CHAPTER 4

Empirical Results

This study has two objectives to study the financial status of the construction industry's stock exchanges in ASEAN exchanges and analyze the relationship between stock prices of construction industry and each chosen stock market index in extreme event case. The method was done by using Bivariate Generalized Extreme Value Distribution model (BGEV) and Bivariate Generalized Pareto Distribution model (BGPD).

Firstly, the analysis of ASEAN construction industry stock exchanges can be considered from financial analysis of Siam Cement Public Company Limited (SCC), Siam City Cement Public Company Limited (SCCC), Gamuda Berhad (GAM), IJM Corporation Berhad (IJM), Chip Eng Seng Corporation Limited, and Low Keng Huat limited. The financial analysis is as follows:

4.1 The financial status of stock market of The Siam Cement Public Company Limited (SCC).

Table 4.1: Balance sheet from 2011 – 2014 of The Siam Cement Public Company Limited (SCC).

	Currency in Millions of Thai Bahts			
	Consolidated Financial Statements			
	Dec-11	**Dec-12**	**Dec-13**	**Dec-14**
Assets				
Cash And Equivalents	22,679.80	25,063.80	17,433.90	19,030.70
Short-Term Investments	7,205.00	7,676.80	6,984.00	8,022.50
TOTAL CASH AND SHORT TERM INVESTMENTS	29,884.80	32,740.70	24,417.90	27,053.20
Accounts Receivable	33,624.90	36,776.20	39,828.80	40,308.10
Notes Receivable	154.10	136.60	146.40	114.70
Other Receivables	7,032.00	6,101.00	9,624.00	11,534.00
TOTAL RECEIVABLES	40,811.10	43,013.80	49,599.20	51,956.80
Inventory	41,838.30	48,890.40	55,556.90	52,747.00
Other Current Assets	4,229.60	4,621.60	5,555.70	6,240.70
TOTAL CURRENT ASSETS	116,763.80	129,266.50	135,129.70	137,997.70
Gross Property Plant And Equipment	375,786.10	399,103.90	435,964.70	471,496.30
Accumulated Depreciation	-219,103.00	-233,812.00	-252,123.00	-266,411.00
NET PROPERTY PLANT AND EQUIPMENT	156,683.10	165,291.90	183,841.70	205,085.30
Goodwill	2,510.90	3,801.10	10,300.50	10,799.30
Long-Term Investments	84,614.00	80,908.80	93,804.30	93,811.60
Loans Receivable, Long Term	401.30	137.30	142.70	149.30
Deferred Tax Assets, Long Term	2,903.40	4,301.40	4,603.90	4,261.40
Deferred Charges, Long Term	335.00	465.00	1,619.00	1,552.00
Other Intangibles	3,676.00	4,404.80	4,659.50	5,491.70
Other Long-Term Assets	5,901.70	6,996.40	6,587.10	6,674.30
TOTAL ASSETS	373,789.30	395,573.10	440,688.50	465,822.60
LIABILITIES & EQUITY				
Accounts Payable	35,955.90	45,132.20	50,680.10	44,707.30
Accrued Expenses	277.00	279.00	352.00	325.00
Short-Term Borrowings	20,151.40	13,876.60	13,005.30	12,599.10
Current Portion Of Long-Term Debt/Capital Lease	44,215.10	35,128.80	20,879.20	33,023.50
Current Portion Of Capital Lease Obligations	544.00	580.00	843.30	23.80
Current Income Taxes Payable	4,177.10	2,304.10	2,596.10	2,025.10
Other Current Liabilities, Total	1,675.40	2,009.80	2,279.50	2,837.60
TOTAL CURRENT LIABILITIES	106,451.80	98,730.60	89,792.20	95,517.50
Long-Term Debt	96,620.00	125,763.40	153,086.90	150,354.00
Capital Leases	1,375.00	807.00	460.00	72.00
Minority Interest	22,769.60	17,936.60	25,223.30	32,034.00
Unearned Revenue, Non-Current	504.00	420.00	381.00	415.0**0**

Table 4.1 (Continued): Balance sheet from 2011 – 2014 of The Siam Cement Public Company Limited (SCC).

