1.4%	-1.9%	-2.2%	-3.4%	-3.6%	-3.5%	-3.0%	-3.0%	-3.3%	-3.9%	-2.9%	-3.3%	-5.6%

Table 27 - Deletions – AAR & CAAR Brazil

On the day of the announcement there is an average abnormal return (AAR) of 0.53 percent for deletions for Brazil. Following the announcement, the share price fluctuates, resulting in a recurring drift until the actual deletion. The CAARs in the run-up period is -3.25 percent for deletions. When the share is deleted in MSCI EM for Brazil, its price reduces. The price decrease that occurs as a result of the announcement of deletion is discovered to be permanent.

c) Trading Volume

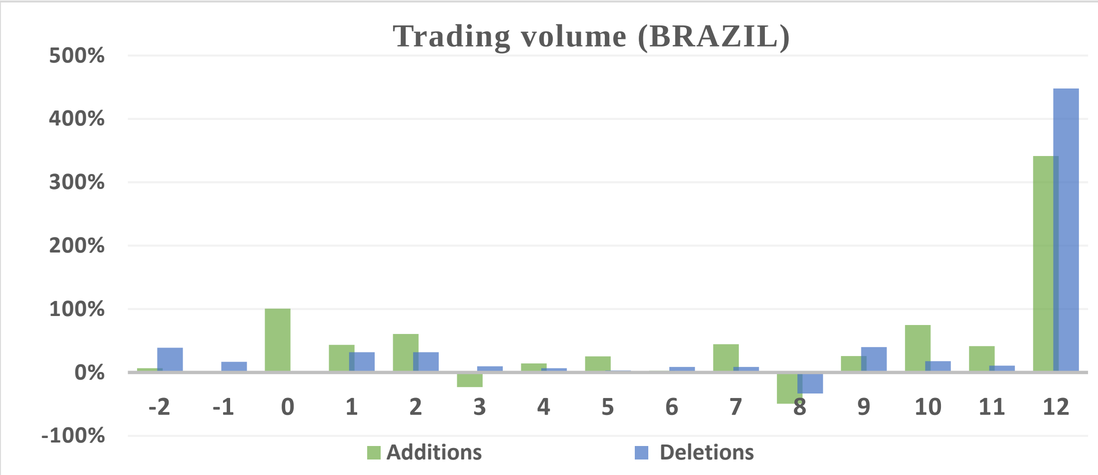

Figure 23 (Inclusions & Deletions Trading Volume - Brazil)

Trading Volume (Brazil)															
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Inclusions	6.9%	-0.5%	100.8%	43.3%	60.5%	-23.1%	14.4%	25.3%	2.5%	44.4%	-49.3%	25.7%	74.9%	41.5%	341.6%
Deletions	39.2%	16.9%	-0.2%	32.0%	32.2%	9.7%	6.7%	3.0%	8.8%	8.9%	-33.4%	40.0%	17.8%	10.6%	447.8%

Table 28 - Inclusions & Deletions Trading Volume - Brazil

The trading volume of shares added to the EM index for Brazil increases during the event month. While the trading volumes increases temporarily with the inclusions on the actual effective date (day 12). The inclusion into an index also has a direct impact on trade volume. The changes in the trading volume reveal that the volume peaks shortly on the day of announcement and the day of actual inclusion. Following the inclusion into the index, the volume returns to levels before the announcement date. Deletions has a bigger and more noticeable effect on volumes than inclusions for Brazil. The highest volume is noticed on the day of the index change (day 12).

VI. THAILAND

a) Inclusions

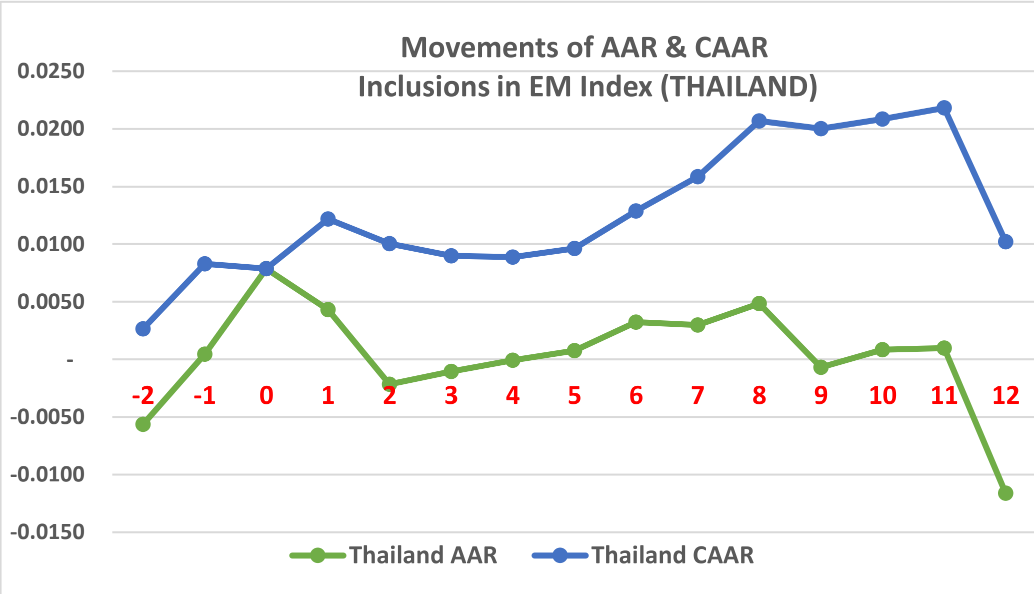

Figure 24 (Inclusions – AAR & CAAR Thailand)

Inclusions (Thailand)															
Time (t)	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12
AAR	-0.6%	0.0%	0.8%	0.4%	-0.2%	-0.1%	0.0%	0.1%	0.3%	0.3%	0.5%	-0.1%	0.1%	0.1%	-1.2%
CAAR	0.3%	0.8%	0.8%	1.2%	1.0%	0.9%	0.9%	1.0%	1.3%	1.6%	2.1%	2.0%	2.1%	2.2%	1.0%

Table 29 - Inclusions – AAR & CAAR Thailand

On the day of the announcement, there is an average abnormal return (AAR) for Thailand of 0.43% for inclusions. Following the announcement, the share price fluctuates, resulting in an apparent cyclical drift until the actual inclusion. The outcomes of inclusions to the MSCI EM Index for Thailand in the time preceding their inclusion in the index show a cumulative average abnormal return of 2.18 percent.

b) Deletions

On the day of the announcement there is an average abnormal return (AAR) of -0.20 percent for deletions for Thailand. Following the announcement, the share price fluctuates, resulting in a recurring drift until the actual deletion. The CAARs in the run-up period is -2.41 percent for deletions. When the share is deleted in MSCI EM for Thailand, its price reduces. The price decrease that occurs as a result of the announcement of deletion is discovered to be permanent.

