DOI: https://doi.org/10.57125/FEL.2024.12.25.09

How to cite: Faez Hasan, M., Hussein Neama, N., & Rabee Hadi, M. (2024). Optimising Stock Market Indices for Emerging Economies: An Empirical Study of the Iraqi Stock Exchange. *Futurity Economics&Law, 4*(4). 154-170. https://doi.org/10.57125/FEL.2024.12.25.09

Optimising Stock Market Indices for Emerging Economies: An Empirical Study of the Iraqi Stock Exchange

Mohammed Faez Hasan*

Associate Professor, Dr., Finance and Investment Department, Faculty of Management and Economics, Kerbala University, Kerbala, Iraq, https://orcid.org/0000-0002-4579-3214

Nagham Hussein Neama

Professor, Dean of College, Dr.,Economics of Investment and Business Management Department, College of Business Economics, Al-Nahrain University, Baghdad, Iraq, https://orcid.org/0000-0003-3953-1581

Maithem Rabee Hadi

Professor, Dr., Financial Management Department, Faculty of Management and Economics, Kerbala University, Kerbala, Iraq, https://orcid.org/0000-0001-8216-230X

***Corresponding Author**: *mohammed.faiz@uokerbala.edu.iq*

Received: July 6, 2024 | **Accepted:** September 30, 2024 | **Available online:** October 22, 2024

Abstract: This research explores the efficiency of different ways to construct a stock market index in the Iraqi Stock Exchange (ISX) context, an emerging market with unique traits. Five methods are considered: Price-Weighted Index (PWI), Equal-Weighted Index (EWI), Geometric Mean Index (GMI), Risk-Weighted Index (RWI) and Volatility-Weighted Index (VWI). The ISX60 index is used as a benchmark against their performance. The study employs 57 stocks listed on the ISX from August 2022 to August 2024, covering two years. We examine each method's stability, performance, and representativeness through graphical analysis and comparative evaluation when building an index. The results indicate that broader indices with more components show higher stability under all constructions. GMI works well in tracking general trends across the market, while RWI and VWI appear

effective at controlling risk and reducing exposure to volatile assets, respectively. It also underscores diversification as critical for constructing indices and tradeoffs between representation versus stability in emerging markets. Such insights enhance understanding of how indices can be created in developing financial systems and have practical implications for investors, policymakers, and financial analysts operating within Iraqi or similar emerging economy settings.

Keywords: Stock Market indexes, Iraq Stock Exchange, ISX, Price-Weighted Index, emerging economies.

Introduction

In the financial world, stock market indices act as economic health indicators and provide benchmarks for evaluating investment performance. These metrics have come a long way since 1896, when the Dow Jones Industrial Average (DJIA) was created; however, many methods still need development to fix past problems and account for more complicated market behaviours (Shoven & Sialm, 2000). How stock market indices are built remains an active area of study because it affects what people think about how sound markets are doing and what they should do with their money (Arnott et al., 2005). The Iraq Stock Exchange (ISX) was established in 2004 and is a growing market with specific features and problems. When the country's economy is still expanding and attracting international investors, it becomes increasingly necessary to have representative stock market indicators, too. Among them, the Iraqi Stock Exchange (ISX60) is a general indicator of how well markets perform, although some say it does not sufficiently consider all aspects of such an environment (Faraj, 2021).

This research evaluates different methods for building indices on the Iraqi Stock Exchange. The study looks at five strategies, namely, Price Weighted Index (PWI), Equal Weighted Index (EWI), Geometric Mean Index (GMI), Risk Weighted Index(RWI)and Volatility Weighted Index(VWI). It also seeks to understand what each method brings out concerning strengths and weaknesses when representing the Iraqi stock market. Each of these approaches gives us another way of looking at behaviour within markets having implications for investment strategy and risk management (Chow et al., 2011).

The Price-Weighted Index represents the DJIA. It is one of the simplest and oldest methods. However, other methods have been developed because they tend to overrepresent high-priced stocks (Siegel, 2022). The Equal-Weighted Index overcomes this limitation by giving equal importance to all stocks that make up the index; this could ensure a better representation of smaller-cap stocks (Dash & Loggie, 2008). Indications of long-term growth rates are found in the Geometric Mean Index, with Risk-Weighted Index and Volatility Weighted Indicators accounting for risks and price fluctuations to create more stable indices (Choueifaty & Coignard, 2008; Jacobs et al., 2015). With a focus on the Iraqi Stock Exchange, this research aims to contribute towards understanding how various methods work in developing economies when constructing indices. In such an exceptional economic situation, the study also examines how weighting affects indexes' stability, performance and representativeness. This is because there has been an increasing interest in investing within emerging markets coupled with the need for reliable benchmarks (Bekaert et al., 2023).

Research Problem

The Iraqi Stock Exchange (ISX), established in 2004, offers an equal measure perspective of an emerging market with peculiarities and difficulties. The ISX uses only the ISX60 index as an indicator of market activity, which may not be sufficient based on the structural and dynamic nature of such a developing financial market. This singular approach to market representation potentially leads to an incomplete view of market success portrayals and a lack of placing the market in context. This would, however, be useful in establishing more robust market indicators scaled within the Iraqi Stock Exchange context. The focus of this research will seek to bridge these gaps by introducing and testing five different

indexing methods (Price-Weighted, Equal-Weighted, Geometric Mean, Risk-Weighted, and Volatility-Weighted) against the ISX60, measuring their effectiveness with varying sample sizes, and examining the efficacy of these indexers given the peculiarities of this emerging market- the ISX. As such, this study seeks to see what index construction looks like within the scope of liquid emerging markets and provide practical recommendations for facilitating the enhancement of market representation within ISX, which may subsequently lead to improved market productivity and both internal and external investor participation.

Research Focus

Over the period between August 2022 and August 2024, researchers employed a sample that consisted of fifty-seven stocks listed on ISX60. We want our findings to provide more comprehensive insights into what happens if we create indexes using different approaches vis-a-vis ISX60 in an emerging market context. The conclusions of this research may apply to investors who operate at or deal with the Iraqi stock market. Policymakers and financial analysts are also working on other parts of international capital markets, especially where new frontiers are being explored through investments involving countries considered part of frontier regions.

Research Aim and Research Questions

The purpose of the current is to examine several indexing approaches within the Iraq Stock Exchange and unveil whether the index of the Iraq Stock Exchange (ISX60) performs perfectly and accurately in terms of market performance direction compared to the studied approaches. Therefore, we can suggest the most optimised index that reflects the daily movements and reactions of market conditions interactively. Consequently, the main research question is whether the current index (ISX60) is the best index construction approach that reflects truly and actively all Iraq stock exchange performance or whether there is another index construction superior to the current in action.

