

Research Article

Co-Movement and Integration among Stock Markets: A Study of 10 Countries

Nitesh S Vibhute¹, Jeelan Basha V², Haralayya Bhadrappa³

¹Assistant Professor, Faculty of Business Studies MBA, Sharnbasva University.

²Professor of Commerce, Vijayanagara Sri Krishnadevaraya University, Bellary.

³HoD and Associate Professor Department of MBA Lingaraj Appa Engineering College Bidar.

I N F O

Corresponding Author:

Nitesh S Vibhute, Faculty of Business Studies
MBA, Sharnbasva University.

E-mail Id:

niteshsv21@gmail.com

How to cite this article:

Jeelan BV, Haralayya B, Vibhute NS. Co-Movement and Integration among Stock Markets: A Study of 10 Countries. *J Adv Res Acct Fin Mgmt* 2021; 3(2): 23-38.

Date of Submission: 2021-10-28

Date of Acceptance: 2021-11-18

A B S T R A C T

A transparent market is important for economic growth of a country as it fosters investors' confidence that will induce them to invest their savings, which in turn, will be used for productive purposes. Over the years, the reforms in the financial markets of Asia, Latin America, Europe and Africa have introduced different policies in order to erect a solid regulatory architecture for financial markets. Furthermore, it is observed that these policy initiatives have eased to liberalize various segments of financial markets so as to attract investors both foreign and domestic. By and large JKSE as the only index has more than 10% average rate of return. However BSE is the most consistent index and hence it is more preference.

Keywords: Financial markets, Management, Foreign Investment, Stock Market, Investor Sentiment

Introduction

The stock market is the barometer for the economy of any country. Since many years, the stock market has been important for the economists, researchers, governments and policy makers. In past years, the Indian stock market has witnessed many ups and down with other International markets. Many well known researchers made attempts to study the co movement among the selected markets in the 1980s and 1990s (Cheung & Mak, 1992; Hilliard, 1979). Currently, a co-movement of stock markets is among the most popular topics in finance for research. The study existence of co-movement among International capital markets has serious implications over the economic policies of a nation. Till date, studies have not covered International economic events. In this study, the co-movement of 10 selected stock markets covering the period from January 1998 to January 2020 is examined. The selection of the time period was done considering various global ups & downs, global recession, growth of the world market, emergence

of new market in the world and so forth. This study aims at exploring the short and long term relationship between 10 stock exchanges.

In order to make financial markets transparent and vibrant to achieve confidence of the market participants, financial markets have undergone reforms over the last few decades. Financial markets should have depth and liquidity for trades to execute smoothly and to have lower bid-ask spread. A transparent market is important for economic growth of a country as it fosters investors' confidence that will induce them to invest their savings, which in turn, will be used for productive purposes. Over the years, the reforms in the financial markets of Asia, Latin America, Europe and Africa have introduced different policies in order to erect a solid regulatory architecture for financial markets. Furthermore, it is observed that these policy initiatives have eased to liberalize various segments of financial markets so as to attract investors both foreign and domestic. Different countries have established institutional frameworks to ensure that the stock markets are governed by corporate

governance, prudential norms, resolution mechanism and so forth so that the investors are protected. A well-developed financial market is imperative to have a sustained real economic growth.

Karim, Majid and Karim (2009) pointed out that integrated stock markets at regional levels are more efficient as compared to segmented markets. They opined that the study of stock market integration has an important role to play in portfolio diversification. They further maintained that financial market integration has its impact upon the stability of the overall economic system. The benefit of portfolio diversification can be thwarted if the stock markets are related in the long run. Thus, the study of market integration not only helps the investors, but is also important for policy makers to form suitable policies.

Raju and Khanpuri(2009) opined that in the recent past, emerging economies have received importance in the global market because of their ability to generate better risk adjusted returns as compared to their developed counterparts. They further argued that the emerging economies are comparatively distant from each other and also, they are little away from the developed markets. Thus, the emerging economies are not so affected by the shocks of other countries.

Yusof and Majid(2006) pointed out that interest on the study of stock market integration has increasingly grown since the market crash of 1987 and particularly after the Asian Financial crisis of 1997. They said that largely, there are two ways to measure market integration, that is, asset pricing and statistical standpoint . The law of one price states that if the financial markets of two different countries are integrated, then the price of same assets listed in two different market should be same since they have a similar risk profile. In such an integrated market, the arbitrage opportunity for the investors in minimal. From a statistical standpoint, stock market integration implies that two markets in different countries should have a long run equilibrium relationship between them. There might be temporary disequilibrium from this long run path, but there should be some common factor that will make the markets converge to the long run equilibrium path.

The present study tries to examine the issue of stock market integration for India and some of the selected countries of the globe using econometric approach. The thrust of the study is to analyze long run equilibrium relationship between India and the selected countries. The novelty of the study lies in the fact that it examines the long run co-movement of the India with as many as 33 other countries across the globe.

The last 2 decades have witnessed significant growth of the Indian economy. Globalization led India to make radical policy changes and open up to foreign investment

(FIIs). AS a result, FIIs increased their investment in India which led to great momentum in the Indian stock market. Financial reforms (LPG in 1993) resulted in expansion rates that were higher than those in last four decades. Undoubtedly, the Indian stock market has performed over the years and its contribution to the Indian economy is Unquestionable. However, whether the stock market is a true barometer of economic growth has been a moot point. Nevertheless, many researcher including Sinha and Macri (2001), Levine and Zervos (1996), Bhattacharya, Sarkar and Mukhopadhyay (2003), Arestis and Demetriades (1997) argued that there was a positive association between stock market performance and growth of economy.

Usually stock market performance is taken as an index of industry or corporate performance only but globalization has turned it into an indicator of economic development. It has now become a way to attract new and valuable financial sources for faster development. Paramati and Gupta (n.d.) asserted that the new economic policy of 1991 positively affected the Indian stock market and significantly contributed to the economic transformation. Financial management is a theory of funds allocation and effective utilization thereof so that remaining funds can either be retained and/or distributed to investors. Till the year 2000, Indian economy faced liquidity constraints but in the last 10 years, things have changed and impressive growth rates have been recorded at the stock market. This made the Indian economy one of the fastest developing markets.

Advanced financial management takes stock market theory as a concept of wealth maximization. This is evident by the past performance and exceptional growth of many corporations. Further, it is noteworthy that wealth maximization also contributes to profit maximization, if an organization raises its capital (equity or debt) for expansion, it might lead to a positive sentiment in the market raising the value of the organization's shares, thus increasing wealth without necessarily earning profits. This raises the question: what kind of analysis would correctly explain such behavior, technical or fundamental?

Post financial reforms the Indian stock market has been driven more by foreign investment rather than domestic investment. Researchers such as Mukherjee and Coondoo (2002), Mangesh and Rao (2011), Murthy and Singh (2013) verified the statement. The question raised here is: Why domestic investor don't invest more in the stock market? A possible answer to this question might be that the erratic and unstructured return behaviors of Indian indices are not able to gain the trust of investors. The absence of scientific study or established tools to provide true estimation of set returns further compounds the problem. For investors, various indices are available at Indian stock exchanges including BSE and NSE, but a method

of rational estimation of these indices does not exist, which increases the risk factor. Karmakar (2005) also emphasized on the necessity of a framework that offered inter linkage among Indian stock market indices as they operate under different cultural, institutional and regulatory functions as compare to developed countries. This warrants a study of co-movements between indices to shed light on ways to calculate risk and return.

This paper as to attempt to assess the performance of the prominent indices of the Bombay Stock Exchange (BSE) and determine the mutual relationship shared among them. This study offers a deeper understanding of the co-movement between the selected series during 2010-2014 and also offers an approach to compare individual performance of select indices of the BSE.

