Advanced and Emergent Equity Market Behaviour

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Abstract: ***The drive of this work is to observe the bidirectional association in a section of advanced and emergent equity market places at diverse points of time. For the study purpose top ten Advanced and emergent markets are taken into consideration. Daily closing prices of these markets' representative index were taken over a period of twenty-three years. Granger Causality Test was applid after checking the assumption of causality. An existence of bidirectional relational was established for nations. VAR test was also applied further to estimate the causality in the short term.***

Keywords: Granger Causality, Development, Emergent Markets, Stock Market Behaviour, Vector Auto-Regression.

I. INTRODUCTION

The return dynamics of Advanced and Emergent nations have always been area to explore (Maharaj, Galagedera, and Dark (2011)). The stock market world over is increasingly getting interrelated (Fayyad and Daly, 2010). Apart from Advanced nation's markets, there is an increasing attraction for investment in emergent markets as well (Hartmann and Khambata (1993)). Both Advanced and Emergent markets have differences in aspects like volatility, risk/return, level of integration/ correlation,etc. (Bekaert& Harvey (1997). The integration of Advanced and Emergent markets and implications for investment as well as risk (Tudor and Popescu-Dutaa" a, 2012).

Portfolio diversification and risk reduction can be planned for getting the maximum benefit out of an investment. It can limit the overall volatility of portfolio but the investor should keep in mind the presence of the foreign exchangerisk.

Much research has been done in India in the region related to the determining of the volatility of stock markets like Goudarzi and Ramanarayanan (2010 and 2011) surveyed the unpredictability of the "Indian stock market"by means ofthe "BSE 500" stock index using different techniques. Mittal, Arora, and Goyal (2012) used GARCH and pGARCH models to examine volatility as opposed to Vijayalakshmi and Gaur (2013) using eight diverse GARCH based prototypes to predict volatility in Indian and overseas stock marketplaces.

Significant contributions worldwide have also been made by Baillie and DeGennaro 1990; Bekaert andWu 2000; Karmakar (2005 and 2007)Chand, Kamal, and Ali 2012; Kenneth 2013 as quoted by y Banumath and Azhagaiah in 2015) as well in this area. To add further, similar kinds of studies have been done for stock exchanges of Egypt (Zakaria and Winker (2012), Ahmed and Aal (2011); for Middle East nations (Floros, 2008); for Nepal (Bahadur 2008). Conditional Variance and GARCH based estimation techniques have been used majorly in this researches.

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Yet, numerousinvestigators like Konstantinos (2000) argued that unpredictability in ESMs has droppedas they unwrapped up to foreign investors like Richards (1996), Kim and Singal(1993), Bekaert (1995), Claessens, Dooley, and Warner (1995), Choudhry (1996).

The present study did acontrast between Advanced and Emergent Equity Market' returns of selected economies for volatility and causality. The research work begins initially with the development of concepts ofAdvanced market, volatility, various theories explaining the volatility of stock market, Emergent Markets, etc. Further an extensive review is done for these variables of the study. Through existing literature review, objectives are set and research methodology is Advanced. The results are discussed in next section after applying different statistical tools. Finally, a conclusion and references are given.

II. ADVANCED & EMERGENT MARKET

A country can be calledAdvanced based on the economic progress of its economy and capital market. Anadvanced country has a high income, is more open to foreign ownership,capital movement is easy and market institutions are efficient. Cavusgil (1987) has defined emergent markets like the ones with high-growth and havestrikingcorporatechances for Western firms. They have much commercialimpending.Republic of China, India, Mexico, Brazil, Chile in Southeast Asia, few countries in Eastern Europe, parts of Africa and Latin America are few examples of emergent economies.

The International Finance Corporation (IFC) characterizes nations as "per their per capita GNP", which is similarly the grouping utilized by the World Bank. Conferring to IFC, ESMs are financial exchanges in nations with low-to-center per capita pay. Different meanings of ESM can be seen in the writings of Divecha et. al. (1992), Errunza (1983), Taliente and Fraser (1995). Be that as it may, it is hard to locate an accurate meaning of an ESM, since the business sectors which are depicted as developing today change generally in their organization, execution, possibilities and chief highlights (Barry and Lockwood (1995)).

Emergent economies have been a great attraction for investment flows post since the 1980s. The majorshare of outlayin such emergent markets was in the form of debt. The reasons for such huge attraction of investments were the extraordinary returns they offered. Till mid-1980s, business banks have customarily given investible assets in numerous Emergent economies. The value markets have been moderately latent because of the macroeconomic and administrative strategies which didn't urge the private division to assume a functioning job in the economy. There were high financial obligations, high swelling, low or negative genuine loan fees,

the prevailing job of the open area and quantitative limitations on the accessibility of credit were the fundamental explanations behind the powerlessness of the secluded part to add to national monetary development. Further high expenses on profits and capital additions, insufficient guidelines, and supervision of money related markets, the low quality of dispersal of data and hindrances to inflows of remote capital all added to low interest for value account (Cashin and McDermott, 1995).