Literature Review

For many years, stock market indexes have been seen as precious tools for measuring and evaluating the performance of financial markets. These indicators serve as thermometers of economic health that can tell investors, analysts and policymakers a lot about what is happening with world investment trends and general economic conditions. The history of developing stock market indices goes back one hundred years to when Charles Dow created the Dow Jones Industrial Average (DJIA) in 1896 (Shoven & Sialm, 2000). Then, with time, their number has grown enormously. Markets aren't just represented by time; they are compared to other investments measured against it used to evaluate performance and even create products from etcetera. According to Arnott et al. (2005), many problems and prejudices were encountered in traditional approaches; therefore, they should be replaced by new methods which are more complicated in their construction but more extensive in size to cover more expansive geographical representation areas that can involve all people at once because different individuals have different earning powers or saving levels as mentioned in the same work (Duterme, 2023).

One of the simplest methods for index creation is a price-weighted index (PWI), as DJIA has done! Each stock in the list gets assigned a weight based on its absolute cost. Thus, more expensive stocks significantly influence moving our index value higher or lower than cheaper ones. However, some critics say that this kind of weighting can end up overweighting high-priced stocks regardless of whether they genuinely are overvalued or not undervalued compared to their peers. Siegel (2022) said different things altogether because we're trying for equal representation across the board, weren't we? That's why those alternative weightings were proposed, which tried achieving just that suitable – evening out representation across an entire market instead of letting a few companies dominate the whole thing again. But all said and done, PWI still has flaws even though some big-time players use it daily, merely habitually more than anything else (Fernholz et al., 1998).

The creation of the Equal-Weighted Index (EWI) method was stimulated by the restrictions that price-weighted indexes had. The EWI gives equal weights to each stock regardless of its market capitalisation or price, thus seeking broader market representation with lower risk due to concentration in large caps (Dash & Loggie, 2008). According to studies, EWIs tend to outperform other indices weighted by market capitalisation over time, mainly when dealing with mean-reverting markets like those described (Plyakha et al., 2012). This performance is explained by its implicit contrarian strategy; this means that rebalancing is done regularly to maintain equal weights, which forces purchases when prices are low and sales when prices are high. Nevertheless, critics argue that these indices may not reflect the actual structure of the economy. Also, Chow et al. (2011) pointed out higher turnover costs could be incurred due to frequently rebalancing them.

The Geometric Mean Index (GMI) is a less common but more exciting approach for constructing indices theoretically. Carter and Van Auken (1990) observed that GMIs try to accurately estimate the central tendency of stock price movement, particularly in situations where data has multiplicative rather than additive properties; hence, they should use geometric averages instead of arithmetic ones. Long-term growth rates and compounded returns are better captured by the GMI method, making it valuable for certain types of financial analysis. However, because it is complex and values cannot be interpreted easily, Elton and Gruber (1974) noted limited application within mainstream index construction.

The Risk-Weighted Index (RWI) methodology is more complicated than the average index construction approach because it incorporates risk measures into the weights of the stocks. The main goal of this strategy is to assign more significant weightings to less risky stocks to create a stable index that may provide for better risk-adjusted returns (Choueifaty & Coignard, 2008). This is based on the modern portfolio theory, which considers risk control when making investment decisions. Many researchers have shown that RWIs are widely recognised for their ability to safeguard investments during bearish markets while still having the potential to earn more in bullish times when prices rise (Amenc et al., 2012). However, what makes one tool better than another under constant conditions or adaptable across different stages of a turbulent economy's development is its accuracy in measuring risks combined with this quality at various moments throughout variable periods over any stage during coming out from instability (Clarke et al., 2013).

One way to control risk is through the Volatility Weighted Index (VWI) technique. It's a method of calculating weightings in which stock prices serve as one of the variables. The VWI doesn't take stocks at face value; instead, it emphasises low-volatility ones so that indices won't shake too much when there are big moves in markets or any sudden jerks caused by extreme events within them (Jacobs et al., 2015). Because of this, it may be beneficial for highly volatile markets, especially during stressful periods. Many studies indicate that such indexes can provide higher returns adjusted for risk than traditional market cap-weighted benchmarks while reducing drawdowns substantially (Li et al., 2019). However, similar to RWIs, accurate long-term forecasting is challenging due to problems associated with correctly predicting volatilities; thus, the effectiveness of VWIs depends on their forecasts' accuracy and the persistence of patterns for these forecasts (Han et al., 2016). The methodology for constructing stock market indices has shifted over time according to the development of financial theories and the evolution of the markets (Bonanno et al., 2000). Indices developed in the past heavily depended on either price-weighted indices or market cap weightage. Still, over the years, other schemes have emerged that seek to address the defects that have long been complained about in the previous methods (Dávila & Parlatore, 2023). Other sub-indices, such as equal-weighted, fundamentally weighted, and factor-based indices, have been developed, each taking a slightly different view of the performance of the market and its risk-return profile.

The emergence of innovative beta strategies that seek to exploit particular characteristics or shortcomings of the markets has augmented the family of indices even further. Such strategies usually entail index construction around so-called 'factors' such as value, momentum, quality, low volatility, etc.

(Asness et al., 2019). Smart beta indices have become a reality, and the management of investments seems to be void of any boundaries between active and passive investing. Such strategies offer investors higher returns or lower risk than market cap-weighted indices (Lim et al., 2023).

In light of robust international capital flows, the developing stock markets today encounter various difficulties and prospects regarding the formation and use of stock market indices. Some examples include higher fluctuation, limited liquidity, and underdeveloped institutional regulations (Bekaert et al., 2023). Hence, constructing indices for emerging markets requires such consideration to capture market movements and instability (Gil-Alana et al., 2020). Moreover, it is not only to invest that stock market indices help emerging economies. Considerable economic activities are well signified by such stock market indices and even point towards a developing financial sector (Levine & Zervos, 1998). With the enhancement of globalisation in the financial markets, there came the invention of international and regional indices, which contribute to the ease of comparison and movement of investments across borders, for example, The MSCI World Index, The FTSE Developed Market Index and others (Karolyi & Wu, 2018). Countries or a country's status concerning the indices' inclusion or exclusion would affect the amount of capital inflow into the country and the pace to which its markets grow, which is essential for developing economies like Tanzania, which is in pursuit of drawing more foreign investments (Junior et al., 2015).

Nothing seems to be out of the question in the modern-day construction industry. High proficiency and analytical talent led to adapting, calculating, and broadcasting the stock market indices to the new realities (O'Hara, 2015). Furthermore, the emergence of big data and artificial intelligence provided new opportunities for constructing indices of a different kind, such as indices on the sentiment scale derived from other data sources, including mass media (Bartram et al., 2020). It is impossible to overstate the importance of stock market indices in developing financial instruments. Index-related financial products, sometimes as futures, options, and structured products, have become commonplace in capital markets for traders/manage investors to hedge, speculate and manage portfolios (Statman, 2014). In particular, the development of the exchange-traded fund (ETFs) industry has been persistent with the advancement of stock market indices as it enables the holders of ETFs to broaden their access to different levels within the market (Ben-David et al., 2017).