Research Methodology

This paper has used correlation, Granger causality test and Johansen's co-integration test to determine the co-movement among selected markets and to study the long and short run association among all exchanges. ADF and PP approaches are used to check the stationarity of data. To perform various statistical tests, EvIEWS 7 and SPSS 20 were used. Data were taken from various sources such as google finance and Yahoo finance covering a period of February 2, 1998 to February 2, 2020. The study covers 10 exchanges, namely, BSEN Sensex (India), DIJ, IXIC, FCHI, EURO, HIS, JKSE (Indonesia), MXX (Mexico), GDAXI, KSP11.

This study examines the relationship among the various indices of the BSEN, DIJ, IXIC, FCHI, EURO, HIS, JKSE, MXX, GDAXI, KSP11 were taken for the purpose of this study. The period considered for this study is February 2, 1998 to February 2, 2020. there fore, data for a total of 22 years (66 quarters) is taken for the purpose of the study and has been analyzed using econometric tools.

Econometric analysis can be performed on series of stationary nature. In order to check stationary nature of all series, a line graph and correlogram is prepared for each of the data series. For final confirmation, whether series are stationary are not the Augmented Dicky-Fuller test under the unit root test has been performed. Afterwards with the stationary long series of all the selected variables, We carry out the granger's causality model in order to understand : whether any selected indices are variables Granger causes other variable or variables.

Afterwards Granger we apply VAR model. It is commonly used for forecasting system of inter-related time series and for analyzing the dynamic impact of random disturbances on the system of variables. The VAR approach sidesteps the need for structural modeling by treating every endogenous variable in the system as a function of the lagged values of all of the endogenous variables in the system.

Finally, we apply the variance decomposition analysis in order to finally quantify the extent to which the 10 indices are influenced by each other. While impulse response functions trace the effects of a shock to one endogenous variable on to the other variables in the VAR, but variance decomposition separates the variation in an endogenous vaeiable into the component shocks to the VAR. Thus, the variance decomposition provides information about the relative importance of each random innovation in affecting the variables in the VAR.

Objectives

- To study co-movement of selected indices namely BSEN, DIJ, IXIC, FCHI, EURO, HIS, JKSE, MXX, GDAXI, KSP11 in terms of average Return, Risk, Consistency and Compound annual growth rate.
- To provide suggestions based on the findings of the suggestion.

Theoretical Background of Indices

What is an Exchange?

First, what is an exchange? Put simply, an exchange is an institution, organization, or association which hosts a market where stocks, bonds, options, futures and commodities are traded. Buyers and sellers come together to trade during specific hours on business days. Exchanges impose rules and regulations on the firms and brokers that are involved with them. If a particular company is traded on an exchange, it is referred to as "listed."

Securities that are not listed on a stock exchange are sold OTC, which stands for Over-The- Counter. Companies that have shares traded OTC are usually smaller and riskier because they do not meet the requirements to be listed on a stock exchange. Many giant blue-chip stocks, such as Berkshire Hathaway, at one time traded on the over-the-counter market before migrating to the so-called "Big Board," or New York Stock Exchange.

What Is the Purpose of a Stock Exchange?

When a business raises capital by issuing shares, the owners of those new shares are likely going to want to sell their stake someday. Maybe they have a child going to college and need to cover the tuition bill. Perhaps they pass away and their estate is subject to some hefty estate taxes. They may even leave it to their grandchildren, who get to enjoy the stepped-up basis loophole, but the heirs want to liquidate to buy a house. Whatever is driving their decision, they aren't likely to tie up their funds unless they know somehow, someday, at some point in the future, they'll be able to find a buyer for their holdings without too much trouble in what is known as "the secondary market."

Without a stock exchange, these owners would have to go around to friends, family members and community

members, hoping to find someone to whom they could sell their shares. (Technically, you can do this. You don't have to sell your shares on a stock exchange. You can take physical possession of your stocks in certificate form, endorse them and sign them over to someone in exchange for payment in your lawyer's office, or at your dining room table if you are so inclined. When the stock exchange was closed during World War I, many people did just that, creating a secondary shadow market.

The downside is that there is no transparency. Nobody knows what the best price is for a given stock at any given moment in time. You could be selling your shares for \$50 while the guy two towns over is getting \$70.) With a stock exchange, you will never know the person on the other end of the trade. He, she, or it could be halfway around the world. It could be a retired teacher. It could be a multi-billion dollar insurance group. It could be a publicly traded mutual fund or hedge fund.

The need for convenience is what led to the establishment of the biggest stock exchange in the world. In the United States, a group of stockbrokers met under a buttonwood tree in New York City. On May 17th, 1792, twenty-four of these stockbrokers got together outside of 68 Wall Street to sign the now-famous Buttonwood Agreement, which effectively created the New York Stock & Exchange Board. Almost three-quarters of a century later, in 1863, it was officially renamed the New York Stock Exchange. These days, most people refer to it as the NYSE.

What are the benefits of stock exchange?

While stock exchanges are often associated with wealth creation and capitalism, they are much more than a place for brokers to buy and sell shares of companies. Stock exchanges allow businesses access to capital and the opportunity to enhance their visibility and public image. Savvy businesses can harness the power of stock exchanges to grow and enhance their companies. While significant financial and regulatory costs are associated with being listed on a stock exchange, the benefits far outnumber the disadvantages.

Access to Capital

A 2012 National Small Business Association survey revealed that one of the major impediments to business growth was a lack of affordable capital. Companies listed on a stock exchange can quickly raise affordable capital by issuing more shares for investors to purchase. The capital raised from the issuance of shares can be used to help the company grow and pay for different business costs.

Enhanced Profile

Companies listed on a stock exchange are much more recognizable and visible than their privately held

counterparts. The increased visibility that comes with being listed on an exchange can help a company attract new clients and customers and it draws press attention that might be difficult and expensive for the company to draw on its own.

Ability to Attract Better Employees

High quality employees are attracted to employers that have name recognition and visibility. Stock exchanges can help companies become household names and better attract employers capable of making the company more profitable. Because of the increased access to capital, companies are also able to better compensate employees to keep them from moving to competitors.

Increased Visibility

There may be no better PR move for a company than to go public, as the process generates free publicity and excitement in the marketplace for the company. A successful IPO also results in a flood of cash for a newly public company and this cycle can be repeated down the road with secondary offerings of additional stock. With this additional money, companies can further expand their operations, or allow companies to offer more lucrative share option packages to employees.

Ability to Maintain Control

Companies not listed on stock exchanges typically rely on capital provided by venture capitalists and private investors. In exchange for purchasing shares of a privately held company, investors usually insist on having some degree of control of the company, including having members appointed to the board. These demands can work counter to the intentions of the company itself outside investors often prioritize rapid returns on their investment rather than supporting a company's long-term vision. Stock exchanges allow companies to maintain more autonomy and control, because people who purchase the shares of a publicly traded company only have the limited rights afforded to all shareholders.

Reduction of the Cost of Other Capital

Going public reduces the costs of obtaining capital through bank loans. Banks view publicly traded companies as less of a credit risk than their privately held counterparts, because publicly traded companies have access to other capital and the auditing requirements for public companies make their financial condition more transparent.

How is XYZ Stock Index Calculated?

Each stock index is calculated according to its own calculation which can range from relatively straightforward to rather complex (as shown in the above examples). The calculation that is used for a particular stock index is usually available

via the website of the exchange that provides the stock index (but not always).

Stock Index

Ike is a securities analyst for a brokerage firm. He has created a small index for a few local companies called the Ike Index. An index tracks the stock price performance of a group of companies. So instead of looking up a bunch of different stock prices to see how the local ones are doing, interested investors can just look at the Ike Index to see if the group is doing well or poorly. It's just like the market averages you hear reported on radio and TV all the time, only smaller. He sends his results out every day to clients and colleagues who are interested in the health of the local economy.

Ike is getting ready to make some big changes to how he calculates his index numbers. His clients would like to see the index weighted, or how much each individual company has on the index number, to make the larger companies count for more than the smaller ones, since the biggest companies have the most influence on the local job market and economic health. In other words, they want the bigger companies to have more weight, or influence, on his index number.

