

# Analysis of indian stock market finance essay

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## **Executive Summary**

The research paper basically explores the relation between the Indian stock market and the other global and regional (Asian) stock markets. It also studies the various macro economic variables which can have an effect on the stock index. We have run a factor analysis to establish the relationship between the various indices of India, US, UK, Europe, Germany, Hong Kong, China, Japan and Singapore. The monthly returns of the adjusted close values of the stocks have been from 1997 to 2009 have been taken for the study. We have conducted two factor analyses. First to see the impact on BSE of all the global and regional indices over the period from 1999-2007. Second by dividing the time period into two halves 1999-2003 and 2003-2009, we have analysed how the impact of the global indices have changed with the increase in globalization and integration of the world economy. The results show that the 5 indices belonging to the developed economies explain a majority of the impact on the Indian stock exchange. They explain 51% of the variance in the Indian stock exchange from 1997-2009. Component 2 contains the Hong Kong index, Shanghai and the Singapore

Index. These are the Asian economies and the developing economies. These account to 42% of the variation of the Indian stock exchange. The Indian Stock exchange is highly correlated to all the nine indices mentioned in this study, but the developed economies i. e the European and the American indices have a much bigger impact than the developing economies in the aggregated time period of 1997-2009. Over the years correlation between BSE and Hong Kong, Chinese and Singaporean indices has strengthened due to an increasing dominance of the Asian economies. Also the total variance as explained by the two factors has increased from 85.98% in 1997-2003 to 95.87% in 2004-2009. This is attributed to the integration of the world economy. For both the periods 1997-2003 and 2004-2009, the first factor has still been the group comprising of the global indices of US, UK, Europe and Japan rather than the Asian ones.

## **Literature Review (I): Integration of India's stock market with global and major regional markets**

### **Janak Raj and Sarat Dhal**

The purpose of this study is to understand whether the Indian Stock Market is integrated with global and regional markets, the extent of such integration and what are the regional and global markets that have a dominant influence on India's stock market. A correlation and the vector error correction and co integration model (VECM) is used to gauge the integration of India's stock market with global markets such as United States, the United Kingdom and Japan, and with major regional markets such as Singapore and Hong Kong.

## Data Used

The study has used six stock price indices, the 200-scrip index of BSE of India as the domestic market, regional markets include Singapore and Hong Kong, and three global stock price indices United States, the United Kingdom and Japan. With regards to frequency of data, the study uses daily and weekly stock indices. The data is measured both in the local currency as well as the US dollar. The selected indices are selected on the basis of significant financial and trade relationships with India.

## Hypothesis

As per the paper, the correlation of financial asset prices and the linkage among markets comes from the movement in the price of risks due to investors' risk aversion. A cointegration model is useful since it not only distinguishes between the nature of long-run and of short-run linkages among financial markets, but captures the interaction between them as well. There are perspectives relating to price equalisation, market equilibrium, market efficiency and portfolio diversification. According to the paper, The cointegration hypothesis has a generalised and statistical perspective on equilibrium dynamics among economic and financial variables, the vector can be consistent with the standard asset demand function, such that the price of one asset (domestic) depends on other assets (regional and global), some of which may serve as substitutes or complements to domestic assets. Therefore, portfolio diversification in the long run would depend on the size and the sign condition of the coefficients of the cointegration vector relating to various stock prices. Finally according to the study, the cointegration of stock contradicts the efficient market hypothesis.