Nonetheless, this growing dependence on indices in making investment decisions and developing products has also raised concerns about market distortions and systemic risks emanating from such practices. Also, it is argued that any over-dependence on index investing will cause a level of stock correlation with the rest of the correlation, boosting the volatility of the markets during stress (Wurgler, 2012). Meanwhile, having most assets on a few standard indices can lead to liquidity risks and affect market price discovery (Barberis et al., 2005). The past several years have witnessed a growing emphasis on the governance of stock market indices and their regulation, particularly after index manipulation and the index providers' apparent self-dealing (Duffie & Stein, 2015). For instance, the EU Benchmark Regulation aims to stave off index construction or management for derivates that cannot be objectively established, as respect relates to the fact that these derivates are very important to an economic system (Rauterberg & Verstein, 2012).

Anticipating such strategies, it stands to reason that market indices will continue evolving due to technological advances, new market structures, and changing investor behaviour. In this context, the increase in social impact investing is becoming the main drive for a new trend - incorporating environmental particularities into the index construction methodologies (Berg et al., 2022). Also promising is the use of blockchain technology in calculating and disseminating indices, which could improve transparency and reduce risks of hidden objectives (Yermack, 2017). Recent research has provided additional insight into the stock market indices and their use for diversification purposes in investment portfolios. David et al. (2021) analysed the global country stock indexes' bounce back from this shock after the pandemic, offering some clues on how aggressive specific markets can be in post-crisis periods. Their findings emphasise the need to incorporate the risks of pandemics in constructing

and managing indexes. Belanes et al. (2024) undertook a comparative study of Islamic and conventional stock market indexing and studied the possible benefits of such diversification. This paper contributes a further understanding of the elements of Islamic indices that are different from other indices and explains why an investor who wishes to deviate from the conventional investing style would seek to include an Islamic index-based fund in his portfolio.

The methods used in creating stock market indices suggest that people are constantly searching for a more precise, comprehensive and convenient benchmark. Every approach has pros and cons; it starts with simple price-weighted methods to sophisticated algorithms such as risk or volatility-weighted (de Dios-Alija et al., 2024). Their choice may significantly impact investment tactics and performance appraisal during market research. Since financial markets keep growing and acquiring new features, index constructors will need to make necessary changes to respond to these challenges appropriately according to different investors' needs analysts. Future studies might concentrate on combining machine learning with artificial intelligence technologies to create indexes that would be flexible enough to adapt and anticipate changes, thus revolutionising the perception of measuring (Gerlein et al., 2016; Guo & Polak, 2021).

Materials and Methods

Sample and Participants

This research aims to examine the performance of 57 stocks traded on the Iraq Stock Exchange (ISX) and the ISX60 index within two years from August 2022 through August 2024. This data was taken from Investing.com, which contains the daily closing price for each selected stock and ISX60. To make them comparable with other stock indexes being studied, all figures (hereafter) were adjusted by dividing them by one hundred or thousand, given that the base value for ISX60 is one thousand points.

Instruments and Procedures

The study created stock indices using five methods. Each method provided a different way of examining market activity.

Price-Weighted Index (PWI):

PWI is calculated by equation. one by considering the close price of the stock as the main driver for this approach:

$$IPW = \frac{\sum_{i=1}^{n} P_i}{D} \quad (1)$$

Pi: Price of the *i-th* stock.

n: Total number of stocks in the index.

D: Divisor used for adjustment to maintain continuity in the index value over time.

Equal-Weighted Index (EWI):

Each stock is given equal weight regardless of market capitalisation and calculated as the equation.2

$$EWI = \frac{1}{N}\sum_{i=1}^{N} P_i \quad (2)$$

Geometric Mean Index (GMI):

The index value is derived from the geometric mean of the stock prices as in the equation.3

$$GMI = \left(\prod_{i=1}^{N} P_i\right)^{\frac{1}{N}} \quad (3)$$

Risk-Weighted Index (RWI):

This index accounts for the risk associated with each stock, with lower-risk stocks having higher weights, and its value calculation is the following equation.4

$$RWI = \frac{\sum_{i=1}^{N} \frac{P_i}{\sigma_i}}{D} \quad (4)$$

σi: Volatility (standard deviation) of the *i-th* stock.

This index accounts for the risk associated with each stock, with lower-risk stocks having higher weights.

Volatility-Weighted Index (VWI):

Similar to RWI, this index emphasises stocks with lower volatility as exhibited by eqauition.5

$$VWI = \frac{\sum_{i=1}^{N} \frac{P_i}{volitility\ i}}{D} \quad (5)$$

Data Analysis

The Current study utilises a graphic analysis procedure to compare and analyse the performance of indices constructed with five different methods with respect to the ISX60 index across a given period of time. For each index, values are calculated based on given equations. Then, index values are plotted against time to show how each approach performed regarding volatility and general differences from other approaches towards building an index. All mentioned procedures are prepared using the Microsoft Excel application, beginning with preparing the dataset and ending with drawing the current study's graphs.

Results

Price-Weighted Index

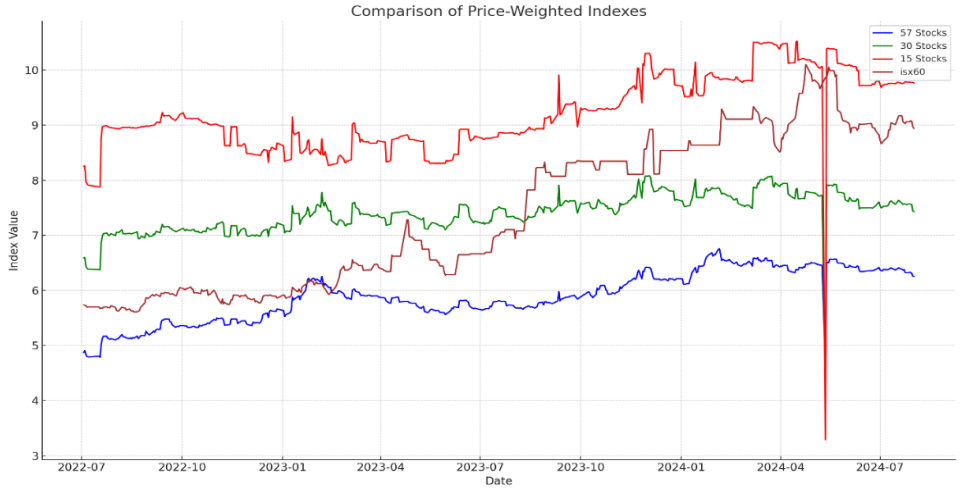
Comparatively analysing the price-based indexes, which include 57 Stocks, 30 Stocks, 15 Stocks, and the ISX60 index, offers several significant findings about how such indexes have performed during this period. Trajectories of the 57 Stocks Index, 30 Stocks Index, and 15 Stocks Index differed, indicating different levels of diversification and market capitalisation. The blue line represents the trend for the index with 57 stocks, which shows relatively stable growth interrupted by slight fluctuations in value over time. Its stability is because it has broader diversification; hence, each stock's volatility will not significantly affect it. Conversely, the green line is an index containing only thirty selected natural resource companies' shares listed at ISX. More ups and downs are shown on this line than any other lines representing indexes because these stocks were chosen from a narrower base, so they are highly responsive to changes in the general business environment compared to different types of portfolios used here. Consequently, there should be no surprise if we observe higher levels of risk associated with such investments. The red line represents fifteen shares traded on ISX that belong to the various sectors of the Iraq Stock Exchange. This portfolio also has some common stocks with those found in the other two categories, but their percentage weightings differ significantly.

