Relationship between Major Developed Equity Markets and Major Frontier Equity Markets of World

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Abstract: The core aim of this study is to compute the long run relationship between frontier equity markets Pakistan (KSE 100 Index), Argentina (MERVAL BUENOS AIRES) stock Exchange, NSE.20 (Kenya), MSM 30 (MSI) Oman and equity markets of developed world (OMXS30) Sweden, SMI (Switzerland), SSE Composite Index (China) and STI index (Singapore) by taking weekly values from stock return prices for the period 1st week of January-2000 to last week of January/2014. Descriptive statistic, Correlation, Augmented dickey fuller (ADF), Phillips Perron test, Johanson and Jelseluis test of co-integration, Granger causality test, Variance Decomposition Test and Impulse Response are used to find the relationship among frontier and developed markets. The results of this study reveal that frontier markets have no long run relationship with equity markets of developed world. Furthermore, this study is helpful for investors to enhance the returns by diversifying the unsystematic risk at given level of profit because results of this study confirm that markets are no co-integrated.

Key words: Diversification; portfolio; frontier markets; unit root test; Co-integration test

JEL Classification*:* G10; G20

1. Introduction

There are different types of investment institutions available almost all over the world which offers investment opportunities for investors to make investment in them. Frontier equity markets are also part of investment institution for investors defined as the markets at early stage of growth as compared to other markets, while emerging markets defined as a country having or possessing some of the qualities to reach the level of those developed market which have already occupied their position in the world.

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The word frontier equity market was first used by international finance corporation in 1996, represent a small number of liquid securities and offer excellent diversification benefits to investors. The word frontier defined as the small markets which impose restrictions on foreign ownership. The frontier equity markets are launched to achieve economic development and growth by diversifying risk. Before investing in frontier equity markets all shareholders, investors and portfolio managers make assure either their investment funds utilized efficiently or not, also they analyze that any sign of prosperity is visible or not and to how much extent their funds will give benefit to them. Further investors become more aware about safety of their funds saved and they already learn about amount of their risk and return, which may lead them for saving in frontier equity markets. Frontier markets are becoming important source of strong earnings in the form of return, so investors focus on these markets on the basis of following benefits which are offered to their policy owners, there is no ownership in frontier equity markets, creating potential earnings economy for all investors and shareholders in the form of return. No doubt, frontier markets are less liquid but trend of investments does not decrease. (Schroders)

To understand the relationship between frontier equity market and equity market of developed country, selected some major frontier equity market (Pakistan, Argentina, Kenya and Oman) with developed equity stock markets of Sweden, Switzerland China, Singapore for the period 1st week of January-2000 to last week of March/2014. If the markets of regional countries move together to invest in different equity markets would not gain any profit. Regional diversification suggests investing in those stock markets which are less correlated. To gain the benefit of diversifying, it is necessary that your portfolio assets should be invested in those markets which are negatively correlated as compared to developed markets which offer higher return to investors (Markowitz). Now a day's all investors are investing in frontier equity markets and developed equity markets. So individual, foreign and institutional investor began to diversify their risk by investing in different frontier and developed equity markets.

The terrorist's activities are the major obstacles in the growth of frontier markets so there is huge amount of risk involved in frontier markets, but no doubt the investors are more interested to get higher return as compared to other markets. Effective liberalization encourages the investors to make their investments in domestic and foreign equity markets but unfortunately there is absence of effective liberalization due to market integration, so on these reasons investors get back from investments (Bekaert et all 2003). The deregulation and liberalization affect directly investors behavior and consequently investment trend declines day by day, so investors feel hesitant in making investments mansoor at al (2014).

All business private organizations have a primary objective to maximize the shareholder wealth in a good way. The investor or portfolio managers can enhance

the returns by diversifying the unsystematic risk at given level of profit. The stock Investor by making investment in different stock of domestic country are unable to achieve optimum diversification (Mansoor et al.). This may be due to companies' face the same economic or political situation. So the Frontier equity markets have different economic environment as compared to developed equity market. This study will suggest the investors or portfolio managers to invest across the border in those equity markets which are different to each other economically and politically. In this way, the portfolio managers may be able to attain fully diversified portfolio and minimize the country risk.