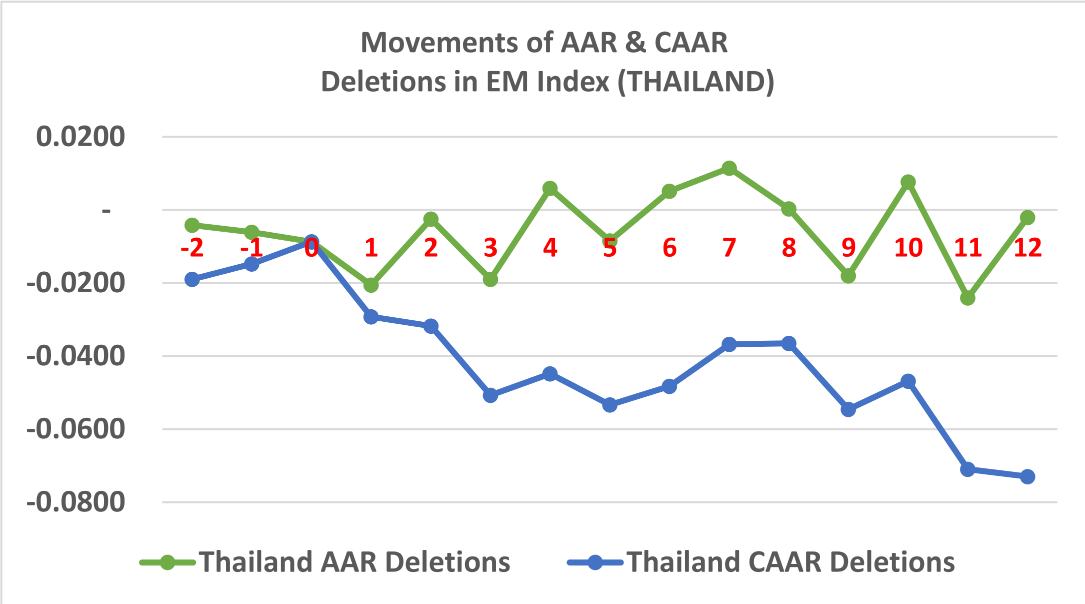

Figure 25 (Deletions – AAR & CAAR Thailand)

Deletions (Thailand)															
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
AAR	-0.4%	-0.6%	-0.9%	-2.1%	-0.3%	-1.9%	0.6%	-0.9%	0.5%	1.1%	0.0%	-1.8%	0.8%	-2.4%	-0.2%
CAAR	-1.9%	-1.5%	-0.9%	-2.9%	-3.2%	-5.1%	-4.5%	-5.3%	-4.8%	-3.7%	-3.7%	-5.5%	-4.7%	-7.1%	-7.3%

Table 30 - Deletions – AAR & CAAR Thailand

c) Trading Volume

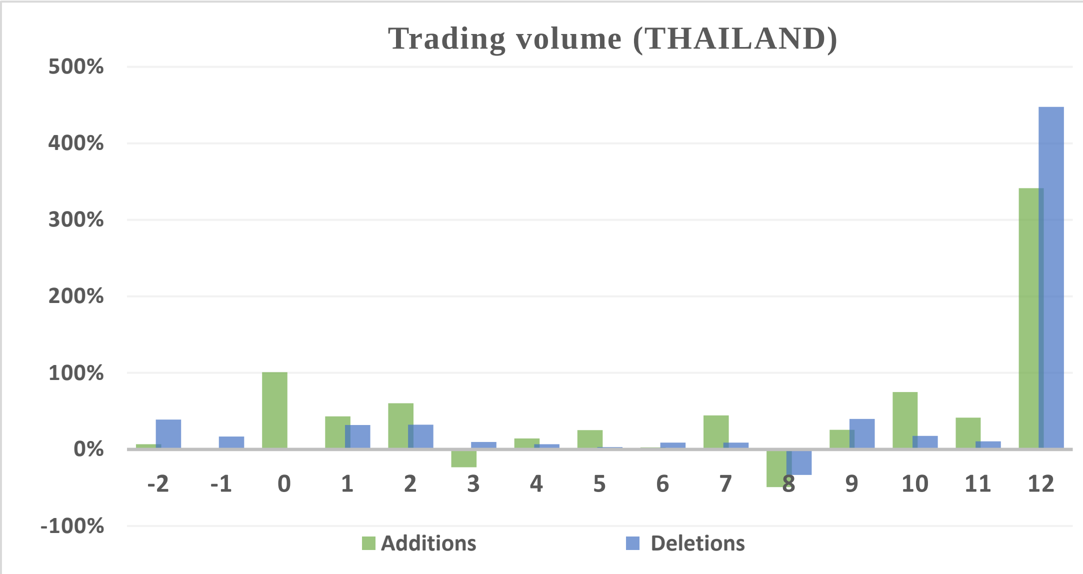

Figure 26 (Inclusions & Deletions Trading Volume - Thailand)

Trading Volume (Thailand)															
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Inclusions	14.8%	24.6%	44.8%	-3.0%	14.0%	25.8%	12.5%	19.1%	11.1%	28.5%	-18.9%	3.7%	52.5%	66.5%	491.3%
Deletions	24.0%	-32.1%	55.1%	152.5%	-45.6%	27.9%	13.7%	72.9%	96.9%	-10.7%	41.1%	-31.6%	76.5%	106.6%	396.4%

Table 31 - Inclusions & Deletions Trading Volume - Thailand

The trading volume of shares added to the EM index for Thailand increases during the event month. While the trading volumes increases temporarily with the inclusions on the actual effective date (day 12). The inclusion into an index also has a direct impact on trade volume. The changes in the trading volume reveal that the volume peaks shortly on the day of announcement and the day of actual inclusion. Following the inclusion into the index, the volume returns to levels before the announcement date. Deletions has a bigger and more noticeable effect on volumes than inclusions for Thailand. The highest volume is noticed on the day of the index change (day 12).

VII. MALAYSIA

7.1 Inclusions

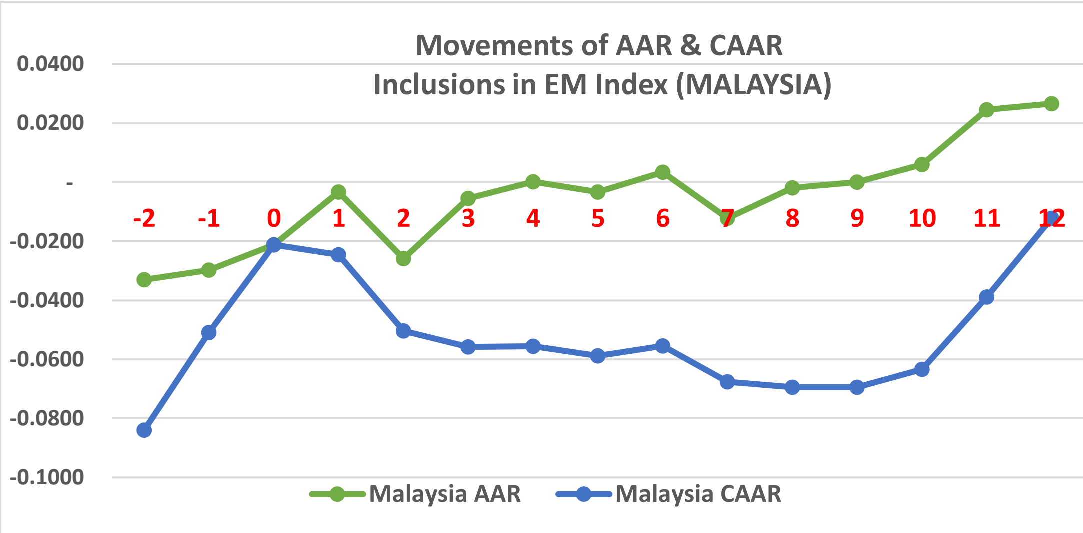

Figure 27 (Inclusions – AAR & CAAR Malaysia)

Inclusions (Malaysia)															
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
AAR	**-3.3%**	**-3.0%**	**-2.1%**	**-0.3%**	**-2.6%**	**-0.5%**	**0.0%**	**-0.3%**	**0.3%**	**-1.2%**	**-0.2%**	**0.0%**	**0.6%**	**2.5%**	**2.7%**
CAAR	**-8.4%**	**-5.1%**	**-2.1%**	**-2.4%**	**-5.0%**	**-5.6%**	**-5.6%**	**-5.9%**	**-5.5%**	**-6.8%**	**-6.9%**	**-6.9%**	**-6.3%**	**-3.9%**	**-1.2%**

Table 32 - Inclusions – AAR & CAAR Malaysia

On the day of the announcement, there is an average abnormal return (AAR) for Malaysia of -0.33% for inclusions. Following the announcement, the share price fluctuates, resulting in an apparent cyclical drift until the actual inclusion. The outcomes of inclusions to the MSCI EM Index for Malaysia in the time preceding their inclusion in the index show a cumulative average abnormal return of -3.88 percent.