The brown line in Figure 1 represents the ISX60 index, which has a different trend from other indexes. Its performance implies moderate volatility as it lies between the 57 Stocks index and the 15 Stocks index, which are wider and narrower, respectively. The behaviour of ISX60 may reflect what it is made up of or how this was done, i.e., beyond simple price weighting, like market cap weights or sector representation could be considered, hence leading to a unique performance pattern shown by such indices.

In general terms, this chart emphasises that diversification plays a vital role towards reducing index volatilities. When an index includes many stocks, individual movements cancel each other out more, resulting in stable outcomes. Conversely, because they track the fewest components' prices, narrow indexes experience huge swings triggered by those few firms' performances alone. Such a comparative study clearly shows that investment strategies within financial markets should consider the composition of indices and diversifications in risk management approaches.

Figure 1

Price–Weighted Index Timeframes



Source: Author's development.

Equal-Weighted Index

Figure 2, which compares the ISX60 index with 15 stocks, 30 stocks and 57 stocks equal-weighted indices, is full of interesting patterns and correlations. The primary observation from this graph is that the equal-weighted index of different stock samples is more volatile than the ISX60 index. This increased volatility can be explained by the method used in equal weighting, which does not consider market capitalisation, thus significantly enhancing smaller capriciousness shares to affect overall performance.

Particularly for the 15 and 30 stock samples, the equal-weighted indices display more pronounced fluctuations throughout the observed period. These frequently exhibit sharper peaks and troughs compared with the ISX60 index and 57 stock samples. This shows that when we talk about any equal-weighted index, a smaller sample size may make it more sensitive towards individual stock's movements, i.e., any single stock within the index will have a higher influence. On the other hand, an ISX60 index appears to be stable, meaning it is diversified and reflects a market cap weighting approach. This suggests that established, more extensive stocks with significant market capitalisations tend to play a major role in reducing the overall volatility of such an index. Its smoother trend line indicates that it could give a better signal for broader market performance because it is less susceptible to wild swings by small-cap volatile shares.

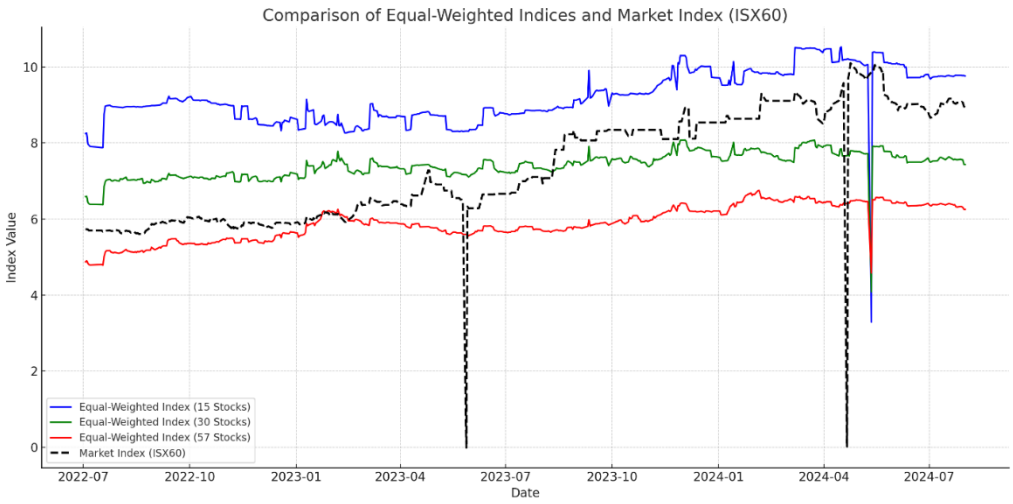
Moreover, there seems to be some convergence in long-term trends among all these indexes, although short-term divergences might exist at times. Throughout history, different weighting methods and sample sizes have been used. Still, they follow the same general direction over very long periods, showing how broader market forces affect various parts of it even where they are not expected to do so based on their construction alone.

The comparison demonstrates the trade-offs between equal-weighted and market-cap-weighted indices. Equal-weighted indices are more sensitive to smaller stocks, which results in higher volatility and may bring more significant returns during bullish markets. Conversely, market-cap-weighted indexes such as ISX60 are more stable, so they can be considered a better reflection of overall market

performance. This study shows that it is essential to consider the weighting scheme and several observations while interpreting the index's behaviour or making investment choices.

Figure 2

Equal-Weighted Indexes Timeframes



Source: Author's development.

Geometric Mean index

The behaviour and properties of different stock index designs are illustrated in Figure 3. It compares the Geometric Mean Indices for 15, 30, and 57 stocks against the Market Index (ISX60). Firstly, among the three indices mentioned above, the Geometric Mean Index for 57 stocks is the most stable as it closely follows the Market Index (ISX60). This means that when a more significant number of stocks are included in an index, individual stock volatilities cancel out each other, resulting in a more representative performance which tracks overall market trends over time. Moreover, this also implies a strong correlation between the broader range of securities selected and the true reflection of the general health of the market indicated by ISX60. On the other hand, the geometric mean index for 30 stocks has slightly higher volatility than that of 57 stocks, but it still shows stable performance on average. This moderate degree of stability suggests that although smaller groupings can capture broad market movements well enough, diversification benefits may not be fully realised at this level. Therefore, we learn from these findings that thirty shares indicate the importance of having enough numbers to compensate for variations caused by different shares.