## **Results:**

The empirical analysis of this study has provided various applied finance perspectives on cointegration among stock markets, after checking the sensitivity of results to sample periods in an environment of structural shifts, to the currency denomination of stock prices, and to the frequency of daily and weekly data. There is support to the international integration of India's stock market in terms of stock prices measured in US dollars but not in local currency, a finding attributable to investment decisions of foreign investors. The differential nature of stock market cointegration arising from US dollar- and local currency-denominated stock prices also has implications for the efficiency of national stock markets. At the same time, the study established that India's stock market provides opportunities for higher returns than other regional and global markets. Also, in terms of risk adjusted return, the Indian market outperforms others. Correlations of daily stock price indices and returns suggest a strengthening of the integration of India's stock market with global and regional markets in the more recent period since 2003. There is evidence of the differential impact of regional and global stock markets on the Indian market in the long run as well as the short run. The absolute size of coefficients in the long-run cointegration relation suggests that the Indian market's dependence on global markets, such as the United States and the United Kingdom, is substantially higher than on regional markets such as Singapore and Hong Kong. Innovation accounting in the VECM for the more recent period shows that international market developments at regional and global levels together could account for the bulk of the total variation in the Indian stock market. Within Asia, the Singapore and Hong Kong markets have significant influence, while the Japanese market has weak influence on

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the Indian market. The two global markets, the United States and the United Kingdom, could have a differential impact on the Indian market in the opposite direction, amid a structural shift in India's integration with these global markets. From a policy perspective, cointegrated stock markets would contribute to financial stability, since they cannot deviate too far from the long-run equilibrium path. From the standpoint of their portfolio diversification objective, investors cannot benefit from arbitrage activities in the long run. However, in the short run, markets would continue to be influenced by the portfolio diversification objective of foreign investors. The lack of evidence of integration of stock markets in terms of local currency gives rise to a concern that India's stock market integration may not be complete, a finding attributable to the inadequate role of domestic investors.

## **Literature Review (II): Effect of Macroeconomic Variables on Stock Market Returns For Four Emerging Economies: Brazil, Russia, India, And China**

Robert D. Gay, Jr., Nova South-Eastern University  
The goal of this study is to investigate the time-series relationship between stock market index prices and the macroeconomic variables of exchange rate and oil price for Brazil, Russia, India, and China (BRIC), and test whether the relationship is as strong as the relationship that exists between share prices and macroeconomic indices for developed markets like USA.

### **Data Used**

The study used the monthly returns averages of respective stock market indices, foreign exchange rates, and oil price between 1999 and 2006. The Box-Jenkins Autoregressive Integrated Moving Average (ARIMA) time-series

process was used to determine the relationship between the dependent variable (stock market index) to the independent variables (exchange rate and oil price). The study used the moving-averages at the one-month MA(1), three-month MA(3), six-month MA(6), and twelve-month MA(12) for the lagged dependent of stock market price and the two intervening variables of exchange rate and oil price.

## **Hypothesis**

This paper hypothesizes a positive relation between the exchange rate and the stock market index. As currencies depreciated against the U. S. dollar their respective exported products became comparatively cheaper on the world market, thus increasing aggregate demand for them. If demand is elastic export volume would increase, causing increased cash flows and profits and generally increase the stock price of domestic firms. The relationship between crude oil prices and stock prices is hypothesized to be negative in nature. As energy prices rise, production and input costs will generally increase, decreasing firm gross profits and cash flows. In conducting the Dickey-Fuller test on the original time-series datasets it was found that the null hypothesis could not be rejected for the dependent (stock price) and both independent variables (exchange rate and oil price) for Brazil, China, and India, with the same null hypothesis not being rejected for both stock and oil price for Russia at the one and five percent confidence level.

## **Results :**

The analysis of the effect of international macroeconomic factors of exchange rate and oil price on the stock market exchange price of Brazil, <https://assignbuster.com/analysis-of-indian-stock-market-finance-essay/>