Many of the most widely followed stock market indices are value-weighted. That includes The NASDAQ Composite Index and the Wilshire 5000 Total Market Index.

Value-Weighting a Simple Index

Ike knows the solution from what he learned in college. He'll assign a weight to each company in the index based on the company's value. This weight will determine how much influence each company will have on the results. Investors value a company based on its market capitalization, which is the price of its stock times the number of shares outstanding. Bigger companies are more valuable, so they have a higher market capitalization.

Let's look at a sample index for three of Ike's companies to see how the process works. The first thing he does is look up the three companies' stock prices and number of shares outstanding.

Then he multiplies them together to get the market capitalization for each. Take a look at the table below to see how that looks:

Table 1

Company	Stock price	Shares outstanding	Market capitalization
Company A	\$200	500,000	\$100,000,000
Company B	\$125	1,000,000	\$125,000,000
Company C	\$50	200,000	\$10,000,000

Now to get the weights for each company, first add up the market capitalization for each company to get the total. Then take each company's market capitalization and divide it by the total to get its weight. For example, Company A's weight = $\$100,000,000 / \$235,000,000 = 43\%$. The results for all three look like the updated table:

Table 2

Company	Stock price	Shares outstanding	Market capitalization	Weight
Company A	\$200	500,000	\$100,000,000	43%
Company B	\$125	1,000,000	\$125,000,000	53%
Company C	\$50	200,000	\$10,000,000	4%

As you can see, total market capitalization = \$235,000,000

Note how small company C has a much lower weight than the bigger companies - 4% compared to the 43% of Company A and the 53% of Company B. That means Company C will have a much smaller impact on the index.

Stock Market Index: Meaning, Importance, NSE & BSE and more

Stock Market Indices give an insight into the overall trends of the capital markets and sentiment of the investors towards a particular stock or set of stocks in an industry.

This article covers the following:

What Are Stock Indices?

Why are stock indices required?

How is stock market indices developed? What is NSE & BSE?

How to invest in Equities?

What Are Stock Indices?

A stock market index is a statistical measure which shows changes taking place in the stock market. To create an index, a few similar kinds of stocks are chosen from amongst the securities already listed on the exchange and grouped together.

The criteria of stock selection could be the type of industry, market capitalization or the size of the company. The value of the stock market index is computed using values of the underlying stocks. Any change taking place in the underlying stock prices impact the overall value of the index. If the prices of most of the underlying securities rise, then the index will rise and vice-versa in this way, a stock index reflects overall market sentiment and direction of price movements of products in the financial, commodities or any other markets.

Some of the Notable Indices in India are as follows

- Benchmark indices like NSE Nifty and BSE Sensex
- Broad-based indices like Nifty 50 and BSE 100
- Indices based on market capitalization like the BSE Small cap and BSE Midcap
- Sectorial indices like Nifty FMCG Index and CNX IT

Why are stock Indices Required?

The stock market index acts like a barometer which shows the overall conditions of the market. They facilitate the investors in identifying the general pattern of the market. Investors take the stock market as a reference to decide about which stocks to go for investing.

The following lists the importance of Stock Market Index

Aids in Stock-Picking

In a share market, you would thousands of companies listed on the exchange. Broadly, picking the appropriate stock for investment may seem like a nightmare. Without a benchmark, you may not be able to differentiate between the stocks. Simultaneously sorting the stocks becomes a challenge. In this situation, a stock market acts like an instant differentiator. It classifies the companies and their shares based on key characteristics like the size of company, sector, industry type and so on.

Acts as a Representative

Investing in equities involves risk and you need to take an informed decision. Studying about stocks individually may seem very impractical. Indices help to fill the knowledge gaps that exist among the investors. They represent the trend of the whole market or a certain sector of the market. In India, the NSE Nifty the BSE Sensex act as the benchmark indices. They are believed to indicate the performance of the entire stock market. In the same manner, an index which is made up of pharma stocks is assumed to portray the average price of stocks of companies operating in the pharmaceutical industry.

The Parameter for Peer Comparison

Before including a stock in your portfolio, you have to assess whether it's worth the money. By comparing with the underlying index, you can easily judge the performance of a stock. If the stock gives higher returns than the index, it's said to have outperformed the index. If it gives lower returns than the index, it's said to have underperformed the index. You would definitely want to invest in a multi bagger so as to justify the risk assumed. Else you can be better off investing in low-cost professionally managed index funds. You may also compare the index with a set of stocks like the Information technology sector. As an investor, you can know market trend easily.

Reflects Investor Sentiment

When you are participating in equity markets, amongst other things, knowing investor sentiment becomes an important aspect. It is because the sentiment affects the demand for a stock which in turn impacts the overall price. In order to invest in the right stock, you should know the reason behind the rise/fall in its prices. At this juncture, indices help to gauge the mood of investors. You may even recognize investor sentiment for a particular sector and across market capitalizations.

Helps in Passive Investment

Passive investment refers to investing in a portfolio of securities which replicates the stocks of an index. Investors who want to cut down on the cost of research and stock selection prefer to invest in index portfolio. Consequently, the returns of the portfolio will resemble that of the index. If an investor's portfolio resembles the Sensex, then his portfolio is going to deliver returns of around 8% when the Sensex earns 8% returns.

How is stock market Indices developed?

An index is made up of similar stocks based on market capitalization, industry or company size. Upon selection of stocks, the index value is computed. Each stock will have a different price and price change in one stock would not be proportionately equal to the price change in another. So, the value of the index value cannot be arrived at as a simple sum of the prices of all the stocks.

Here is when the importance of assigning weights to stocks comes into play. Each stock in the index is assigned a particular weightage based on its market capitalization or price. The weight represents the extent of the impact that the stock's price change has on the value of the index.

The two most commonly used stock market indices are as follows:

Market-cap weight age

Market capitalization refers to the total market value of the stock of a company. It is calculated by multiplying the total number of outstanding stocks floated by the company with the share price of a stock. It, therefore, considers both the price as well as the size of the stock. In an index which uses market-cap weightage, the stocks are assigned weightage based on their market capitalization as compared to the total market capitalization of the index.

Suppose a stock has a market capitalization of Rs. 50,000 whereas the underlying index has a total market-cap of Rs. 1,00,000. Thus, the weightage given to the stock will be 50%. It is important to note that market capitalization of a stock changes every day with the fluctuation in its price. Due to this reason, weightage of the stock would change

daily. But usually such a change is marginal in nature. Moreover, the companies with higher market-caps get more importance in this method.

In India, free-float market capitalization is used by most of the indices. Here, the total number of shares listed by a company is not used to compute market capitalization. Instead, use only the amount of shares available for trading publicly. Consequently, it gives a smaller number than the market capitalization.

Price weight age

In this method, the value of an index value is computed based on the stock price of a company rather than the market capitalization. Thus, the stocks which have higher prices receive greater

weightages in the index as compared to the stocks which have lower prices. This method has been used in The Dow Jones Industrial Average in the US and the Nikkei 225 in Japan.

What is NSE & BSE?

Started in 1994, the National Stock Exchange (NSE) is the largest stock exchange in India in terms of total and average daily turnover for equity shares. Being a pioneer in technology, NSE has a fully- integrated business model to provide high-quality data and services to market participants and clients. It includes trading services, exchange listings, indices, market data feeds, clearing and settlement services, financial education offerings and technology solutions. NSE ensures that trading and clearing members and listed companies follow the rules and regulations of the exchange.