Studies show that macroeconomic unpredictability is a significant impediment to development. Dawe (1996) has examined the impact of instability in trades on venture and development. He found both constructive outcomes of instability on speculation through an expansion in prudent investment funds, and a negative impact on development through a designation of cash-flow to divisions with lower yields. Dehn (2000), then again, recognizes a huge adverse effect of stuns in the cost of crude resources on interest in Emergent nations. Guillaumont, Guillaumont-Jeanneney, and Brun (1999) found anadverse impact of unpredictability in the pace of venture on development, in view of a decrease in normal efficiency.

Frenzied behavior is shown by stock prices. It may be observed that "stock market behavior" can be projected to some degree in the short-run but it is difficult to predict the same in long run. Similarly, a large number of factors affect the price movements in the stock market and lead to its volatility. These factors include news related to organization, other macro-economic factors, etc. (French and Roll, 1986).

Few researchers found that stock trades volume causes volatility (Fama,1965; French, 1980). Further asymmetrical volatility may be caused because of the interaction between volume and price interaction (Bessembinder and Seguin 1993). In 1992, Madhavan said that investors prefer low volatility as they want low risk. This gives them an option to liquidate their assets during un-favorable price movements.

A. Volatility

Volatility is these days the main consideration in the creationof any portfolio formations and outlaychoices (Lux &Marchesi, 2000). Daly (1999) has discovered that unpredictability has become a significant issue for some, reasons like for not finding fitting clarifications for value changes. The unpredictability of the corporation is a noteworthyfeature in defining the likelihood of insolvency, the bid-ask spread, hedging methods such as portfolio spread are influenced by the instability level, with the costs of protection expanding with unpredictability and last yet at the very least due to thought that customers are hazard opposed.

Liu et al. (1999) had expressed that unpredictability has significant handy advantages to dealers since it evaluates the hazard and is the way to distinguishing circumstances where stocks give off an impression of being undervalued or overrated. Adding to the concept of volatility, Gordon in 1959 has explained that normal stock valuation modelslike the "dividend growth model" assume that the core value of the stock is dogged by probable flows of cash and rate at which returns are generated. "The arbitrage pricing theory" (Ross 1987) quantified that variationsin forthcomingflow of cash and required returns would, therefore, have influence on stock return.In various studies, stock market instability has been measured using two of the unpredictability models: first is the "stochastic volatility (SV) model" and the second is "autoregressive conditional heteroskedastic (ARCH) model"given by Poon and Granger (2003).

B. Understanding the "Stock Market"

The working and behavior of the stock market have been explained by different theories and quantitative models from time to time. Some of the important theories are discussed below:

a) Efficient Market Hypothesis (EMH)

An "Efficient Market Hypothesis (EMH)", the data is accessible to mirror the stock costs. There are three types of EHM: solid structure, semi-solid structure, and powerless structure. According to Fama, a Strong type of EMH consistently mirrors the significant data and the arrangement of costs. The semi-solid structure consistently reflects open data. Finally, feeble type of EMH consistently mirrors the chronicled costs (Malkiel (2003)).

C. Capital Asset Pricing Model (CAPM)

As indicated by Fama and French (2004), "Capital Asset Pricing Model (CAPM)" is a prototypical used to gauge the expense of capital for firms and assess the portfolio's venture. According to Fama (2004), there are observational matters in CAPM and it caused irregularity with the hypothesis. CAPM consistently distinguishes the hazard of stock which has aconnotation with the market portfolio.

D. Random Walk Theory

Random Walk Theory says that predefined value moves haphazardly and subjectively. As per Fama (1965) the potential gaining limit of security relies on the characteristic estimation of that security. Adding to it, Samuelson (1965) said that foreseen costs may change haphazardly and it is hard to anticipate stock cost with such vacillations.

E. The Neoclassical theory, Keynesian and Post-Keynesian View

The neo-old style hypothesis advocates that money-related 'extending related to monetary advancement could lessen securities exchange unpredictability. Further it contends that administration mediation prompts bend of money related costs. According to this methodology, the advancement procedure should improve the job of the financial exchange and should help interest of the two firms and speculators in the securities exchange, leading to reduced volatility of equity prices. Keynes has proposed the Keynesian theory in-response Great Depression and some arguments proposed by earlier classical theories. This theory emphasizes the role of government and its policies to address and manage the economic recession. The post-Keynesian view considers market to be imperfect and proposes that volatility induce even more volatility (Keynes (1936)). So as per this theory, financial liberalization leads to increased volatility through increased liquidity.