The study has objectives to recognize a long run relationship between developed equity markets and frontier equity market and secondly there exists lead lag relationship or not.

2. Literature Review

Shezad et al (2014), examined the relationship between co-integration of Pakistani stock markets whose selected Asian stock market for the period 2001 to 2013 by taking monthly values of stock market return. This study used descriptive statistics, correlation analysis, unit root test, VAR, Co-integration test and VECM test. Result shows that KSE is not co-integrated with Japan, Malaysia, Taiwan and China. All these tests and their results show that there is correlation between Chines markets and KSE 100. This study also concluded that for the Chinese investors have opportunities to make investment in these markets.

Khan & Aslam (2014), explored the study on co-integration of Karachi Stock Exchange index 100 with major Asian stock exchange markets Bombay Stock Exchange (BSE Index 30), Malaysian Stock Exchange (FTSE) and Japan Stock Exchange for the period 2007 to 2013 by selecting monthly values of stock markets. This study use data description and Augmented Fuller test (ADF) result shows that there is no co-integration of KSE 100 index with developed countries such as China and Japan. But Pakistani KSE 100 index co-integrated with India and Malaysia stock markets.

Prakhar Porwal (2014), explored the concept of diversification that how diversification will be achieved by focusing on frontier markets as well as developed markets. For this purpose, data was collected by MSCI and S&P Sri Lanka of the frontier and emerging markets. The data was analyzed by correlation and volatility of MSCI indices. The result shows that in frontier markets there is more risk involved but higher return will be gained with low volatility as compared to other emerging market.

Narayan et al (2004) examined the dynamic linkage between the stock markets of developing countries such as Bangladesh, India, Pakistan and Sri Lanka by binding

the relationship among the stock prices indices within a multivariate co integration framework for the period 1995-2001 by taking daily values of stock markets return. This study use co integration, causality testing, unit root test. Result shows that there exists a long run relationship between the Sri Lanka stock prices with Pakistan. It further used impulse response which concludes that Sri Lanka market has small impact on Pakistani market.

Aslam et al (2012) investigated the relationship between Karachi stock exchange with major developed equity market for the period 1999-212 by taking weekly values of stock prices. The stock data was analyzed by using VAR statistic, unit root test, unrestricted co-integration rank test (trace), unrestricted co-integration rank test (maximum Eigen value) granger causality. The result and finding shows that Karachi stock exchange is less or weakly correlated with developed equity markets and there is no co-integration exists among the stock markets.

Mansoor et al (2012) investigated a study on relationship between major Asian markets (kse 100,india BSE 500,srilanka CSE) with developed equity markets (cac40, ftse100, nikkie 225, s&p 500). The weekly data was collected for the period 2000-2012.the data was analyzed by applying descriptive statistic, augmented dickey fuller test, Phillips test, granger causality test, Johansen co-integration test, vector error correction model and variance decomposition test. The result shows that there is no long run relationship exists between south Asian equity markets while short run significant relationship exists. Further study help the investor or portfolio managers can enhance the returns by diversifying the unsystematic risk at given level of profit. The stock Investor by making investment in different stock of domestic country unable to achieve optimum diversification.

Khalil Jebran (2014) investigated a study on dynamic linkage between selected south Asian equity markets(India, Indonesia, China, Malaysia And Sri Lanka) with Pakistani stock market by using monthly data of stock prices was taken for the period 2003 to 2013. The correlation matrix, unit root test, Johansen and juselius co-integration, Granger Causality test and variance decomposition were applied to analyze data. The result shows that Indonesia stock market shows highest return among the selected Asian equity markets. India and Indonesia equity markets show high level of correlation and Johansen and Juselius result shows that long run relationship exist between selected stock markets. These all results show that there exists no confirmation of selected equity markets with Karachi stock exchange.

3. Hypothesis

H1: There is long run relationship exists between frontier equity markets and equity markets of Developed world.

H01: There is no long run relationship exists between frontier equity markets and equity markets of Developed world.

H2: There is Lead Lag relationship exists between the frontier equity markets and equity markets of Developed world.

