Chapter IV

Research Finding and Discussion

A. Introduction

This research will discuss the finding of all four econometric metrologies adopted in this chapter. The finds will be analyzed, interpreted and elaborated in order to statistically analysis whether there is any linkage between selected markets.

B. Summary Statistics

Descriptions of all selected 15 Asia Pacific stock indices under study are given. As follow, these including distribution of mean, median, standard deviation, skewness and kurtosis and the movement of the indices. For the purpose of comparison, the monthly closing price index for each stock market is transformed to the return form.

1. Descriptive Statistics

Table4.1 represents descriptive statistics of stock returns of 15 Asia-Pacific stock markets for period 2000-2012. In term of absolute value, CSE is the highest monthly log return at 1.5001 percent, followed by KSE's 1.4342 percent. JKSE is the third highest return among these countries which is 1.2564 percent. Stock markets namely TWII (-0.2009 percent) and N225 (-0.5119 percent) yields negative returns. As far as the risk is concerned KSE got 8.5151 percent standard deviation which is highest among all. It follow by SSE 8.1198 percent, and then SET 7.9161 percent, CSE got the number four highest standard deviation 7.5199 percent. JKSE also got a very high standard deviation 7.3135 percent. This provides the theory of finance which states that higher return higher risk, lower return lower risk. Least return risk is AORD stock market which is 3.8957

percent and only 0.2168 percent log monthly return mean during time 2000-2012. Another aspect we will find from Table4.1 is that almost all Asian pacific stock markets' indices are positive average return throughout all this period, except TWII and N225. Furthermore, return of all the stock indices are negative skewness except CSE which reject the normal distribution of return returns. Negative skewness shows that most of values are above or near mean value. Result of kurtosis are greater than 3 which mean the monthly returns are not normally distributed and have much thicker tail and peak is higher as compared to a normally distributed data. Jarque-Bera test also confirms kurtosis and skewness finding that is not a normally distributed except CSE.

Table4.1 Summary Statistics of Stock Markets Returns during 2000-2012

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Coefficient of Variance	Probability
AORD	0.002495	0.010622	0.073643	-0.150878	0.038957	-0.99945	4.476258	39.36525	15.61402806	0
HSI	0.002168	0.010404	0.157634	-0.254455	0.066359	-0.611687	4.033356	16.3485	30.60839483	0.000282
TWII	-0.002009	-0.000972	0.224201	-0.21503	0.073634	-0.049263	3.657882	2.821037	-36.6520657	0.244017
BSE	0.00829	0.010187	0.248851	-0.272992	0.075417	-0.457751	4.039391	12.2303	9.0973462	0.002209
JKSE	0.012564	0.022711	0.183417	-0.377197	0.073135	-1.134094	7.193448	144.9017	5.820996498	0
KLSE	0.003894	0.009794	0.127032	-0.165142	0.046487	-0.52473	4.030919	13.79654	11.93810991	0.00101
N225	-0.005119	0.002369	0.120888	-0.272162	0.05943	-0.744767	4.57842	30.02704	-11.60968939	0
STI	0.002021	0.011463	0.193002	-0.27364	0.060913	-1.046271	6.672235	113.8832	30.14002969	0
KS11	0.004614	0.011448	0.202537	-0.263112	0.073699	-0.441316	3.649035	7.651824	15.97290854	0.021799
PSEI	0.006506	0.014307	0.139495	-0.275382	0.064921	-0.727134	4.766118	33.36718	9.978635106	0
NZG	0.005959	0.012679	0.081806	-0.111789	0.03562	-0.69901	3.782309	16.36121	5.977513006	0.00028
KSE	0.014342	0.019073	0.241114	-0.448796	0.085151	-1.14925	8.317711	213.9524	5.937177521	0
CSE	0.015001	0.009815	0.225223	-0.17615	0.075199	0.239152	3.341884	2.203574	5.012932471	0.332277
SET	0.006264	0.014157	0.209946	-0.285626	0.079161	-0.592027	4.711129	27.60339	12.63745211	0.000001
SSE	0.001951	0.00676	0.242526	-0.282779	0.081198	-0.528947	4.474115	20.9875	41.6186571	0.000028

Source: appendix 3

The coefficient of variation allows you to determine how much volatility (risk) you are assuming in comparison to the amount of return you can expect from your investment. In simple language, the lower the ratio of standard deviation to mean return, the better your risk-return tradeoff. If the expected return in the denominator of the calculation is negative or zero, the ratio will not make sense.From the table 4.1 can find out CSE (Sri Lanka) the risk is lowest, and it is the best place for invest, then JKSE (Indonesia), KSE (Pakistan), NZGI (New Zealand) also are good stock markets for invest during selected Asia Pacific stock markets. However, for TWII and N225 both CV are negative. If invest in these two stock markets it is very difficult to get profit. The most risk stock market is SSE (Shanghai), the CV is 41.6186571, the risk is very high and the return is very low in this stock market.

2. Correlation Analysis

The correlations are computed to measure the strength of the association between the stock indices. However it is a weaker measure to identify the relationship and not an absolute measure to prove the cause and effect relationship.

Table4.2 presents the correction matrix for the Asian pacific stock markets return for the period 2000-2012. The correlations of market returns are positive across all the Asian pacific stock markets, except SET. Correlation between HSI and STI indices is the highest at 0.753, HSI and AORD also have a high correlation coefficient at 0.702 in the second place. These numbers show that HSI has a positive co-movement with STI and AORD, while SET with AORD, HSI and N225 indices are negative and lowest. All the indices connected with CSE, KSE, SET and SSE indices are low correction coefficients, which means if the investor want make short term international diversification can add

these four countries for portfolio.

From this Table this research can state that all developed markets have more strength co-movement relationship than developing stock markets in Asia pacific regional.

Table4.2 Correlation Matrix of Stock Returns from the selected group of Asia Pacific stock markets

	AORD	BSE	CSE	HSI	JKSE	KLSE	KS11	KSE	N225	NZGI	PSEI	SET	SSE	STI	TWII
AORD	1														
BSE	0.654	1													
CSE	0.269	0.239	1												
HSI	0.702	0.688	0.2644	1											
JKSE	0.573	0.651	0.2349	0.566	1										
KLSE	0.446	0.512	0.1853	0.545	0.542	1									
KS11	0.644	0.647	0.204	0.637	0.568	0.441	1								
KSE	0.276	0.23	0.0708	0.191	0.156	0.125	0.245	1							
N225	0.674	0.605	0.2374	0.624	0.533	0.35	0.607	0.1992	1						
NZGI	0.674	0.543	0.2949	0.465	0.47	0.393	0.513	0.2302	0.53	1					
PSEI	0.473	0.564	0.2019	0.47	0.63	0.414	0.52	0.1176	0.427	0.457	1				
SET	-0.01	0.083	0.2798	-0.01	0.178	0.102	0.06	0.0486	-0.01	0.042	0.135	1			
SSE	0.361	0.354	0.0271	0.49	0.274	0.347	0.29	0.0601	0.289	0.296	0.24	0.034	1		
STI	0.741	0.694	0.2912	0.753	0.682	0.582	0.659	0.2895	0.606	0.604	0.609	0.08	0.329	1	
TWII	0.58	0.549	0.2065	0.626	0.436	0.586	0.684	0.2251	0.512	0.478	0.441	0.035	0.3	0.64	1

Source: appendix 4

2. Movement of all the indices

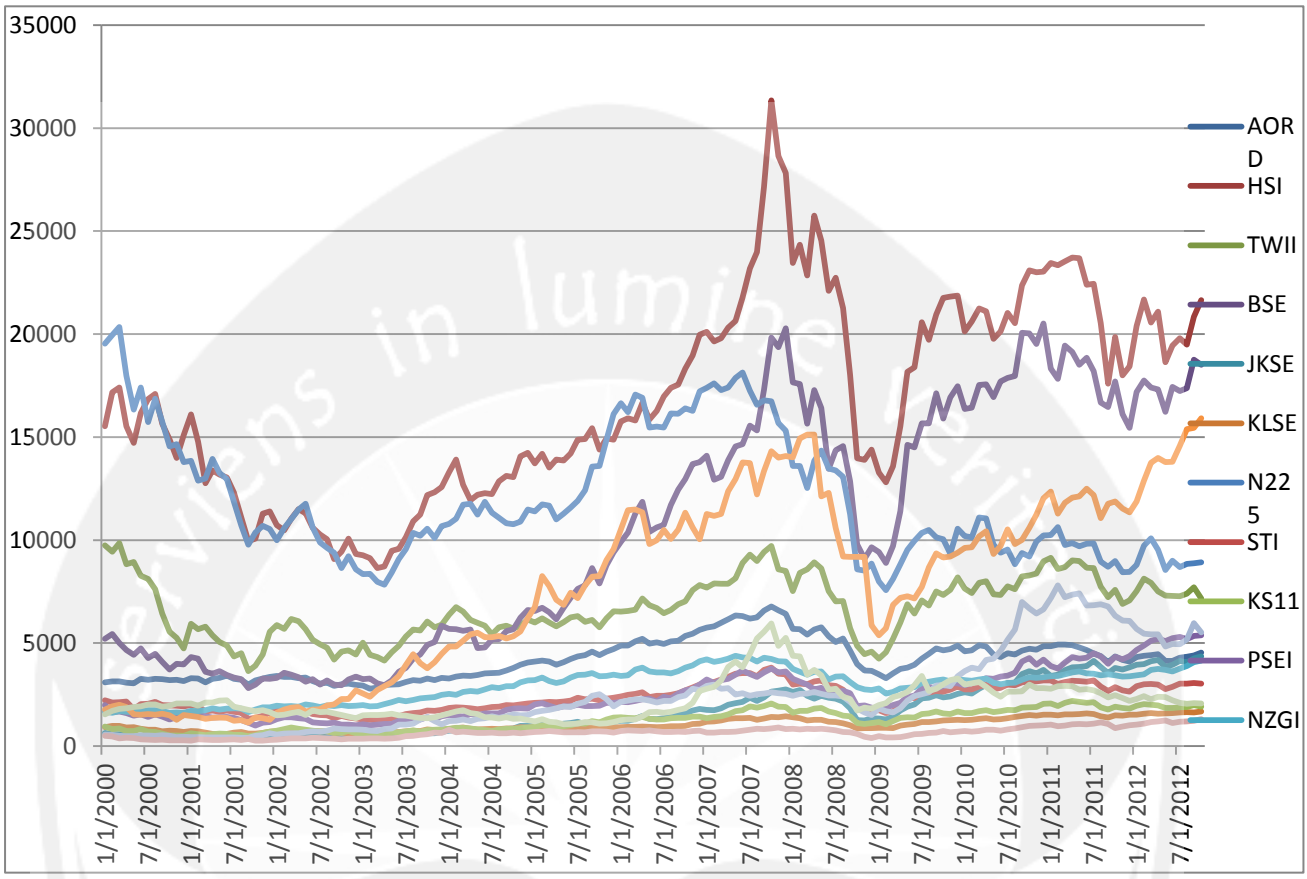


Figure 4.1 Movements of Indices in the Observed Period. Source: appendix 1

Figure 4.1 presents the movements of all 15 indices in the observed period from January 2000 to December 2012. There are many reasons can affect stock volatility, like crisis, panic, policy changes, political situation, high-frequency trading, for the developing markets stock volatility more bigger than developed market. As we see from 4.1. HSI record market is shows much higher than those of other observed indices. At here for HSI (Hong Kong), Hong Kong is the third largest stock markets in Asia, and seventh-largest in the world. Hong Kong is one of the world's most active and most liquid securities market, no restriction on capital flows, there is no capital gains or dividend tax. So it has the biggest volatility among selected