Regardless of whether instability will increment or not as the securities exchange extends is actually an experimental inquiry. The two primary hypotheses (neoclassical and post-Keynesian) are not useful at clarifying how securities exchange instability is influenced by financial exchange advancement.

III. REVIEW OF LITERATURE

Many pieces of research are available which are done for different stock markets for exploring the causality effects between the stock markets of the nations, between returns and volumes and similar areas. These studies have not given and generalized conclusion as with time, changing macroeconomic conditions lead to changes in the associations. Adding to it are behavioral factors too which have changed and are changing over a period of time. Starting with a study of Singh, Mehta and Holani (2010) on "price and volume effects"variationsto the "Madrid Stock Exchange", cited that the market respondsabsolutely, to news of additions to the index.Prorokowski and Lukasz (2011) in a study for Poland found the cross-border consequences of diverse economic and financial evidencecreated during the financial crisis. Maharaj et al. (2011)did not find the dynamics of the market return of Advanced and emergent markets as different Karmakar (2007), Zakaria and Winker (2012) and Mandimika and Chinzara (2012); andfurther the results presented in the study are in opposing to the investigation findings of Karmakar (2007) Banumathy and Azhagaiah(2015) who had examined the instability pattern of Indian stock market and hadprovided indication for the presence of a constructive and unimportant"risk premium" as per GARCH-M (1,1) model. Nzomo and Dombou (2017) found NSE as a more volatile return series and Ghufran et al. (2016), Kanasro et al. (2009), Saleem(2007) found Karachi Stock exchange as more volatile.

Donadelli et al. (2013) found the equity risk quality in emergent markets is complexcompared Advanced markets. Aggarwal et al. (1999) examined emergent stock markets, America, Argentina, andIndia. They found that bigger occasions cause huge moves in the unpredictability of rising financial exchanges.

Bhargava, Malhotra, and Singh's (2012) study results had shownthe evidence that volatility diffusion from the "US dollar interest rate swap"marketplaces to the Indian swap markets.Adler andQi (2003) studied the North American stock market, the native Mexican equity market and the pesoy-dollar conversation rate to find integration between these and further found evidence of integration.

Bekaert, Harvey, and Lundblad (2005) found a monetarily and factually huge lessening in both GDP and utilization development changeability post-progression.

Calvo(1999) in his study for emergent markets showed that"balance-of-payments"crunches in emergent market economies were rapidlyendorsed to macroeconomic negligence. Umutlu, et al (2009) study revealed aadverseassociationamongst the amount of "financial liberalization" and combined stock-return instability in an emergent market.Mala and Reddy (2007) examined Fiji's financial exchange and their examination indicated the association in Volatility and Stock market utilizing GARCH Model. Masih, Peters, and Mello (2010) considered oil value vacillations and oil value unpredictability on value showcase execution and found the strength of oil value instability on genuine stock returns for Korea. Perotti and Oijen (1999) inspected whether privatization in new economies has a critical roundabout impact on neighborhood securities exchange improvement through the goals of political hazard.

Constructed on the directly above review, the following supposition can be postulated:

- Ha1: There is a bi-directional causal association between the stock index returns under study.

IV. OBJECTIVE

- To scrutinize the bi-directiona linstrumental association amongst the different nation's stock index returns under study.

V. RESEARCH METHODOLOGY-

The study wasvivid with ancillary data being used to conduct the same. The sample size of the study was of 10 Advanced and 10 Emergentnations' representative indices. The individual representative index acted as a sample element for the study.The time frame of the study of last 20 yeari.e. financial year 1995 to financial year 2018.The data wascollected through secondary sources like yahoo finance .com www. Bloomberg.com, www.in.investing.com, www.world-stock-exchanges.net

List of Indices is given below where the first ten indices are of emergent economies and the next ten are of Emergent nations.