H02: There is no Lead Lag relationship exists between the frontier equity markets and equity markets of Developed world.

4. Methodology

In this study weekly data of frontier equity markets and developed markets was collected by using Investing.com and Yahoo finance for the period 1st week of January-2000 to last week of January/2014. To explore the relationship, we selected some frontier equity market such as KSE 100 Index (Pakistan), Argentina (MERVAL BUENOS AIRES) stock Exchange, NSE.20 (Kenya), MSM 30 (MSI) Oman and major developed equity stock markets of (OMXS30) Sweden, SMI (Switzerland), SSE Composite Index (China), and STI index (Singapore). This study assists the portfolio manager and decision makers to calculate the return rate by applying the equation of Rtn=logn (Prt./Prt-1)

Where Rtn =shows the return in a given period t

Prt =shows the price at the time of closing

Prt-1=shows the price at the time of opening

Logn=represent the natural logarithm

In this study the techniques of Correlation, unit root test, co- integration, variance decomposition, granger causality and impulse response are used to measure the nature of relationship.

5. Results

Table 5.1. Descriptive statistics

	Argentina	Pakistan	Oman	Kenya	China	Singapore	Sweden	Switzerland
Mean	0.003995	0.004248	-0.00179	-0.00129	8.04E-05	0.000697	0.000327	5.56E-05
Median	0.006076	0.007797	-0.00174	-0.00094	0	0.00209	0.002864	0.002456
Maximum	0.228494	0.109173	0.196173	0.146802	0.139447	0.153205	0.122749	0.162885
Minimum	-0.31181	-0.20098	-0.1139	-0.1481	-0.14898	-0.164684	-0.22528	-0.252017
Std. Dev.	0.048886	0.033678	0.024911	0.026935	0.033586	0.026978	0.031494	0.027724
Skewness	-0.38899	-1.21761	1.464611	-0.39738	0.071572	-0.516395	-0.83174	-1.033043
Kurtosis	7.705482	7.925848	15.51188	8.990935	5.088118	9.334665	7.843319	16.88758
Jarque-Bera	655.8666	870.6017	4761.176	1053.078	126.3109	1187.779	756.1505	5684.02
Probability	0	0	0	0	0	0	0	0

The table 5.1 shows the description of markets. The table represents the value of mean, median, maximum, minimum Standard deviation, Skewness and kurtosis. The results reveal that Pakistan stock exchange 100 and Argentina show high return while Sweden and Singapore show the positive return. The stock markets of Oman and Kenya represent the negative values of return. On the other hand, in terms of standard deviation Argentina stock markets shows the highest value of standard deviation (0.04) which differentiate it from all other equity markets at given period of time.SO we can conclude that Argentina stock market is one of the riskier or higher return stock market because it gives the highest value of return in a given time period.

Table 5.2. Correlation technique

	Argentina	Pakistan	Oman	Kenya	China	Singapore	Sweden	Switzerland
Argentina	1							
Pakistan	-0.05403	1						
OMAN	-0.01873	0.002242	1					
Kenya	-0.0368	-0.01364	0.114115	1				
China	0.042664	0.003137	0.019924	0.117559	1			
Singapore	0.079592	0.042175	0.012116	-0.01806	-0.00205	1		
Sweden	-0.02248	0.005737	-0.03101	0.014288	-0.01266	0.622465	1	
Switzerland	-0.01282	-0.00328	-0.03398	-0.01858	-0.02412	0.581179	0.760497	1

Table (5.2) explores the correlation among the different stock markets. It indicates that the frontier equity markets are negatively correlated to each other. Argentina frontier stock exchange is negatively correlated with Sweden and Switzerland stock markets. KSE is weekly correlated with china, Singapore and Sweden, while negatively correlated with Kenya and Switzerland. The frontier markets of OMAN and Kenya are also negatively correlated with Switzerland market.