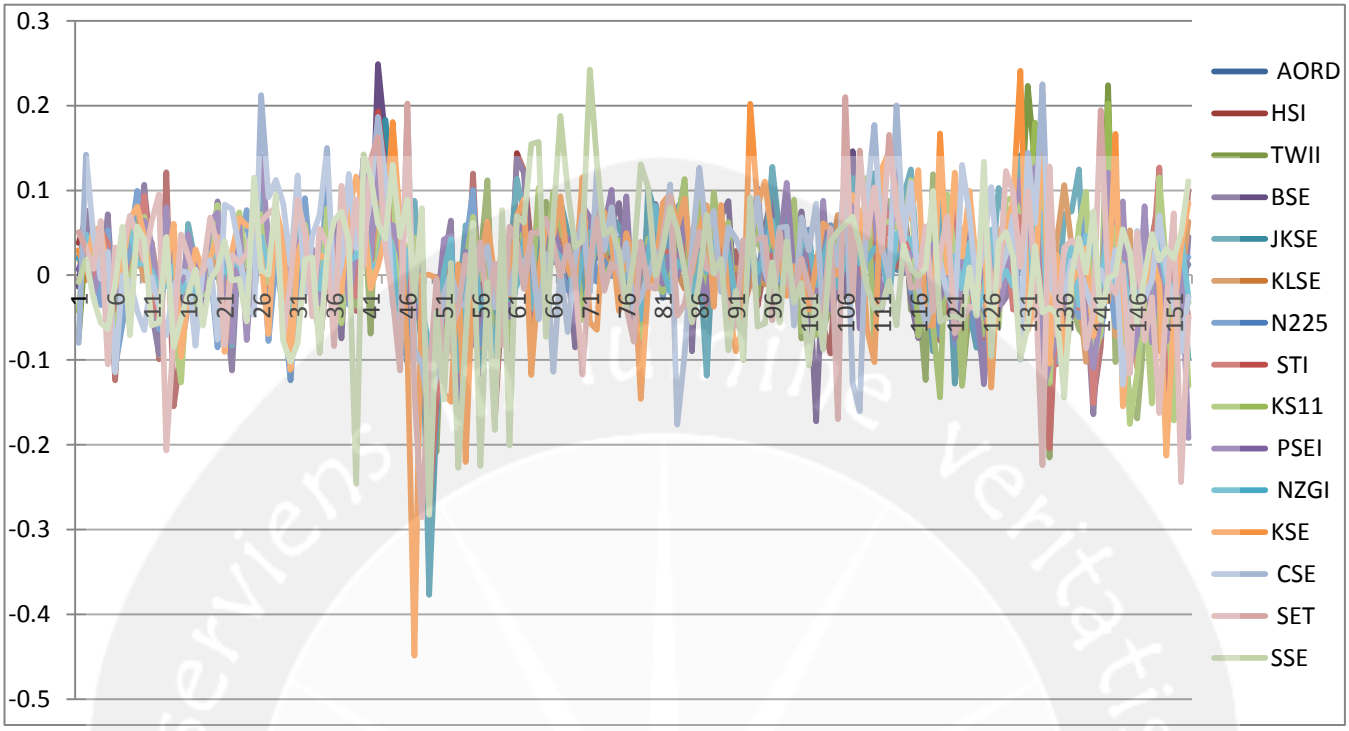
Asian Pacific stock markets.

N225 and TWII indices show negative returns, TWII just a slightly decrease, but for N225, from July 2007 to July 2012 suffer a big decrease. After 2009 all the other stock indices begin to recover increase but for N225 just have a slight recover still decrease. And BSE and KSE indices show positive returns.

All the indices get increase during the middle of 2006 to the middle of 2007, Especial HSI and BSE, get a sharp increase. But during middle of 2007 to end of 2008 all the indices start to big decline or negative growth. This is because of the Global Financial Crisis (credit crisis) which most world stock markets are falling in tandem with each other.

Form Figure 4.2 shows the volatility all the indices return and aggregation during the observed period. KSE and SSE show a bigger volatility among all indices return. While JKSE, N225 shows less volatility and aggregation, but sometime still exist big volatility.

Panel A



Panel B

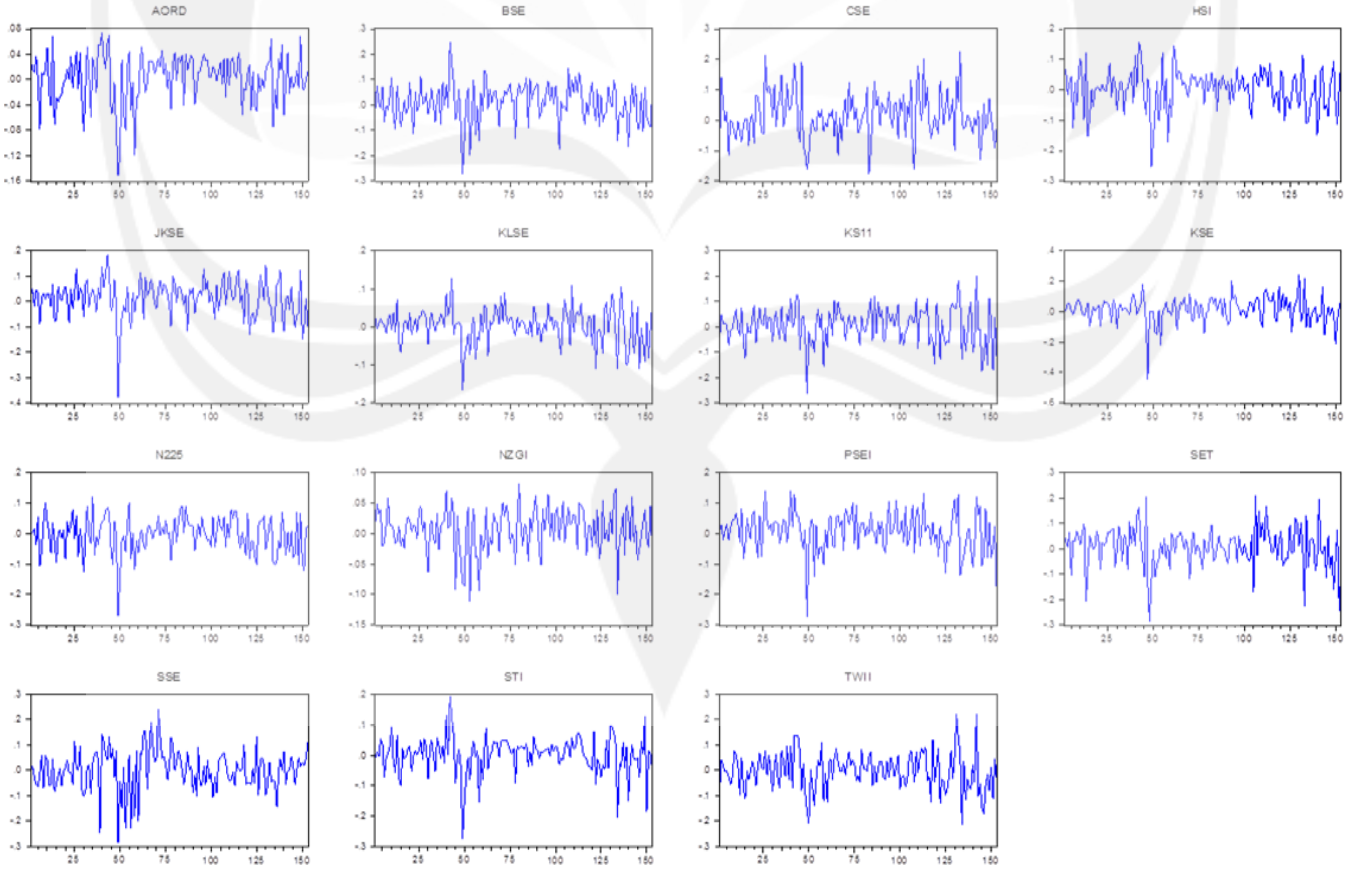


Figure 4.2 Asia Pacific Stock Market Return Index Source: appendix 1and 2

C. Unit Root Test

Preliminary condition for co-integration test is that the series are integrated of same order. To check whether the index is stationary or not, the use Augmented Dickey-Fuller test and Phillips-Perron test are used in this research. Frist of all it need to decide whether should include draft term and/or none of them, for this purpose this researchplot all the data of natural log of series at levels and their first difference (which is equal to return of stock price). The ADF test carried out with whatever lag length was found necessary to remove autocorrelation from residuals, which was found to up to six lags. The PP test was carried out with truncation lag of eight periods throughout. ADF test also carried out the first difference in order to check whether non stationary variables were I (0) or I (1).