1. AORD: All Ordinaries of Australia.
2. BEL: Benchmark stock market index of Euro next Brussels
3. BESSN: Bombay stock exchange of India
4. IPCMXX: Jasa Armada of Indonesia
5. JKSE Jakarta Composite Index of Jakarta
6. MBASE: of Athens
7. NZSE50 main stock market index in New Zealand
8. OSE Osaka Securities Exchange Co., Ltd. In Japan
9. STI: Straits Times Index (Singapore)
10. TW: Taiwan Stock Exchange of Taiwan
11. CAC French stock market index of France
12. ATX: The Austrian Traded Index of Australia
13. FTSE: FTSE Group (FTSE) Singapore
14. GDAXI: German Stock Exchange
15. HSI: Hang Sang Index
16. The BOVESPA benchmark index of Brazil
17. GSPC: S&P 500 group
18. TSX The Toronto Stock Exchange of Toronto, Ontario, Canada
19. SSEC Shanghai Stock Exchange index of Shanghai China
20. SWISS: SIX Swiss Exchange (formerly SWX Swiss Exchange), based in Zurich

Tools used for data analysis: Granger Causality test to discover the bidirectional associationamong the 'stock market returns' of stock indices under study. VAR was used to confirm the causality in the short term and cointegration in long run.

VII. NORMALITY OF RESIDUALS

The normality of residuals of index returns series was checked with the Jarqe-bera test. The probabilityvalue of all indexes' value was less than 0.5%. Thus the null suppositionof normality was rejected (Refer table I).

Table I: Normality of Residuals

	AORD	BEL	BSESN	IPCMXX	JKSE	MBASE	NZSE50	OSE	STI	TW	CAC	ATX	FTSE	GDAXI	HIS	BOVESPA	GSPC	TSX	SSEC	SWISS
Jarque-Bera	7750.0498	7238.458	3731.427	1404.552	816.836	4706.633	1086.714	1703.615	1615.559	1309.967	2458.158	8595.149	1001.563	3362.244	2182.739	5073.276	2721.918	38.74347	9381.510	2569.942
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

VIII. CORRELATION ANALYSIS

The correlation among different stock returns series was done using correlation analysis. The test checked for the strength and direction of a linear association between different time series. Correlation is a step before causation. Results showeda significant correlation between series.

IX. UNIT ROOT

ADF test was used to check the presence of volatility in the series data.

The Null Hypothesis tested here is: "Stock Index returnsRuns has unit root and is non-stationary"

The abovesupposition wasprecluded for all the return series and hence the data was found to be stationary which further can be used for causal analysis (refer table II).

Table II: Data Stationarity

SNO	SERIES	TEST VALUE	PROB	NULL HYPOTHESIS
1	AORD	-13.30532	0.000000	REJECTED
2	BEL	-13.89771	0.000000	REJECTED
3	BSESN	-18.69337	0.000000	REJECTED
4	IPCMXX	-16.87934	0.000000	REJECTED
5	JKSE	-19.31435	0.000000	REJECTED
6	MBASE	-20.51065	0.000000	REJECTED
7	NZSE50	-7.146937	0.000000	REJECTED
8	OSE	-24.22026	0.000000	REJECTED
9	STI	-11.51489	0.000000	REJECTED
10	TW	-14.20471	0.000000	REJECTED
11	CAC	-16.17713	0.000000	REJECTED
12	ATX	-14.87234	0.000000	REJECTED
13	FTSE	-15.88881	0.000000	REJECTED
14	GDAXI	-11.36092	0.000000	REJECTED
15	HSI	-14.72700	0.000000	REJECTED
16	Bo Vespa	-20.99242	0.000000	REJECTED
17	GSPC	-12.55510	0.000000	REJECTED
18	TSX	-53.66036	0.000000	REJECTED
19	SSEC	-23.03104	0.000000	REJECTED
20	SWISS	-15.37197	0.000000	REJECTED

X. THE TEST OF EQUALITY OF VARIANCE BETWEEN SERIES

*The Null Hypothesis tested here is: "*equal discrepancy of the residuals*"*

The result test figuresdiscard the null supposition of the equal discrepancy of the residualsacross nations, providing a robustindication of the incidence of group-wiseheteroskedasticity. In this test the null supposition of equivalentdifference of the residual cross countries is rejected and the Bartlett weighted standard deviation is 10.88981 (refer table III).

Table III: Heteroskedasticity Test

Test for Equality of Variances Between Series			
Method	df	Value	Probability
Bartlett	19	7422.639	0.0000
Levene	(19, 97620)	204.0483	0.0000
Brown-Forsythe	(19, 97620)	173.7286	0.0000
Category Statistics			
		Mean Abs.	Mean Abs.
Variable	Count	Std. Dev.	Mean Diff.	Median Diff.
AORD	5286	10.79874	7.875859	7.562056
BEL	5322	11.29632	7.941546	7.621195
BSESN	4554	10.47678	7.322037	7.006883
IPCMXX	5257	10.67999	7.611722	7.307731
JKSE	4465	10.16761	7.283235	7.042802
MBASE	4708	10.46209	7.258691	6.908472
NZSE50	3164	18.33987	14.46368	14.42733
OSE	693	10.61630	7.689771	7.431900
STI	5235	11.20151	7.900862	7.614393
TW	4544	11.04232	7.908928	7.577950
CAC	5325	10.63414	7.478616	7.140508
ATX	5183	10.88459	7.588594	7.259023
FTSE	5287	10.85294	7.749365	7.452141
GDAXI	5306	10.65827	7.635275	7.345156
HIS	7143	10.69573	7.651005	7.374960
BOVESPA	5178	9.468048	6.747840	6.435011
GSPC	5272	11.66592	8.242768	7.918302
TSX	5363	4.759102	4.155440	4.147492
SSEC	5093	11.39721	7.902640	7.555544
SWISS	5262	10.94440	7.831762	7.522867
All	97640	18.25130	7.678940	7.394486
Bartlett weighted standard deviation: 10.88981			