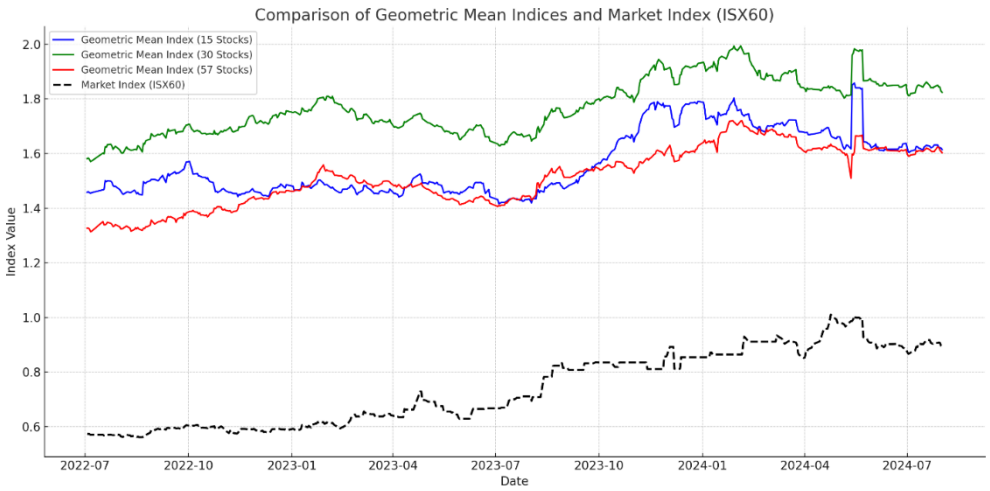
The blue line represents the Geometric Mean Index for fifteen stocks with the most instability out of all the indices examined. This increased volatility is unsurprising; smaller sample sizes are more sensitive to movements in individual stocks. The performance of this index, made up of fifteen different companies, shows how many businesses should be included in an index versus its resulting price swings. When fewer stocks are chosen, they become much more vulnerable to a single company's success or failure.

Diversification is critical across financial markets, as evidenced by these analyses themselves. The 57-stock index has proven less risky than its counterparts by showing excellent stability and lower fluctuation levels among values. This was achieved by including more shares into the portfolio, spreading risk between various corporations rather than concentrating it within one or two firms, as seen with 15 stock indices that tend towards higher volatilities due to narrow scope selection. As a result, broader-ranging measures like those containing 57 different companies will do better at following market indexes while reflecting over entire performance records across industries. This realisation validates the need for broad-based tracking, such as in this example, where fifty-seven

components were considered while recognising that diversifying investments is critical if stable returns are expected.

Figure 3

Geometric Mean Indexes Timeframes



Source: Author's development.

Risk-Weighted Index

According to Figure 4, in the comparative analysis of risk-weighted indexes for different samples of stocks, such as 57 Stocks, 30 Stocks, 15 Stocks and the ISX60 index, clear trends and patterns can be seen about their risk-adjusted performance throughout the given period. This chart tells us that the 57 Stocks index, represented by the blue line, is the least volatile trendline among these indices, which have been created with broad diversification so that there will not be any big swings in their values caused by one particular stock alone. Regarding fluctuations, the 30-stock index has more significant swings than the 57-stock index, shown in green. This increased volatility implies lesser diversification caused by fewer stocks used as a sample. Although relatively stable throughout history, this index also reacts more strongly to market movements, signifying that few options are available when dealing with broader risks involving a limited number of shares. The higher responsiveness indicates the need for broader baseness on the part of an index seeking improved risk management.

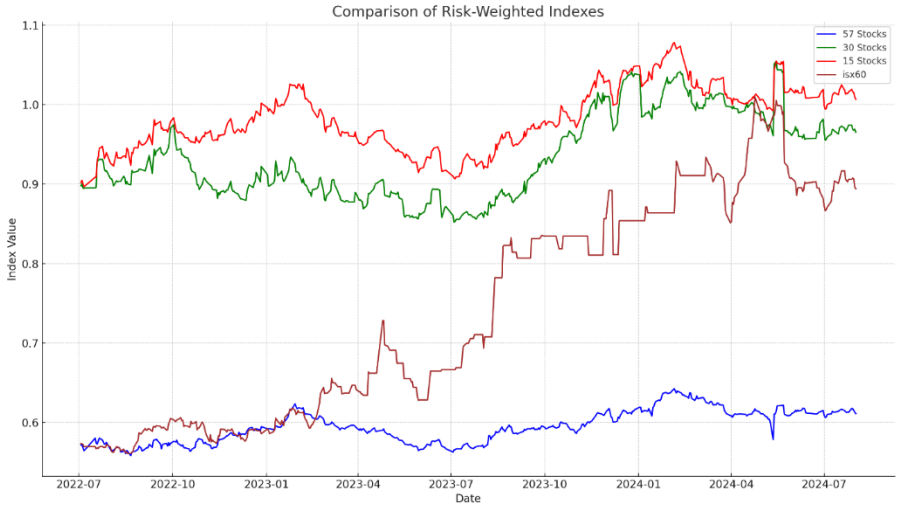
However, the index of 15 red stocks displays more volatility than any other asset class. This is evidenced by multiple peaks and valleys over the timeframe. These giant swings represent higher risk levels because they indicate fewer investments being spread out across various sectors or companies within those sectors. Additionally, its risk-adjusted returns vary significantly as it is more vulnerable to individual stock performances. This means there should be more comprehensive coverage but less uncertainty through improved selection diversifications among indices like ISX60, shown at this moment brown lines against the broader-based 57 stocks (green) line & narrower-based fifteen stocks (red) line, respectively.

The ISX60 is shown by brown lines, which is different from any other measure. The cause of its stability may be that it swings between 57 highly volatile indicators and 15 fairly non-volatile ones. This may happen because of what the index is made up of and how much each part counts towards the final number, such as giving more importance to more prominent companies according to their sizes or taking into account industry coverage among listed firms on these exchanges where shares trade every day locally while diversifying at this level. A medium risk level indicates an unbiased attitude to risk management regarding investment across different securities since they provide a tradeoff between broad-based diversification through shares of many companies and concentrated decisions based on a few selected enterprises' stocks. According to the chart, the most effective way to mitigate risk is by

expanding one's investments across various sectors or areas of industry. Diversification across numerous assets leads to broader-based indexes having lower volatility, like in the case of the 57 Stocks Index; however, if an investor decides against spreading out their money among many businesses but instead chooses a few single units, they believe will perform well individually, then greater price swings become inevitable as illustrated by 15-stocks Index. On the other hand, moderate fluctuations within ISX60 indicate a compromise between too much diversification and insufficient focus on individual companies.

Figure 4

Risk-Weighted Indexes Timeframes



Source: Author's development.

Volatility-Weighted Index

The main observation in Figure 5 is that the index is calculated on the weighted volatility principle for stock samples of 57, 30, and 15 against the ISX60 index over a given period. The graph provides insight into how these measures relate to the rest of the market represented by the ISX60 index.