7.2 Deletions

On the day of the announcement there is an average abnormal return (AAR) of 0.44 percent for deletions for Malaysia. Following the announcement, the share price fluctuates, resulting in a recurring drift until the actual deletion. The CAARs in the run-up period is 0.28 percent for deletions. When the share is deleted in MSCI EM for

Malaysia, its price reduces. The price decrease that occurs as a result of the announcement of deletion is discovered to be permanent.

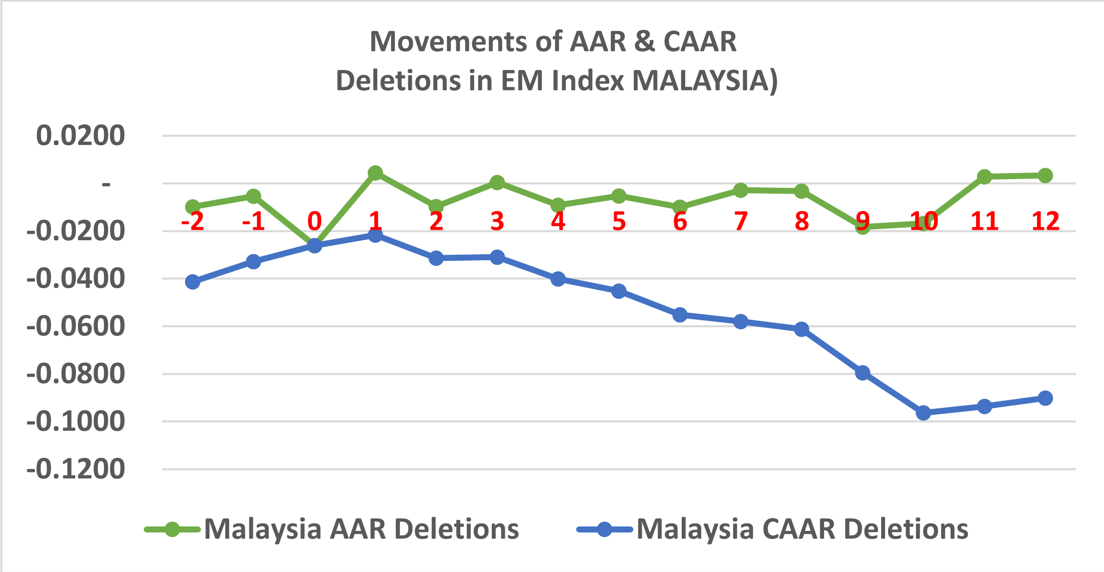

Figure 28 (Deletions – AAR & CAAR Malaysia)

Deletions (Malaysia)															
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
AAR	**-1.0%**	**-0.5%**	**-2.6%**	**0.4%**	**-1.0%**	**0.0%**	**-0.9%**	**-0.5%**	**-1.0%**	**-0.3%**	**-0.3%**	**-1.8%**	**-1.7%**	**0.3%**	**0.3%**
CAAR	**-4.1%**	**-3.3%**	**-2.6%**	**-2.2%**	**-3.1%**	**-3.1%**	**-4.0%**	**-4.5%**	**-5.5%**	**-5.8%**	**-6.1%**	**-8.0%**	**-9.6%**	**-9.4%**	**-9.0%**

Table 33 - Deletions – AAR & CAAR Malaysia

7.3 Trading Volume

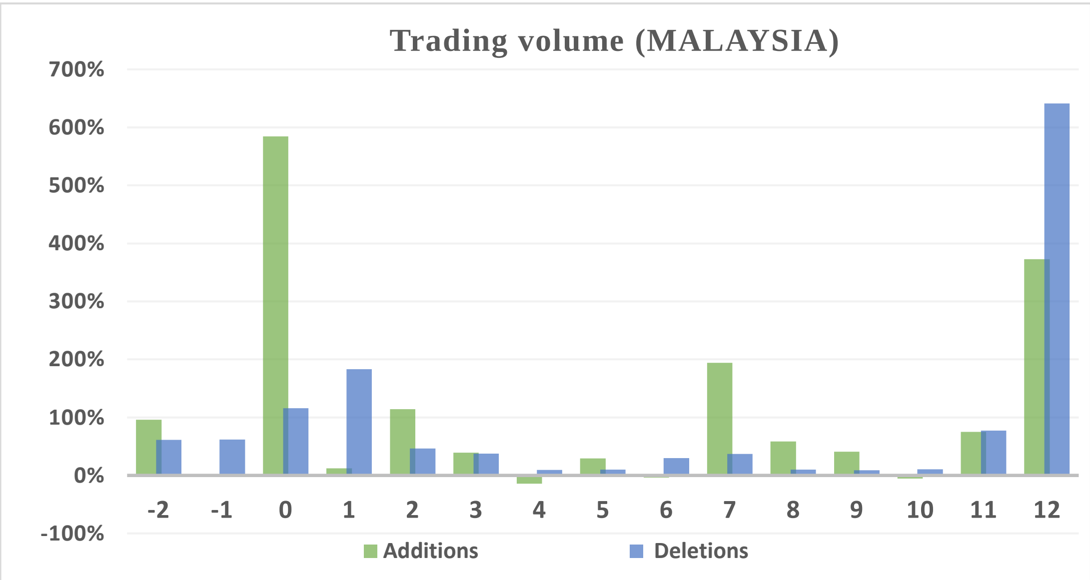

Figure 29 (Inclusions & Deletions Trading Volume - Malaysia)

Trading Volume (Malaysia)															
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Inclusions	95.9%	-0.8%	584.3%	12.0%	114.4%	39.2%	-14.2%	29.5%	-4.0%	194.2%	58.3%	40.8%	-5.5%	74.8%	372.5%
Deletions	61.1%	61.8%	116.1%	182.9%	46.3%	37.3%	9.3%	9.9%	29.9%	36.7%	10.0%	9.0%	10.6%	77.2%	641.4%

Table 34 - Inclusions & Deletions Trading Volume - Malaysia

The trading volume of shares added to the EM index for Malaysia increases during the event month. While the trading volumes increases temporarily with the inclusions on the actual effective date (day 12). The inclusion into an index also has a direct impact on trade volume. The changes in the trading volume reveal that the volume peaks shortly on the day of announcement and the day of actual inclusion. Following the inclusion into the index, the volume returns to levels before the announcement date. Deletions has a bigger and more noticeable effect on volumes than inclusions for Malaysia. The highest volume is noticed on the day of the index change (day 12).