Russia, India, and China did not reveal a significant relationship. This is not unexpected, as other international and domestic macroeconomic variables (e. g., production, inflation, dividend yield, interest rates, trade balance, rate structure) may also have a role in the determination of stock price expectations. Further research into the relationship between these other macroeconomic variables and stock prices is warranted. As the horizon of exchange rate and oil prices was extended by using their respective three- and six-month moving averages the R<sup>2</sup> continued to decrease significantly. As hypothesized, the relationship between exchange rates and stock prices should be positively related. This hypothesis was found to exist between the stock index price and exchange rate for Brazil, India, and China but not for Russia until the MA(12) level, which is possibly explained by the slight decreasing trend in the RBL/USD rate in the latter stages of 2003. With India in the infancy of its emerging economy, this relationship appears to not have had a chance to manifest itself as in the other countries already researched. Whereas for China, although it adheres to a fixed exchange rate regime, the exchange rate appears to have experienced dramatic increase at the MA(6) and MA(12) levels, more than likely due to the strong downward shift of about 0. 270 CNY/USD after mid-2005. Another interesting point of the results is the relationship observed between respective stock market prices and monthly oil prices. As hypothesized, the relationship would be inverse. However this relationship was not consistent for all of the BRIC countries, which alternated between a positive or negative relationship as the time-frame was carried forward, with significance value only for India at MA(1). Since this study did not include other macroeconomic variables, such as inflation, it may be that oil prices themselves may not have as much of a

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profound effect as expected. Instead, the change in oil prices may be better reflected in the inflation rate, which may have a more profound effect on stock market prices. Although the explanatory values of both exchange rate, oil prices, and the lagged stock market prices were not significant, this study has shown the effect of other macroeconomic factors, both domestic and international, should also be explored for their relationship with stock market prices. Further research into this area may prove significant in explaining and possibly forecasting the direction of respective country stock market prices to both internal and external shocks.

### **Summary of Results for Box-Jenkins MA (1)**

Country/Co-efficient Brazil Russia India China Constant 1.918. 35\*\*1. 78\*0.  
35MA(1)-0.020. 06-0. 44\*\*\*0. 01 Exchange Rate -16.03\*1. 94-2. 92-14. 82 Oil  
Price 0.210. 671. 05\*-0. 06 N888888888R20. 060. 020. 310. 02

### **Summary of Results for Box-Jenkins MA (3)**

Country/Co-efficient Brazil Russia India China Constant 2.178. 23\*1. 93-0.  
12MA(3) 0.050. 010. 28-0. 09 Exchange Rate -15.544. 81-5. 41-14. 81 Oil  
Price -0.36-0. 18-0. 120. 52 N8787878787R20. 030. 000. 030. 03

### **Summary of Results for Box-Jenkins MA (6)**

Country/Co-efficient Brazil Russia India China Constant 2.008. 49\*1. 58-0.  
51MA(6) 0.01-0. 02-0. 09-0. 12 Exchange Rate -23.865. 71-3. 13-82. 10 Oil  
Price -0.02-0. 600. 000. 40 N8484848484R20. 030. 000. 000. 04

## Summary of Results for Box-Jenkins MA (12)

Country/Co-efficient Brazil Russia India China Constant 1. 595. 652. 87-0.

50MA(12)-0. 01-0. 060. 11-0. 08 Exchange Rate-49. 91-1. 10-18. 92-152.

70 Oil Price 0. 495. 56-1. 820. 51 N78787878R20. 060. 020. 030. 06

## Literature Review (III): Factors Affecting Stock Prices in the UAE Financial Markets

(Presented at the. Singapore Economic Review Conference, Singapore, August 2-4, 2007) This paper attempts to identify and investigate the most influencing factors for the stock market of an emerging market like UAE while at the same time highlighting some of the findings of research carried out earlier, most of which were carried out for developed stock markets.