All the log price (level series) start with some intercept and has a trend that may be up and down, so this research add intercept and trend when checking unit root at levels. However, if you see plotted values at first difference, you can point out there is no common trend in the Figure but all the series started with some intercept. So this research added intercept when checking for unit root test at first level.

Table4.3 shows the result of ADF test and PP test at levels (with both intercept and rend) and at first difference (with only intercept and no trend) of natural log closing price of equity market. It means that all the log prices of stock markets are non-stationary series at levels in ADF test and PP test. All of them can not reject the null hypothesis of a unit root. However, unit root at first difference of stock indices

series, all the indices rejected the null hypothesis at critical 1% , 5%, 10% level and all of them are found be stationary at first difference. And integrated of order that is one I (1). Which are consistent with result in the finance literature. Now this research will proceed with co-integration analysis.

Table4.3 ADF and Phillips –Perron Unit Root Test

	ADF Test statistic		PP Test statistic	
Index	Level I(0)	first differences I(1)	Level I(0)	first differences I(1)
Australia AORD	-1.84217	-10.16399	-1.909561	-10.39231
Hong Kong HSI	-2.093255	-10.46824	-1.983909	-10.46966
Shanghai SSE	-2.869058	-6.56275	-2.286752	-11.93309
Taiwan TWII	-2.589255	-10.8352	-2.042453	-10.90562
India BSE	-1.254432	-11.15559	-1.660102	-11.2486
Indonesia JKSE	-1.60767	-9.665133	-1.641009	-9.673448
Japan N225	-1.22778	-10.77313	-1.550026	-10.80904
South Korea KS11	-1.824733	-11.65493	-1.383988	-11.69938
Malaysia KLSE	-1.144864	-10.56463	-1.787648	-10.60835
New Zealand NZGI	-1.15522	-11.59432	-1.238829	-11.58725
Pakistan KSE	-1.399755	-11.12269	-1.460913	-11.12715
Philippines PSEI	-0.771732	-11.09279	-1.091663	-11.203
Singapore STI	-1.545002	-10.7161	-2.059741	-10.82627
Sri Lanka CSE	-1.858628	-10.83234	-2.269915	-10.98591
Thailand SET	-1.838319	-12.38979	-1.830758	-12.42188
1% level	-4.019561	-3.473672	-4.019151	-3.473672
5% level	-3.439658	-2.880463	-3.439461	-2.880463
10% Level	-3.144229	-2.576939	-3.144113	-2.576939

Source: appendix 5-8

E.Co-integration Test

1. Multivariate Co-integration: Johansen's Approach

From the ADF test can know all the stock indices are I (1), so now this research will apply Johansen's test to check co-integration among the stock exchange markets.

Table4.4 and Table4.4 show the result of Asian pacific group co-integration.

Table4.4 Johansen's Multivariate Co-integration of Asian pacific (Trace Statistics)

Portfolio	Hypothesized No. of CE(s)	Eigen value	Trace Statistic	5% Critical Value	Prob.**	Remarks
ACRD	r=0	0.581769	841.1414	NA	NA	Eleven Co-intergartion Vectos at 5% critical valaue
BSE	r≤ 1	0.563585	711.2548	NA	NA	
CSE	r ≤ 2 *	0.490058	587.7096	NA	NA	
HIS	r ≤ 3 *	0.457126	487.3644	334.9837	0.0000	
JKSE	r ≤ 4 *	0.421419	396.3435	285.1425	0.0000	
KLSE	r ≤ 5 *	0.395523	314.8141	239.2354	0.0000	
PSEI	r ≤ 6*	0.280404	239.8087	197.3709	0.0001	
KS11	r ≤ 7 *	0.255536	190.7780	159.5297	0.0003	
KSE	r ≤ 8 *	0.241257	146.8094	125.6154	0.0013	
N225	r ≤ 9 *	0.185771	105.6716	95.75366	0.0087	
NZGI	r ≤ 10 *	0.173713	75.05014	69.81889	0.0180	
SET	r ≤ 11	0.132206	46.61906	47.85613	0.0650	
SSE	r ≤ 12	0.086564	25.49063	29.79707	0.1446	
STI	r ≤ 13	0.062230	11.99988	15.49471	0.1569	
TWI	r ≤ 14	0.016154	2.426560	3.841466	0.1193	

**MacKinnon-Haug-Michelis (1999) p-values

Table4.5 Johansen's Multivariate Co-integration of Asian pacific (Max-Eigen Statistics)

Portfolio	Hypothesized No. of CE(s)	Eigen value	Trace Statistic	5% Critical Value	Prob.**	Remarks
ACRD	r=0	0.581769	129.8866	NA	NA	Six Co-intergartion Vectos at 5% critical valaue
BSE	r≤ 1	0.563585	123.5452	NA	NA	
CSE	r ≤ 2 *	0.490058	100.3452	NA	NA	
HIS	r ≤ 3 *	0.457126	91.02091	76.57843	0.0015	
JKSE	r ≤ 4 *	0.421419	81.52934	70.53513	0.0036	
KLSE	r ≤ 5 *	0.395523	75.00543	64.50472	0.0037	
PSEI	r ≤ 6	0.280404	49.03068	58.43354	0.3080	
KS11	r ≤ 7	0.255536	43.96857	52.36261	0.2772	
KSE	r ≤ 8	0.241257	41.13782	46.23142	0.1589	
N225	r ≤ 9	0.185771	30.62148	40.07757	0.3840	
NZGI	r ≤ 10	0.173713	28.43109	33.87687	0.1943	
SET	r ≤ 11	0.132206	21.12842	27.58434	0.2685	
SSE	r ≤ 12	0.086564	13.49075	21.13162	0.4081	
STI	r ≤ 13	0.062230	9.573323	14.26460	0.2415	
TWI	r ≤ 14	0.016154	2.426560	3.841466	0.1193	

**MacKinnon-Haug-Michelis (1999) p-values

Source: appendix 9

From the Table4.4, trace statistics suggest that there are eleven co-integrating equations over vectors at 95% confidence level. This confirms that there is a long term relationship between macroeconomic variables and equity market return. And then this researchwill proceedings multivariate co-integration analysis of Max-Eigen value is applied to confirm the long run relationship. Max-Eigen statistics in Table4.5 suggests five co-integration vectors at 95% confidence level. Max-Eigen statistics is used to examine the null hypothesis of "r" co-integration vector against other alternative hypothesis of "r+1" co-integration vector. From this test it is easy to find out there are exist co-integration among the stock markets of Asian pacific. At here this research prefers Max Eigen Statistics result in this study.

Table4.6 Residual ADF test

Null Hypothesis: E has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic based on SIC, MAXLAG=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-11.20920	0.0000
Test critical values:	1% level	-3.473672	
	5% level	-2.880463	
	10% level	-2.576939	

*MacKinnon (1996) one-sided p-values.

Source: appendix10

After finding there exist co-integration among Asian Pacific 15 stock markets, this research will test whether the residual is situational or not. From Table4.6 can find out the ADF test statistic is -11.20920, which is smaller than 1% level critical value, so it means

among the Asian Pacific stock markets have co-integration.

2. Bivariate Co-integration

Multivariate co-integration test shows the co-integration among a group. At this point, the thesis examines the level of integration between two different stock market indexes, to report the pair wise co-integration exist or does not between the giving set of the variables within the special period of study. This research will apply bivariate co-integration test to check it. The result of this test has been shown on Table4.7. If the trace statistic is greater than critical value, this research rejected the null hypothesis of co-integration.

4.7 Bivariate Co-integration Analysis trace statistics for Asian Pacific Stock Markets

	AORD	BSE	CSE	HSI	JKSE	KLSE	KS11	KSE	N225	NZGI	PSEI	SET	SSE	STI	TWII
AORD															
BSE	H0														
CSE	H0	H0													
HSI	H0	H1	H0												
JKSE	H0	H0	H0	H0											
KLSE	H0	H0	H0	H0	H0										
KS11	H0	H0	H0	H0	H1	H0									
KSE	H0	H0	H0	H0	H0	H0	H0								
N225	H0	H0	H0	H0	H0	H0	H0	H0							
NZGI	H1	H0	H0	H0	H0	H0	H0	H0	H0						
PSEI	H0	H0	H0	H1	H0	H0	H0	H0	H0	H0					
SET	H0	H0	H0	H0	H0	H0	H0	H0	H0	H0	H0				
SSE	H0	H0	H0	H0	H0	H0	H0	H0	H1	H0	H0	H0			
STI	H0	H0	H0	H0	H0	H0	H0	H0	H0	H0	H1	H0	H0		
TWII	H0	H0	H0	H0	H0	H0	H0	H0	H0	H0	H0	H0	H0	H0	1
	H0: No Co-integration						H1:Co-integrated								

Source: appendix11

From the Table4.7 reveal that there exist six co-integrated vectors. This result same

with the Max Eigen statistic test. Six of them have tighter co-integration with other markets. PSEI is co-integrated with STI, and HSI. It means that for PSEI investors cannot diversify their funds in long term in these two markets. And same for STI and HSI investors also cannot achieve international portfolio diversification with the investment in PSEI markets. HSI except co-integrated with PSEI, also co-integrated with BSE. Similarly, AORD and NZGI are co-integration, JKSE and KS11 are co-integrated, N225 and SSE are co-integration. So for investors should not put all these mutual co-integrated markets inside their long term portfolio. However all other markets are not mutually co-integrated, like CSE, KLSE, KSE, SET and TWII, which means that just avoid the mutual co-integrated markets, the rest of markets or just select one of pair wise market can places for investment and long term diversification.

F. Vector Error Correction Model

Vector error correction models (VECMs) are useful as a further test of the co-integration hypothesis. It explores the short run dynamics between the variables to show the short term relationship of variable. Error correction model is helpful to identify error term at 5% level of significance and also determine the coefficients of each stock exchange indices. The error correction parameter, estimated for the error correction term, is sometimes called the speed of adjustment and it indicates how quickly the economy moves back to the long run equilibrium after a shock.