VIII. SOUTH AFRICA

a) Inclusions

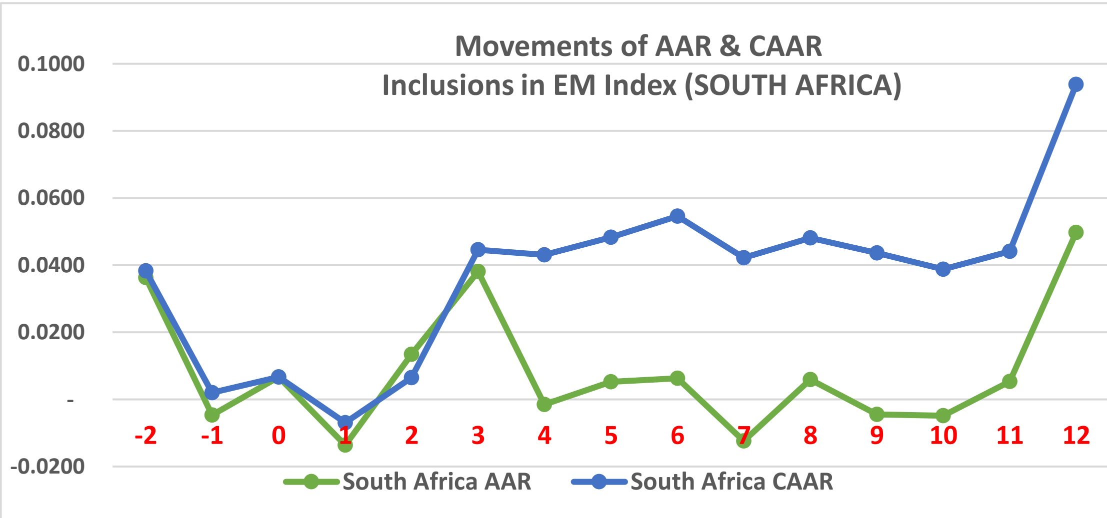

Figure 30 (Inclusions – AAR & CAAR South Africa)

Inclusions (South Africa)															
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
AAR	3.6%	-0.5%	0.7%	-1.4%	1.3%	3.8%	-0.2%	0.5%	0.6%	-1.2%	0.6%	-0.5%	-0.5%	0.5%	5.0%
CAAR	3.8%	0.2%	0.7%	-0.7%	0.6%	4.5%	4.3%	4.8%	5.5%	4.2%	4.8%	4.4%	3.9%	4.4%	9.4%

Table 35 - Inclusions – AAR & CAAR South Africa

On the day of the announcement, there is an average abnormal return (AAR) for South Africa of -1.36% for inclusions. Following the announcement, the share price fluctuates, resulting in an apparent cyclical drift until the actual inclusion. The outcomes of inclusions to the MSCI EM Index for South Africa in the time preceding their inclusion in the index show a cumulative average abnormal return of 4.41 percent. Following the modification (actual effective date), the price remains at the new level, as indicated by the CAAR.

b) Deletions

On the day of the announcement there is an average abnormal return (AAR) of 0.04 percent for deletions for South Africa. Following the announcement, the share price fluctuates, resulting in a recurring drift until the actual deletion. The CAARs in the run-up period is 5.28 percent for deletions. When the share is deleted in MSCI EM for South Africa, its price reduces. The price decrease that occurs as a result of the announcement of deletion is discovered to be permanent.

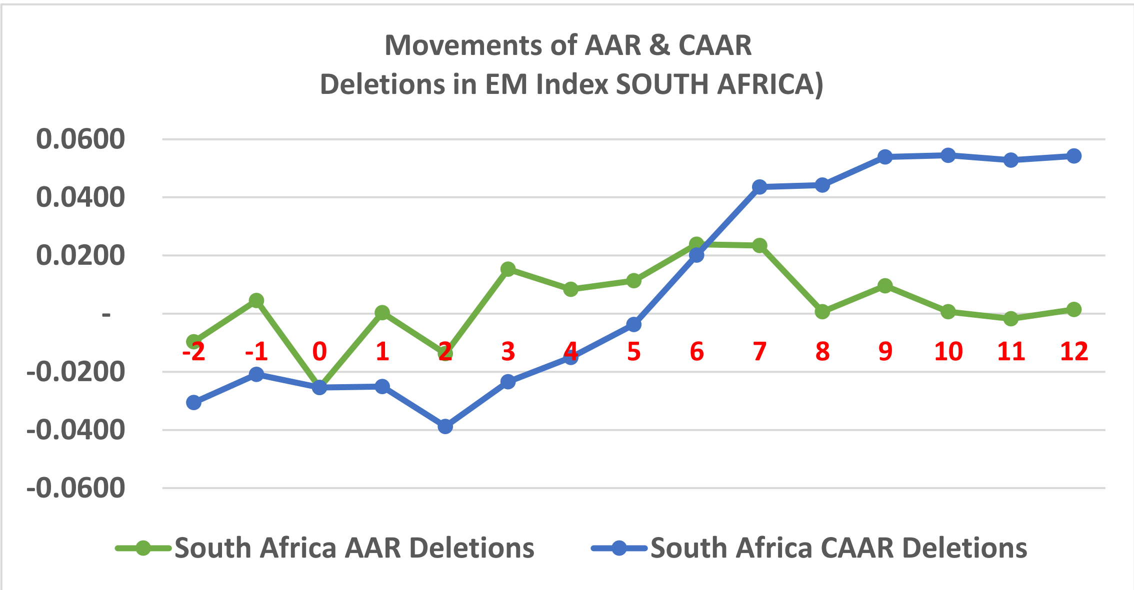

Figure 31 (Deletions – AAR & CAAR South Africa)

Deletions (South Africa)															
Time (t)	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
AAR	**-1.0%**	**0.5%**	**-2.5%**	**0.0%**	**-1.4%**	**1.5%**	**0.8%**	**1.1%**	**2.4%**	**2.3%**	**0.1%**	**1.0%**	**0.1%**	**-0.2%**	**0.1%**
CAAR	**-3.1%**	**-2.1%**	**-2.5%**	**-2.5%**	**-3.9%**	**-2.3%**	**-1.5%**	**-0.4%**	**2.0%**	**4.4%**	**4.4%**	**5.4%**	**5.4%**	**5.3%**	**5.4%**

Table 36 - Deletions – AAR & CAAR South Africa

c) Trading Volume

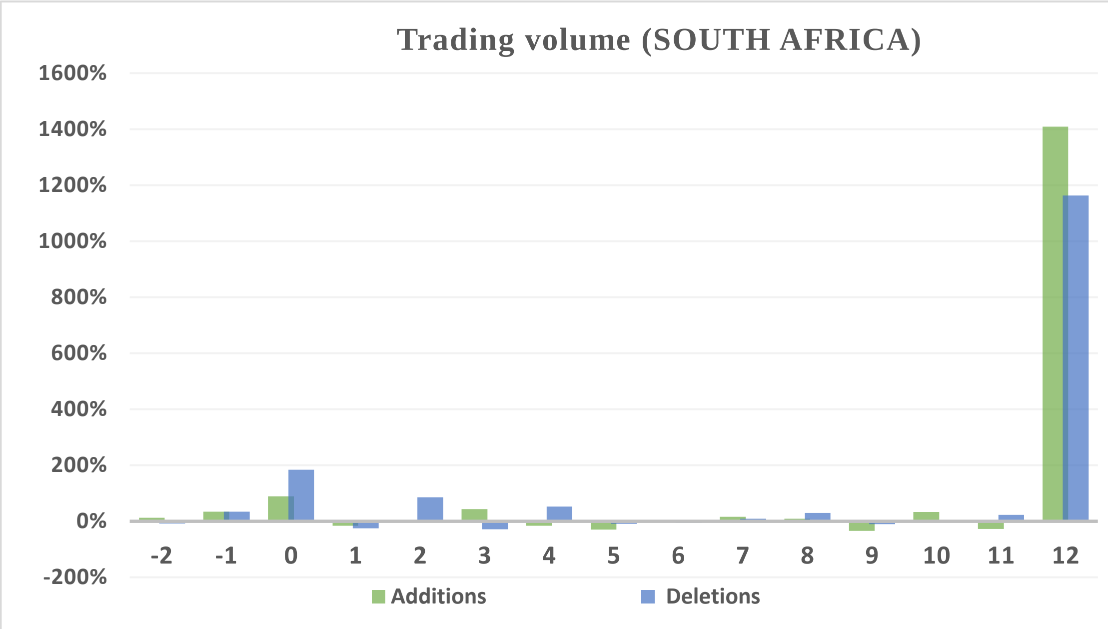

Figure 32 (Inclusions & Deletions Trading Volume – South Africa)

Trading Volume (South Africa)															
Time (t)	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12
Inclusions	12.7%	34.3%	89.3%	-16.4%	-2.3%	43.9%	-16.2%	-29.7%	4.7%	16.5%	9.5%	-34.2%	32.7%	-27.5%	1409.4%
Deletions	-7.6%	34.5%	183.9%	-25.3%	85.9%	-28.9%	52.4%	-9.5%	-5.2%	9.5%	30.3%	-10.8%	-1.8%	22.7%	1163.3%

Table 37 - Inclusions & Deletions Trading Volume – South Africa

The trading volume of shares added to the EM index for South Africa increases during the event month. While the trading volumes increases temporarily with the inclusions on the actual effective date (day 12). The inclusion into an index also has a direct impact on trade volume. The changes in the trading volume reveal that the volume peaks shortly on the day of announcement and the day of actual inclusion. Following the inclusion into the index, the volume returns to levels before the announcement date. Inclusions has a bigger and more noticeable effect on volumes than deletions for South Africa. The highest volume is noticed on the day of the index change (day 12).