Pension & Other Post-Retirement Benefits	3,898.80	5,565.80	6,122.80	6,330.70
Deferred Tax Liability Non-Current	1,562.50	2,472.50	2,785.20	2,366.20
Other Non-Current Liabilities	408.70	691.20	1,298.70	1,450.10
TOTAL LIABILITIES	210,820.80	234,450.50	253,926.80	256,505.60
Common Stock	1,200.00	1,200.00	1,200.00	1,200.00
Retained Earnings	139,414.20	148,176.10	166,453.00	185,249.40
Comprehensive Income And Other	-415.20	-6,190.00	-6,114.70	-9,166.40
TOTAL COMMON EQUITY	140,198.90	143,186.10	161,538.30	177,283.10
TOTAL EQUITY	162,968.60	161,122.70	186,761.70	209,317.00
TOTAL LIABILITIES AND EQUITY	373,789.30	395,573.10	440,688.50	465,822.60
Revenues	368,578.70	407,600.50	434,251.20	487,545.10
TOTAL REVENUES	368,578.70	407,600.50	434,251.20	487,545.10
Cost Of Goods Sold	315,810.50	353,695.40	363,096.00	409,431.20
GROSS PROFIT	52,768.10	53,905.10	71,155.20	78,113.90
Selling General & Admin Expenses, Total	32,995.40	36,526.60	40,004.60	44,945.00
Other Operating Expenses	-3,589.10	-4,207.70	-6,572.90	-5,070.70
OTHER OPERATING EXPENSES, TOTAL	29,406.20	32,318.90	33,431.70	39,874.40
OPERATING INCOME	23,361.90	21,586.20	37,723.50	38,239.60
Interest Expense	-6,663.00	-7,245.00	-7,488.00	-7,895.00
Interest And Investment Income	4,305.00	5,744.00	5,932.00	4,819.00
NET INTEREST EXPENSE	-2,358.00	-1,501.00	-1,556.00	-3,076.00
Income (Loss) On Equity Investments	6,773.90	1,560.60	6,546.30	6,108.50
Currency Exchange Gains (Loss)	644.00	943.00	-688.00	643.00
Other Non-Operating Income (Expenses)	-0.10	0.20	-0.20	-0.40
EBT, EXCLUDING UNUSUAL ITEMS	28,421.80	22,589.00	42,025.70	41,914.60
Merger & Restructuring Charges	-172.00	-10.00	-45.00	-21.00
Impairment Of Goodwill	-	151.00	-	-
Gain (Loss) On Sale Of Investments	2,894.00	634.00	636.00	34.00
Gain (Loss) On Sale Of Assets	106.00	-	-	-
EBT, INCLUDING UNUSUAL ITEMS	31,249.80	23,364.00	42,616.70	41,927.60
Income Tax Expense	7,504.10	4,741.90	5,003.20	4,967.70
Minority Interest In Earnings	3,535.00	4,957.90	-1,091.20	-3,344.60
Earnings From Continuing Operations	23,745.70	18,622.10	37,613.40	36,959.90
NET INCOME	27,280.70	23,580.00	36,522.20	33,615.30
NET INCOME TO COMMON INCLUDING EXTRA ITEMS	27,280.70	23,580.00	36,522.20	33,615.30
NET INCOME TO COMMON EXCLUDING EXTRA ITEMS	27,280.70	23,580.00	36,522.20	33,615.30

Source: http://www.bloomberg.com

Table 4.2: Financial highlight of Siam Cement Public Company Limited (SCC).

Period	Y/E '12	Y/E '13	Y/E '14	Q1 '15
as of	31/12/2012	31/12/2013	31/12/2014	31/3/2015
Financial Data				
Assets	395,573.10	440,688.50	465,822.60	475,039.37
Liabilities	234,450.50	253,926.80	256,505.60	263,403.58
Equity	161,122.70	186,761.70	209,317.00	178,382.43
Paid-up Capital	1,200.00	1,200.00	1,200.00	1,200.00
Revenue	407,600.50	434,251.20	487,545.10	114,869.49
Net Profit	23,580.00	36,522.20	33,615.30	11,072.63
EPS (Baht)	19.65	30.44	28.01	9.23
Financial Ratio				
ROA(%)	5.96	8.29	7.22	11.18
ROE(%)	14.63	19.56	16.06	21.39
Net Profit Margin(%)	5.79	8.41	6.89	9.64

*From calculation

4.1.1 Balance sheet analysis

● **Total Asset:** it can be seen that The Siam Cement Public Company Limited has been increasing its asset every year. The largest portion of asset is property plant and equivalent by total asset increased from 373,789.30 million baht in 2011 to 465,822.60 million baht in 2014. This means the company has developed a lot of property plants, which increase the company's potential. However, cash and equivalent has decreased from 29,884.80 million baht in 2011 to 27,053.20 million bath in 2014 and accounts receivables are among the industry's worst years.

● **Total Liabilities:** it indicates that the most beneficial factor of the company comes from long-term liabilities. Moreover, the debt of company is more than the equity, it means that there are not enough liquid assets to satisfy current obligations, operating profits are more than adequate to service the debt.

● **Total Equity:** The Siam Cement Public Company Limited has 1,200,000,000 baht of common stock. The balance sheet found that the company has increased profit in about 2 or 3 years ago, which was considered from the retained earnings. The result has influenced to the equity that has been increasing in the value every year.