Founded in 1875, Bombay Stock Exchange Ltd. (BSE), is the fastest stock exchange in the world which has the speed of 6 microseconds. It provides an efficient, integrated, transparent and secure market for trading in equity, currencies, debt instruments, derivatives, mutual funds. It provides an array of services like clearing, settlement, risk management, education and market data services. It has a global reach with overseas customers and a nationwide presence. It provides depository services through its Central Depository Services Ltd. (CDSL) arm. The S&P BSE SENSEX is India's most widely tracked stock market benchmark index. It is traded internationally on the EUREX as well as leading exchanges of the BRICS nations (Brazil, Russia, China and South Africa).

How to Invest in Equities?

Many a time investing in equity becomes complex. In case you don't possess enough financial knowledge and are finding it difficult to understand, then just go for ClearTax Invest. Here, instead of directly investing in equities, you can try investing in Equity Funds. You can choose hand-picked equity funds in a hassle-free and paperless manner. Using

the following steps, you can start your investment journey:

Step 1: Sign in at cleartax.in

Step 2: Enter your personal details regarding the amount of investment and period of investment.

Step 3: Get your e-KYC done in less than 5 minutes.

Step 4: Invest in your favourite debt fund from amongst the hand-picked mutual funds.

Indices:

A stock market index is a measure of the relative value of a group of stocks in numerical terms. As the stocks within an index change value, the index value changes. An index is important to measure the performance of investments against a relevant market index.

Current Market Reports Historical Data About Indices

A stock market index is created by selecting a group of stocks that are representative of the whole market or a specified sector or segment of the market. An Index is calculated with reference to a base period and a base index value. An Index is used to give information about the price movements of products in the financial, commodities or any other markets. Financial indexes are constructed to measure price movements of stocks, bonds, T-bills and other forms of investments. Stock market indexes are meant to capture the overall behaviour of equity markets. More about indices.

Broad Market Indices

These indices are broad-market indices, consisting of the large, liquid stocks listed on the Exchange. They serve as a benchmark for measuring the performance of the stocks or portfolios such as mutual fund investments.

More about Broad Market Indices

Nifty 50 Index Nifty Next 50 Index Nifty 100 Index Nifty 200 Index Nifty 500 Index Nifty Midcap150 Index Nifty Midcap 50 Index Nifty Midcap 100 Index Nifty Small cap 250 Index Nifty Small cap 50 Index Nifty Small cap 100 Index NIFTY Large Midcap 250 Index Nifty MidSmallcap 400 Index IndiaVia Index.

Sectorial Indices

Sector-based index are designed to provide a single value for the aggregate performance of a number of companies representing a group of related industries or within a sector of the economy.

More about Sectorial Indices

Thematic Indices

Thematic indices are designed to provide a single value for the aggregate performance of a number of companies representing a theme.

More about Thematic Indices

Strategy Indices

Strategy indices are designed on the basis of quantitative models/ investment strategies to provide a single value for the aggregate performance of a number of companies.

More about Strategy Indices

Fixed Income Indices

Fixed income index is used to measure performance of the bond market. The fixed income indices are useful tool for investors to measure and compare performance of bond portfolio. Fixed income indices also used for introduction of Exchange Traded Funds.

Hybrid Indices

NIFTY Hybrid Index series seeks to track the performance of a hybrid portfolio having pre- defined exposure to equity and fixed income assets.

Index Concepts

Indices and index linked investment products provide considerable benefits. Important concepts and terminologies are associated with Index construction. These concepts are important for investors to learn from the information that indices contain about investment opportunities.

More about Index Concepts

Impact Cost Beta Total Returns IndexInvestible Weight Factors (IWFs).

Index Funds

An Index Fund is a type of mutual fund with a portfolio constructed to match the constituents of the market index, such as Nifty 50. An index fund provides broad market exposure and lower operating expenses for investors.

An Index is used to give information about the price movements of products in the financial, commodities or any other markets. Financial indexes are constructed to measure price movements of stocks, bonds, T-bills and other forms of investments. Stock market indexes are meant to capture the overall behaviour of equity markets. A stock market index is created by selecting a group of stocks that are representative of the whole market or a specified sector or segment of the market. An Index is calculated with reference to a base period and a base index value.

Stock market indexes are useful for a variety of reasons. Some of them are:

- They provide a historical comparison of returns on money invested in the stock market against other forms of investments such as gold or debt.
- They can be used as a standard against which to compare the performance of an equity fund.
- In It is a lead indicator of the performance of the overall economy or a sector of the economy.
- Stock indexes reflect highly up to date information.
- Modern financial applications such as Index Funds, Index Futures, Index Options play an important role in financial investments and risk management.

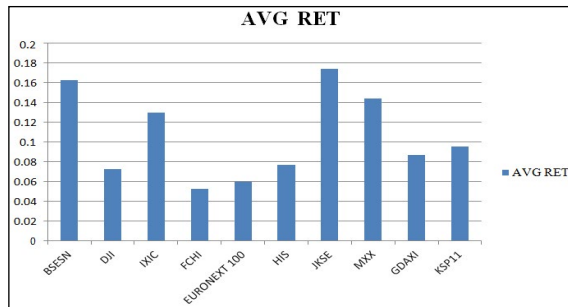
Table I

	BSES								GDAX	
Year	N	DJI	IXIC	FCHI	Euro	HIS	JKSE	MXX	I	KSP11
01-02-1999	-0.107	0.089	0.292	0.196	0.054	-0.141	-0.179	-0.109	0.045	-0.07
01-02-2000	0.685	0.088	1.053	0.513	0.129	0.742	0.456	0.729	0.559	0.593
01-02-2001	-0.22	0.036	-0.542	-0.133	0.065	-0.139	-0.257	-0.181	-0.188	-0.302
01-02-2002	-0.161	-0.037	-0.195	-0.169	0.026	-0.291	0.058	0.116	-0.188	0.418
01-02-2003	-0.078	-0.219	-0.228	-0.383	-0.18	-0.13	-0.119	-0.12	-0.495	-0.298
01-02-2004	0.726	0.341	0.518	0.353	0.2	0.524	0.906	0.686	0.578	0.535
01-02-2005	0.185	0.017	0.011	0.081	0.242	0.021	0.411	0.38	0.083	0.145
01-02-2006	0.545	0.021	0.112	0.242	0.179	0.121	0.146	0.357	0.332	0.356
01-02-2007	0.248	0.116	0.059	0.103	0.185	0.235	0.415	0.424	0.159	0.033
01-02-2008	0.359	0	-0.06	-0.132	-0.045	0.238	0.563	0.086	0.005	0.208
01-02-2009	-0.494	-0.424	-0.393	-0.436	-0.4	-0.473	-0.528	-0.386	-0.43	-0.379
01-02-2010	0.848	0.462	0.624	0.372	0.387	0.609	0.983	0.782	0.457	0.5
01-02-2011	0.085	0.184	0.243	0.108	0.042	0.132	0.361	0.17	0.299	0.273
01-02-2012	-0.004	0.059	0.066	-0.16	-0.11	-0.071	0.148	0.022	-0.057	-0.002
01-02-2013	0.062	0.085	0.065	0.078	0.187	0.062	0.203	0.167	0.129	-0.023
01-02-2014	0.12	0.161	0.363	0.184	0.059	-0.008	-0.037	-0.121	0.252	0.003

Data Analysis and Interpretation

Interpretation (I)

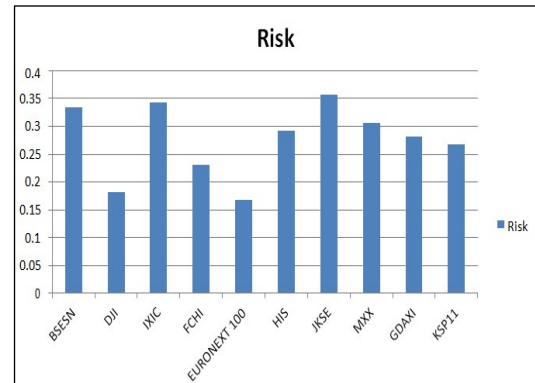
JKSE as the highest average rate of return of 17.4% followed by BSE of 16.2% and 14.4% of MXX. The other selected indices have less than 10% of average rate of returns during the study period.