XI. ARCH TEST

"The ARCH test" is used to find out the "ARCH effect" in residuals. Therefore, the 'ARCH-LM' test was applied to showthe 'arch effect' in residual of time series under study. The results are helpful in making decisions related to volatility predicting and financial decision making. Arch model is considered better than ordinary least square regression method based on their ability to use past information and predicting of variance of returns (refer table IV).

Table IV: Arch Test Results

EMERGING NATIONS				DEVELOPED NATIONS			
Series Name	Test Statistics	Probability	Arch Effect/No Arch Effect Null Hypothesis: There is no arch up to order Q in the residuals.	Series Name	Test Statistics	Probability	Arch Effect/No Arch Effect Null Hypothesis: There is no arch up to order Q in the residuals.
AORD	0.064011	0.800275	No Arch Effect	CAC	8.643326	0.003297	Arch Effect
BEL	0.000625	0.980058	No Arch Effect	ATX	0.010583	0.918092	No Arch Effect
BSESN	1.441775	0.229915	No Arch Effect	FTSE	0.022522	0.880751	No Arch Effect
IPCMXX	0.002270	0.962002	No Arch Effect	GDAXI	0.118638	0.730621	No Arch Effect
JKSE	0.086069	0.769250	No Arch Effect	HSI	0.055566	0.813715	No Arch Effect
MBASE	0.086069	0.769250	No Arch Effect	BOVESPA	0.005022	0.943524	No Arch Effect
NZSE50	1.240992	0.265337	No Arch Effect	GSPC	0.008940	0.924700	No Arch Effect
OSE	0.091027	0.762895	No Arch Effect	TSX	0.984129	0.321527	No Arch Effect
STI	0.002130	0.963206	No Arch Effect	SSEC	0.092722	0.760836	No Arch Effect
TW	0.486798	0.485390	No Arch Effect	SWISS	1.351457	0.245423	No Arch Effect

From table 4,it is visible ARCH Effect is present in only the CAC index i.e. French Stock market. This means that only CAC is exhibiting conditional heteroscedasticity.

XII. GRANGER CAUSALITY TEST

"The Granger causality test" is used to checkin what wayconsiderable of the current values can be explicated by past values or by adding lagged values of the same. The causal association between the time sequence under study can be studied using 'the Granger causality test'. Also the test is used to decideif one-time series is beneficial in predicting other time series.From the results, it is found that there is a both-ways associationbetween AORD, BEL, BESEN, IPCMXX, MBASE, JKSE, NZSE50. OSE, STI, CAC, ATX,GDXAI, HIS, BOVESPA, GSPC, SSEC, SWISS, and all other stock index series under study.

XIII. VAR [VECTOR AUTO REGRESSION]

The vector autoregression (VAR) can be interpreted as OLS. In the output, the table of VAR can be interpretedHere each line relates to a regressor in the condition and on each right-hand side variable, the assessed coefficient, its standard error, and the t-measurement are accounted for the condition.

The vector autoregression (VAR) was utilized for breaking down the dynamic effect of arbitrary unsettling influences on the arrangement of factors, for example, the market return arrangement contemplated.The coefficients foreach VAR model results can be considered for the causal association in the short period, and co-integration association in the long period. The regression coefficients found for all associations is significant. Hence causal association is present among series in short term and co-integrating in long term (refer table V).