4.1.2 Return on Assets analysis: ROA

Return on assets ratio (ROA) is the ratio that shows asset management efficiency of a company's profit, which 1 bath of asset can be calculated to find out profit as follows:

$$\text{Return on Asset (\%)} = \frac{\text{Net profit} \times 100}{\text{Total asset}} \quad (125)$$

From ROA value of The Siam Cement Public Company limited, it was found that ROA values increase every year. The result shows that the company has efficiency in asset management and increase of profitability. In 2013 (8.29%), it was found that the ROA value was more than in 2014 (7.22%) by 1.07%. However, the trend is still increasing continuously. In the first quarter of 2015, the value of ROA has shown to be 11.18% which is more than that of year 2011 by 5.22%.

4.1.3 Return on Equity analysis: ROE

Return on equity ratio (ROE) is the ratio which shows the investment of equity which will receive return and how much return from the operation of the company. It can be calculated as follows:

$$\text{Return on Equity (\%)} = \frac{\text{Net profit} \times 100}{\text{Total Equity}} \quad (126)$$

From ROE value of The Siam Cement Public Company limited, it is found that ROE values increase every year. The ROE values show that the company has profit efficiency. Although, ROE value in first quarter of 2015 was higher and the trend is still increasing meaning the company still has a potential to gain profits.

Table 4.3: Statistic highlight of Siam Cement Public Company Limited (SCC).

Statistics as of	28/12/2012	27/12/2013	30/12/2014	2/7/2015
Last Price(Baht)	440.00	400.00	448.00	522.00
Market Cap.	528,000.00	480,000.00	537,600.00	626,400.00
F/S Period (As of date)	30/9/2012	30/9/2013	30/9/2014	31/3/2015
P/E	22.39	13.14	15.99	17.25
P/BV	3.85	3.07	3.20	3.51
Book Value per share (Baht)	114.21	130.30	140.20	148.65
Dvd. Yield(%)	4.47	7.61	6.25	2.39

* From calculation

4.1.4 Price to Earnings Ratio (P/E Ratio) analysis

P/E ratio is a number which shows whether the stock price is higher than earning per share or not. It can be calculated from closing price per share divided by earning per share as follows:

$$\text{P/E Ratio} = \frac{\text{Closing price per share}}{\text{Earning per share}} \quad (127)$$

From the calculation, P/E ratio of The Siam Cement Public Company Limited has increased from 13.14% in 2013 to 17.25% in the first quarter of 2015. It means that the higher P/E ratio comes from the decrease in earnings per share. Therefore, investors should sell this stock with high P/E ratio. The results show that this company is not interested in the construction group so the investors should consider many factors before make an investment.

4.1.5 Price to Book Value Ratio (P/BV Ratio) analysis

P/BV ratio is a value which shows whether the stock price is higher than book value per share or not. It can be calculated from closing price per share divided by book value per share as follows:

$$\text{P/BV Ratio} = \frac{\text{Closing price per share}}{\text{Book value per share}} \quad (128)$$

From P/BV ratio of The Siam Cement Public Company Limited, it has shown the annual increase which means this asset has higher value than current market price. Higher P/BV ratio means that investors will buy stock more than book value. Therefore, if the investors consider about the P/BV ratio, it means that they should sell this asset. Moreover, the investors should consider many factors before making the investment.

4.1.6 Future outlook of Siam Cement Public Company Limited (SCC)

The strategic importance of The Siam Cement Public Company Limited has only two reasons for this, including go regional to create growth and higher value added requirements integration incorporate culture and investment potential of people. The key target is to succeed in 2015, which has been moving slowly for nine years ago for SCC. The company has revenue from traditional businesses in the region 100,912 million baht, with revenues from business operations in the region of 44,397 million baht. The number has gone up to 14% from 2013, whereas the revenue of exports to ASEAN countries is 56,615 million baht showing the increase of 21% as compared to 2013. SCC can generate revenue from a planned foray into ASEAN by Go Regional plan at substantial levels surpass one billion baht a year. Thus, this is likely to expand further in the future (Sanoachitt, 2015).

4.2 The financial status of stock market of Siam City Cement Public Company Limited (SCCC)

Table 4.4: Balance sheet from 2011 – 2014 of Siam City Cement Public Company Limited (SCCC).