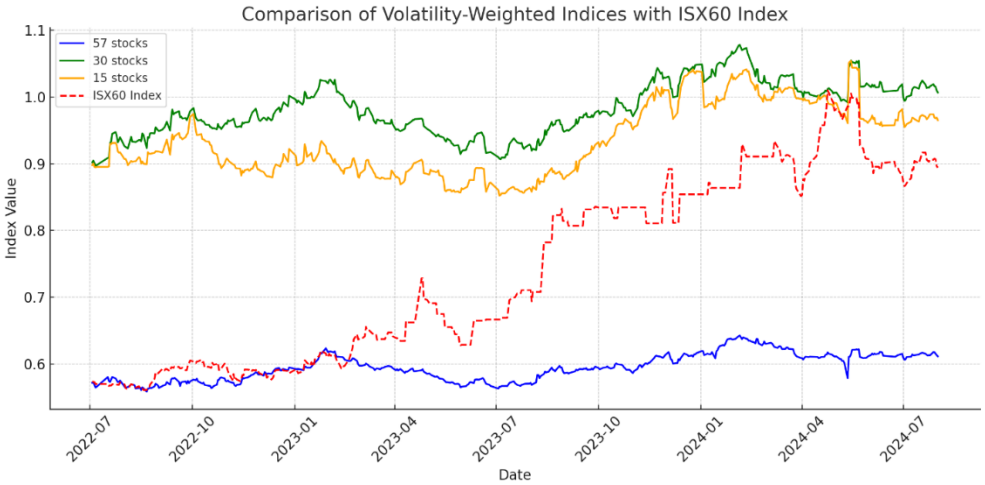
To start with, it can be seen that the indicators corresponding to 57 stocks as well as 30 ones and also those relating to fifteen stocks have shown a somewhat steady pattern throughout this period, i.e., only minor changes were recorded. This implies that such an approach stabilises them against big swings, usually observed in traditional financial market indices. Even though they may differ slightly, all three indexes indicate almost similar directionality, meaning size does not change much in any sample. However, it has some effect on them, thus suggesting common behaviour among underlying securities under consideration when applied under a weighted scheme of things.

Moreover, the volatility-weighted indices point in different directions from the ISX60 Index. ISX60 Index is more volatile because it moves up and down quickly, but this represents broader market movements and external factors not captured by volatility-weighted measures. Hence, other signals apart from ISX60 indicate that while it can react to events or sentiments across systems, each one does not represent all markets but provides safer readings regarding global markets yet conflicts with views about levels of volatility.

This chart shows that compared with conventional indicators like ISX60, those based on variation give consistent histories of how markets perform over time. Additionally, even considering different sample sizes here, it implies stability holds, thus indicating strength behind risk weighted. Therefore, according to this research, any investor who wants to hedge against sudden changes in prices or values caused by fluctuations within an economy should include indices based on volatilities in their investment strategies.

Figure 5

Volatility-Weighted Indexes Timeframes



Source: Author's development.

Discussions

This research aimed to answer three distinct questions principally within the framework of the Iraqi Stock Exchange (ISX): how the different methods of constructing the index perform comparatively against ISX60, how does the sample size of the index affect its performance and stability as well as the market, and whether risk-adjusted and volatility focusing indexing methods capture the specific nature of this emerging market. The results of this study are valuable for further understanding growing problems. According to our findings, the alternative index construction methodologies offer other facets besides the actual circumstantial ISX60 index. This agrees with the recent work by de Dios-Alija et al. (2024) that compared versatile models of the stock market within the sustainability context. In their case, the focus was on developed markets. Ours goes one step further and attempts the same analysis in an emerging market, which reveals specific challenges and opportunities peculiar to the developing financial system such as Iraq's. This is important because it emphasises the need for such extensions when constructing the index in markets likely to differ from developed markets. In this context, the EWI had a more extensive value range than the free-float adjusted one, yet captured smaller stocks better. This is consistent with Lim et al. (2023), who state that equal-weighted indices more effectively capture market movements in periods with high volatility. On the other hand, this paper takes a step further. It demonstrates this effect when increasing the sample size of the EWI analysis (15, 30 and 57 stocks), which adds layers to the understanding of EWI in emerging markets. This helps structural analysis, whereby, when looking at a country such as Iraq, the stock space is smaller and possibly more volatile than that of developed countries.

As for how the size of the sample affects the performance of the index based on these weighting methods, it has been noted that broader-based indices (on the order of 57 stocks) had a more stable performance across all the various sampling methods used, but perhaps at the price of honouring less the current movements of the market. In this respect, however, it is an interesting contradiction to the work of Belanes et al. (2024), wherein customary and Islamic stock indexing lesser but concentrated indices on some occasions tend to outperform the broader ones. Such differences, however, could explain this phenomenon in terms of the peculiar characteristics that the Iraqi market may have or perhaps factors that are concerned with the different approaches in indexing conventional versus Islamic stocks. It underlines an essential direction for future studies, especially in terms of how structural characteristics of the markets interchange and non-financial issues such as religion or culture may affect the optimal design of indexes in the context of different emerging markets.

However, our understanding of the development of the Risk-Weighted Index (RWI) and Volatility Weighted Index (VWI) for ISX pointed to their usefulness in risk management. Still, they were likely to be too conservative in the context of ISX. This view is partly corroborated by the analysis of Dávila and Parlatore (2023), who highlighted the ambiguous relationship between volatility and market informativeness. However, the central point relates to developed ones; thus, there is little evidence of how these relationships work in developing countries such as Iraq. The possibly unreasonable adoption of conservatism in this study regarding RWI and VWI leads to a looming question of how the appropriate risk appetite against emerging markets' growth opportunities can be achieved by balancing these two.

A severe weakness of prior works has been identified and explains several reasons why our effort is worthwhile. Whereas Duterme (2023) analysed the construction of stock market indices from the winner and loser's angles, the same study does not focus on emerging markets. We address this shortcoming by presenting robust evidence from Iraq to show how different approaches used in constructing stock market indices can produce different outcomes when measuring stock market performance in a developing country. This is important since it highlights the possible shortcomings and problems in using index methods developed for advanced economies in other less developed economies.

In addition, our research findings related to the Geometric Mean Index (GMI) add to the sparse literature in this regard. The GMI was reported earlier in developed markets. In recent years, however, a few studies have explored its potential in emerging economies with particular reference to the Middle East. It is suggested that in the framework of accompanying manufacturing and trading activities, expanding GMI will allow measuring long-term developmental trends in emerging economies, providing a new perspective for further studies. This is particularly important for markets such as the Iraqi economy, where the development trends might deviate from the usual growth patterns of developed countries.