Graph 1

Interpretation (2)

EURO Index as the lowest average risk of 16.8% during the study period. It is followed by DJI of 18.1%. The rest of the selected indices have more than 20% of average risk.



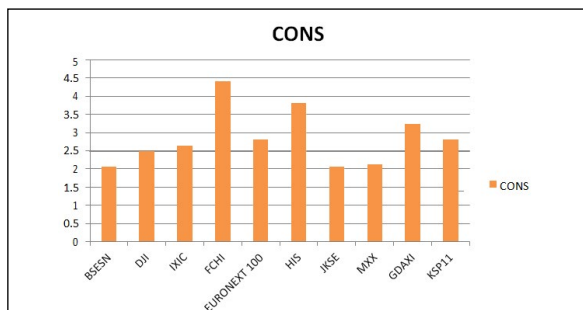
Graph 2

Table 2

Years	Bsesn	DJI	IXIC	FCHI	Euro	HIS	JKSE	MXX	GDAXI	KSP11
01-02-1999	-0.107	0.089	0.292	0.196	0.054	-0.141	-0.179	-0.109	0.045	-0.07
01-02-2000	0.685	0.088	1.053	0.513	0.129	0.742	0.456	0.729	0.559	0.593
01-02-2001	-0.22	0.036	-0.542	-0.133	0.065	-0.139	-0.257	-0.181	-0.188	-0.302
01-02-2002	-0.161	-0.037	-0.195	-0.169	0.026	-0.291	0.058	0.116	-0.188	0.418
01-02-2003	-0.078	-0.219	-0.228	-0.383	-0.18	-0.13	-0.119	-0.12	-0.495	-0.298
01-02-2004	0.726	0.341	0.518	0.353	0.2	0.524	0.906	0.686	0.578	0.535
01-02-2005	0.185	0.017	0.011	0.081	0.242	0.021	0.411	0.38	0.083	0.145
01-02-2006	0.545	0.021	0.112	0.242	0.179	0.121	0.146	0.357	0.332	0.356
01-02-2007	0.248	0.116	0.059	0.103	0.185	0.235	0.415	0.424	0.159	0.033
01-02-2008	0.359	0	-0.06	-0.132	-0.045	0.238	0.563	0.086	0.005	0.208
01-02-2009	-0.494	-0.424	-0.393	-0.436	-0.4	-0.473	-0.528	-0.386	-0.43	-0.379
01-02-2010	0.848	0.462	0.624	0.372	0.387	0.609	0.983	0.782	0.457	0.5
01-02-2011	0.085	0.184	0.243	0.108	0.042	0.132	0.361	0.17	0.299	0.273
01-02-2012	-0.004	0.059	0.066	-0.16	-0.11	-0.071	0.148	0.022	-0.057	-0.002
01-02-2013	0.062	0.085	0.065	0.078	0.187	0.062	0.203	0.167	0.129	-0.023
01-02-2014	0.12	0.161	0.363	0.184	0.059	-0.008	-0.037	-0.121	0.252	0.003
01-02-2015	0.384	0.111	0.152	0.123	0.097	0.087	0.18	0.139	0.176	-0.035
01-02-2016	-0.213	-0.089	-0.082	-0.121	-0.177	-0.23	-0.125	-0.011	-0.167	0.091
01-02-2017	0.25	0.26	0.278	0.116	0.17	0.242	0.129	0.072	0.246	0.161
01-02-2018	0.189	0.203	0.248	0.095	0.053	0.299	0.225	0.012	0.051	-0.096
01-02-2019	0.049	0.035	0.036	-0.015	0.025	-0.072	-0.023	-0.097	-0.074	-0.017
01-02-2020	0.112	0.096	0.231	0.142	0.126	-0.068	-0.087	0.052	0.133	0.004
Risk	0.334	0.181	0.343	0.231	0.168	0.292	0.357	0.305	0.281	0.268
Rank	VIII	II	IX	III	I	VI	X	VII	V	IV

Interpretation (3)

BSE Is the most consistent index of among the selected indices over the study period. The other indices are almost closer to BSE index.



Graph 3

Interpretation (4)

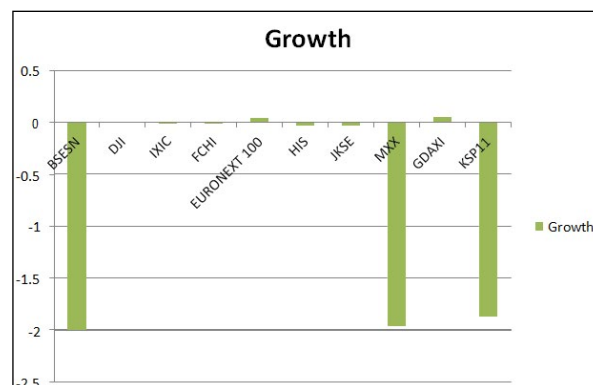
There are only 3 indices having positive CAGR(compound annual growth rate) in which GDAXI index as CAGR of 5.3% followed by EURO of 4.1% and DJI of 0.04%. The rest of

the indices have negative growth during the study period.

Correlation of Indices

Interpretation (5)

The correlations among indices under study have strong positive correlation.



Graph 4 Figure

Table 3

Year	Bsesn	DJI	IXIC	FCHI	Euro	HIS	JKSE	MXX	GDAXI	KSP11
01-02-1999	-0.107	0.089	0.292	0.196	0.054	-0.141	-0.179	-0.109	0.045	-0.07
01-02-2000	0.685	0.088	1.053	0.513	0.129	0.742	0.456	0.729	0.559	0.593
01-02-2001	-0.22	0.036	-0.542	-0.133	0.065	-0.139	-0.257	-0.181	-0.188	-0.302
01-02-2002	-0.161	-0.037	-0.195	-0.169	0.026	-0.291	0.058	0.116	-0.188	0.418
01-02-2003	-0.078	-0.219	-0.228	-0.383	-0.18	-0.13	-0.119	-0.12	-0.495	-0.298
01-02-2004	0.726	0.341	0.518	0.353	0.2	0.524	0.906	0.686	0.578	0.535
01-02-2005	0.185	0.017	0.011	0.081	0.242	0.021	0.411	0.38	0.083	0.145
01-02-2006	0.545	0.021	0.112	0.242	0.179	0.121	0.146	0.357	0.332	0.356
01-02-2007	0.248	0.116	0.059	0.103	0.185	0.235	0.415	0.424	0.159	0.033
01-02-2008	0.359	0.000	-0.060	-0.132	-0.045	0.238	0.563	0.086	0.005	0.208
01-02-2009	-0.494	-0.424	0.393	-0.436	-0.4	-0.473	-0.528	-0.386	-0.43	-0.379
01-02-2010	0.848	0.462	0.624	0.372	0.387	0.609	0.983	0.782	0.457	0.5
01-02-2011	0.085	0.184	0.243	0.108	0.042	0.132	0.361	0.17	0.299	0.273
01-02-2012	-0.004	0.059	0.066	-0.160	-0.11	-0.071	0.148	0.022	-0.057	-0.002
01-02-2013	0.062	0.085	0.065	0.078	0.187	0.062	0.203	0.167	0.129	-0.023
01-02-2014	0.12	0.161	0.363	0.184	0.059	-0.008	-0.037	-0.121	0.252	0.003
01-02-2015	0.384	0.111	0.152	0.123	0.097	0.087	0.18	0.139	0.176	-0.035
01-02-2016	-0.213	-0.089	-0.082	-0.121	-0.177	-0.23	-0.125	-0.011	-0.167	0.091
01-02-2017	0.25	0.26	0.278	0.116	0.17	0.242	0.129	0.072	0.246	0.161
01-02-2018	0.189	0.203	0.248	0.095	0.053	0.299	0.225	0.012	0.051	-0.096
01-02-2019	0.049	0.035	0.036	-0.015	0.025	-0.072	-0.023	-0.097	-0.074	-0.017
01-02-2020	0.112	0.096	0.231	0.142	0.126	-0.068	-0.087	0.052	0.133	0.004
CONS	2.052	2.489	2.641	4.401	2.817	3.817	2.067	2.115	3.243	2.805
Rank	I	III	IV	X	VI	IX	II	VII	VIII	V