	Currency in Millions of Thai Bahts			
	Consolidated Financial Statements			
	Dec-11	**Dec-12**	**Dec-13**	**Dec-14**
Assets				
Cash And Equivalents	1,921.40	2,158.70	3,172.70	2,757.30
TOTAL CASH AND SHORT TERM INVESTMENTS	1,921.40	2,158.70	3,172.70	2,757.30
Accounts Receivable	2,311.10	3,080.10	3,851.20	3,804.10
Other Receivables	76.00	98.40	92.70	121.20
TOTAL RECEIVABLES	2,387.10	3,178.40	3,943.90	3,925.40
Inventory	2,392.80	2,096.70	1,967.10	2,040.30
Other Current Assets	185.70	241.60	279.40	330.50
TOTAL CURRENT ASSETS	6,887.10	7,675.50	9,363.10	9,053.40
Gross Property Plant And Equipment	39,799.60	40,485.20	44,395.20	46,953.40
Accumulated Depreciation	-25,037.10	-25,251.50	-25,535.50	-26,152.70
NET PROPERTY PLANT AND EQUIPMENT	14,762.40	15,233.60	18,859.70	20,800.70
Long-Term Investments	1,907.30	1,816.10	1,952.30	2,113.40
Deferred Tax Assets, Long Term	630.60	472.50	532.40	611.90
Other Intangibles	1,733.90	1,944.50	1,975.30	2,250.40
Other Long-Term Assets	615.20	860.20	771.10	686.90
TOTAL ASSETS	26,536.50	28,002.50	33,453.90	35,516.90
LIABILITIES & EQUITY				
Accounts Payable	1,802.90	2,118.00	2,440.80	2,599.40
Accrued Expenses	1,519.00	1,736.20	1,408.00	1,060.70
Short-Term Borrowings	169.50	304.20	45.00	291.40
Current Portion Of Long-Term Debt/Capital Lease	70.30	4,078.30	268.00	366.90
Current Income Taxes Payable	533.20	109.00	560.30	499.10
Other Current Liabilities, Total	174.40	175.00	368.10	356.10
Unearned Revenue, Current	-	-	615.90	757.50
TOTAL CURRENT LIABILITIES	4,269.40	8,520.70	5,706.00	5,931.20
Long-Term Debt	4,340.80	780.50	7,365.60	7,442.20
Minority Interest	5.00	6.50	6.20	6.20
Pension & Other Post-Retirement Benefits	826.90	976.00	1,064.10	1,161.80
Other Non-Current Liabilities	91.70	72.80	73.90	79.10
TOTAL LIABILITIES	9,528.80	10,350.00	14,209.60	14,614.30
Common Stock	2,300.00	2,300.00	2,300.00	2,300.00
Additional Paid In Capital	10,106.30	10,106.30	10,106.30	10,106.30
Retained Earnings	4,668.50	5,314.50	6,890.40	8,522.90
Comprehensive Income And Other	-72.10	-74.80	-58.70	-32.80
TOTAL COMMON EQUITY	17,002.70	17,646.00	19,238.10	20,896.40

Table 4.4 (Continued): Balance sheet from 2011 – 2014 of Siam City Cement Public Company Limited (SCCC).

TOTAL EQUITY	17,007.70	17,652.50	19,244.30	20,902.60
TOTAL LIABILITIES AND EQUITY	26,536.50	28,002.50	33,453.90	35,516.90
Revenues	23,149.70	26,427.00	29,949.50	31,862.20
Other Revenues	101.00	147.50	86.50	90.80
TOTAL REVENUES	23,250.70	26,574.50	30,036.00	31,953.00
Cost Of Goods Sold	12,863.80	15,272.90	16,522.30	17,598.30
GROSS PROFIT	10,386.90	11,301.60	13,513.80	14,354.80
Selling General & Admin Expenses, Total	5,790.80	6,750.50	7,404.40	7,972.20
OTHER OPERATING EXPENSES, TOTAL	5,790.80	6,750.50	7,404.40	7,972.20
OPERATING INCOME	4,596.10	4,551.10	6,109.40	6,382.60
Interest Expense	-215.60	-267.40	-304.90	-373.30
Interest And Investment Income	-	17.30	9.10	15.50
NET INTEREST EXPENSE	-215.60	-250.10	-295.70	-357.70
Income (Loss) On Equity Investments	483.70	368.60	283.70	228.00
Currency Exchange Gains (Loss)	36.30	-0.50	-121.50	41.50
Other Non-Operating Income (Expenses)	-	0.00	-	-
EBT, EXCLUDING UNUSUAL ITEMS	4,900.50	4,669.10	5,975.90	6,294.40
Gain (Loss) On Sale Of Investments	-	-226.80	-	-
Other Unusual Items, Total	6.00	17.40	-27.10	16.00
EBT, INCLUDING UNUSUAL ITEMS	4,906.50	4,459.70	5,948.70	6,310.30
Income Tax Expense	1,615.10	822.40	1,152.80	1,227.90
Minority Interest In Earnings	2.00	-1.70	-	-
Earnings From Continuing Operations	3,291.40	3,637.30	4,795.90	5,082.40
NET INCOME	3,293.40	3,635.70	4,795.90	5,082.40
NET INCOME TO COMMON INCLUDING EXTRA ITEMS	3,293.40	3,635.70	4,795.90	5,082.40
NET INCOME TO COMMON EXCLUDING EXTRA ITEMS	3,293.40	3,635.70	4,795.90	5,082.40

Source: http://www.bloomberg.com

Table 4.5: Financial highlight of The Siam City Cement Public Company Limited (SCCC).