Table 5.3 Unit root test

	ADF LEVEL	ADF 1st DIF	PP LEVEL	PP 1st DIF
Argentina	-0.63543	-16.9202	-0.64664	-25.608
Kenya	-0.86179	-16.4465	-0.8063	-23.1552
Oman	-0.06037	-17.6506	-0.0431	-25.0565
Pakistan	-1.03391	-16.0384	-0.99302	-22.2643
China	-1.27974	-16.925	-1.24598	-24.7775
Singapore	-1.17255	-17.097	-1.10826	-24.8885
Sweden	-1.14818	-18.1455	-1.20293	-27.7898
Switzerland	-1.57687	-18.5342	-1.75573	-30.9652
Critical values				
1%	-3.43959	-3.4396	-3.43957	-3.43959
5%	-2.86551	-2.86551	-2.8655	-2.8655
10%	-2.56894	-2.56894	-2.56894	-2.56894

The table 5.3 shows both augmented and Philips- Perron test confirmed that data is not stationary at level but it is stationary at first difference.

Table 5.4. Multivariate co integration

		Eigen value	Trace statistic	Critical value 5%	Remarks
Argentina	**None***	0.079856	205.0772	159.5297	Co-integrated
Kenya	**At most 1**	0.067405	147.5686	125.6154	Co-integrated
KSE	**At most 2**	0.055726	99.34768	95.75366	Co-integrated
Oman	**At most 3**	0.035023	59.72683	69.81889	No cointegration
China	**At most 4**	0.024779	35.09179	47.85613	No cointegration
Singapore	**At most 5**	0.014847	17.75394	29.79707	No cointegration
Sweden	**At most 6**	0.010363	7.417996	15.49471	No cointegration
Switzerland	**At most 7**	0.000318	0.220076	3.841466	No cointegration

Table 5.4 shows the values of multivariate co integration. Result indicates that there exist three co-integration equations at the 0.05 level.

Table 5.5. Bivariate co-integration Argentina

	Eigenvalue	Statistic	Critical Value	Prob.**	Remarks
Argentina-Sweden	0.019866	13.86697	15.49471	0.0867	NO-Cointegration
	0.00000226	0.001563	3.841466	0.9664	
Argentina-Switzerland	0.012679	8.962591	15.49471	0.3688	NO-Cointegration
	0.00021	0.145117	3.841466	0.7032	
Argentina-China	0.007237	6.121436	15.49471	0.6812	NO-Cointegration
	0.001594	1.102339	3.841466	0.2938	
Argentina-Singapore	0.014223	10.20236	15.49471	0.2655	NO-Cointegration
	0.00044	0.303822	3.841466	0.5815	

The results of above table reveal that Argentina stock exchange are not co-integrated with Sweden, Switzerland, china and Singapore, which encourage all shareholders, portfolio managers and investors to get the benefit of diversification.

Table 5.6. Bivariate co-integration KSE

	Eigenvalue	Statistic	Critical Value	Prob.**	Remarks
KSE-SWEDEN	0.018355	13.09568	15.49471	0.1113	NO-COINTEGRATION
	0.000426	0.294604	3.841466	0.5873	
KSE-Switzerland	0.012848	9.589598	15.49471	0.3136	NO-COINTEGRATION
	0.000946	0.653812	3.841466	0.4188	
KSE-China	0.005785	5.389523	15.49471	0.7661	NO-COINTEGRATION
	0.001995	1.38024	3.841466	0.2401	
KSE-Singapore	0.014754	10.92561	15.49471	0.2161	NO-COINTEGRATION
	0.000947	0.654901	3.841466	0.4184	

The results of above table reveal that Karachi stock exchange are not co-integrated with Sweden, Switzerland, china and Singapore, which encourage all shareholders, portfolio managers and investors to get the benefit of diversification.

Table 5.7. Bivariate co-integration Oman stock exchange

	Eigenvalue	Statistic	Critical Value	Prob.**	Explanation
Oman-Sweden	0.005728	4.014098	15.49471	0.9024	NO-cointegration
	0.0000647	0.044739	3.841466	0.8325	
Oman - Switzerland	0.004745	3.306717	15.49471	0.9512	NO-cointegration
	0.0000293	0.020223	3.841466	0.8868	
Oman - china	0.020036	16.88333	15.49471	0.0307	NO-cointegration
	0.004185	2.897798	3.841466	0.0887	
Oman - Singapore	0.005934	4.214785	15.49471	0.8855	NO-cointegration
	0.000148	0.102079	3.841466	0.7493	

Above table represents the bivariate co-integration relationship of OMAN (MSM 30) with selected major developed market. The result shows that OMAN (MSM 30) is not co-integrated with Sweden, Switzerland, china and Singapore. So investors have potential to make investment in OMAN (MSM 30) to take the advantage of diversification.