Table 5

Year	Bsesn	DJI	IXIC	FCHI	Euro	HIS	JKSE	MXX	GDAXI	KSP11
01-02-1999	-0.107	0.089	0.292	0.196	0.054	-0.141	-0.179	-0.109	0.045	-0.07
01-02-2000	0.685	0.088	1.053	0.513	0.129	0.742	0.456	0.729	0.559	0.593
01-02-2001	-0.22	0.036	-0.542	-0.133	0.065	-0.139	-0.257	-0.181	-0.188	-0.302
01-02-2002	-0.161	-0.037	-0.195	-0.169	0.026	-0.139	0.058	0.116	-0.188	0.418
01-02-2003	-0.078	-0.219	-0.228	-0.383	-0.18	-0.291	-0.119	-0.12	-0.495	-0.298
01-02-2004	0.726	0.341	0.518	0.353	0.2	0.524	0.906	0.686	0.578	0.535
01-02-2005	0.185	0.017	0.011	0.081	0.242	0.021	0.411	0.38	0.083	0.145
01-02-2006	0.545	0.021	0.112	0.242	0.179	0.121	0.146	0.357	0.332	0.356
01-02-2007	0.248	0.116	0.059	0.103	0.185	0.235	0.415	0.424	0.159	0.033
01-02-2008	0.359	0.000	-0.06	-0.132	-0.045	0.238	0.563	0.086	0.005	0.208
01-02-2009	-0.494	-0.424	-0.393	-0.436	-0.400	-0.473	-0.528	-0.386	-0.43	-0.379
01-02-2010	0.848	0.462	0.624	0.372	0.387	0.609	0.983	0.782	0.457	0.5
01-02-2011	0.085	0.184	0.243	0.108	0.042	0.132	0.361	0.17	0.299	0.273
01-02-2012	-0.004	0.059	0.066	-0.16	-0.11	-0.071	0.148	0.022	-0.057	-0.002
01-02-2013	0.062	0.085	0.065	0.078	0.187	0.062	0.203	0.167	0.129	-0.023
01-02-2014	0.12	0.161	0.363	0.184	0.059	-0.008	-0.037	-0.121	0.252	0.003
01-02-2015	0.384	0.111	0.152	0.123	0.097	0.087	0.18	0.139	0.176	-0.035
01-02-2016	-0.213	0.089	-0.082	-0.121	-0.177	-0.230	-0.125	-0.011	-0.167	0.091
01-02-2017	0.25	0.26	0.278	0.116	0.17	0.242	0.129	0.072	0.246	0.161
01-02-2018	0.189	0.203	0.248	0.095	0.053	0.299	0.225	0.012	0.051	-0.096
01-02-2019	0.049	0.035	0.036	-0.015	0.025	-0.072	-0.023	-0.097	-0.074	-0.017
01-02-2020	0.112	0.096	0.231	0.142	0.126	-0.068	-0.087	0.052	0.133	0.004
GROWTH	-2.002	0.004	-0.011	-0.015	0.041	-0.034	-0.034	-1.965	0.053	-1.868
Rank	X	III	IV	V	II	VII	VI	IX	I	VIII

Table 6

Bsesn	DJI	IXIC	FCHI	Euro	HIS	JKSE	MXX	GDAXI	KSP11
1.0000	0.7268	0.7686	1.0000	0.7417	0.9202	0.8657	0.8777	0.8598	0.7541
0.7268	1.0000	0.673	0.7888	0.8275	0.7421	0.7284	0.6313	0.8116	0.5715
0.7686	0.673	1.0000	0.8826	0.5582	0.815	0.6157	0.708	0.8548	0.6886
1.0000	0.7268	0.7686	1.0000	0.8085	0.7978	0.631	0.7618	0.9505	0.6918
0.7417	0.8275	0.5582	0.7417	1.0000	0.6782	0.6851	0.74	0.7751	0.5812
0.9202	0.7421	0.815	0.9202	0.6782	1.0000	0.8512	0.8438	0.838	0.6908
0.8657	0.7284	0.6157	0.8657	0.6851	0.8512	1.0000	0.8836	0.7378	0.7659
0.8777	0.6313	0.708	0.8777	0.74	0.8438	0.8836	1.0000	0.8007	0.844
0.8598	0.8116	0.8548	0.8598	0.7751	0.838	0.7378	0.8007	1.0000	0.7636
0.7541	0.5715	0.6886	0.7541	0.5812	0.6908	0.7659	0.844	0.7636	1.0000

Table 7

Bsesn	DJI	IXIC	FCHI	Euro	HIS	JKSE	MXX	GDAXI	KSP11
1.0000	0.7268	0.7686	1.0000	0.7417	0.9202	0.8657	0.8777	0.8598	0.7541
0.7268	1.0000	0.673	0.7888	0.8275	0.7421	0.7284	0.6313	0.8116	0.5715
0.7686	0.673	1.0000	0.8826	0.5582	0.815	0.6157	0.708	0.8548	0.6886
1.0000	0.7268	0.7686	1.0000	0.8085	0.7978	0.631	0.7618	0.9505	0.6918
0.7417	0.8275	0.5582	0.7417	1.0000	0.6782	0.6851	0.74	0.7751	0.5812
0.9202	0.7421	0.815	0.9202	0.6782	1.0000	0.8512	0.8438	0.838	0.6908
0.8657	0.7284	0.6157	0.8657	0.6851	0.8512	1.0000	0.8836	0.7378	0.7659
0.8777	0.6313	0.708	0.8777	0.74	0.8438	0.8836	1.0000	0.8007	0.844
0.8598	0.8116	0.8548	0.8598	0.7751	0.838	0.7378	0.8007	1.0000	0.7636
0.7541	0.5715	0.6886	0.7541	0.5812	0.6908	0.7659	0.844	0.7636	1.0000

Table 8

Bsesn	DJI	IXIC	FCHI	Euro	HIS	JKSE	MXX	GDAXI	KSP11
1.0000	0.7268	0.7686	1.0000	0.7417	0.9202	0.8657	0.8777	0.8598	0.7541
0.7268	1.0000	0.673	0.7888	0.8275	0.7421	0.7284	0.6313	0.8116	0.5715
0.7686	0.673	1.0000	0.8826	0.5582	0.815	0.6157	0.708	0.8548	0.6886
1.0000	0.7268	0.7686	1.0000	0.8085	0.7978	0.631	0.7618	0.9505	0.6918
0.7417	0.8275	0.5582	0.7417	1.0000	0.6782	0.6851	0.74	0.7751	0.5812
0.9202	0.7421	0.815	0.9202	0.6782	1.0000	0.8512	0.8438	0.838	0.6908
0.8657	0.7284	0.6157	0.8657	0.6851	0.8512	1.0000	0.8836	0.7378	0.7659
0.8777	0.6313	0.708	0.8777	0.74	0.8438	0.8836	1.0000	0.8007	0.844
0.8598	0.8116	0.8548	0.8598	0.7751	0.838	0.7378	0.8007	1.0000	0.7636
0.7541	0.5715	0.6886	0.7541	0.5812	0.6908	0.7659	0.844	0.7636	1.0000