Period	Y/E '12	Y/E '13	Y/E '14	Q1 '15
as of	31/12/2012	31/12/2013	31/12/2014	31/3/2015
Financial Data				
Assets	28,002.46	33,453.87	35,516.91	37,053.53
Liabilities	10,349.97	14,209.60	14,614.31	14,731.65
Equity	17,646.00	19,238.05	20,896.38	22,315.66
Paid-up Capital	2,300.00	2,300.00	2,300.00	2,300.00
Revenue	26,960.42	30,328.87	32,238.08	8,462.94
Net Profit	3,635.69	4,795.92	5,082.44	1,392.30
EPS (Baht)	15.81	20.85	22.10	6.05
Financial Ratio				
ROA(%)	12.98	14.34	14.31	16.84
ROE(%)	20.60	24.93	24.32	21.03
Net Profit Margin(%)	13.49	15.81	15.77	16.45

4.2.1 Balance sheet analysis

● **Total Asset:** The Siam City Cement Public Company Limited increases its asset every year, which in 2014 (35,516.90 million baht) had more than 2011(26,536.50 million baht) by 25.41%. The company has more gross property plant and equipment is one of the main reasons that shows the company wants to invest in fixed assets.

● **Total Liabilities:** most of the company liabilities are long-term and short-term debt. If it compares with the equity, the result shows debt to equity ratio is not high. Therefore, the company has ability to debt repayment.

● **Total Equity:** The Siam City Cement Public Company Limited has 2,300,000,000 baht of common stock. The company has ability to make profit every year as in 2014 (20,902.60 Million Bath) shows that the company has more than that of 2011 (17,007.70 Million Bath) by 54.78%. The result implies to the increased equity every year.

4.2.2 Return on Assets analysis: ROA

From ROA value of Siam City Cement Public Company limited, the result showed that ROA values are increased every year. It indicates that the company has efficiency in asset management and increase in profitability. However, in 2014

(14.31%), ROA was found less than that of 2013 (14.34%) just a little bit, but the trend is still increasing.

4.2.3 Return on Equity analysis: ROE

From ROE value of Siam City Cement Public Company limited, the ROE values are increasing continuously according to the analysis in 2013 that has more than every year. The results show that the company still has a potential. Although ROE value in the first quarter of 2015 decreased, the trend is still increasing may be because the balance sheet has not included other quarters.

Table 4.6: Statistical highlight of The Siam City Cement Public Company limited (SCCC).

Statistics as of	28/12/2012	27/12/2013	30/12/2014	2/7/2015
Last Price(Baht)	420.00	398.00	434.00	365.00
Market Cap.	96,600.00	91,540.00	99,820.00	83,950.00
F/S Period (As of date)	30/9/2012	30/9/2013	30/9/2014	31/3/2015
P/E	26.57	19.09	19.64	18.36
P/BV	5.71	4.96	4.93	3.76
Book Value per share (Baht)	73.51	80.26	88.02	97.02
Dvd. Yield(%)	3.76	5.24	5.09	4.11

Source: From calculation.

4.2.4 Price to Earnings Ratio (P/E Ratio) analysis

From the P/E ratio calculation of Siam City Cement Public Company limited, it has shown significant decrease from 26.57% in 2012 to 18.36% in the first quarter of 2015. It means that the lower P/E ratio which comes from the company has increased earnings per share. Therefore, investors should buy this stock with lower P/E ratio to show this company is very interested in construction group. However, the investors should consider many factors before making an investment.

4.2.5 Price to Book Value Ratio (P/BV Ratio) analysis

The value of P/BV ratio of Siam City Cement Public Company Limited decreases every year. It means this asset has lower value than current market price. Lower P/BV ratio means investor can buy stock less than the book value. Therefore, if the investors

consider the P/BV ratio, they should invest in this asset. Moreover, they should consider on many factors before making an investment.

4.2.6 Future outlook of Siam City Cement Public Company Limited (SCCC)

SCCC reflects its market position as the second largest cement manufacturer in Thailand as measured by market share. The market share is at 27 percent and the company is expected to have good brand reputation of cement and ready-mix concrete, and is widely known. Low debt ratio is a favorable credit rating of SCCC and the company has sufficient financial flexibility for the costs to be incurred investment strategy aimed at growth of the business over the next two years. Revenue and gross profit of the company will be increased gradually from 2016, in line with economic growth and spending of public infrastructure on the rise (Hoon Inside, 2015).