3.4 Data Limits

The index period after 3 March 2020 was affected by the COVID19 pandemic, so any data from the March date will be inconsistent, so a decision was made to exclude any quarterly or semi-annual reviews after February 2020. During the sample selection, there were significant China and Saudi inclusions completed during the May 2018 and November 2019 semi-annual index review and due to the large inconsistency in the data, these inclusions and deletions were excluded. An inclusion 14 companies were excluded from the sample due to insufficient data available, to arrive at a more realistic sample of 315 (329 – 14).

Deletions				
Inclusions	May 2016 Index Review	Semi-Annual Index Review	01 June 2016	**1**
Deletions	November 2016 Index Review	Semi-Annual Index Review	30 November 2016	**1**
Inclusions	May 2017 Index Review	Semi-Annual Index Review	31 May 2017	**1**
Inclusions	May 2017 Index Review	Semi-Annual Index Review	31 May 2017	**1**
Deletions	May 2017 Index Review	Semi-Annual Index Review	01 June 2017	**1**
Inclusions	November 2017 Index Review	Semi-Annual Index Review	30 November 2017	**1**
Inclusions	November 2017 Index Review	Semi-Annual Index Review	30 November 2017	**1**
Inclusions	November 2017 Index Review	Semi-Annual Index Review	30 November 2017	**1**
Deletions	May 2018 Index Review	Semi-Annual Index Review	01 June 2018	**1**
Deletions	November 2018 Index Review	Semi-Annual Index Review	02 December 2018	**1**
Deletions	November 2018 Index Review	Semi-Annual Index Review	02 December 2018	**1**
Inclusions	February 2019 Index Review	Quarterly Index Review	28 February 2019	**1**
Inclusions	May 2019 Index Review	Semi-Annual Index Review	29 May 2019	**1**
Inclusions	February 2020 Index Review	Quarterly Index Review	02 March 2020	**1**
				14

Table 9 – Deletions

CHAPTER 4: FINDINGS AND CONCLUSION

4.1 Introduction

The effects of index adjustments are determined by looking at a sample of shares included and removed from the MSCI Emerging Markets index between the period 2016 and 2020.

4.2 Findings

The study investigates the effect of shares included and deleted from the MSCI Emerging Market Index (EM) between 2016 and 2020, during quarterly (QIR) and semi-annual index (SAIR) reviews. The analysis finds that when a share is included in MSCI Emerging Market Index, its price increases slightly following the announcement. After the announcement, there is a further price increase during the period preceding the actual index change. The price increase for inclusions is deemed to be permanent.

When shares are excluded from the MSCI Emerging Market Index, the share price decreases slightly following the announcement and gradually increases thereafter over time. It is not consistent with the starting premise that deletions would result in a negative share performance.

The inclusion into an index also has a direct impact on trade volume. The changes in the trading volume reveal that the volume peaks shortly on the day of announcement and the day of inclusion. Following the inclusion into the index, the volume returns to levels before the announcement. Deletions have a larger and more noticeable effect on volumes. Deletions therefore has a greater and more significant impact on volume than inclusions.

4.3 Conclusion

The focus of this study was to see if there is a price effect when a share enters or exits the MSCI Emerging Markets index. This study covered shares that were added and removed from the MSCI Emerging Markets index as a result of index reviews from February 2016 to February 2020, and it reflects a period of twelve days preceding inclusion (deletions) to the index.

The price and trading volume effect of index inclusions and deletions on a country level was further examined to understand if the outcome on MSCI EM price effects was representative of the underlying countries in MSCI EM. India, Korea (Republic of South), Saudi Arabia, Taiwan, Brazil, Thailand, Malaysia, and South Africa were explored. For inclusions on the actual effective date, the share price increases to a new level for all countries above except Thailand, where share price decreases. For deletions on the actual effective date, the share price increased to new level for all countries except Malaysia and Thailand, where the share price decreased. Deletions therefore has a greater and more significant impact on volumes for Korea, Malaysia, Taiwan, Thailand and Brazil. Inclusions has a more visible effect on volumes for India, Saudi and South Africa.

This study is consistent with prior studies (Hacibedel, 2007 and Parthasarathy, 2010) which found that when a share enters an index, its price rises permanently. On the announcement date when MSCI announces which shares will be included in the index, the positive price effect begins. When comparing to previous research on emerging markets from Hacibedel (2007), and the Indian index from Parthasarathy (2010), both studies demonstrate a favourable price effect. Both inclusions and deletions have major pricing implications. Index inclusions cause a transient price spike following the announcement date. Trading volume on a MSCI EM index level for deletions has a bigger and more noticeable effect on volumes than inclusions. Prior research has all indicated that adding a share to the index has a favourable price impact. Doeswijk (2007) found a significant and strong price effect on the AEX, Chen et al (2003) & Zhou (2011) (S&P500) and Masse et al (TSE300). When it comes to shares that are removed from the index, the scenario is somewhat different. Emerging market indices, showed a price reduction, with the price not fully restored to its pre-index deletions price. These findings were reported by Hacibedel (2007) on the Emerging Markets index, and Parthasarthy (2010) on the Indian share market's delayed price recovery on deletions.

4.4 Recommendations

Based on the models of Vij (1994) and Barberis et al., they compare the price effects to the trading volume of the shares included or deleted from the index (2002). This could assist to identify if these price effects were activated by excessive index activity on the announcement day.

Differentiate between shares that enter the index for the first time and shares that re-enter the Emerging Markets index for second time. Prior research on the S&P 500 by Zhou (2011) found that freshly added shares suffer a substantially larger permanent price increase than re-entered shares.

REFERENCES

Afego, P.N., 2017. Effects of changes in stock index compositions: A literature survey. International Review of Financial Analysis, 52, pp.228-239.

Ahluwalia, E., Mishra, A.K. and Tripathy, T., 2020. Institutional ownership, investor recognition and stock performance around index rebalancing: Evidence from Indian market. Journal of Multinational Financial Management, 55, p.100615.

Ahmed, N. and Bassiouny, A., 2018. The effects of index changes on stock trading: Evidence from the EGX. Review of Economics & Finance, 11(1), pp.55-66.

Altman, R.C., 2009. The great crash, 2008. Foreign Aff., 88, p.1.

Amihud, Y. and Mendelson, H., 1986. Asset pricing and the bid-ask spread. *Journal of financial Economics*, *17*(2), pp.223-249.

Amihud, Y., Mendelson, H. and Lauterbach, B., 1997. Market microstructure and shares values: Evidence from the Tel Aviv Share Exchange. *Journal of financial Economics*, *45*(3), pp.365-390.

Anadu, K., Kruttli, M.S., McCabe, P.E. and Osambela, E., 2020. The shift from active to passive investing: Potential risks to financial stability. Available at SSRN 3244467.