Table V: Va R Results

	CAC	ATX	FTSE	GDAXI	HIS	BOVESPA	GSPC	TSX	SSEC	SWISS	AORD	BEL	BSESN	IPCMX	JKSE	MBAS E	NZSE50	OSE	STI	TW
CAC (-1)	-0.048145	0.009510	0.039652	-0.073763	0.051973	0.013478	0.012729	-0.000043	-0.043054	0.000984	0.126008	0.293320	0.059942	-0.000966	-0.048434	-0.033905	-0.097085	0.061995	-0.017196	-0.043552
CAC (-2)	0.110713	-0.042156	0.145044	0.020752	-0.074186	-0.002423	0.017461	-6.08E-05	-0.002516	0.034739	0.024668	0.025175	0.012711	-0.007005	-0.011325	0.015671	-0.061104	-0.013497	0.011906	0.015938
ATX (-1)	0.068630	0.019881	0.079042	0.070813	-0.011689	0.055678	0.103252	0.000134	0.046079	0.088062	-0.004926	0.053384	-0.028205	0.020602	-0.050411	0.060899	0.021677	0.022644	0.028646	0.021395
ATX (-2)	0.049832	0.058237	0.044210	0.032324	-0.030038	-0.007394	0.168021	-0.000476	-0.041289	0.082289	-0.053842	0.095585	-0.011712	-0.036764	-0.025407	-0.063633	0.029715	0.078963	-0.019499	0.000146
FTSE(-1)	0.133703	-0.076824	0.003293	0.004411	0.019260	0.049194	0.035963	-0.000524	0.003847	0.095781	0.068636	0.013194	0.015068	-0.003062	0.008660	-0.004395	-0.013833	0.093496	-0.040688	-0.057595
FTSE(-2)	0.093271	0.094881	0.029107	0.025028	0.022497	0.001749	0.056126	5.63E-05	0.014551	-0.052438	0.021270	0.012297	0.010794	-0.037664	0.019443	0.023173	-0.02707	0.019235	0.018221	0.054451
GDAXI(-1)	0.060245	0.009521	0.006064	0.040988	-0.006341	0.006805	-0.005944	-0.000671	0.008048	0.015566	-0.034527	0.003417	-0.019892	-0.056955	-0.041384	-0.031175	-0.063107	0.049455	0.012866	0.032659
GDAXI(-2)	-0.006436	0.006514	-0.051543	-0.047291	-0.041446	-0.023134	-0.056037	-0.000102	0.047004	0.023549	0.069389	-0.074092	-0.015348	0.093667	0.059393	0.085437	-0.060400	0.052326	0.021740	0.030724
HIS(-1)	0.017395	-0.049634	0.045722	0.026203	-0.001058	0.018159	0.013704	0.000683	-0.033937	0.024093	-0.011811	0.050281	0.012173	0.017922	-0.033854	-0.024991	0.039418	-0.003411	0.051011	0.036534
HIS(-2)	0.084170	0.043014	0.017637	0.024914	0.073781	0.056121	-0.005612	0.000104	-0.009126	0.008924	-0.045818	-0.027159	0.030080	-0.011272	0.043408	0.016296	0.002433	-0.016748	0.072184	0.063303
BOVESPA(-1)	-0.045338	-0.042154	0.021908	0.047904	-0.033393	-0.006723	-0.041563	-1.69E-05	0.041867	0.012640	0.072062	-0.063804	0.081807	-0.021562	0.030674	0.017430	0.016279	-0.003911	-0.011538	0.047163
BOVESPA(-2)	-0.032807	-0.030605	-0.043978	0.064839	0.005699	0.024059	0.066013	-9.61E-05	0.009556	-0.006687	-0.005255	0.034065	0.009132	-0.046709	0.000869	-0.002907	0.065361	0.061038	0.000783	0.029039
GSPC(-1)	-0.004736	0.034125	-0.027424	0.041795	0.053751	0.009624	-0.063736	4.03E-05	0.011484	-0.002239	0.021537	-0.018599	0.009083	-0.030888	-0.030348	-0.002622	-0.033915	0.023702	0.026214	0.012727
GSPC(-2)	0.008721	-0.031561	0.055316	0.010309	0.025128	-0.001808	0.021270	-0.000712	-0.032259	0.032397	0.057264	-0.009928	-0.032264	0.046201	0.011826	-0.003825	-0.022026	0.067882	0.087260	-0.012419
TSX (-1)	-1.360066	-1.018866	-2.438574	1.033524	2.156335	0.717310	-0.262675	1.080353	-1.121782	-0.050915	0.405345	0.330883	3.612387	5.630136	5.778973	6.967434	-6.037899	0.617637	2.616928	3.445915
TSX (-2)	-0.224578	0.862544	3.403223	-1.867583	-1.690752	-0.857254	1.520545	-0.000849	0.854954	0.086913	0.855825	1.002502	-2.109039	-3.304405	-3.615873	-7.816901	6.452133	-2.142412	-1.677581	-3.242024
SSEC(-1)	0.092241	-0.017551	0.046672	-0.048506	0.020747	0.068666	0.042815	0.000425	0.068808	0.022780	0.004003	-0.043313	0.019202	0.009618	0.084915	0.024381	-0.010538	0.035457	-0.036233	0.046224
SSEC(-2)	0.025587	0.016890	0.007035	0.067536	0.078545	0.032080	-0.035065	-0.000567	0.041375	-0.030354	0.021659	-0.034767	-0.022516	0.039561	0.058032	0.028034	-0.075138	1.24E-05	-0.021514	0.009870