4.3 The financial status stock market of Gamuda Berhad (GAM)

Table 4.7: Balance sheet from 2011 – 2014 of Gamuda Berhad (GAM).

Currency in Millions of Malaysian Ringgits				
	Consolidated Financial Statements			
	Jul-11	**Jul-12**	**Jul-13**	**Jul-14**
Assets				
Cash And Equivalents	1,049.00	1,337.40	876.60	882.00
Short-Term Investments	28.70	53.20	72.50	468.30
Trading Asset Securities	336.60	279.10	429.50	37.70
TOTAL CASH AND SHORT TERM INVESTMENTS	1,414.20	1,669.60	1,378.60	1,388.00
Accounts Receivable	1,618.60	1,542.40	1,051.30	1,303.30
Other Receivables	75.30	62.60	69.10	72.40
TOTAL RECEIVABLES	1,693.90	1,605.00	1,120.40	1,375.70
Inventory	1,434.90	1,952.90	1,894.50	1,947.20
Prepaid Expenses	2.60	1.60	5.80	4.50
Other Current Assets	-	-	-	994.30
TOTAL CURRENT ASSETS	4,545.60	5,229.20	4,399.30	5,709.70
Gross Property Plant And Equipment	605.30	593.00	500.00	487.90
Accumulated Depreciation	-259.50	-217.60	-200.40	-203.00
NET PROPERTY PLANT AND EQUIPMENT	345.70	375.40	299.50	284.90
Goodwill	41.40	41.40	41.40	0.00
Long-Term Investments	1,620.40	1,661.10	2,277.30	1,234.40
Accounts Receivable, Long Term	57.10	51.20	40.10	113.10
Loans Receivable, Long Term	-	-	-	41.50
Deferred Tax Assets, Long Term	19.30	23.50	46.40	26.20
Deferred Charges, Long Term	323.40	318.80	-	1,755.30
Other Intangibles	59.60	56.50	53.40	0.00
Other Long-Term Assets	538.90	742.00	1,278.70	1,187.50
TOTAL ASSETS	7,551.30	8,498.90	8,436.10	10,352.80
LIABILITIES & EQUITY				
Accounts Payable	645.80	1,041.90	823.90	703.80
Accrued Expenses	136.70	173.00	49.00	83.10
Short-Term Borrowings	530.90	555.20	360.70	159.30
Current Portion Of Long-Term Debt/Capital Lease	96.70	592.80	101.60	634.80
Current Income Taxes Payable	15.40	28.80	28.40	46.10
Other Current Liabilities, Total	48.40	41.70	116.80	119.60
Unearned Revenue, Current	692.50	491.60	108.60	52.70
TOTAL CURRENT LIABILITIES	2,166.40	2,925.00	1,589.10	1,799.40
Long-Term Debt	1,327.40	1,041.20	1,514.80	1,738.60
Minority Interest	200.30	220.80	226.10	687.40
Unearned Revenue, Non-Current	8.80	11.30	13.80	85.50
Pension & Other Post-Retirement Benefits	10.20	11.00	17.20	18.20
Deferred Tax Liability Non-Current	86.30	84.60	81.10	391.00
Other Non-Current Liabilities	65.30	156.90	116.00	158.40

Table 4.7 (Continue): Balance sheet from 2011 – 2014 of Gamuda Berhad (GAM).

TOTAL LIABILITIES	3,664.40	4,230.10	3,332.00	4,191.10
Common Stock	2,064.80	2,079.40	2,276.60	2,323.40
Additional Paid In Capital	126.20	153.20	517.50	626.30
Retained Earnings	1,459.30	1,757.80	2,034.60	2,483.20
Comprehensive Income And Other	36.20	57.60	49.30	41.40
TOTAL COMMON EQUITY	3,686.60	4,048.00	4,878.00	5,474.30
TOTAL EQUITY	3,886.90	4,268.90	5,104.10	6,161.70
TOTAL LIABILITIES AND EQUITY	7,551.30	8,498.90	8,436.10	10,352.80
Revenues	2,673.20	3,087.00	2,235.40	2,229.60
TOTAL REVENUES	2,673.20	3,087.00	2,235.40	2,229.60
Cost Of Goods Sold	2,116.50	2,389.70	1,645.10	1,578.50
GROSS PROFIT	556.70	697.30	590.40	651.10
Selling General & Admin Expenses, Total	88.40	70.30	98.40	105.90
Depreciation & Amortization, Total	19.20	23.70	22.00	26.60
Other Operating Expenses	110.90	63.50	63.10	80.60
OTHER OPERATING EXPENSES, TOTAL	218.60	157.50	183.50	213.10
OPERATING INCOME	338.10	539.80	406.90	438.00
Interest Expense	-58.80	-62.40	-51.40	-66.40
Interest And Investment Income	28.20	36.60	29.90	37.30
NET INTEREST EXPENSE	-30.50	-25.80	-21.50	-29.10
Income (Loss) On Equity Investments	222.40	206.10	362.20	429.70
Currency Exchange Gains (Loss)	-	0.10	-8.20	-21.20
Other Non-Operating Income (Expenses)	14.50	8.00	27.60	27.00
EBT, EXCLUDING UNUSUAL ITEMS	544.50	728.20	767.10	844.50
Impairment Of Goodwill	-	-	-	-41.40
Gain (Loss) On Sale Of Investments	-	-	-	98.80
Other Unusual Items, Total	-	-	-110.70	-50.30
Other Unusual Items	-	-	-110.70	-
EBT, INCLUDING UNUSUAL ITEMS	544.50	728.20	656.40	851.60
Income Tax Expense	111.60	162.20	106.90	116.60
Minority Interest In Earnings	-7.50	-18.70	-8.70	-15.70
Earnings From Continuing Operations	432.90	566.00	549.60	735.10
NET INCOME	425.40	547.30	540.90	719.40
NET INCOME TO COMMON INCLUDING EXTRA ITEMS	425.40	547.30	540.90	719.40
NET INCOME TO COMMON EXCLUDING EXTRA ITEMS	425.40	547.30	540.90	719.40