### Sample

The author selects 17 companies - 9 Banks & 8 Non Banks for the sample and constitutes an index based on Price weighted methodology similar to Dow Jones Industrial Average. Hypothesis to be tested is stated as follows

### **SP = f (EPS, DPS, OL, GDP, CPI, INT, MS)**

Where SP: Stock price; EPS: Earnings per share; DPS: Dividend per share; OL: Oil price; GDP: Gross domestic product; CPI: Consumer price index; INT: Interest rate; MS: Money supply Test for Multicollinearity conducted on the data reveals a significant correlation between Oil Prices and GDP as expected since Oil accounts for about 30% of UAE GDP. There was also significant correlation between DPS and EPS. Thus both DPS and Oil Price indicators were eliminated from the analysis. Multiple Regression Analysis

was conducted using: Case1: The constituted Index  
Case 2: Stock returns of the 9 Banks only  
Case 3: Stock returns of the 8 Non Banks only

## Regression Results

The nature of relationship was determined and found to be the same in all 3 cases (consistent with previous research) as shown below:

## Independent Variable

### Relation

### Significance of Relation

Case 1: Index Case 2: Banks Case 3: Non Banks

## Money Supply

Positive

-

Significant\*Significant\*

## GDP

PositiveSignificantSignificant

-

## CPI (Inflation)

NegativeSignificantSignificant

-

## Interest Rate

Negative

- 
- 
- 

## **EPS**

Positive Significant Significant Significant \* Significant at higher levels of Significance Thus the analysis in the paper reveals that Earnings (EPS) is the strongest driver of stock price change (as observed in all the 3 cases). Also Inflation (CPI) as well as Money Supply (MS) and GDP display a more dominant role for share price returns of Banks compared to Non Banks. At the same time, this paper highlights the fact that the key stock market drivers vary across countries (especially due to deferring market efficiencies ranging from semi strong to strong).

## **Factor Analysis (1997 – 2009)**

The objective of the study is to find out the impact of the various stock indices on the Indian stock exchange and check if any of the indices has a greater impact on the Indian economy in the given time period. The time frame used in this study is 1997-2009. The indices being considered is as follows - Bombay Stock Exchange (India) CAC 40 Index (Europe) DAX (Germany) FTSE 100 Index (UK) Hang Seng (Hong Kong) NIKKEI (Japan) SP (USA) Shanghai (China) Strait times (Singapore) We will be using the principal components method for extraction and the varimax method for rotation.

Analysis & Interpretation of the data The correlation matrix shows that the Hangseng and the strait times index are highly correlated with the Bombay stock exchange (0. 909 & 0. 897 respectively). The European and the Japanese markets are the least correlated with the Indian stock exchange.

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The validity and the reliability of the data can be checked with the help of the Kaiser Meyer Olkin (KMO test) and the Bartlette's test of sphericity. Ideally the KMO should be closer to zero and the bartlette's test should be significant. As you can see from the above table, the value of the KMO test is 0. 831 which shows that the sample is adequate. The Bartlett's test is significant (less than 0. 005), it is 0. 000 in our case. Hence, we can go ahead with the interpretation of the data. There are primarily two factors which influence the Bombay stock exchange. The two factors together explain 93% of the variation in the Bombay stock exchange. The third component will explain 96% of the variation, since the difference is not high, we will be reducing the indices into two factors. The rotated component matrix describes the grouping of the various indices into the two factors. According to this table, the indices coming under group 1 areCAC (European)DAX (German)FTSE (UK)NIKKEI (Japan)SP (USA)The indices coming under group 2 areHangseng (Hong Kong)Shanghai (China)Strait Times (Singapore)ConclusionThe 5 indices belong to the developed economies and they explain a majority of the impact on the Indian stock exchange. They explain 51% of the variance in the Indian stock exchange from 1997-2009. Component 2 contains the Hong kong index , shanghai and the Singapore Index. These are the asian economies and the developing economies. These account to 42% of the variation of the Indian stock exchange. The Indian Stock exchange is highly correlated to all the nine indices mentioned in this study, but the developed economies i. e the European and the American indices have a much bigger impact than the developing economies in the aggregated time period of 1997-2009.