Table 9. T- Test Table

Indices	Significant@ 5%		P-Value		Null Hypothesis		Result	
	One Tail	Two Tail	One Tail	Two Tail	One Tail	Two Tail	One Tail	
BSESN and DJI	0.05	0.05	0.5	0.273	Accepted	Accepted	No Significant Differance	No Significant Differance
BSESN and IXIC	0.05	0.05	0.376	0.752	Accepted	Accepted	No Significant Differance	No Significant Differance
BSESN and FCHI	0.05	0.05	0.5	1	Accepted	Accepted	No Significant Differance	No Significant Differance
BSESN and Euro NEX T	0.05	0.05	0.103	0.205	Accepted	Accepted	No Significant Differance	No Significant Differance
BSESN and HIS	0.05	0.05	0.186	0.372	Accepted	Accepted	No Significant Differance	No Significant Differance
BSESN and JKSE	0.05	0.05	0.454	0.909	Accepted	Accepted	No Significant Differance	No Significant Differance
BSESN and MXX	0.05	0.05	0.426	0.852	Accepted	Accepted	No Significant Differance	No Significant Differance

BSESN and GDAXI	0.05	0.05	0.21	0.42	Accepted	Accepted	No Significant Difference	No Significant Difference
BSESN and KSP11	0.05	0.05	0.234	0.468	Accepted	Accepted	No Significant Difference	No Significant Difference
DJI and IXIC	0.05	0.05	0.246	0.493	Accepted	Accepted	No Significant Difference	No Significant Difference
DJI and FCHI	0.05	0.05	0.137	0.273	Accepted	Accepted	No Significant Difference	No Significant Difference
DJI and EURONEXT	0.05	0.05	0.405	1	Accepted	Accepted	No Significant Difference	No Significant Difference
DJI and HIS	0.05	0.05	0.477	0.955	Accepted	Accepted	No Significant Difference	No Significant Difference
DJI and JKSE	0.05	0.05	0.122	0.243	Accepted	Accepted	No Significant Difference	No Significant Difference
DJI and MXX	0.05	0.05	0.175	0.349	Accepted	Accepted	No Significant Difference	No Significant Difference
DJI and GDAXI	0.05	0.05	0.423	0.845	Accepted	Accepted	No Significant Difference	No Significant Difference
DJI and KSP11	0.05	0.05	0.371	0.741	Accepted	Accepted	No Significant Difference	No Significant Difference
IXIC and FCHI	0.05	0.05	0.376	0.752	Accepted	Accepted	No Significant Difference	No Significant Difference
IXIC and Euro NEX T	0.05	0.05	0.198	0.395	Accepted	Accepted	No Significant Difference	No Significant Difference
IXIC and HIS	0.05	0.05	0.292	0.585	Accepted	Accepted	Significant Difference	Significant Difference
IXIC and JKSE	0.05	0.05	0.338	0.677	Accepted	Accepted	No Significant Difference	No Significant Difference
IXIC and MXX	0.05	0.05	0.442	0.884	Accepted	Accepted	No Significant Difference	No Significant Difference
IXIC and GDAXI	0.05	0.05	0.325	0.65	Accepted	Accepted	No Significant Difference	No Significant Difference
IXIC and KSP11	0.05	0.05	0.357	0.713	Accepted	Accepted	No Significant Difference	No Significant Difference
FCHI and EURONEXT	0.05	0.05	0.103	0.205	Accepted	Accepted	No Significant Difference	No Significant Difference
FCHI and HIS	0.05	0.05	0.186	0.372	Accepted	Accepted	No Significant Difference	No Significant Difference
FCHI and JKSE	0.05	0.05	0.454	0.908	Accepted	Accepted	No Significant Difference	No Significant Difference
FCHI and MXX	0.05	0.05	0.426	0.852	Accepted	Accepted	No Significant Difference	No Significant Difference
FCHI and GDAXI	0.05	0.05	0.21	0.42	Accepted	Accepted	No Significant Difference	No Significant Difference
FCHI and KSP11	0.05	0.05	0.234	0.468	Accepted	Accepted	No Significant Difference	No Significant Difference

Euro NEXT and HIS	0.05	0.05	0.408	0.185	Accepted	Accepted	No Significant Difference	No Significant Difference
Euro NEXT and JKSE	0.05	0.05	0.092	0.184	Accepted	Accepted	No Significant Difference	No Significant Difference
Euro NEXT and MXX	0.05	0.05	0.131	0.283	Accepted	Accepted	No Significant Difference	No Significant Difference
Euro NEXT and GDAXI	0.05	0.05	0.352	0.352	Accepted	Accepted	No Significant Difference	No Significant Difference
Euro NEXT and KSP11	0.05	0.05	0.3	0.6	Accepted	Accepted	No Significant Difference	No Significant Difference
HIS and JKSE	0.05	0.05	0.165	0.331	Accepted	Accepted	No Significant Difference	No Significant Difference
HIS and MXX	0.05	0.05	0.23	0.46	Accepted	Accepted	No Significant Difference	No Significant Difference
HIS and GDAXI	0.05	0.05	0.455	0.911	Accepted	Accepted	No Significant Difference	No Significant Difference
HIS and KSP11	0.05	0.05	0.413	0.827	Accepted	Accepted	No Significant Difference	No Significant Difference
JKSE and MXX	0.05	0.05	0.383	0.3	Accepted	Accepted	No Significant Difference	No Significant Difference
JKSE and GDAXI	0.05	0.05	0.186	0.373	Accepted	Accepted	No Significant Difference	No Significant Difference
JKSE and KSP11	0.05	0.05	0.208	0.415	Accepted	Accepted	No Significant Difference	No Significant Difference
MXX and GDAXI	0.05	0.05	0.259	0.518	Accepted	Accepted	No Significant Difference	No Significant Difference
MXX and KSP11	0.05	0.05	0.288	0.577	Accepted	Accepted	No Significant Difference	No Significant Difference

Table 10.ANOVA Summary

Source	Degrees of Freedom	Some of Squares	Mean Squares	F-stat	P-Value
Between Groups	9	0.379	0.0421	0.5257	0.855
Within Groups	210	16.825	0.0801		
Total:	219	17.2041			

From the T-statistic, it is ebient that there are no significant differences among the indices under study since their P-value more than 5% of significant level.

Interpretation (6)

It is ebient from the F-statistic that there are no significant differences between the group and within the group. Since their P-value is more than 5% significance level.

Interpretation (7)

It is understood from the grand rank of the indices under different parameters of returns, Risk, consistence and growth, DJI stood top in all the parameters. It is followed by EURO, JKSE, GDAXI, BSE, IXIC, KSPI, MXX, FCHI and HIS respectively.

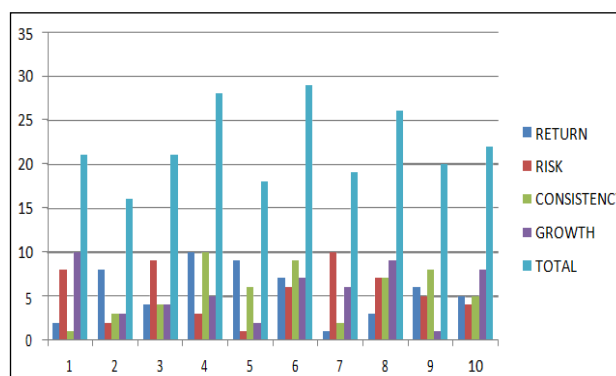


Table 10.ANOVA Summary

Findings

JKSE as the highest average rate of return of 17.4% followed by BSE of 16.2% and 14.4% of MXX. The other selected indices have less than 10% of average rate of returns during the study period.

Euro Index as the lowest average risk of 16.8% during the study period. It is followed by DJI of 18.1%. The rest of the selected indices have more than 20% of average risk.

BSE Is the most consistent index of among the selected indices over the study period. The other indices are almost closer to BSE index.

There are only 3 indices having positive CAGR(compound annual growth rate) in which GDAXI index as CAGR of 5.3% followed by EURO of 4.1% and DJI of 0.04%. The rest of the indices have negative growth during the study period.

The correlations among indices under study have strong positive correlation. Among the indices under study, there is a weak deviation.