There remain pretty several unexplored perspectives on this scientific problem that deserve attention. First, there is a need to research these alternative indices in more detail without time limits and covering various economic periods within the Iraq market. This studies how different indexing techniques can withstand the adversity of different economic environments. Second, the influence of intangible assets on index composition in a country dominated by an oil industry index is of particular interest. This may expose how index behaviour responds to the degree of concentration in a resource-rich economy. Third, opportunities exist to research the possibilities of using and improving hybrid index construction methods that merge a range of weighting strategies for better performance in emerging markets. Thus, this mixture of methods may enable the development of indices that would resist trends in the underlying market yet still be responsive to changes in the market conditions. Finally, the studies on the correlation between the market efficiency of emerging economies and the methods employed in constructing the stock indices seem to be highly understudied. This could yield insight into how different indexing strategies may help or follow the evolution of market efficiency over time.

More work might be done in the above areas in the future; this may also broaden the market potential for more effective and representative ones in the case of designated countries such as Iraq. These changes may prove beneficial in various ways for the market and international investors and authorities, enhancing the efficiency of the markets and the inflow of funds and total development of young financial markets. In an economically vigorously integrated world, it is undeniable that accurate and representative market indices will be desperately and keenly necessary in emerging economies; hence, this dynamic segment warrants further attention and creativity.

Limitations of the Study

While this study makes a significant contribution by outlining index construction techniques regarding the Iraqi stock exchange, it should be noted that there are a few limitations that may affect

the results obtained from their application. The analysis spans over two years, from August 2022 to August 2024, which, while helpful in understanding certain aspects, is likely, however, not sufficient to evaluate long-term trends or cycles. Although considerable, a sample of 57 stocks is only the central part of the total Iraqi market. Assessing the trends may exclude the effect of the smaller or more illiquid stocks. Reports obtained from Investing.com are reasonable but, of course, may contain things that are common with emerging market reporting. Focusing on Iraq only for the sake of the study without benchmarking to other emerging markets limits broader assertions relating to the development of an index in the context of developing economies. Besides, the research considers only price data, whereby external factors such as political incidents or world economy status, which might influence stock prices, are left out. Here, the practical application of the analysed factors is not considered as they do not regard transaction costs or liquidity constraints concerning the given indices. Finally, the comprehensive quantitative study, however, lacks impressions from market participants or players, which were qualitative and would have added value to the understanding of the topic under investigation.

Notwithstanding these limitations, the research offers valuable first steps towards alternative construction methods for the Iraqi Stock Exchange's stock market index. This can be a platform for future work that can overcome these limitations and take the knowledge of emerging market indices one step further.

Conclusions and Implications

This research looks at how different indexing methods work and what they are like in the context of an emerging market with unique difficulties: the Iraqi Stock Exchange (ISX). We have learnt that there may be better ways to show this growing financial system by studying five approaches, which include the Price-Weighted Index (PWI), Equal-Weighted Index (EWI), Geometric Mean Index (GMI), Risk-Weighted Index (RWI) and Volatility-Weighted Index (VWI) against ISX60 benchmark. Our results point out that making indexes needed diversification, especially when constructing them for use in less developed countries. However, broader-based indices were more stable but had the potential of not representing smaller stocks, which are more dynamic. The EWI offered a fairer market representation but with more significant fluctuations, bringing stability and comprehensive reflection to all market parts. With wider bases, GMI could track general trends within overall markets, thus indicating its relevance in capturing long-term growth patterns across economies that are still developing. Meanwhile, RWIs and VWIs have proved themselves valuable tools when dealing with risk management by reducing exposure towards volatility from investments made in various sectors.

These findings matter significantly to investors, policymakers and financial analysts in Iraq and other emerging markets. They indicate that constructing indexes in such markets should balance simplicity, risk-adjusted performance, and accuracy in representing the market as it is. With more changes taking place at ISX, there may be a need for advanced indices that can best capture its distinctiveness. Another research can build on this by looking into more extended periods, investigating sector-specific indexes or carrying out comparisons among different developing countries. In summary, what has been done here adds to what is already growing about building indices within economies considered up-and-coming, thereby giving insights into how well different methods work within the context of Iraq. So, gained understanding may become a base for more robust inclusive market indicators, eventually improving efficiency within Iraqi capital markets and leading to their expansion.

Suggestions for Future Research

For future academic works, it is recommended to study other index approaches that could be studied but with further requirements (specific data), like fundamental indexes and foreign shares of the outstanding listed firms. Suggestions for new approaches could be fruitful if they are based on several weighted index scenarios to find out the most volatility-sensitive index that could be engaged with the Iraqi Stock Exchange.

Acknowledgements

The authors have acknowledged the relationship officer of the Iraq Stock Exchange (Mrs. Jimmy Tooma) for her cooperation regarding reported official facts about the construction of ISX60 (the official index of the Iraq Stock Exchange).

Conflict of Interest

None.

Funding

The Authors received no funding for this research.

References

Amenc, N., Goltz, F., & Lodh, A. (2012). Choose your betas: Benchmarking alternative equity index strategies. *Journal of Portfolio Management, 39*(1), 88–111. https://doi.org/10.3905/jpm.2012.39.1.088

Arnott, R. D., Hsu, J., & Moore, P. (2005). Fundamental indexation. *Financial Analysts Journal, 61*(2), 83–99. https://doi.org/10.2469/faj.v61.n2.2718

Asness, C. S., Frazzini, A., & Pedersen, L. H. (2019). Quality minus junk. *Review of Accounting Studies, 24*(1), 34–112. https://doi.org/10.1007/s11142-018-9470-2

Barberis, N., Shleifer, A., & Wurgler, J. (2005). Comovement. *Journal of Financial Economics, 75*(2), 283–317. https://doi.org/10.1016/j.jfineco.2004.04.003

Bartram, S. M., Branke, J., & Motahari, M. (2020). *Artificial intelligence in asset management*. SSRN. https://doi.org/10.2139/ssrn.3692805

Bekaert, G., Harvey, C. R., & Mondino, T. (2023). Emerging equity markets in a globalized world. *Emerging Markets Review, 56*, Article 101034. https://doi.org/10.1016/j.ememar.2023.101034

Belanes, A., Saâdaoui, F., & Abedin, M. Z. (2024). Potential diversification benefits: A comparative study of Islamic and conventional stock market indexes. *Research in International Business and Finance, 67*, Article 102098. https://doi.org/10.1016/J.RIBAF.2023.102098

Ben-David, I., Franzoni, F., & Moussawi, R. (2017). Exchange-traded funds. *Annual Review of Financial Economics, 9*(1), 169–189. https://doi.org/10.1146/annurev-financial-110716-032538

Berg, F., Kölbel, J. F., & Rigobon, R. (2022). Aggregate confusion: The divergence of ESG ratings. *Review of Finance, 26*(6), 1315–1344. https://doi.org/10.1093/rof/rfac033

Bonanno, G., Vandewalle, N., & Mantegna, R. N. (2000). Taxonomy of stock market indices. *Physical Review E, 62*(6), R7615–R7618. https://doi.org/10.1103/PhysRevE.62.R7615