SWISS(-1)	-0.014886	-0.01594	0.066352	0.154677	-0.048504	-0.000079	0.073608	-0.001003	0.060028	0.086140	0.004819	0.017879	-0.030029	0.015128	0.025159	-0.046405	-0.142884	0.015325	-0.008826	0.004408
SWISS(-2)	0.067585	-0.00032	0.021561	0.028086	-0.00093	-0.001518	-0.002782	0.000298	0.061620	0.014450	-0.004814	0.032515	0.018784	-0.012106	-0.056447	-0.039845	-0.041182	-0.061091	-0.056248	-0.081192
AORD(-1)	0.029369	0.014821	-0.015246	-0.045339	0.033130	0.037847	-0.005127	-0.000626	0.032323	0.022267	0.008749	-0.063366	-0.034305	-0.026292	-0.023177	-0.076426	-0.076595	-0.009325	-0.018215	0.013660
AORD(-2)	0.038377	-0.019086	-0.050727	-0.085665	0.028616	-0.006219	-0.024659	-0.001008	0.010767	0.005497	0.085036	-0.023326	-0.026837	-0.065707	-0.075124	-0.006671	-0.042896	-0.019794	-0.061890	-0.079005
BEL(-1)	-0.009891	0.038555	-0.024306	0.019571	-0.036782	-0.000886	0.002766	-0.000766	-0.056552	-0.018948	0.011446	-0.058154	-0.028961	-0.036785	-0.006664	-0.071803	0.056332	0.024014	-0.053500	-0.084327
BEL(-2)	-0.036048	0.023128	0.056194	0.034335	-0.045735	0.021363	-0.011506	-0.000368	0.022234	0.023148	0.042069	-0.046384	0.054803	0.013435	0.039261	-0.050733	-0.016931	0.010245	-0.025068	0.062524
BSESN(-1)	-0.018434	0.049494	-0.054945	-0.035261	-0.030261	-0.005982	-0.044248	-0.000261	0.002394	-0.017974	-0.033108	-0.058233	-0.025965	-0.035420	-0.025066	-0.026701	-0.062991	-0.038950	-0.004823	-0.049681
BSESN(-2)	-0.012002	0.050527	-0.003523	0.008812	-0.005941	-0.002577	-0.020601	-0.000114	0.038623	-0.017017	-0.037563	-0.082900	-0.031495	-0.080007	-0.027523	-0.030606	-0.035465	-0.016904	-0.002994	-0.013466
IPCMXX(-1)	-0.043137	-0.018142	-0.020817	-0.027955	-0.012033	-0.001480	-0.005585	-0.000441	-0.008233	-0.005968	-0.044025	-0.032791	-0.032076	-0.036157	-0.032457	-0.001309	-0.004108	-0.019196	-0.042537	-0.016094
IPCMXX(-2)	-0.065904	-0.004053	-0.077833	-0.023514	-0.005980	-0.027299	-0.010406	-0.000131	-0.021853	-0.064230	-0.025017	-0.002673	-0.082872	-0.016682	-0.031546	-0.011796	-0.036002	-0.031560	-0.047165	-0.004380
JKSE(-1)	-0.025073	-0.056513	-0.031812	-0.025905	-0.039836	-0.083370	-0.033802	-0.000243	-0.016882	-0.059757	-0.046513	-0.001108	-0.098033	-0.054994	-0.040046	-0.082067	-0.047175	-0.018891	-0.021218	-0.011722
JKSE(-2)	-0.023917	-0.090995	-0.036303	-0.031925	-0.064206	-0.050370	-0.017501	-0.000416	-0.005797	-0.034305	-0.025516	-0.012758	-0.004735	-0.052341	-0.003972	-0.047712	-0.051754	-0.019866	-0.015339	-0.028176
MBASE(-1)	-0.023127	-0.009237	-0.023475	-0.068363	-0.006016	-0.009951	-0.040342	-5.02E-05	-0.015136	-0.013827	-0.032201	-0.097964	-0.042569	-0.011584	-0.001107	-0.007832	-0.085804	-0.027124	-0.028997	-0.020327
MBASE(-2)	-0.081866	-0.090696	-0.079761	-0.052518	-0.032978	-0.017733	-0.024842	-7.38E-05	-0.003575	-0.002078	-0.013891	-0.005135	-0.085727	-0.048152	-0.020879	-0.061882	-0.041362	-0.014609	-0.028654	-0.013840
NZSE50(-1)	-0.005662	-0.048825	-0.003688	-0.021996	-0.006168	-0.020007	-0.010089	-0.000251	-0.046001	-0.009116	-0.002670	-0.065732	-0.037791	-0.014066	-0.032203	-0.011807	-0.096642	-0.021420	-0.018393	-0.019771
NZSE50(-2)	-0.045973	-0.040089	-0.004104	-0.052538	-0.003841	-0.048294	-0.037903	-0.000162	-0.035232	-0.050786	-0.050898	-0.005192	-0.011381	-0.001878	-0.000172	-0.010317	-0.056093	-0.028118	-0.022444	-0.036314
OSE(-1)	-0.013627	-0.027502	-0.002903	-0.075470	-0.010563	-0.003165	-0.018264	-5.93E-06	-0.018872	-0.001375	-0.031575	-0.027387	-0.003632	-0.009963	-0.026179	-0.022138	-0.020293	-0.020648	-0.034542	-0.025553
OSE(-2)	-0.053337	-0.013405	-0.037778	-0.014212	-0.016418	-0.006676	-0.076268	-4.30E-05	-0.016209	-0.083559	-0.002806	-0.024074	-0.059896	-0.070068	-0.019261	-0.026083	-0.064363	-0.048130	-0.038398	-0.037992
STI(-1)	0.166377	0.014508	-0.010867	0.080131	-0.063785	0.003558	-0.048604	-4.05E-05	0.045223	0.013790	0.007351	-0.038949	-0.022665	-0.017387	-0.039746	-0.047357	-0.058378	0.024824	-0.015421	-0.027891