Table 5.8. Bivariate co-integration Kenya stock exchange

	Eigenvalue	Statistic	Critical Value	Prob.**	Explanations
Kenya-Sweden	0.005576	4.748923	15.49471	0.8349	NO-cointegration
	0.00128	0.884919	3.841466	0.3469	
Kenya – Switzerland	0.00874	9.526947	15.49471	0.3189	NO-cointegration
	0.004997	3.461238	3.841466	0.0628	
Kenya – china	0.009734	9.905461	15.49471	0.2881	NO-cointegration
	0.004543	3.146245	3.841466	0.0761	
Kenya – Singapore	0.002869	2.645854	15.49471	0.9806	NO-cointegration
	0.000956	0.660824	3.841466	0.4163	

Above table represent the bivariate co-integration relationship between Kenya (NSE 20) with selected major developed markets. The result reveals that NSE 20 not co-integrated with Sweden, Switzerland, china and Singapore.

Granger causality:

Null Hypothesis:	F-Statistic	Prob.
CHINA does not Granger Cause ARGENTINA	0.78103	0.6196
ARGENTINA does not Granger Cause CHINA	2.09873	0.0339
KENYA does not Granger Cause ARGENTINA	0.56165	0.8096
ARGENTINA does not Granger Cause KENYA	1.43952	0.1765
KSE_100 does not Granger Cause ARGENTINA	2.42754	0.0137
ARGENTINA does not Granger Cause KSE_100	4.30704	5.E-05
OMAN does not Granger Cause ARGENTINA	0.50506	0.8529
ARGENTINA does not Granger Cause OMAN	0.91241	0.5055
SINGAPUR does not Granger Cause ARGENTINA	21.7933	1.E-29
ARGENTINA does not Granger Cause SINGAPUR	1.14324	0.3319
SWEDEN does not Granger Cause ARGENTINA	19.2906	3.E-26
ARGENTINA does not Granger Cause SWEDEN	1.55105	0.1363
SWITZERLAND does not Granger Cause ARGENTINA	15.6387	3.E-21
ARGENTINA does not Granger Cause SWITZERLAND	1.77595	0.0787
KENYA does not Granger Cause CHINA	0.75250	0.6450
CHINA does not Granger Cause KENYA	1.86265	0.0631
KSE_100 does not Granger Cause CHINA	2.48316	0.0117
CHINA does not Granger Cause KSE_100	2.94565	0.0030
OMAN does not Granger Cause CHINA	0.73718	0.6587
CHINA does not Granger Cause OMAN	1.36321	0.2094
SINGAPUR does not Granger Cause CHINA	2.57337	0.0090
CHINA does not Granger Cause SINGAPUR	0.59373	0.7835
SWEDEN does not Granger Cause CHINA	1.94984	0.0503
CHINA does not Granger Cause SWEDEN	1.49569	0.1551
SWITZERLAND does not Granger Cause CHINA	1.51078	0.1498
CHINA does not Granger Cause SWITZERLAND	1.81077	0.0720
KSE_100 does not Granger Cause KENYA	1.41036	0.1885
KENYA does not Granger Cause KSE_100	1.36271	0.2096
OMAN does not Granger Cause KENYA	4.43440	3.E-05
KENYA does not Granger Cause OMAN	1.73623	0.0869
SINGAPUR does not Granger Cause KENYA	1.56386	0.1322
KENYA does not Granger Cause SINGAPUR	0.47153	0.8765
SWEDEN does not Granger Cause KENYA	0.27483	0.9741
KENYA does not Granger Cause SWEDEN	0.58314	0.7922
SWITZERLAND does not Granger Cause KENYA	0.64928	0.7363
KENYA does not Granger Cause SWITZERLAND	0.96985	0.4584
OMAN does not Granger Cause KSE_100	1.29593	0.2424
KSE_100 does not Granger Cause OMAN	0.62276	0.7591
SINGAPUR does not Granger Cause KSE_100	1.98812	0.0455
KSE_100 does not Granger Cause SINGAPUR	2.03545	0.0401