Table 4.8 Vector Error Correction Model Estimated Results

D(ACRD)	D(BSE)	D(CSE)	D(HSI)	D(JKSE)	D(KLSE)	D(KS11)	D(KSE)	D(N225)	D(NZGI)	D(PSEI)	D(SET)	D(SSE)	D(STI)
-0.023797													
[-2.13379]*	[-1												
-0.104801													
[-0.67104]	[-0												
-0.07088	0.553475	-0.064169	0.627934	0.009189	0.001484	-0.180357	-0.239185	-0.044838	0.143037	0.078135	-0.071556	-0.273711	0.0096
[-0.43030]	[0.69537]	[-0.26602]	[0.52646]	[0.07767]	[0.03148]	[-2.30201]*	[-0.41089]	[-0.06364]	[1.28136]	[0.50011]	[-1.90263]	[-1.10530]	[0.06958]
0.003377	0.06131	0.067946	0.109447	0.042372	0.008554	0.012274	0.097851	0.155517	0.00279	0.030433	0.00422	-0.004059	-0.0018
[0.12485]	[0.46909]	[1.71540]	[0.55881]	[2.18100]*	[1.10541]	[0.95406]	[1.02367]	[1.34414]	[0.15223]	[1.18624]	[0.68329]	[-0.09982]	[-0.08235]
-0.041985	-0.443726	-0.005516	-0.171726	-0.023938	-0.003152	-0.032413	0.050176	-0.140746	-0.039914	-0.045768	-0.010247	-0.014222	-0.0338
[-1.60194]	[-3.50375]*	[-0.14371]	[-0.90487]	[-1.27163]	[-0.42034]	[-2.60014]*	[0.54173]	[-1.25543]	[-2.24724]	[-1.84110]	[-1.71249]	[-0.36096]	[-1.53934]
0.010957	-0.02652	0.193514	-0.072158	0.008258	0.015118	-0.041861	-0.225272	-0.324183	0.019841	-0.035081	0.009833	0.041944	-0.0487
[0.16770]	[-0.08400]	[2.02253]*	[-0.15252]	[0.17597]	[0.80877]	[-1.34704]	[-0.97564]	[-1.15995]	[0.44810]	[-0.56610]	[0.65916]	[0.42703]	[-0.88945]
0.12989	0.671306	0.04115	0.85726	0.109589	0.021401	0.094341	0.32099	0.70872	0.040661	0.090825	-0.018252	0.012316	0.1256
[2.01739]*	[2.15775]*	[0.43644]	[1.83876]	[2.36973]*	[1.16183]	[3.08062]*	[1.41072]	[2.57331]*	[0.93190]	[1.48725]	[-1.24162]	[0.12724]	[2.32677]
0.043608	0.241493	-0.086716	0.062074	-0.000404	0.002936	-0.001999	-0.114669	-0.092931	0.005869	0.009722	0.000261	0.020728	0.0178
[1.83153]	[2.09904]*	[-2.48707]*	[0.36005]	[-0.02360]	[0.43100]	[-0.17655]	[-1.36280]	[-0.91246]	[0.36373]	[0.43050]	[0.04808]	[0.57907]	[0.89396]
-0.021852	-0.003758	-0.026436	-0.285704	-0.007366	-0.004406	-0.008355	-0.025499	-0.264549	-0.021083	-0.015065	0.006631	0.009054	-0.0170
[-0.89652]	[-0.03191]	[-0.74065]	[-1.61879]	[-0.42078]	[-0.63185]	[-0.72072]	[-0.29603]	[-2.53737]	[-1.27640]	[-0.65163]	[1.19151]	[0.24709]	[-0.83257]
-0.212425	-0.292616	-0.454602	0.494796	-0.097202	-0.038226	-0.029808	-0.933868	-1.068875	0.054082	0.069169	0.11875	0.132847	0.0646
[-1.12454]	[-0.32058]	[-1.64339]	[0.36174]	[-0.71642]	[-0.70733]	[-0.33176]	[-1.39892]	[-1.32282]	[0.42247]	[0.38606]	[2.75337]*	[0.46780]	[0.40810]
-0.20309	1.338479	0.751673	-0.72061	-0.242626	-0.072373	-0.052759	-0.250104	-0.084868	0.041529	-0.140558	0.079031	-0.408231	-0.1102
[-1.06775]	[1.45632]	[2.69865]*	[-0.52321]	[-1.77597]	[-1.33000]	[-0.58318]	[-0.37208]	[-0.10431]	[0.32218]	[-0.77912]	[1.81984]	[-1.42765]	[-0.69134]
-0.526145	0.27155	1.268208	-5.66697	0.807165	-0.01366	-0.064719	-1.817802	3.059633	-0.141287	0.174308	0.149229	-1.276232	-0.175
[-1.09961]	[0.11745]	[1.80994]	[-1.63563]	[2.34864]*	[-0.09979]	[-0.28437]	[-1.07502]	[1.49489]	[-0.43572]	[0.38408]	[1.36599]	[-1.77420]	[-0.43850]
-0.504832	-4.227032	0.166629	-6.684726	0.163512	-0.053717	-0.508156	1.494987	-1.304445	0.117915	0.068721	0.065062	-1.640875	-0.6449
[-1.03693]	[-1.79683]	[0.23372]	[-1.89621]	[0.46760]	[-0.38567]	[-2.19445]*	[0.86892]	[-0.62637]	[0.35739]	[0.14882]	[0.58532]	[-2.24190]*	[-1.57936]
-0.0842	-2.627658	0.652138	-0.734149	-0.309191	-0.16849	-0.160859	-0.272146	-0.566985	-0.286432	-0.500481	0.12382	-0.302038	-0.3220
[-0.27341]	[-1.76576]	[1.44602]	[-0.32922]	[-1.39779]	[-1.91236]	[-1.09816]	[-0.25005]	[-0.43040]	[-1.37243]	[-1.71337]	[1.76095]	[-0.65237]	[-1.24666]
0.011359	0.158579	0.175405	1.961209	0.249416	0.109355	0.069612	1.43589	2.16666	0.013033	0.184923	0.085867	0.194217	0.158
[0.03927]	[0.11345]	[0.41405]	[0.93626]	[1.20038]	[1.32134]	[0.50592]	[1.40453]	[1.75094]	[0.06648]	[0.67396]	[1.30005]	[0.44658]	[0.65238]
0.055748	0.188872	0.002377	0.299017	0.027159	0.008235	0.034017	0.114972	0.099007	0.012695	0.00615	0.005563	0.0273	0.0279
[2.33502]*	[1.63720]	[0.06798]	[1.72966]	[1.58380]	[1.20573]	[2.99561]*	[1.36268]	[0.96948]	[0.78461]	[0.27160]	[1.02048]	[0.76063]	[1.39466]
0.036346	0.100388	0.048675	0.044436	0.011495	0.002542	0.003988	-0.112964	0.041644	0.011315	-0.01249	0.005809	0.008785	0.0140
[1.66891]	[0.95394]	[1.52622]	[0.28178]	[0.73488]	[0.40800]	[0.38497]	[-1.46775]	[0.44702]	[0.76668]	[-0.60464]	[1.16824]	[0.26832]	[0.76941]
-0.006471	0.070494	0.000864	-0.070105	0.040779	0.001184	-0.000908	0.017029	0.095054	0.00565	0.03414	0.001292	-0.072735	0.0356
[-0.24492]	[0.55217]	[0.02232]	[-0.36644]	[2.14887]*	[0.15660]	[-0.07222]	[0.18238]	[0.84107]	[0.31556]	[1.36236]	[0.21411]	[-1.83118]	[1.60764]
-0.010131	-0.212198	-0.008395	-0.212313	-0.039882	-0.001257	-0.010849	0.059621	0.043084	-0.023771	-0.019019	0.000932	-0.00664	-0.0239
[-0.38387]	[-1.66397]	[-0.21721]	[-1.11099]	[-2.10391]*	[-0.16650]	[-0.86428]	[0.63926]	[0.38164]	[-1.32910]	[-0.75980]	[0.15475]	[-0.16736]	[-1.08369]
0.117582	-0.120295	-0.294643	-0.14157	-0.103999	-0.013635	-0.113739	-1.363429	-0.039933	-0.113951	0.11665	-0.057414	0.045357	-0.1277
[0.63056]	[-0.13351]	[-1.07900]	[-0.10485]	[-0.77649]	[-0.25560]	[-1.28239]	[-2.06898]*	[-0.05006]	[-0.90173]	[0.65954]	[-1.34856]	[0.16180]	[-0.81680]
-0.428494	-2.469987	-0.481064	-2.346623	-0.269269	-0.071867	-0.029644	-1.009986	-2.035361	-0.371371	-0.248702	0.067963	-0.1095	-0.283
[-2.18551]*	[-2.60718]*	[-1.67553]	[-1.65292]	[-1.91211]	[-1.28126]	[-0.31788]	[-1.45767]	[-2.42692]*	[-2.79504]*	[-1.33738]	[1.51824]	[-0.37150]	[-1.72180]
-0.050702	-0.806381	-0.187013	-1.103769	-0.138035	-0.008457	-0.049566	1.087559	-0.181153	0.012862	-0.283814	0.024068	-0.317578	-0.0774
[-0.39113]	[-1.28739]	[-0.98517]	[-1.17593]	[-1.48255]	[-0.22805]	[-0.80392]	[2.37406]*	[-0.32670]	[0.14641]	[-2.30837]*	[0.81321]	[-1.62963]	[-0.71234]
-0.210983	-0.68035	-0.261692	-1.291229	-0.006092	0.036747	-0.083268	-0.338559	0.129058	0.038621	-0.062218	0.011277	0.104418	-0.1360
[-1.65880]	[-1.10700]	[-1.40500]	[-1.40201]	[-0.06668]	[1.00988]	[-1.37641]	[-0.75321]	[0.23721]	[0.44806]	[-0.51574]	[0.38833]	[0.54609]	[-1.27577]
0.514021	2.769414	-0.649563	6.528525	0.346603	0.117829	0.366639	3.108694	0.926692	0.022866	0.70984	-0.241366	0.68706	0.5572
[1.28766]	[1.43574]	[-1.11117]	[2.25858]*	[1.20885]	[1.03175]	[1.93101]	[2.20362]*	[0.54270]	[0.08453]	[1.87478]	[-2.64824]*	[1.14486]	[1.66429]
0.424401	1.638502	-0.454841	3.764038	0.069324	-0.018284	0.104616	2.418715	1.224653	0.094647	0.364029	-0.113531	0.832797	0.292
[1.39961]	[1.11827]	[-1.02431]	[1.71429]	[0.31830]	[-0.21076]	[0.72536]	[2.25711]*	[0.94417]	[0.46059]	[1.26571]	[-1.63986]	[1.82687]	[1.15016]
-0.032548	-0.716297	0.020171	-0.631767	-0.017956	-0.008294	-0.085458	-0.243656	0.211259	-0.007918	-0.011537	-0.004649	-0.190657	-0.0549
[-0.42909]	[-1.95429]	[0.18159]	[-1.15023]	[-0.32958]	[-0.38219]	[-2.36866]*	[-0.90895]	[0.65110]	[-0.15404]	[-0.16036]	[-0.26845]	[-1.67193]	[-0.86363]
0.270718	1.703895	0.226908	2.42013	0.218918	0.042959	0.12898	0.650398	0.922967	0.100261	0.167447	-0.015149	0.165352	0.2039
[3.61570]*	[4.70963]*	[2.06950]*	[4.46390]*	[4.07077]*	[2.00554]*	[3.62180]*	[2.45806]*	[2.88183]*	[1.97597]	[2.35788]*	[-0.88621]	[1.46900]	[3.24742]
0.138956	-0.185196	0.483453	0.983564	0.050339	0.070537	0.017095	-0.702382	0.121476	-0.020739	0.191254	-0.022708	0.281872	-0.0737
[0.65670]	[-0.18113]	[1.56022]	[0.64194]	[0.33122]	[1.16522]	[0.16986]	[-0.93930]	[0.13421]	[-0.14463]	[0.95295]	[-0.47004]	[0.88610]	[-0.41571]
0.689411	1.792838	0.401695	1.971096	0.255487	0.032948	0.331792	-0.506052	2.478488	0.313076	0.368116	0.016162	0.154257	0.4061
[3.38179]*	[1.82002]	[1.34556]	[1.33529]	[1.74484]	[0.56493]	[3.42183]*	[-0.70242]	[2.84224]*	[2.26615]*	[1.90380]	[0.34723]	[0.50333]	[2.37528]
0.025305	0.168611	-0.029475	0.615651	-0.004155	0.001042	0.053909	0.252333	0.239269	0.005906	0.047634	0.000511	0.133217	0.0870
[0.52957]	[0.73025]	[-0.42123]	[1.77931]	[-0.12107]	[0.07625]	[2.37194]*	[1.49427]	[1.17060]	[0.18237]	[1.05101]	[0.04685]	[1.85444]	[2.17159]
0.054681	0.360745	-0.017723	0.436866	-0.015306	0.002903	0.036312	-0.035854	-0.038574	0.015865	-0.04939	-0.006769	0.231457	0.0202
[1.13201]	[1.54555]	[-0.25055]	[1.24900]	[-0.44115]	[0.21006]	[1.58048]	[-0.21003]	[-0.18669]	[0.48465]	[-1.07802]	[-0.61374]	[3.18730]*	[0.50071]
15.94316	116.6998	19.6575	46.77574	25.49908	4.637908	11.32538	96.39192	-61.47259	15.20757	30.09267	-0.291857	15.70238	15.753
[1.08584]	[1.64486]	[0.91424]	[0.43996]	[2.41788]*	[1.10411]	[1.62169]	[1.85767]	[-0.97876]	[1.52835]	[2.16082]*	[-0.08706]	[0.71137]	[1.27923]
og likelihood		-14215.1	Akaike information criter		194.8358	Standard errors in ( ) & t-statistics in [ ]							
			Schwarz criterion		204.7269	* Indicates Significance at 5%							