S TI (-2)	0.097 44	0.468 32	0.248 31	-0.372 34	0.473 13	0.738 46	0.384 39	0.005 77	0.258 32	0.608 06	0.238 06	0.579 36	-0.189 37	0.928 75	0.002 42	0.541 14	0.571 44	0.835 80	0.033 76	0.757 81
T W (-1)	-0.006 22	-0.256 46	-0.810 01	-0.040 86	0.240 88	0.236 95	0.111 30	-0.003 61	0.615 74	0.666 79	-0.071 57	-0.821 23	0.104 85	0.042 11	0.378 17	-0.278 87	0.036 67	0.704 82	-0.107 86	-0.220 47
T W (-2)	0.651 52	0.099 93	0.637 76	0.438 39	0.105 38	0.159 09	0.375 60	-0.006 47	0.327 74	0.309 35	-0.547 31	-0.131 98	0.628 82	0.403 38	0.060 80	0.069 96	0.134 26	0.243 46	-0.170 43	-0.408 31

XIV. CONCLUSION

The major drive of the work was to examine the bidirectional causality of selected stock indices of the Advanced and emergent market by using the granger casualty test. The finding validates the indications of volatility spread across emergent markets and their Advanced counterparts.

This research started with the examination of normality for both emergent and Emergent markets by using descriptive statistics tests andjarquebera test.ADF test was applied to findfor existence of unit root in the time series. 'The arch test' was used for checking the serial co-relation and instability in the time series under study. The result indicated the presence of no serial correlation among different time series. The bidirectional association was checked through 'the granger causality test' and it was found thatthere is the bidirectional association is bidirectional betweenthe indices under study.VAR confirms this causal association for all the selected indices further.In a huge number of observational investigations of risk-return examination, it is seen that financial strength and great viewpoints have been key resources for the advancement of Advanced and emergent markets. Enhancement of assets to decrease portfolio hazard is additionally one of the purposes of fascination in local and remote institutional financial specialists. In this work, hazard and vulnerability are read for chosen financial exchanges of rising economies as well asadvanced economies. Information on everyday stock costs of chosen markets is gathered for a late decade and detail autoregressive contingent heteroskedasticity (ARCH) and its summed up models are utilized to assess restrictive and unbalanced volatilities.

The fundamental discoveries of this exploration support the past ones in regards to the way that, generally speaking, eminent markets are the two transmitters and collectors of unpredictability. They add to the expanded unpredictability in worldwide markets and they are added as often as possible influenced by other market volatilities on the planet. These universal instability transmissions are synonymous with infection in the midst of budgetary emergencies, which requires a significant worry by controllers and global financial specialists in these nations. The revelations from this article have critical repercussions for adventure the officials, particularly for gigantic advantages resources and protection offices.

The investigation concentrated on the securities exchange, and it is important to make reference to that other budgetary markets, for example, the cash, security, and foreign trade markets, likewise offer the potential for expansion, money related steadiness, and fiscal system.

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