From the T-statistic, it is evident that there are no significant differences among the indices under study since their P-value more than 5% of significant level.

It is evident from the F-statistic that there are no significant differences between the group and within the group. Since their P-value is more than 5% significance level.

It is understood from the grand rank of the indices under different parameters of returns, Risk, consistence and growth, DJI stood top in all the parameters. It is followed by EURO, JKSE, GDAXI, BSE, IXIC, KSPI, MXX, FCHI and HIS respectively.

Suggestion

The indices should improve the growth rate as it has experienced negative growth during the study period. As there are positive strong co-relation among the indices during the study period it is very difficult to forecast accurately because of collinearity.

Conclusion

By and large JKSE as the only index has more than 10% average rate of return .However BSE is the most consistent index and hence it is more preference.

References

1. Jeelan BV. Impact of Buyback Announcements on Stock Market in India (June 27, 2015). *Global Journal for Research Analysis* 2015.
2. Jeelan BV. An Empirical Study on Analysis of Stock Brokers in Indian Stock Markets with Special Reference to Cash Market. *Indian Journal of Applied Research* 2014.
3. Jeelan BV. Performance Evaluation of Mutual Funds with Special Reference to Selected Schemes. *International Journal of Current Research* 2015; 7(4): 15316-15318.
4. Jeelan BV. Wealth Maximization: An Empirical Analysis of Bonus Shares and Right Issue . *Indian Journal of Applied Research* 2014.
5. Jeelan BV. Forecasting Imports of India Using Autoregressive Integrated Moving Average. *International Journal of Business and Administration Research Review* 2015.
6. Jeelan BV. Comparative Study on NPAs (With Special Reference to Scheduled Commercial Bank Public Sector Banks and Foreign Banks in India. *Global Journal for Research Analysis* 2016.
7. Jeelan BV. Testing for Granger Causality between BSE Sensex and Forex Reserves: An Empirical Study. *International Journal of Current Research* 2015; 7(11): 23381-2338.
8. Jeelan BV. A Study on Type and Method of Issues- A Corner Stone of Primary Market. *International Journal of Business and Administration Research Review* 2015.
9. Haralayya B, Aithal PS. Performance Affecting Factors of Indian Banking Sector: An Empirical Analysis. *George Washington International Law Review* 2021; 7(1): 607-621.
10. Haralayya B, Aithal PS. Technical Efficiency Affecting Factors in Indian Banking Sector: An Empirical Analysis. *Turkish Online Journal of Qualitative Inquiry* 2021; 12(3): 603-620.
11. Haralayya B, Aithal PS. Implications of Banking Sector on Economic Development In India. *George Washington International Law Review* 2021; 7(1): 631-642.
12. Haralayya B, Aithal PS. Study on Productive Efficiency of Banks In Developing Country. *International Research Journal of Humanities and Interdisciplinary Studies* 2021; 2(5): 184-194.
13. Haralayya B, Aithal PS. Study on Model and Camel Analysis of Banking. *Iconic Research and Engineering Journals* 2021; 4(11): 244-259.
14. Haralayya B, Aithal PS. Analysis of cost efficiency on scheduled commercial banks in India. *International Journal of Current Research* 2021; 13(6): 17718-17725.
15. Haralayya B, Aithal PS. A Study On Structure and Growth of Banking Industry in India. *International Journal of Research in Engineering, Science and Management* 2021; 4(5): 225–230.
16. Haralayya B. Retail Banking Trends in India. *International Journal of All Research Education and Scientific Methods* 2021; 9(5): 3730-3732.
17. Haralayya B, Aithal PS. Factors Determining The Efficiency in Indian Banking Sector: A Tobit Regression Analysis. *International Journal of Science & Engineering Development Research* 2021; 6(6): 1-6.
18. Haralayya B, Aithal PS. Implications Of Banking Sector On Economic Development in India. *flusserstudies* 2021; 30: 1068-1080.

19. Haralayya B, Aithal PS. Study on Productive Efficiency of Financial Institutions. *International Journal of Innovative Research in Technology* 2021; 8(1): 159-164.
20. Haralayya B. Study of Banking Services Provided By Banks in India. *International Research Journal of Humanities and Interdisciplinary Studies* Volume 2021; 2(6): 06-12.
21. Haralayya B, Aithal PS. Analysis of Bank Performance using Camel Approach. *International Journal of Emerging Technologies and Innovative Research* 2021; 8(5): 305-314.
22. Haralayya B, Aithal PS. Analysis of Bank Productivity using Panel Causality test. *Journal of Huazhong University of Science and Technology* 2021; 50(6): 1-16.
23. Haralayya B, Aithal PS. Inter Bank Analysis of Cost Efficiency Using Mean. *International Journal of Innovative Research in Science, Engineering and Technology* 2021; 10(6): 6391-6397.
24. Haralayya B, Aithal PS. Analysis of Total Factor Productivity and Profitability Matrix of Banks by Hmtfp and Fptfp. *Science, Technology and Development Journal* 2021; 10(6): 190-203.
25. Haralayya B, Aithal PS. Analysis of Banks Total Factor Productivity by Aggregate Level. *Journal of Xi'an University of Architecture & Technology* 2021; 13(6): 296-314.
26. Haralayya B, Aithal PS. Analysis of Banks Total Factor Productivity By Disaggregate Level. *International Journal of Creative Research Thoughts* 2021; 9(6): 488-502.
27. Haralayya B. Importance of CRM in Banking and Financial Sectors. *Journal of Advanced Research in Quality Control and Management* 2021, 6(1): 8-9.
28. Haralayya B. How Digital Banking has Brought Innovative Products and Services to India. *Journal of Advanced Research in Quality Control and Management* 2021; 6(1): 16-18.
29. Haralayya B. Top 5 Priorities That will Shape The Future of Retail Banking Industry in India. *Journal of Advanced Research in HR and Organizational Management* 2021; 8(1&2): 17-18.
30. Haralayya B. Millennials and Mobile-Savvy Consumers are Driving a Huge Shift in The Retail Banking Industry. *Journal of Advanced Research in Operational and Marketing Management* 2021; 4(1): 17-19
31. Haralayya B. Core Banking Technology and Its Top 6 Implementation Challenges. *Journal of Advanced Research in Operational and Marketing Management* 2021; 4(1): 25-27
32. Vibhute NS, Jewargi CB, Haralayya B. Study on Non-Performing Assets of Public Sector Banks. *Iconic Research and Engineering Journals* 2021; 4(12): 52-61.
33. Jeelan BV, Haralayya B. Performance Analysis of Financial Ratios Indian Public Non-Life Insurance Sector, 2021.
34. Haralayya B. Testing Weak Form Efficiency of Indian Stock Market-An Empirical Study on NSE. *Emerging Global Strategies for Indian Industry*, 2021
35. Vinoth S, Vemula HL, Haralayya B et al. Application of cloud computing in banking and e-commerce and related security threat Materials Today: Proceedings.
36. Jeelan BV. Financial Performance Analysis of Post-Merger and Acquisition. *International Journal of Business and Administration Research Review* 2016; 1(1).
37. Jeelan BV. Empirical Study on Estimation of Value using Constant Dividend Growth (Gordo Model: With Special Reference to Selected Companies, 2014. *International Journal Management and Social Sciences Research* 2014.
38. Jeelan BV. Empirical Study on Determinants of Foreign Exchange Rates with Reference to India Rupee v/s US Dollar. *International Journal of Business and Administration Research Review* 2015; 2(10).
39. Jeelan BV. An Empirical Study on Relationship between Future and Spot Price. *International Journal of Current Research* 2016; 8(6): 33775-33779.
40. Jeelan BV. A Study on Private placement-A Key to Primary Market. *International Multidisciplinary E-Journal* 2015.
41. Jeelan BV. Examination of GARCH Model for Determinants of Infosys Stock Returns. *International Journal of Current Research* 2015; 7(12): 24811-24815.