Source: appendix12 and 13

On Table4.8, It can find that error correction term coefficients that are not significant belong to BSE, CSE, HSI, JKSE, KSE, N225, NZGI, PSEI, SET, and STI. This means that these indices are weakly exogenous to the system. The weak exogenous of the indices further

implies that the markets are the initial receptor of external shocks, and it in turn, will transmit the shocks to the other markets in the observed region. As a result, the equilibrium relationship of the 15 markets is disturbed. The adjustment back to equilibrium can be inferred from the signs and magnitude of the coefficients. The negative sign means that the respective index will pose shock to the other indices in the observed region. In this sense, SSE(Shanghai index) will give the largest negative impact on the other observed Asian Pacific markets, since it has the greatest error term coefficient. AORD, KS11, KSE, SSE and TWII show error term coefficients that are significant at significance level of 5%.

It proves that SSE (Shanghai) and CSE (Sri Lanka) are shock-creator in the future equilibrium. Especially for SSE it impact to 12 other stock markets. But very interesting it got impacted by only 2 other stock markets. Except these two bigger shock-creators other indices also have different levels impacting to others. Except KS11 (South Korea), which don't impact to any one others, but very interesting it got impacted by other 9 stock markets. This means KS11is not a good choose for make portfolio, SSE and CSE better not put in one portfolio program.

KS11 (South Korea) is affected by 9 other markets among selected region. It impacted by AORD with lag 2, BSE with lag 2, CSE with lag 2, KLSE with lag 2, KSE with lag 1, STI with lag 2, TWII with lag 1and very strongly affected by SSE with lag 1and lag 2, This shows KSII's returns are strongly affected by major stock markets returns of Asian Pacific in short term.

JKSE (Indonesia) is explained by BSE, KLSE with lag 1, explained by CSE, SSE with

lag2, and also explained by N225 with lag 1 and 2. It shows Indonesia and Japan have some good ties in short term. KSE (Pakistan) also affected by other 6 stock markets among selected region. It affected by AORD, NZGI, PSEI, SSE and SET with lag 1 and lag 2. Which means Pakistan and Thailand are integrated in short-term.

Australia (AORD) return are affect by CSE with lag 2, KSE with lag 1, NZGI with lag 2, SSE with lag 2, and STI with lag 2. So means AORD stock market with CSE, KSE, NZGI, SSE, STI have short term integrated. However, co-integration has not find any integration between them, except NZGI. Similarly, N225 (Japan) also affected by other 5 stock markets, it affected by AORD, HSI, NZGI, SSE, and STI with lag 2. BSE (India) return index it explained by its own returns with 2 months earlier returns-lag 2, and also affected by returns of CSE, HSI, NZGI, and SSE.

STI (Singapore), TWII (Taiwan), CSE (Sri Lanka) are affected by themselves and other 3 stock markets in selected region. Except themselves, STI explained by CSE, SSE, TWII. TWII explained by KSE, SET, SSE. CSE explained by HSI, JKSE and SSE.

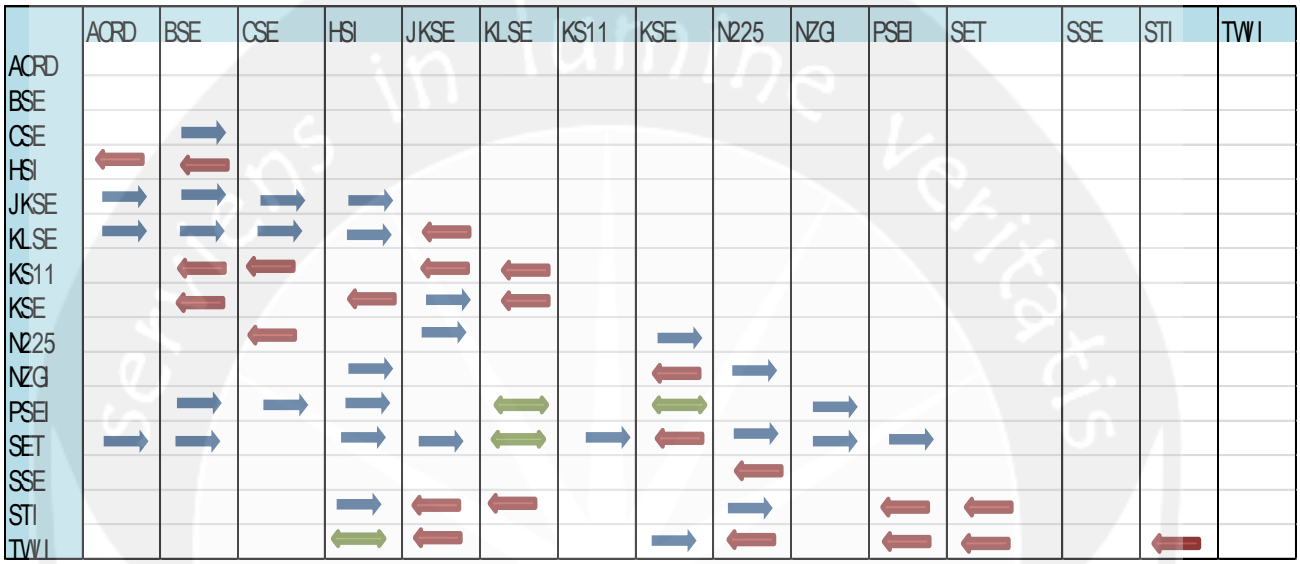
NZGI (New Zealand) is explained by its own with lag 2, and also impacting by AORD and STI. HSI (Hong Kong), SET (Thailand), SSE (Shanghai) are affected by other 2 stock markets. HSI affected by SET, and SSE. PESI affected by NZGI and SSE. SSE affected by KLSE and TWII.

KLSE (Malaysia) is only affected by SSE. Which means KLSE is very weakly exogenous with other markets. And also from Table4.10 we find that out SSE (Shanghai) almost impact all the selected Asia Pacific markets in the short term, except NZGI and SET.

Which means SSE impacts many other markets, so when investors make short term portfolio, they should not including SSE.

G. Granger Causality

Table4.9 Granger Causality results



Source: appendix 14 A and B

The meaning of arrows at table 6.9 for explaining the causality of two different stocks markets. For example ⟵ ⟶ means unidirectional causality, and ⟷ mean bidirectional causality.

After the Vector error correction model (VECM) test. This research moved towards Granger Causality test to check the short term integration between stock markets, find out the stock markets that influence the other ones and shift spillover effect. With the use of E-views 7 software, F-statistic are calculated to test the null hypothesis that is X does not affect Y (H0: b = 0), against the alternative hypothesis that X does affect Y (H0: b ≠ 0). The null hypothesis that Y does not affect X (H0: b* = 0), against the alternative

hypothesis that Y does affect X (H0: b *≠ 0), is also tested. T able 4.7 and 4.8 provides the result of pair wise analysis. Total 104 pair are formed and analyzed against 15 different set of data. The critical value for rejection of null hypothesis is set as probability value less than 5 percent (0.05) and above or equal probability will be accepted. Observed mean total no. of value to be tested after the adjustment for lag.The results of Granger Causality test are explained in detail in the following proceeding.