Beaver, W.H., 1968. The information content of annual earnings announcements. *Journal of accounting research*, pp.67-92.

Bechmann, K.L., 2004. Price and volume effects associated with changes in the Danish blue-chip index: The KFX Index. *Multinational Finance Journal*, *8*(1/2), pp.3-34.

Becker-Blease, J.R. and Paul, D.L., 2006. Share liquidity and investment opportunities: Evidence from index inclusions. *Financial Management*, *35*(3), pp.35-51.

Bekaert, G., Erb, C.B., Harvey, C.R. and Viskanta, T.E., 1998. Distributional characteristics of emerging market returns and asset allocation. *Journal of Portfolio Management*, *24*(2), pp.102-+.

Bekaert, G., Harvey, C.R. and Lundblad, C., 2007. Liquidity and expected returns: Lessons from emerging markets. The review of financial studies, 20(6), pp.1783-1831.

Bender, J., Nagori, R. and Tank, M., 2019. The Past, Present, and Future of the Index Effect. The Journal of Beta Investment Strategies.

Beneish, M.D. and Gardner, J.C., 1995. Information costs and liquidity effects from changes in the Dow Jones Industrial Average list. *Journal of Financial and Quantitative Analysis*, pp.135-157.

Beneish, M.D. and Whaley, R.E., 1996. An anatomy of the "S&P Game": The effects of changing the rules. *The Journal of Finance*, *51*(5), pp.1909-1930.

Beneish, M.D. and Whaley, R.E., 2002. S&P 500 index replacements. The Journal of Portfolio Management, 29(1), pp.51-60.

Biktimirov, E.N., Cowan, A.R. and Jordan, B.D., 2004. Do demand curves for small shares slope down? *Journal of Financial Research*, *27*(2), pp.161-178.

Biktimirov, E.N., 2004. The effect of demand on share prices: Evidence from index fund rebalancing. *Financial Review*, *39*(3), pp.455-472.

Biktimirov, E.N. and Xu, Y., 2019. Market reactions to changes in the Dow Jones industrial average index. International Journal of Managerial Finance.

Bildik, R. and Gülay, G., 2008. The effects of changes in index composition on share prices and volume: Evidence from the Istanbul share exchange. International Review of Financial Analysis, 17(1), pp.178-197.

Black, F., 1974. International capital market equilibrium with investment barriers. *Journal of Financial Economics*, *1*(4), pp.337-352.

Blume, M.E. and Edelen, R.M., 2004. S&P 500 indexers, tracking error, and liquidity. *The Journal of Portfolio Management*, *30*(3), pp.37-46.

Boehmer, E., Masumeci, J. and Poulsen, A.B., 1991. Event-study methodology under conditions of event-induced variance. *Journal of financial economics*, *30*(2), pp.253-272.

Bogle, J.C., 2005. The mutual fund industry 60 years later: For better or worse? *Financial Analysts Journal*, *61*(1), pp.15-24.

Brennan, M.J. and Cao, H.H., 1997. International portfolio investment flows. The Journal of Finance, 52(5), pp.1851-1880.

Brennan, M.J., Chordia, T. and Subrahmanyam, A., 1998. Alternative factor specifications, security characteristics, and the cross-section of expected share returns. *Journal of financial Economics*, *49*(3), pp.345-373.

Brenner, R., 2009. What is good for Goldman Sachs is good for America the origins of the present crisis.

Brown, S.J. and Warner, J.B., 1980. Measuring security price performance. *Journal of financial economics*, *8*(3), pp.205-258.

Brown, S.J. and Warner, J.B., 1985. Using daily share returns: The case of event studies. Journal of financial economics, 14(1), pp.3-31.

Cai, J. and Houge, CFA, T., 2008. Long-term impact of Russell 2000 index rebalancing. Financial Analysts Journal, 64(4), pp.76-91.

Chan, K., Kot, H.W. and Tang, G.Y., 2013. A comprehensive long-term analysis of S&P 500 index inclusions and deletions. *Journal of Banking & Finance*, *37*(12), pp.4920-4930.

Chari, A. and Henry, P.B., 2004. Risk sharing and asset prices: evidence from a natural experiment. *The Journal of Finance*, *59*(3), pp.1295-1324.

Chakrabarti, R., Huang, W., Jayaraman, N. and Lee, J., 2005. Price and volume effects of changes in MSCI indices–nature and causes. *Journal of Banking & Finance*, *29*(5), pp.1237-1264.

Chen, H., Singal, V. and Noronha, G., 2002. Investor awareness and market segmentation: evidence from S&P 500 index changes. *Available at SSRN 302884*.

Chen, H., Noronha, G. and Singal, V., 2004. The price response to S&P 500 index inclusions and deletions: Evidence of asymmetry and a new explanation. *The Journal of Finance*, *59*(4), pp.1901-1930.

Chen, H., Noronha, G. and Singal, V., 2006. Index changes and losses to index fund investors. *Financial Analysts Journal*, *62*(4), pp.31-47.

Chen, S.S. and Lin, Y.H., 2018. The competitive effects of S&P 500 Index revisions. Journal of Business Finance & Accounting, 45(7-8), pp.997-1027.

Chen, H.L., Shiu, C.Y. and Wei, H.S., 2019. Price effect and investor awareness: Evidence from MSCI Standard Index reconstitutions. Journal of Empirical Finance, 50(C), pp.93-112.

Chung, K.H., McInish, T.H., Wood, R.A. and Wyhowski, D.J., 1995. Production of information, information asymmetry, and the bid-ask spread: Empirical evidence from analysts' forecasts. *Journal of Banking & Finance*, *19*(6), pp.1025-1046.

Cooper, D. and Woglom, G., 2003. The S&P 500 effect: Not so good in the long run. *The Journal of Investing*, *12*(4), pp.62-73.

Dann, L.Y., 1981. Common share repurchases: An analysis of returns to bondholders and shareholders. Journal of financial Economics, 9(2), pp.113-138.

Daya, W., Mazouz, K. and Freeman, M., 2012. Information efficiency changes following FTSE 100 index revisions. *Journal of International Financial Markets, Institutions and Money*, *22*(4), pp.1054-1069.

Deininger, C., Kaserer, C. and Roos, S., 2000. Stock price effects associated with index replacements in Germany. Available at SSRN 264570.

De Jong, F., Kemna, A. and Kloek, T., 1992. A contribution to event study methodology with an application to the Dutch share market. Journal of Banking & Finance, 16(1), pp.11-36.

Denis, D.K., McConnell, J.J., Ovtchinnikov, A.V. and Yu, Y., 2003. S&P 500 index inclusions and earnings expectations. *The Journal of Finance*, *58*(5), pp.1821-1840.

Dhillon, U. and Johnson, H., 1991. Changes in the Standard and Poor's 500 List. *Journal of Business*, pp.75-85.

Dunham, L.M. and Simpson, T.H., 2010. Do index fund managers trade opportunistically around index changes? An empirical examination of S&P 500 index funds. *The Journal of Index Investing*, *1*(3), pp.58-64.

Edmister, R.O., Graham, A.S. and Pirie, W.L., 1994. Excess returns of index replacement shares: Evidence of liquidity and substitutability. *Journal of Financial Research*, *17*(3), pp.333-346.
Edmister, R.O., Graham, A.S. and Pirie, W.L., 1996. Trading cost expectations: Evidence from S&P 500 index replacement share announcements. *Journal of Economics and Finance*, *20*(2), pp.75-85.

Elliott, W.B. and Warr, R.S., 2003. Price pressure on the NYSE and Nasdaq: Evidence from S&P 500 index changes. *Financial Management*, pp.85-99.

Elliott, W.B., Van Ness, B.F., Walker, M.D. and Warr, R.S., 2006. What drives the S&P 500 inclusion effect? An analytical survey. Financial Management, 35(4), pp.31-48.