SWEDEN does not Granger Cause KSE_100	1.78962	0.0760
KSE_100 does not Granger Cause SWEDEN	2.16044	0.0287
SWITZERLAND does not Granger Cause KSE_100	2.33972	0.0175
KSE_100 does not Granger Cause SWITZERLAND	1.68682	0.0982
SINGAPUR does not Granger Cause OMAN	0.81179	0.5923
OMAN does not Granger Cause SINGAPUR	0.52281	0.8398
SWEDEN does not Granger Cause OMAN	0.53984	0.8268
OMAN does not Granger Cause SWEDEN	0.37690	0.9330
SWITZERLAND does not Granger Cause OMAN	0.39623	0.9228
OMAN does not Granger Cause SWITZERLAND	0.21419	0.9884
SWEDEN does not Granger Cause SINGAPUR	3.90892	0.0002
SINGAPUR does not Granger Cause SWEDEN	1.77492	0.0789
SWITZERLAND does not Granger Cause SINGAPUR	3.66881	0.0003
SINGAPUR does not Granger Cause SWITZERLAND	1.38331	0.2003
SWITZERLAND does not Granger Cause SWEDEN	2.30097	0.0195
SWEDEN does not Granger Cause SWITZERLAND	3.38883	0.0008

The above table shows the result of Granger causality technique, which explore that frontier equity market of Argentina does not granger cause the stock return in other equity markets excepting China, which clearly conclude that just unidirectional causality exists when we move Argentina to China. On the other hand, frontier market of KSE does not granger cause the stock return in Argentina, china, Switzerland and Singapore. SWITZERLAND stock market does not granger cause the stock return in Singapore and Sweden. While SWEDEN does not Granger Cause in Switzerland.

Table 5.9 Variance Decomposition of Argentina:

Period	S.E.	0man	Argentina	Kenya	Kse100	China	Singapore	Sweden	Switzerland
1	0.048499	0.031996	99.968	0	0	0	0	0	0
2	0.049135	0.032069	97.46985	0.014613	0.174115	0.001376	0.640953	1.291866	0.375155
3	0.04917	0.033014	97.33177	0.01965	0.176776	0.011867	0.678929	1.333615	0.41438
4	0.049171	0.033018	97.32713	0.019649	0.176916	0.011876	0.679265	1.334722	0.417426
5	0.049171	0.033019	97.32676	0.019653	0.176918	0.011878	0.679291	1.334771	0.417706
6	0.049171	0.033019	97.32674	0.019653	0.176919	0.011878	0.679294	1.334773	0.417728
7	0.049171	0.03302	97.32673	0.019653	0.176919	0.011878	0.679294	1.334773	0.41773
8	0.049171	0.03302	97.32673	0.019653	0.176919	0.011878	0.679294	1.334773	0.41773
9	0.049171	0.03302	97.32673	0.019653	0.176919	0.011878	0.679294	1.334773	0.41773
10	0.049171	0.03302	97.32673	0.019653	0.176919	0.011878	0.679294	1.334773	0.41773

Above table show change in Argentina stock exchange explained by due to its own innovation and also tells that other frontier & developed stock exchanges have no effect on it if any change or fluctuation occurs in these markets.