From Table4.9 we can see that the causal relationships exist among all the observed market. SSE (Shanghai stock market) has no causal with other ASEAN Pacific equity markets except N225, it means that for the short term investment and diversification is obtained by Chinese investors when she/he invest in all ASEAN Pacific markets and investors from selected ASEAN Pacific countries can also diversify their funds for short term when they invest in SSE index, this implies that any change of selected stock markets do not cause a change in the SSE index, here except N225 (Japan stock market) because it granger caused by N225. This result supports the low correction found between SSE and other stock index in the analysis of correlation earlier.

AORD, NZGI, KS11 look more dependent than other stock markets (except SSE), all of them have unidirectional with other index. AORD is granger causal by JKSE, KLSE, and SET, it caused to HSI. NZGI is granger causal by KSE, PESI, SET, and it caused to HSI and N225. KSII is granger causal by BSE, CSE JKSE, and KLSE and SET. KS11 also have a long term co-integration with JKSE, so for the investor want to invest in KS11 market need to pay attention to JKSE index, because JKSE has a long and short

term effect to KS11.

HSI and KLSE have granger causality with 10 other selected stock markets. HSI is Granger Causal by AORD, BSE, JKSE, KLSE, NZGI, PSEI, SET, STI and TWII. HSI with PESI also have a long term co-integration, with SET and STI have very high spillover effect, and with TWII have bi-directional granger causality. HSI only cause to KSE. For investor if want diversify risk should not choose HSI and PESI in one portfolio project. KLSE have unidirectional with AORD, BSE, CSE, HSI, JKSE, KS11, KSE and STI. KLSE is granger causal by AORD, BSE, CSE and HSI, it also causal to JKSE, KS11, KSE and STI. KLSE also have bi-directional causality with PSEI and SET.

JKSE has granger causality with 11 selected stock markets. There is unidirectional causality running from AORD, BSE, CSE, HSI, KSE, N225, and SET to JKSE. This implies that any change of these markets will cause the stock price of JKSE. Therefore any development in these stock markets should be considered by the stockholders of JKSE. There is also unidirectional causality running from JKSE to KLSE, KS11, STI, and TWII, which means that any change in JKSE will affect the stock price of these stock markets.

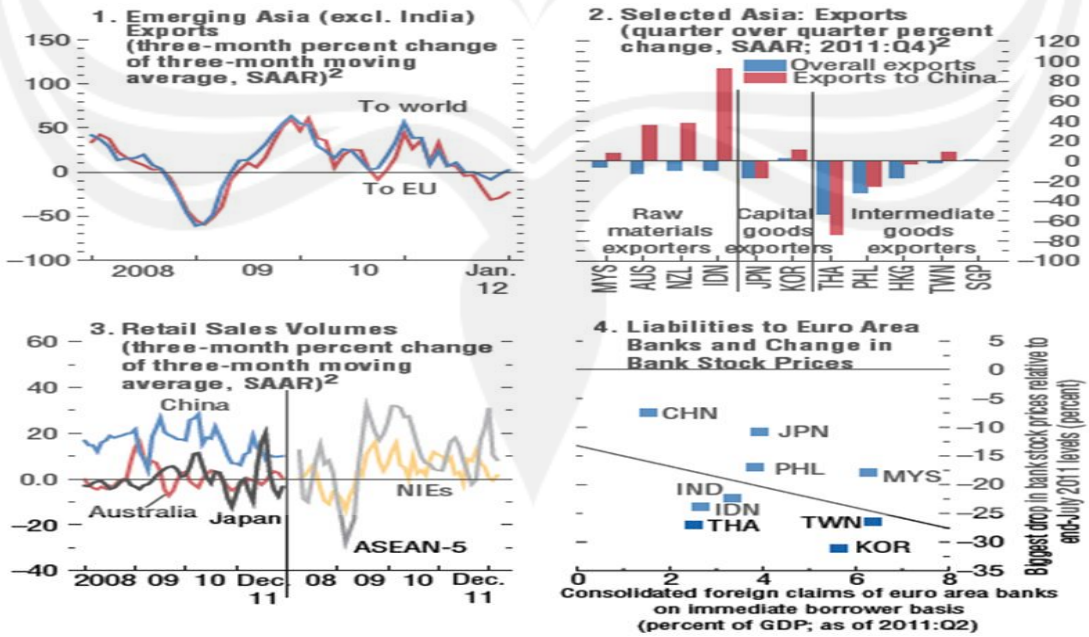
SET (Thailand stock market) almost with all the ASEAN Pacific markets have significantly linked except with CSE and SSE index. SET has unidirectional causality with other stock index AORD, BSE, HSI, JKSE, KS11, KSE, N225, NZGI, PSEI, SET, STI, TWII, and it granger cause to them. It means for these stock markets investors when make short term invest can look SET this history index for predict the own markets or

caused by SET markets. There exist 4 bidirectional causality linkages. HSI and TWII, KLSE and PSEI, KLSE and SET, KSE and PSEI, which means that both are impacting each other in the short term respectively.

H. General explanation

From the result of this research it explants almost all the Asia Pacific stock market have connect with relevant stock markets in long term or short term. And all of them get impacting or impacted with relevant stock markets. From the co-movement of all indices can find out all the Asia Pacific stock markets during 2008 all the indices return had a big decrease. There are many reasons can affect stock volatility, like crisis, panic, policy changes, political situation, and high-frequency trading, this research will give some reasons to explanation as follow:

1. The Economy of Asian Countries 2008-2012



Sources: Bank for International Settlements; CEIC; Consensus Economics; IMF, *Direction of Trade Statistics;* and IMF staff calculations.
[1]Advanced Asia (Adv. Asia): Australia (AUS), Japan (JPN), New Zealand (NZL); ASEAN-5: Indonesia (IDN), Malaysia (MYS), Philippines (PHL), Thailand (THA), Vietnam (VNM); CHN: China; IND: India; Newly Industrialized Asian Economies (NIEs): Hong Kong SAR (HKG), Korea (KOR), Singapore (SGP), Taiwan Province of China (TWN).
[2]SAAR: seasonally adjusted annual rate.

Figure4.3: The Economy of Asian Countries Recently (World Economic 0utlook 2012)

Activity across Asia slowed during the last quarter of 2011, reflecting both external and domestic developments. The effect of spillovers from Europe can be seen in the weakness of Asia's exports to that region (Figure4.3, panel 1). In some economies, such as India, domestic factors also contributed to the slowdown, as a deterioration in business sentiment weakened investment and policy tightening raised borrowing costs. The historic floods that hit Thailand significantly curtailed that country's growth in the last quarter of the year, shaving 2 percentage points off annual growth in 2011, and led to negative spillovers on other economies (for example, Japan). In some other Asian economies, however, robust domestic demand helped offset the drag on growth of slowing exports. Investment and private consumption remained strong in China, buoyed by solid corporate profits and rising household income (Figure4.3, panel 2). Moreover, the rebound from the supply-chain disruptions caused by the March 2011 Japanese earthquake and tsunami was stronger than anticipated. While financial turmoil in the euro area spilled over to Asian markets late last year, the effects were limited. Portfolio flows turned sharply negative in late 2011, equity prices fell sharply, sovereign and bank credit default swap (CDS) spreads increased and regional currencies depreciated. Overall, however, market movements in late 2011 were smaller than the gyrations observed during 2008–09. The movements had limited economic impact and were partially reversed in early 2012. In emerging Asia, adverse market

developments were correlated with countries' reliance on euro area banks (Figure4.3, panel 4). As described in more detail in this chapter's Spillover Feature, euro area banks have already begun reducing their cross-border lending. Asian banks are generally in good financial health, and many large Asian banks have sufficient capacity to step up lending further. But euro area banks handle a substantial share of trade credit in the region and often specialize in complex project financing, for which it could be difficult to find quick substitutes.

2. Global Financial Crisis 2008 – What caused it

The global financial crisis (GFC) or global economic crisis is commonly believed to have begun in July 2007 with the credit crunch, when a loss of confidence by US investors in the value of sub-prime mortgages caused a liquidity crisis. This, in turn, resulted in the US Federal Bank injecting a large amount of capital into financial markets. By September 2008, the crisis had worsened as stock markets around the globe crashed and became highly volatile.

The original reason for HSI financial crisis is the housing market in the United States suffered greatly as many home owners who had taken out sub-prime loans found they were unable to meet their mortgage repayments. As the value of homes plummeted, the borrowers found themselves with negative equity. With a large number of borrowers defaulting on loans, banks were faced with a situation where the repossessed house and land was worth less on today's market than the bank had loaned out originally. The banks had a liquidity crisis on their hands, and giving and obtaining loans became increasingly difficult as the fallout from

the sub-prime lending bubble burst. This is commonly referred to as the credit crunch.

Although the housing collapse in the United States is commonly referred to as the trigger for the global financial crisis, some experts who have examined the events over the past few years, and indeed even politicians in the United States, may believe that the financial system was needed better regulation to discourage unscrupulous lending.

The collapse of Lehman Brothers on September 14, 2008 marked the beginning of a new phase in the global financial crisis. Governments around the world struggled to rescue giant financial institutions as the fallout from the housing and stock market collapse worsened. Many financial institutions continued to face serious liquidity issues.

With Western economies slowing and global investors short of cash and pulling back from any markets deemed risky, many Asian economies suffered sharp slowdowns or dipped into recession in the fourth quarter of 2008 or the first quarter of 2009.