Carter, R. B., & Van Auken, H. E. (1990). Security analysis and portfolio management. *The Journal of Portfolio Management, 16*(3), 81–85. https://doi.org/10.3905/jpm.1990.409271

Choueifaty, Y., & Coignard, Y. (2008). Toward maximum diversification. *Journal of Portfolio Management, 35*(1), 40–51. https://doi.org/10.3905/JPM.2008.35.1.40

Chow, T. M., Hsu, J., Kalesnik, V., & Little, B. (2011). "A survey of alternative equity index strategies:" Author response. *Financial Analysts Journal, 67*(6), 16–20. https://doi.org/10.2469/faj.v67.n6.9

Clarke, R., De Silva, H., & Thorley, S. (2013). Risk parity, maximum diversification, and minimum variance: An analytic perspective. *Journal of Portfolio Management, 39*(3), 39–53. https://doi.org/10.3905/jpm.2013.39.3.039

Dash, S., & Loggie, K. (2008). *Equal weight indexing—five years later*. SSRN. https://dx.doi.org/10.2139/ssrn.1321726

David, S. A., Inácio, C. M. C., & Tenreiro Machado, J. A. (2021). The recovery of global stock markets indices after impacts due to pandemics. *Research in International Business and Finance, 55*, Article 101335. https://doi.org/10.1016/J.RIBAF.2020.101335

Dávila, E., & Parlatore, C. (2023). Volatility and informativeness. *Journal of Financial Economics, 147*(3), 550–572. https://doi.org/10.1016/j.jfineco.2022.12.005

de Dios-Alija, T., del Río Caballero, M., Gil-Alana, L. A., & Martin-Valmayor, M. (2024). Stock market indices and sustainability: A comparison between them. *Journal of Sustainable Finance and Investment, 14*(3), 642–657. https://doi.org/10.1080/20430795.2021.1896988

Duffie, D., & Stein, J. C. (2015). Reforming LIBOR and other financial market benchmarks. *Journal of Economic Perspectives, 29*(2), 191–212. https://doi.org/10.1257/jep.29.2.191

Duterme, T. (2023). The engineering of stock market indices: winners and losers. *Journal of Cultural Economy, 16*(1), 17–31. https://doi.org/10.1080/17530350.2022.2098513

Elton, E. J., & Gruber, M. J. (1974). Portfolio theory when investment relatives are lognormally distributed. *The Journal of Finance, 29*(4), 1265–1273. https://doi.org/10.1111/j.1540-6261.1974.tb03103.x

Faraj, M. M. (2021). The impact of financial development on economic growth in Iraq for the period (2004–2018): An analytical econometric study. *Journal of Economics and Administrative Sciences, 27*(126), 517–533. https://doi.org/10.33095/jeas.v27i126.2122

Fernholz, R., Garvy, R., & Hannon, J. (1998). Diversity-weighted indexing. *Journal of Portfolio Management, 24*(2), 74–82. https://doi.org/10.3905/jpm.24.2.74

Gerlein, E. A., McGinnity, M., Belatreche, A., & Coleman, S. (2016). Evaluating machine learning classification for financial trading: An empirical approach. *Expert Systems with Applications, 54*, 193–207. https://doi.org/10.1016/j.eswa.2016.01.018

Gil-Alana, L. A., Abakah, E. J. A., & Rojo, M. F. R. (2020). Cryptocurrencies and stock market indices. Are they related?. *Research in International Business and Finance, 51*, Article 101063. https://doi.org/10.1016/j.ribaf.2019.101063

Guo, H., & Polak, P. (2021). Artificial intelligence and financial technology FinTech: How AI is being used under the pandemic in 2020. *Studies in Computational Intelligence, 935*, 169–186. https://doi.org/10.1007/978-3-030-62796-6_9

Han, Y., Hu, T., & Yang, J. (2016). Are there exploitable trends in commodity futures prices?. *Journal of Banking and Finance, 70*, 214–234. https://doi.org/10.1016/j.jbankfin.2016.04.013

Jacobs, P. D., Bruce, I., & Levy, K. N. (2015). Smart beta: Too good to be true?. *Journal of Financial Perspectives, 3*(2). https://ssrn.com/abstract=3083567

Junior, L., Mullokandov, A., & Kenett, D. (2015). Dependency relations among international stock market indices. *Journal of Risk and Financial Management, 8*(2), 227–265. https://doi.org/10.3390/jrfm8020227

Karolyi, G. A., & Wu, Y. (2018). A new partial-segmentation approach to modeling international stock returns. *Journal of Financial and Quantitative Analysis, 53*(2), 507–546. https://doi.org/10.1017/S0022109017001016

Levine, R., & Zervos, S. (1998). Stock markets, banks, and economic growth. *American Economic Review, 88*(3), 537–558. https://www.jstor.org/stable/116848

Li, F., Chow, T. M., Pickard, A., & Garg, Y. (2019). Transaction costs of factor-investing strategies. *Financial Analysts Journal, 75*(2), 62–78. https://doi.org/10.1080/0015198X.2019.1567190

Lim, D. T. ., Goh, K. W. ., Sim, Y. W. ., Mokhtar, K. ., & Thinagar, S. . (2023). Estimation of stock market index volatility using the GARCH model: Causality between stock indices. *Asian Economic and Financial Review, 13*(3), 162–179. https://doi.org/10.55493/5002.v13i3.4738

O'Hara, M. (2015). High frequency market microstructure. *Journal of Financial Economics, 116*(2), 257–270. https://doi.org/10.1016/j.jfineco.2015.01.003

Plyakha, Y., Uppal, R., & Vilkov, G. (2012). *Why does an equal-weighted portfolio outperform value- and price-weighted portfolios?*. SSRN. https://doi.org/10.2139/ssrn.1787045

Rauterberg, G. V., & Verstein, A. (2012). Index theory: The law, promise and failure of financial indices. *Yale Journal on Regulation, 30*(1), 1–62. https://repository.law.umich.edu/articles/2302/

Shoven, J. B., & Sialm, C. (2000). The Dow Jones Industrial Average. *The Journal of Wealth Management, 3*(3), 9-18. https://doi.org/10.3905/jwm.2000.320332

Siegel, J. J. (2022). *Stocks for the long run: The definitive guide to financial market returns & long-term investment strategies* (6th ed.). McGraw-Hill Education.

Statman, M. (2014). Behavioral finance: Finance with normal people. *Borsa Istanbul Review, 14*(2), 65–73. https://doi.org/10.1016/j.bir.2014.03.001

Wurgler, J. A. (2012). *On the economic consequences of index-linked investing* (Working paper No. 16376). National Bureau of Economic Research. https://econpapers.repec.org/paper/nbrnberwo/16376.htm

Yermack, D. (2017). Corporate governance and blockchains. *Review of Finance, 21*(1), 7–31. https://doi.org/10.1093/rof/rfw074