Erwin, G.R. and Miller, J.M., 1998. The liquidity effects associated with inclusion of a share to the S&P 500 index: Evidence from bid/ask spreads. Financial Review, 33(1), pp.131-146.

Fama, E.F. and French, K.R., 2012. Size, value, and momentum in international share returns. *Journal of financial economics*, *105*(3), pp.457-472.

Fernandes, M. and Mergulhão, J., 2016. Anticipatory effects in the FTSE 100 index revisions. *Journal of Empirical Finance, 37*, pp.79-90.

Frino, A. and Gallagher, D.R., 2001. Tracking S&P 500 index funds. The Journal of Portfolio Management, 28(1), pp.44-55.

Gabrielsen, A., Marzo, M. and Zagaglia, P., 2011. Measuring market liquidity: An introductory survey.

Gehrig, T., 1993. An information-based explanation of the domestic bias in international equity investment. The Scandinavian Journal of Economics, pp.97-109.

Goetzmann, W.N. and Garry, M., 1986. Does delisting from the S&P 500 affect share price? *Financial Analysts Journal*, *42*(2), pp.64-69.

Gordon, M.J., 1962. *The investment, financing, and valuation of the corporation*. Homewood, IL: RD Irwin.

Gowri Shankar, S. and Miller, J.M., 2006. Market reaction to changes in the S&P SmallCap 600 index. *Financial Review*, *41*(3), pp.339-360.

Griffith-Jones, S. and Ocampo, J.A., 2009. The financial crisis and its impact on developing countries (No. 53). working paper.

Hacibedel, B. and van Bommel, J., 2006, January. Do emerging market shares benefit from index inclusion? In *Money Macro and Finance (MMF) Research Group Conference*.

Hanaeda, H. and Sarita, T., 2001. Price and volume effects associated with a change in the Nikkei 225 index list: Evidence from the Tokyo Share Exchange. *Working Paper*, (68).

Harris, L. and Gurel, E., 1986. Price and volume effects associated with changes in the S&P 500 list: New evidence for the existence of price pressures. *The Journal of Finance*, *41*(4), pp.815-829.

Hau, H., Massa, M. and Peress, J., 2010. Do demand curves for currencies slope down? Evidence from the MSCI global index change. The Review of Financial Studies, 23(4), pp.1681-1717.
Hautcoeur, P.C., 2006. Why and how to measure stock market fluctuations? The early history of stock market indices, with special reference to the French case.

Hegde, S.P. and McDermott, J.B., 2003. The liquidity effects of revisions to the S&P 500 index: An empirical analysis. Journal of Financial Markets, 6(3), pp.413-459.

Huang, W., Chakrabarti, R., Lee, J. and Jayaraman, N., 2002, May. The 'Index Effect 'on Share Prices and Trading Volumes: International Evidence. In EFMA 2002 London Meetings.

Huang, W., Chakrabarti, R., Jayaraman, N. and Lee, J., 2015. Price and Volume Effects of Changes in MSCI Indices-Nature and Causes. Available at SSRN 664185.

Hung, C.W. and Shiu, C.Y., 2016. Trader activities, ownership, and stock price reactions to MSCI standard index changes: Evidence from Taiwan. Journal of Multinational Financial Management, 36, pp.49-63.

Huij, J. and Kyosev, G., 2016. Price Response to Factor Index Inclusions and Deletions. Available at SSRN 2846982.

Jain, P.C., 1987. The effect on share price of inclusion in or deletions from the S&P 500. *Financial Analysts Journal*, *43*(1), pp.58-65.

Kalay, A. and Loewenstein, U., 1985. Predictable events and excess returns: The case of dividend announcements. Journal of Financial Economics, 14(3), pp.423-449.

Kappou, K., Brooks, C. and Ward, C.W., 2008. A re-examination of the index effect: Gambling on inclusions to and deletions from the S&P 500's 'gold seal'. Research in International Business and Finance, 22(3), pp.325-350.

Kappou, K., Brooks, C. and Ward, C., 2010. The S&P500 index effect reconsidered: Evidence from overnight and intraday share price performance and volume. Journal of Banking & Finance, 34(1), pp.116-126.

Kang, J.K. and Stulz, R.M., 1997. Is bank-centred corporate governance worth it? A cross-sectional analysis of the performance of Japanese Company during the asset price deflation. *NBER working paper*, (w6238).

Katzke, N. and Van Tiddens, C., 2019. FTSE/JSE Index migration: Testing for a tradeable index effect. Investment Analysts Journal, 48(4), pp.298-317.

Katzke, N. and Van Tiddens, C., 2019. FTSE/JSE Index Migration: Testing for the Index Effect in Stocks Entering and Exiting the Top 40 (No. 10/2019).

Kaul, A., Mehrotra, V. and Morck, R., 2000. Demand curves for shares do slope down: New evidence from an index weights adjustment. The Journal of Finance, 55(2), pp.893-912.

Kenton, W. (2023). MSCI. Investopedia. Available at: https://www.investopedia.com/terms/m/msci.asp.

Kot, H.W., Leung, H.K. and Tang, G.Y., 2015. The long-term performance of index inclusions and deletions: Evidence from the Hang Seng Index. International Review of Financial Analysis, 42, pp.407-420.

Kruger, R. and Toerien, F., 2013. The impact of index migrations on share prices: Evidence from the Johannesburg Share Exchange. Journal of Applied Business Research (JABR), 29(6), pp.1861-1872.

Lamoureux, C.G. and Wansley, J.W., 1987. Market effects of changes in the Standard & Poor's 500 index. Financial Review, 22(1), pp.53-69.

Lesmond, D.A., Ogden, J.P. and Trzcinka, C.A., 1999. A new estimate of transaction costs. The review of financial *studies*, *12*(5), pp.1113-1141.

Lin, E.C., 2018. The effect of Dow Jones industrial average index component changes on stock returns and trading volumes. The International Journal of Business and Finance Research, 12(1), pp.81-92.

Liu, S., 2000. Changes in the Nikkei 500: New evidence for downward sloping demand curves for shares. *International Review of Finance*, *1*(4), pp.245-267.

Lynch, A.W. and Mendenhall, R.R., 1997. New evidence on share price effects associated with changes in the S&P 500 index. *The Journal of Business*, *70*(3), pp.351-383.

MacKinlay, A.C., 1997. Event studies in economics and finance. Journal of economic literature, 35(1), pp.13-39.

Madhavan, A. and Ming, K., 2002. The hidden costs of index rebalancing: A case study of the S&P 500 composition changes of July 19, 2002. ITG Inc.

Malkiel, B.G., 2017. Index Funds Still Beat ‘Active ‘Portfolio Management. WALL ST. J, p.17.

Mase, B., 2007. The impact of changes in the FTSE 100 index. *Financial Review*, *42*(3), pp.461-484.

Masse, I., Hanrahan, R., Kushner, J. and Martinello, F., 2000. The effect of inclusions to or deletions from the TSE 300 Index on Canadian share prices. Canadian Journal of Economics/Revue canadienne d'économique, 33(2), pp.341-359.

Mazouz, K. and Saadouni, B., 2007. The price effects of FTSE 100 index revision: what drives the long-term abnormal return reversal? *Applied Financial Economics*, *17*(6), pp.501-510.

Merton, R.C., 1987. A simple model of capital market equilibrium with incomplete information.

Miller, C. and Ward, M., 2015. The market impact on shares entering or leaving JSE indices. Investment Analysts Journal, 44(1), pp.84-101.

Morck, R. and Yang, F., 2001. The mysterious growing value of S&P 500 membership (No. w8654). National Bureau of Economic Research.

Morgan Stanley (2023). *Our Company History*. [online] Morgan Stanley. Available at: https://www.morganstanley.com/about-us/history.