3. Global Financial Crisis 2008 –how the selected ASIAN PACIFIC countries responded

Asian policy changes in recent years—including Japan's slow but comprehensive banking reforms, Korea's opening of its financial markets, China's dramatic economic transformation, and the enormous buildup of sovereign reserves across the region—have not fully insulated Asian economies from global contagion.Form the Figure 4.1 in the second However, in the second quarter of 2009, there were signs that many Asian economies were rebounding sharply from the slowdowns and contractions they suffered in the previous months. Many observers have attributed this recovery to the rapid implementation of large

fiscal and monetary stimulus programs that were possible because of the comparatively strong fiscal positions that most Asian governments were in, and the fact that many Asian banking systems are considered healthy as showing in Figure 4.4. (World Economic Outlook, 2009)

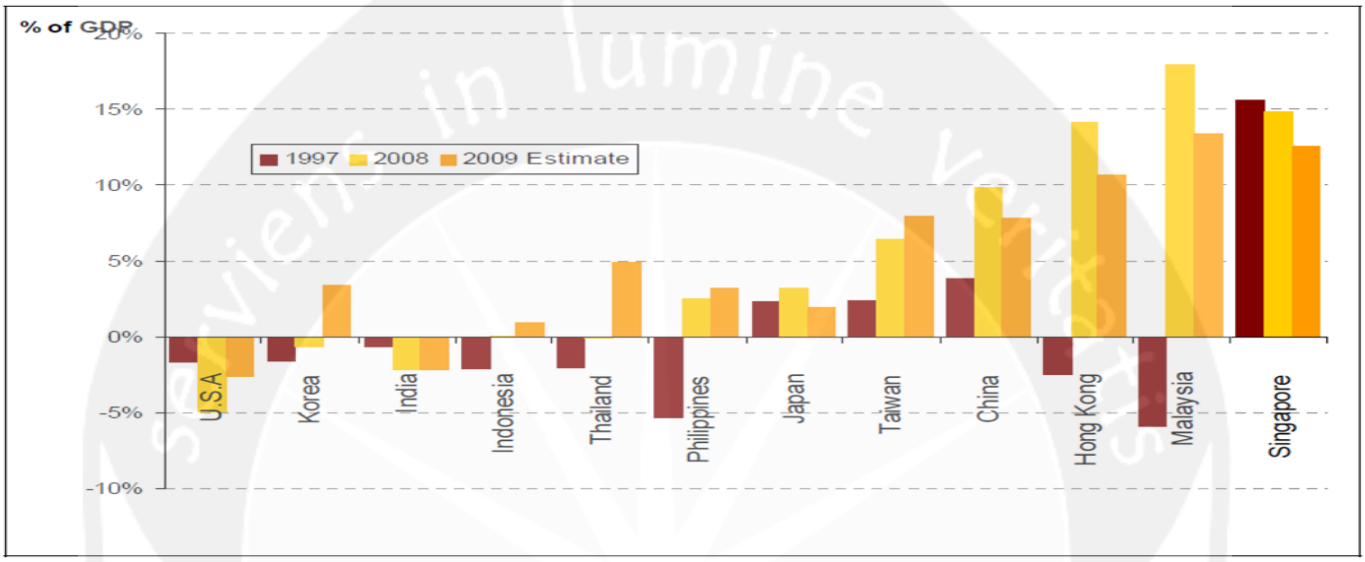


Figure 4.4 Asian Current Account Balances are Mostly Healthy

Source: International Monetary Fund. World Economic Outlook, October, 2009

Several Asian countries—including China, Japan, South Korea, Thailand, Malaysia, Taiwan and Singapore—implemented large fiscal stimulus programs that have shown signs of stimulating domestic investment and consumption. Japan announced several stimulus packages that amounted to 5% of the nation's GDP, while China implemented a package worth 12% of GDP. China also mandated an easing of lending by its state banks, opening up credit lines that had been frozen in the crisis's early stages. By early August, China, Indonesia, South Korea and Singapore had each reported second quarter GDP growth of at least 2.5% over the previous quarter. China's rebound has been particularly striking. The country's

industrial production in the January-July period was up 11% from the same period a year earlier. Stock markets around the region are up, most by amounts larger than in the United States. Between January and July, markets in China, Hong Kong, Taiwan, South Korea, Singapore, and Indonesia were each up by more than 40%. Most Asian economies are showing signs of recovery, some of it based on purely domestic conditions or trade within the region, but Asian officials continue to stress that the strength of their economies is highly dependent on recoveries in the United States and Western Europe. (Nanto 2009)

4.Focus on Japan

Why Japan still can't recover after the global financial crisis, there are several reasons can answer this question. The Slowdown in Growth and Japan's Diminishing Global Role. Japan's economy has stagnated for more than two decades, following the collapse of its real estate and equity bubbles in the early 1990s (Figure 4.5). The Bank of Japan started raising interest rates in the early 1990s, the elevated equity and real estate prices proved to be unsustainable and eventually the bubbles burst. And Japan's real GDP growth rate from 1990–2011 was only 0.9% per year (see Figure 4.6),

Figure 4.5 Japanese Residential Land Prices Crashed in the Early 1990s

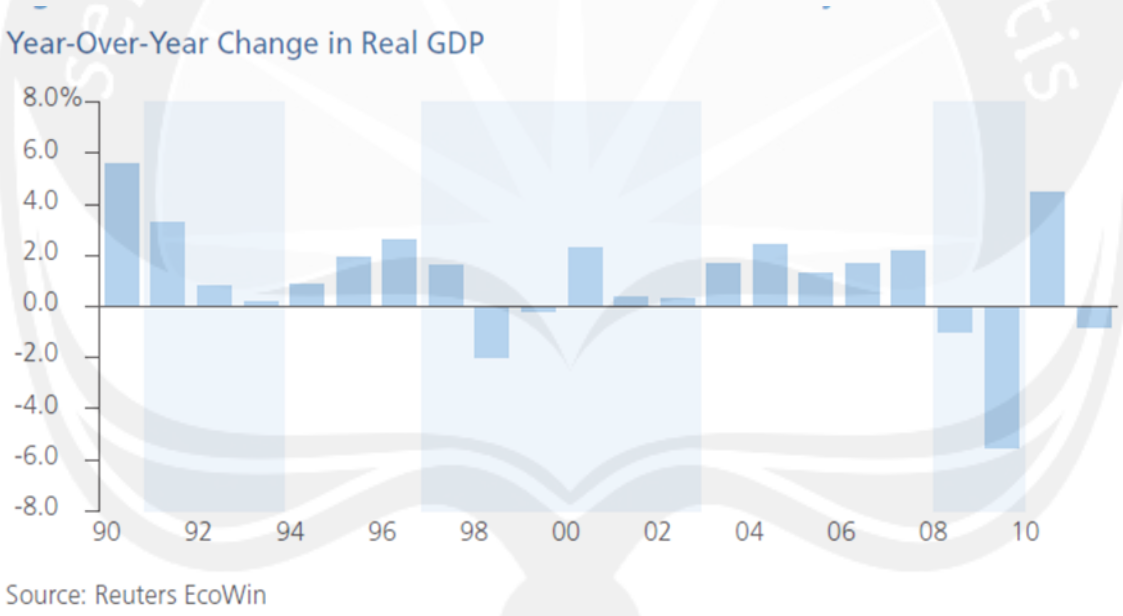


Figure 4.6 Trends Economic Growth Has Slowed Markedly Since 1990

Recession and Natural Disaster make Japan Harder: Real GDP in Japan has yet to recover from the global recession of 2008. While the country's economy initially began to rebound fairly quickly after its post-financial-crisis cratering, the 2011 Tohoku earthquake and tsunami hit before a full recovery could take hold, resulting in a serious disruption to

production, the supply chain and energy supply. The pace of recovery has slowed since then, and prospects remain dim due to both international and domestic factors. The country's exports fell sharply during the global recession, and the economy was particularly harmed by the decline in global demand for advanced manufactured durable goods like motor vehicles, machinery and electronics (Sommer 2009). See Figure 4.7 and 4.8.

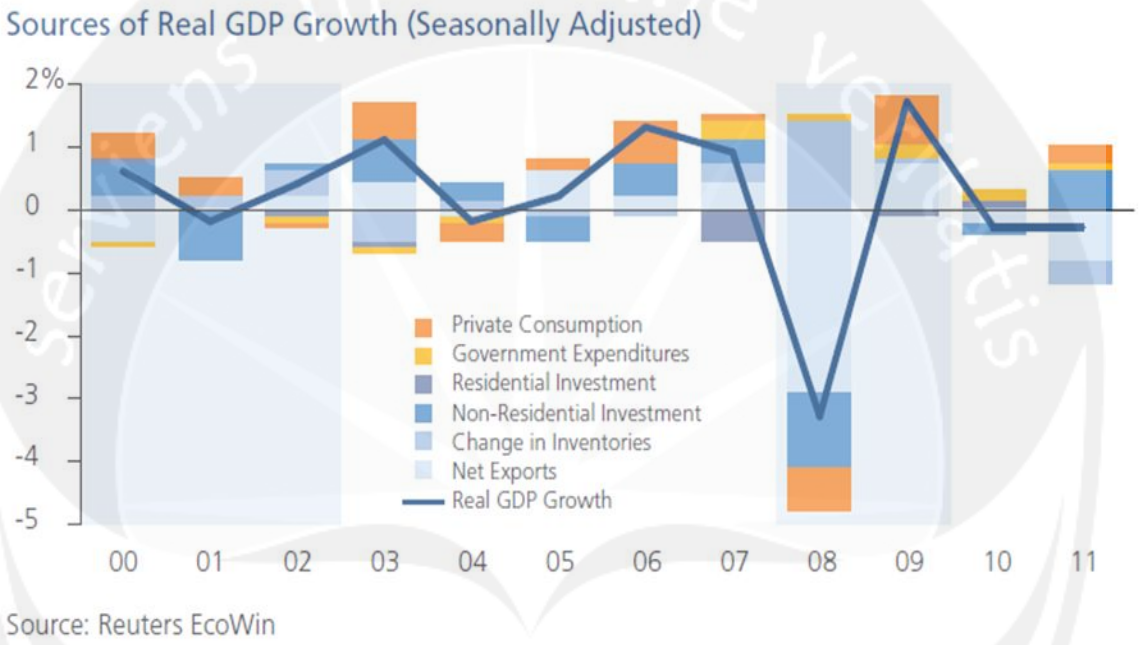


Figure 4.7 Japan Was Hit by a Sharp Decline in Net Exports

Figure 4.8Exports of Motor Vehicles

The Mixed Success of Fiscal Policy and the Paralysis of Policy: Japan has been running government deficits since the mid-1990s. After rising from the early 1990s through the early 2000s, the country's deficit began to decline until the global recession sent it climbing again. As a result of sustained period of high government deficits, Japan has extremely elevated ratios of general government debt — both net and gross — to nominal GDP.(Akram 2012) See Figure 4.9.