Table 5.10. Variance Decomposition of Kenya

Period	S.E.	0MAN	ARGENTINA	KENYA	KSE_100	CHINA	Singapore	SWEDEN	Switzerland
1	0.026831	0.931497	0.089805	98.9787	0	0	0	0	0
2	0.027086	1.100944	0.088908	98.54293	0.002707	0.00031	0.245298	0.005661	0.013246
3	0.027092	1.106061	0.089736	98.52877	0.003128	0.00118	0.250264	0.007477	0.01338
4	0.027092	1.106247	0.089747	98.52844	0.003129	0.001184	0.250355	0.007477	0.01342
5	0.027092	1.10625	0.089748	98.52843	0.003129	0.001185	0.250356	0.007478	0.013421
6	0.027092	1.10625	0.089748	98.52843	0.003129	0.001185	0.250356	0.007478	0.013421
7	0.027092	1.10625	0.089748	98.52843	0.003129	0.001185	0.250356	0.007478	0.013421
8	0.027092	1.10625	0.089748	98.52843	0.003129	0.001185	0.250356	0.007478	0.013421
9	0.027092	1.10625	0.089748	98.52843	0.003129	0.001185	0.250356	0.007478	0.013421
10	0.027092	1.10625	0.089748	98.52843	0.003129	0.001185	0.250356	0.007478	0.013421

Above Table shows change in Kenya stock exchange explained by due to its own innovation and also tells that other developed & developing stock exchanges have no effect on it if any change or fluctuation occurs in these markets.

Table 5.11. Variance decomposition of KSE100

Period	S.E.	0MAN	ARGENTINA	KENYA	KSE_100	CHINA	Singapore	SWEDEN	Switzerland
1	0.033021	0.000338	0.201954	0.011011	99.7867	0	0	0	0
2	0.033836	0.051523	1.244051	0.253927	97.64739	0.178894	0.024304	0.472875	0.127035
3	0.033875	0.059767	1.280689	0.306769	97.5072	0.204338	0.02777	0.482418	0.131046
4	0.033876	0.060281	1.281665	0.309471	97.50124	0.204482	0.028727	0.483087	0.131047
5	0.033876	0.060314	1.281675	0.309634	97.50099	0.204494	0.028745	0.48309	0.131057
6	0.033876	0.060316	1.281676	0.309641	97.50098	0.204494	0.028747	0.483091	0.131057
7	0.033876	0.060316	1.281676	0.309641	97.50098	0.204495	0.028747	0.483091	0.131057
8	0.033876	0.060316	1.281676	0.309641	97.50098	0.204495	0.028747	0.483091	0.131057
9	0.033876	0.060316	1.281676	0.309641	97.50098	0.204495	0.028747	0.483091	0.131057
10	0.033876	0.060316	1.281676	0.309641	97.50098	0.204495	0.028747	0.483091	0.131057

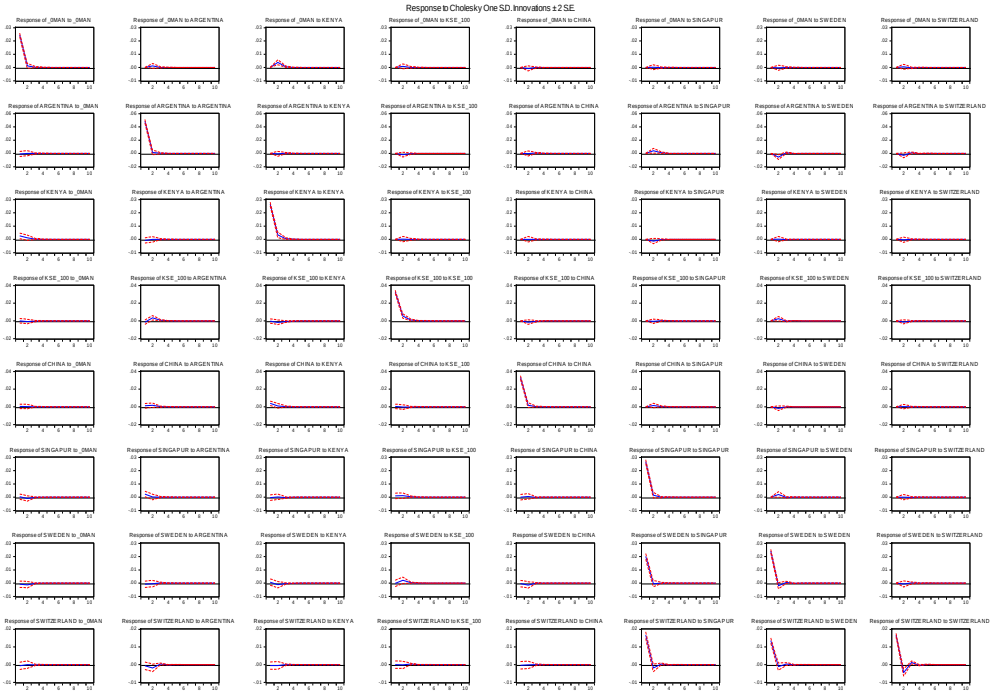
Above Table shows change in KSE stock exchange explained by due to its own innovation and also tells that other developed & developing stock exchanges have no effect on it if any change or fluctuation occurs in these markets.