Source: http://www.bloomberg.com

Table 4.8: Financial highlight of Gamuda Berhad (GAM).

Period	Y/E '12	Y/E '13	Y/E '14	Q1 '15
as of	31/12/2012	31/12/2013	31/12/2014	31/3/2015
Financial Data				
Assets	8,498.90	8,436.10	10,352.80	11,911.10
Liabilities	4,230.10	3,332.00	4,191.10	5,240.60
Equity	4,268.90	5,104.10	6,161.70	6,670.50
Paid-up Capital	2,079.40	2,276.60	2,323.40	2,373.20
Revenue	3,087.00	2,235.40	2,229.60	553.80
Net Profit	547.30	540.90	719.40	734.30
EPS (Ringgit)	0.26	0.25	0.31	0.27
Financial Ratio				
ROA(%)	6.44	6.41	6.95	6.16
ROE(%)	12.82	10.60	11.68	11.01
Net Profit Margin(%)	17.73	24.20	32.27	132.59

*From calculation

4.3.1 Balance sheet analysis

● **Total Asset:** Gamuda Berhad has increased its asset every year, which in 2014 (10,352.80 million ringgit) shows that its asset is more than in 2011(7,551.30 million ringgit) by 27.6%. Gamuda Berhad is among the most efficient in its industry at managing inventories. Account receivable is created when a customer has received a product but has not yet paid for that product. Although Gamuda Berhad's accounts receivables has increased every year, cash and equivalent has declined from 1,337.40 million ringgit in 2012 to 876.60 million ringgit in 2013. It could be because of the economic crisis during that period of time. However, it has increased again from 876.60 million ringgit in 2013 to 882.00 million ringgit in 2014.

● **Total Liabilities:** most of liabilities company structure is long-term, short-term debt, and Minority interest, but the company has equity higher than liabilities. Therefore, the company has ability to debt repayment.

● **Total Equity:** Gamuda Berhad has 2,323,400,000 Ringgits of common stock. The company has ability to make profits every year as in 2014; the company got 2,483.20 million ringgit as compared to 1,459.30 million ringgit in 2011 showing the difference of 36.92%. This result implies to the increase in the equity every year.

4.3.2 Return on Assets analysis: ROA

According to ROA value of Gamuda Berhad, it is found that ROA values are increasing continuously. The result also shows that the company has the efficiency in asset management and increasing profitability. In 2013, the value of ROA was at 6.41% which is less than that of 2012 by 0.03%. There was also a little bit increase in 2014 to 6.95% but again decreased in the first quarter of 2015 (6.16%). This mentioned value is just the value for the first quarter. However, the trend is still increasing.

4.3.3 Return on Equity analysis: ROE

According to the analysis of ROE value of Gamuda Berhad, it is found that the values are decreasing. The ROE values show that the company has an efficiency to make profits. Therefore, ROE value of Gamuda Berhad reveals that the company is bad in profit efficiency.

Table 4.9: Statistical highlight of Gamuda Berhad (GAM).