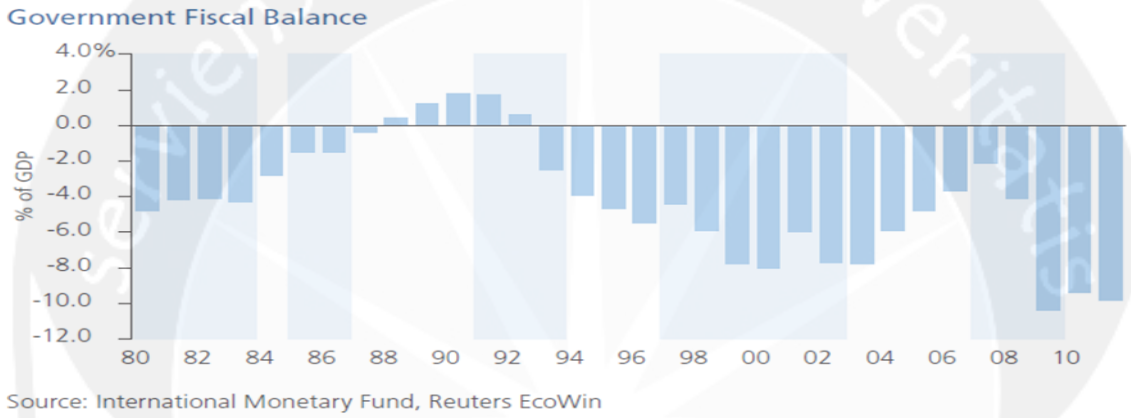


Figure 4.9 Japan Has Been Running Chronic Fiscal Deficits since the Mid-1990s

Except this main reasons still have like Japan have high quality life style, continue population decline and the aging rapidly, overall labor force participation rate has declined and so on.

Chapter V

Conclusion, Limitation and recommendation

A.Conclusion

The objective of this study is to examine the existence of 15 Asian Pacific stock markets co-movements during 2000-2012 for exploring the benefits of international

diversification and to investigate the 15 ASIAN PACIFIC stock markets, which are Australia, Hong Kong, Shanghai, Taiwan, Indonesia, India, Japan, Korea, Malaysia, New Zealand, Philippines, Pakistan, Singapore, Sri Lanka and Thailand stock markets. Thisstudy examines the existence of Asian Pacific stock markets in the term of short run, long run and causality elementary affect. To find out the required result the study applies many econometric techniques i.e. Statistics Descriptive, Unit Root Test (Augmented Dickey Fuller and Phillips-Purpose Test), Multivariate and Bivariate Co-integration Model, Vector Error Correction Model, Granger Causality model on monthly data, which can be summarized.

Based on the analysis of risk and return, we can find almost all Asian pacific stock markets' indices are positive average return throughout all this period, except TWII and N225. CSE (Sri Lanka) is the highest return, followed by KSE (Pakistan) and then JKSE (Indonesia) among these countries. However, those returns also have high risk. KSE (Pakistan) is the highest risk during 15 Asian pacific stock markets. CSE and JKSE also got very high risk, AORD (Australia) and NZGI (New Zealand) got low risk also low return. Which explain the theory of finance it states that higher return higher risk, lower return lower risk.Then compute correlation among all these countries, this approach may provide positive outputs if the formation process employs returns with the lowest correlation coefficients between stocks or indices.

Found out that all developed markets (AORD, NZGI, HSI, STI) have more strength co-movement relationship than developing stock markets in Asian pacific region, like

HSI (Hong Kong) with AORD (Australia) and STI (Singapore) all of them have high coefficient, because all of these three markets are developed markets, so the respond more quickly, and more automatic adjustment by markets. Which have large influence on other stock markets. The correlations of market returns are positive except SET (Thailand). All the indices connected with CSE (Sri Lanka), KSE (Pakistan), SET (Thailand) and SSE (Shanghai) indices are low correction coefficients, which means if the investor want make international diversification can add these four countries for portfolio. From the correlation coefficients suggest some insight on the short term co-movement among 15 Asian Pacific stock markets which suggests that the benefits of any short term diversification or speculative activities still exist between them. However, correlation is a week measure of integration (Akash, elct, 2011), so co-integration is used.

Co-integration is used to check long-term integration of stock markets. Thisapproach focuses more on the potential new equilibrium resulting from long run relationship magnitude. Before moving on to calculate co-integration, we need to check whether the stock markets are stationary or not. It is prerequisite for co-integration that the series should be stationary. So, ADF and Phillips-Perror test is used. Results indicate that all the level series are non-stationary but when they are checked in first difference they become stationary. So, all the series are found to be integrated of order 1. Then we proceed with co-integration.

Multivariate test indicates that Asian Pacific Markets have 11 co-integrating vectors,

so these markets are co-integrating with each other. Then we measure Bivariate co-integrating analysis, results from pair wise co-integration test explore the level of co-integration of markets is different and vary from country to country. It is seen that the countries which are close to each other in terms of capital and trade and have similar economic and political structure, like AORD (Australia) and NZGI (New Zealand). N225 (Japan) and SSE (Shanghai) their markets are co-integrated and even if some of them have co-integration, at least they reflect transference of their spillover effects on each other. On the other hand large (in context of trade volume and capital) and developed or mature markets, they are also integrated like Hong Kong; Shanghai, Singapore and Japan's stock markets. These big markets also transfer their effects on small markets but not as much as they do shift among each other due to similar economic and fiscal policies. Like Japan's stock market is co-integrated with Shanghai stock market but not with Hong Kong stock market, which is linked with India and Philippine stock market. There exist six co-integration vector, which is AORD (Australia) is co-integration with NZGI (New Zealand), HSI (Hong Kong), is co-integration with BSE (India) and PSEI (Philippine), JKSE (Indonesia) is co-integration with KS11 (South Korea), N225 (Japan) is co-integration with SSE (Shanghai), PSEI is co-integration with STI (Singapore).Therefore, for investors should not put all these mutual co-integrated markets inside their long term portfolio. However all other markets are not mutually co-integrated, like CSE, KLSE, KSE, SET and TWII, which means that just avoid these mutual co-integrated markets, the rest of markets or just select one of

pair wise market can places for investment and long term diversification.

Vector Error Correction Model, Granger Causality are used to check short-term integration of stock markets. With the help of VECM, This method stresses on the calculation of coefficient error term,which reflects potential future shock resulting from an index or stock, it proves that SSE (Shanghai) and CSE (Sri Lanka) are shock-creator in the future equilibrium. Especially for SSE (Shanghai) almost impacting all selected the Asia Pacific markets in short term, except NZGI, SET. But very interesting it got impacted by other 2 stock markets. Which means many other markets get impacted by SSE, so when investor make short term portfolio should not put SSE inside. Except these two bigger shock-creators other indices also have different levels impacting to others. Except KS11 (South Korea), which don't impact to any one others, but very interesting it got impacted by other 9 stock markets. This means KS11 is not a good choose for make portfolio. KLSE (Malaysia) is only affected by SSE. Which means KLSE is very weakly exogenous with other markets. PESI (Philippine, HSI (Hong Kong), SET (Thailand) are only affected by other 2 stock markets.

This method assesses the one-way and two-way causal relationship between markets or assets. This study shows that mostly countries are granger causality, which proves the regional integration with each other. SSE (Shanghai stock market) has no causal with other ASEAN PACIFIC equity markets except N225, and for Shanghai stock market and Japan stock market also have long term co-integration. So there is no benefit for investors when she/he invest in these two markets for short and long term. All the

Asian Pacific markets are Ganger causality with other markets are impacting or impacted.

From the research result it can be concluded that H1 and H2 are supported. There are causality relationships among 15 selected Asia pacific markets and there is a long term relationship among 15 selected Asian pacific markets. This result same with previous studies (Masih and Masih, 1999, 2002; Sheng and Tu, 2000; Yang, Kolari and Min, 2002; Febrian and Herwany,2007; Subramanian, 2009; Akash, Khan and Hussain, 2011) and different with previous research (Roca, Antony and Shepherd 1998; Ng Hee, 2002), maybe because the data they use is before 1998 global financial crisis, after 1998 global financial crisis the linkage become more stronger than before (Yang, Kolari and Min, 2002). However, the influence from stock market to other stock is difference. So it means opportunities of reaping benefits of diversification and reduced risk can be obtained for the long term in Asian Pacific selected stock markets, unlike prior studies (Marimuthu and kok Ng 2010; Khan, Hassan and Ahmad 2011) because the scope of Asia Pacific stock markets they selected were different from this research. One selected 8 stock markets from 1997-2007 (Marimuthu and kok Ng 2010),and another one selected 5 stock markets form 1998-2008 (Khan, Hassan, Ahmad 2011),so for them the chooses for portfolio is less than this research. For short termth is research show also can achieved portfolio diversification in Asian Pacific selected stock markets, like prior studies (Marimuthu and kok Ng 2010;Khan, Hassan and Ahmad 2011).

But for different countries investors have to look appropriate linkage, find the best

portfolio strategy. Different portfolio selection approach will give different portfolio outputs. Different assessment's length of observation period also will result in different outputs, as the duration may affect the correlation coefficient as well as the volatility. Big investors can use this study while devising investment strategies in Asia Pacific.

B.Limitation

1. This study does not investigate all the reason behind the existence of ASEAN PACIFIC stock markets co-movement.
2. This study does not investigate all the influence of economic condition to the existence of co-movement across ASEAN PACIFIC stock markets.

C.Recommendation

1. The future study could investigate the reason behind the Asian Pacific stock markets co-movement. Why or why not these equities are integrated? What are the aspects that make them co-integrated? Maybe like some regional issue etc. AFTA (Asian Free Trade Agreement), SAFT (South Asian Federation of Exchange), this may affect the influence of co-movements among Asian Pacific stock markets.
2. The future study could investigate the connection between economic condition and Asian Pacific stock markets co-movement.
3. The future study could investigate what are the common points in these indices which are co-integrated?

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APPENDICES