Table 5.12. Variance decomposition of OMAN (MSM 3O):

Period	S.E.	OMAN	ARGENTINA	KENYA	KSE_100	CHINA	Singapore	SWEDEN	Switzerland
1	0.024666	100	0	0	0	0	0	0	0
2	0.025047	97.17052	0.215842	2.371608	0.096049	0.088967	0.005227	0.011227	0.040558
3	0.025056	97.10904	0.216267	2.416374	0.096797	0.089359	0.009398	0.011219	0.051544
4	0.025056	97.10715	0.216501	2.417315	0.096999	0.089434	0.009398	0.011223	0.051982
5	0.025056	97.10707	0.216501	2.417329	0.096999	0.089435	0.009408	0.011223	0.052032
6	0.025056	97.10707	0.216501	2.41733	0.097	0.089435	0.009408	0.011223	0.052035
7	0.025056	97.10707	0.216501	2.41733	0.097	0.089435	0.009408	0.011224	0.052036
8	0.025056	97.10707	0.216501	2.41733	0.097	0.089435	0.009408	0.011224	0.052036
9	0.025056	97.10707	0.216501	2.41733	0.097	0.089435	0.009408	0.011224	0.052036
10	0.025056	97.10707	0.216501	2.41733	0.097	0.089435	0.009408	0.011224	0.052036

Table shows change in OMAN stock exchange explained by due to its own innovation and also tells that other developed & developing stock exchanges have no effect on it if any change or fluctuation occurs in these markets.

Impulse Response:



Impulse response function explains the changes in standard deviation. Resutls shows the response of KSE to the changes in the developed equity markets. However, results of Impulse Response Function shows that Argentina returns are not influnced by the shocks in the other marekts.

6. Conclusion

The main objective of every study is to give direction to the readers. This study is conducted between frontier equity markets and developed equity markets. Both the types of stock markets have different economic, social and geographic conditions.so it may be possible that the economic environment for the investors of these countries is different and same is the case political conditions.

The purpose of this study to relationship among frontier equity markets of Pakistan, Argentina, Kenya, Oman, and developed equity markets including Sweden, Switzerland, China, Singapore for the period 1st week of January-2000 to last week of January/2014. The aim of this study is to investigate whether the co movement or integration exists among these stock markets or not because co movement is very important for the investors. The results of this study reveals that frontier market of Argentina is riskier and high return market, showing a behavior of more volatile market as compared to all other selected markets in the study, which is a best opportunity for local and foreign investors to minimize risk. The correlation analysis indicates that selected frontier markets (Pakistan, Oman, Argentina, Kenya) are weakly correlated with developed country stock markets. This study assists the investor or portfolio managers to enhance the returns by diversifying the unsystematic risk at given level of profit. For this purpose, augmented fuller (ADF) and Phillips-Perron techniques are used for stationary of data at similar order by applying on prices of stock return. Multivariate co integration is applied which indication of three equation of integration among stock markets. Later on bivariate co-integration results confirm that all frontier equity markets indicate no long run relationship with any developed markets. The finding of granger cause explore that frontier equity market of Argentina does not granger cause the stock return in other equity market of China, which clearly conclude that just unidirectional causality exists when we move Argentina to China. The results of vector decomposition designate that change in frontier markets (Argentina, Pakistan, Kenya, Oman) explained by due to its own innovation and other developed & developing stock exchanges have no effect on it if any change or fluctuation occurs in these markets.

This study will suggest the investors or portfolio managers to invest across the border in those equity markets which are different to each other economically and politically. In this way the portfolio managers may be able to attain optimum diversified portfolio and also minimize the country risk.

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