## **Factor Analysis for comparing different periods (2004-2009 and 1997-2003)**

After establishing a relation between the various stock indices over the entire period 1997-2009, we have done further analysis by breaking the time periods into two to see whether the correlation of BSE with other stocks has undergone a change or not in the recent times. The indices being considered are the same: Bombay Stock Exchange (India)CAC 40 Index (Europe)DAX (Germany)FTSE 100 Index (UK)Hang Seng (Hong Kong)NIKKEI (Japan)SP (USA)Shanghai (China)Strait times (Singapore)We will be using the principal components method for extraction and the varimax method for rotation.

### **Analysis & Interpretation of the data**

2004-20091997-2003As is clearly evident from the correlation matrix, the correlation between BSE and Hongkong (0. 940), Chinese (0. 858) and Singaporean (0. 845) indices has strengthened over the recent years due to an increasing dominance of the Asian economies. If we look at the validity and reliability of data, it can be checked through Kaiser Meyer Olkin (KMO test) and the Bartlette's test of sphericity. Ideally the KMO should be closer to zero and the bartlette's test should be significant. As we can see our data is reliable with KMO nearing 1. Bartlett's test is significant (less than 0. 005). it is 0. 000 in our case. Hence, we can go ahead with the interpretation of the data. 2004-20091997-2003As we can see for both the time bands we only have two factors influencing the Bombay Stock Exchange. The total variance as explained by the two factors has increased from 85. 98% in 1997-2003 to 95. 87% in 2004-2009. . The third component will explain 93-97% of the variation, since the difference is not high, we will be reducing the indices into

two factors. 2004-2009 The rotated component matrix describes the grouping of the various indices into the two factors. According to this table, for 2004-2009 the indices coming under group 2 are DAX (German) Hangseng (Hong Kong) Shanghai (China) Strait Times (Singapore) The indices coming under group 1 are CAC (European) FTSE (UK) NIKKEI (Japan) SP (USA) 1997-2003 According to this table, for 1997-2003 the indices coming under group 2 are Hangseng (Hong Kong) Strait Times (Singapore) Shanghai (China) The indices coming under group 1 are CAC (European) FTSE (UK) NIKKEI (Japan) SP (USA) DAX (German) We see a similar relationship between both the periods with the German index being the only exception. As evident all the Asian indices are getting clubbed under one head as one single factor. We can also interpret it as the developing economies being one factor and the developed (non Asian ex Japan) making the other factor. Conclusion Over the years correlation between BSE and Hong Kong, Chinese and Singaporean indices has strengthened due to an increasing dominance of the Asian economies. Also the total variance as explained by the two factors has increased from 85.98% in 1997-2003 to 95.87% in 2004-2009. This is attributed to the integration of the world economy. For both the periods the first factor has still been the group comprising of the global indices rather than the Asian ones.

## Conclusion

There have been a number of research studies carried out on identifying and measuring the impact of the factors that affect stock market fundamentals of an economy (predominantly for developed economies) and many have identified them to be the macroeconomic indicators of the economy under

study. However, with through this study on factors affecting the Indian Stock Market, the leading world stock indices (8 in this study - 5 developed and 3 developing economies) have been identified to have significant impact as drivers. As can be seen from the results of Factor Analysis for the period of study of 1997 - 2009, the indices of the 5 developed economies (US, UK, Europe, Japan, Germany) together represent one factor which accounts for a higher proportion of variation of the Indian Stock Market Index compared to the indices of the other 3 developing economies (China, Hong Kong, Singapore) which get grouped under a second factor. Similar results are obtained for the analysis conducted for the study of the two separate time periods i. e. 1997 - 2003 and 2003 - 2009. Thus, besides the macro economic variables that are generally used, separate independent variables accounting for movement of world stock indices should be incorporated which through this study have been identified to be broadly classified as 2 factors - one being a composite measure of movements of the stock indices of developed economies and the other, that of developing economies. Incorporating these additional measures would add to the accuracy of models used to predict local stock index movements.