Moskowitz, T.J., 2000. Mutual fund performance: An empirical decomposition into share-picking talent, style, transactions costs, and expenses: Discussion. The Journal of Finance, 55(4), pp.1695-1703.

Nedelka, J. (2019). Index Industry Association's Third Annual Survey Finds 2.96 Million Indexes Globally. Available at: https://www.businesswire.com/news/home/20191015006005/en/Index-Industry-Association%E2%80%99s-Third-Annual-Survey-Finds-2.96-Million-Indexes-Globally.

Obstfeld, M. and Rogoff, K., 2009. Global imbalances and the financial crisis: products of common causes. Available at SSRN 1533211.

Opong, K.K. and Hamill, P.A., 2004. *Spot market effects surrounding compositional changes to the FTSE 100: Transitory or permanent*. Working paper. Queen's University Belfast, Belfast.

Parthasarathy, S., 2010. Price and volume effects associated with index inclusions: Evidence from the Indian Share Market. Asian Journal of Finance & Accounting, 2(2), p. E4.

Patel, N. and Welch, I., 2017. Extended stock returns in response to S&P 500 index changes. The Review of Asset Pricing Studies, 7(2), pp.172-208.

Patell, J.M. and Wolfson, M.A., 1979. Anticipated information releases reflected in call option prices. Journal of accounting and economics, 1(2), pp.117-140.

Peerbhai, F., 2020. The impact of Exchange Traded Funds on the microstructure of their constituent shares: A South African case (Doctoral dissertation, UNIVERSITY OF KWAZULU-NATAL).

Petajisto, A., 2008. Selection of an optimal index rule for an index fund. *Available at SSRN 1264698*.

Petajisto, A., 2011. The index premium and its hidden cost for index funds. Journal of Empirical Finance, 18(2), pp.271-288.

Platikanova, P., 2008. Long-term price effect of S&P 500 inclusion and earnings quality. *Financial Analysts Journal*, *64*(5), pp.62-76.

Pruitt, S.W. and Wei, K.J., 1989. Institutional Ownership and Changes in the S&P 500. The Journal of Finance, 44(2), pp.509-514.

Pullen, D. and Gannon, G., 2007. The index effect: An investigation of the price, volume and trading effects surrounding changes to the S&P Australian indices.

Rahman, A. and Rajib, P., 2014. Associated effects of index composition changes: an evidence from the Managerial Finance.

Rahman, A. and Rajib, P., 2018. Index Revisions, Stock Liquidity and the Cost of Equity Capital. Global Business Review, 19(4), pp.1072-1089.

Rena, R. and Msoni, M., 2014. Global financial crises and its impact on the South African economy: A further update. Journal of Economics, 5(1), pp.17-25.

Rigamonti, S. and Barontini, R., 2000. Share index futures and the effect on cash market in Italy: evidence from changes in indexes' composition.

Roll, R., 1984. A simple implicit measure of the effective bid-ask spread in an efficient market. The Journal of finance, 39(4), pp.1127-1139.

Rosenstein, S. and Wyatt, J.G., 1990. Outside directors, board independence, and shareholder wealth. Journal of financial economics, 26(2), pp.175-191.

Selvam, M., Indhumathi, G. and Lydia, J., 2012. Impact on stock price by the inclusion to and deletions from CNX nifty index. Global Business Review, 13(1), pp.39-50.

Shleifer, A., 1986. Do demand curves for shares slope down? The Journal of Finance, 41(3), pp.579-590.

Simons, M.J., The Price effect and Beta changes of stocks added to or deleted from the MSCI Emerging Markets Index.

Stulz, R., 1981. A model of international asset pricing. Journal of financial economics, 9(4), pp.383-406.

Thielmann, K.H., The winner’s curse: Why successful mutual funds are bound to fail.

Utami, Y., 2019. Indeks Saham Syariah Indonesia: Pergerakan Harga dari Perspektif Asimetri Informasi. Jurnal Inovasi Ekonomi, 4(02).

Vespro, C., 2006. Share price and volume effects associated with compositional changes in European share indices. European Financial Management, 12(1), pp.103-127.

Vijh, A.M., 1994. S&P 500 trading strategies and share betas. The Review of Financial Studies, 7(1), pp.215-251.

Wang, C., Murgulov, Z. and Haman, J., 2015. Impact of changes in the CSI 300 Index constituents. Emerging Markets Review, 24, pp.13-33.

Wermers, R., 1999. Mutual fund herding and the impact on share prices. the Journal of Finance, 54(2), pp.581-622.

White, W.R., 2012. Ultra easy monetary policy and the law of unintended consequences. real-world economics review, 1(1), pp.19-56.

Widyawati, K.A. and Wibowo, B., 2021. The Effect of Inclusion and Deletions Indexes Towards LQ45 and MSCI Index on the Pattern of Stock Return and Stock Trading Volume.

Woolridge, J.R. and Ghosh, C., 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), pp.13-24.

Wurgler, J. and Zhuravskaya, E., 2002. Does arbitrage flatten demand curves for shares?. The Journal of Business, 75(4), pp.583-608.

Xie, W., 2013. Media coverage, analyst recommendation upgrade and information content of inclusions into S&P indexes. Investment Management and Finance innovations 10 (1.).

Yildiz, S.B. and Dia-Eddine, K., 2016. Market response to the inclusion and deletion of participation index: Evidence from Turkey. Journal of Islamic Economics, Banking and Finance, 12(4), pp.211-224.

Yun, J. and Kim, T.S., 2010. The effect of changes in index constitution: Evidence from the Korean stock market. International Review of Financial Analysis, 19(4), pp.258-269.

Zhang, J., Lin, E.C. and Shin, H., 2010. S&P 500 Index inclusions and analysts' forecast optimism. The Journal of Investing, 19(4), pp.50-57.

Zhou, H., 2011. Asymmetric changes in share prices and investor recognition around revisions to the S&P 500 index. Financial Analysts Journal, 67(1), pp.72-84.

APPENDIX A

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.175583
R Square	0.030829
Adjusted R Squar	-0.04372
Standard Error	0.003242
Observations	15

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regression	1	4.35E-06	4.35E-06	0.413529	0.531363
Residual	13	0.000137	1.05E-05		
Total	14	0.000141			

	Coefficients	*andard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	-0.02247	0.002394	-9.38611	3.73E-07	-0.02765	-0.0173	-0.02765	-0.0173
Additions (x)	-0.07378	0.114728	-0.64306	0.531363	-0.32163	0.174077	-0.32163	0.174077

RESIDUAL OUTPUT

Observation	*ted Deletic*	*Residuals*	*dard Residuals*
1	-0.02302	-0.00589	-1.88554
2	-0.02318	0.002404	0.769593
3	-0.02294	0.003565	1.141339
4	-0.02359	0.002643	0.846258
5	-0.02353	-0.00217	-0.69503
6	-0.02376	-0.00338	-1.08263
7	-0.02403	-0.00282	-0.90187
8	-0.02422	-0.00126	-0.40186
9	-0.02425	-0.00014	-0.04404
10	-0.02403	0.003887	1.244506
11	-0.02421	0.004763	1.524812
12	-0.02443	-0.00058	-0.18565
13	-0.02425	-0.00017	-0.05577
14	-0.02451	0.002044	0.654364
15	-0.02478	-0.0029	-0.92848

PROBABILITY OUTPUT

Percentile	*eletions (y)*
3.333333	-0.02891
10	-0.02768
16.66667	-0.02715
23.33333	-0.02684
30	-0.0257
36.66667	-0.02547
43.33333	-0.02501
50	-0.02442
56.66667	-0.02439
63.33333	-0.02246
70	-0.02094
76.66667	-0.02078
83.33333	-0.02014
90	-0.01945
96.66667	-0.01938