Statistics as of	31/12/2012	31/12/2013	31/12/2014	2/7/2015
Last Price(Ringgit)	3.64	4.80	5.01	4.76
Market Cap.	7,569.02	10,927.68	11,650.23	11,082.84
F/S Period (As of date)	30/06/2012	30/06/2013	30/06/201	30/04/2015
P/E	14.00	19.20	16.16	17.63
P/BV	1.87	2.24	2.12	1.84
Book Value per share (Ringgit)	1.95	2.14	2.36	2.58
Dvd. Yield(%)	7.14	5.21	6.18	5.67

*From calculation

4.3.4 Price to Earnings Ratio (P/E Ratio) analysis

From the calculation on P/E ratio of Gamuda Berhad, it shows the increase from 14.00% in 2012 to 17.63% in the first quarter of 2015. It means that higher P/E ratio comes from the company which has decreased earnings per share. Therefore, the investors should sell this stock with higher P/E ratio. The P/E value shows that this company is not interested in the construction group. But investors should consider about many factors before making an investment.

4.3.5 Price to Book Value Ratio (P/BV Ratio) analysis

P/BV ratio of Gamuda Berhad has decreased meaning this asset has lower value than current market price. On the other hand, it increased to 2.24% in 2013 and again decreased to 2.12% in 2014. Accordingly, lower P/BV ratio means that the investors can buy stock less than the book value. Therefore, if the investors consider on the P/BV ratio, it means that they should invest on this asset. Anyway, the investors should consider on many factors before making an investment.

4.3.6 Future outlook of Gamuda Berhad (GAM)

Gamuda Berhad has achieved in the underground work, 6 TBMs have been delivered including Cochrane – Pasar Raykat tunnel drive underway, and Semantan - KL Sentral. The company wants strong underlying yield growth with revenue and profit driven by accelerating work progress on KVMRT (Underground and Elevated). Awaiting Cabinet approval and PDP appointment for KVMRT Line2 and expecting initial contract awards to roll out by middle year 2015 (Gamuda, 2015).

4.4 The financial status of stock market of IJM Corporation Berhad (IJM)

Table 4.10: Balance sheet from 2012 – 2015 of IJM Corporation Berhad (IJM).

Currency in Millions of Malaysian Ringgits				
	Consolidated Financial Statements			
	Mar-12	**Mar-13**	**Mar-14**	**Mar-15**
Assets				
Cash And Equivalents	362.20	271.40	484.90	1,560.40
Short-Term Investments	956.80	1,083.40	977.10	-
Trading Asset Securities	584.60	362.70	249.20	214.90
TOTAL CASH AND SHORT TERM INVESTMENTS	1,903.70	1,717.50	1,711.30	1,775.30
Accounts Receivable	1,487.00	1,403.70	1,898.80	2,424.30
Other Receivables	277.90	385.70	334.70	89.50
TOTAL RECEIVABLES	1,765.00	1,789.40	2,233.50	2,513.80
Inventory	2,253.20	2,698.70	4,723.30	6,263.10
Prepaid Expenses	17.20	18.90	29.20	-
Restricted Cash	299.90	353.40	501.20	-
Other Current Assets	279.60	306.10	162.10	630.80
TOTAL CURRENT ASSETS	6,518.50	6,884.10	9,360.50	11,182.90
Gross Property Plant And Equipment	2,250.50	2,478.10	2,641.40	-
Accumulated Depreciation	-920.10	-979.90	-1051.30	-
NET PROPERTY PLANT AND EQUIPMENT	1,330.30	1,498.20	1,590.10	1,726.80
Goodwill	69.40	69.40	69.20	-
Long-Term Investments	1,661.80	2,062.20	1,522.70	1,386.10
Accounts Receivable, Long Term	22.00	20.70	19.30	-
Deferred Tax Assets, Long Term	98.80	109.40	151.80	201.20
Deferred Charges, Long Term	2,201.00	2,353.60	3,324.60	-
Other Intangibles	282.50	345.00	325.40	3,501.40
Other Long-Term Assets	1,706.20	1,778.80	2,034.90	1,732.30
TOTAL ASSETS	13,890.60	15,121.30	18,398.50	19,730.70
LIABILITIES & EQUITY				
Accounts Payable	941.70	901.60	1,020.80	2,007.40
Accrued Expenses	63.60	199.80	321.20	-
Short-Term Borrowings	339.20	621.30	720.70	592.80
Current Portion Of Long-Term Debt/Capital Lease	815.70	982.10	1,647.60	1,403.60
Current Portion Of Capital Lease Obligations	2.00	1.40	-	0.10
Current Income Taxes Payable	25.70	44.70	126.60	27.00
Other Current Liabilities, Total	435.60	400.50	538.90	269.20
Unearned Revenue, Current	331.40	453.40	178.50	-
TOTAL CURRENT LIABILITIES	2,952.80	3,603.40	4,554.20	4,300.10
Long-Term Debt	3,406.00	3,481.00	3,273.90	4,158.10
Capital Leases	1.50	-	-	0.20
Minority Interest	1,609.60	1,695.40	2,211.50	1,145.90
Unearned Revenue, Non-Current	81.40	71.60	244.80	83.30
Pension & Other Post-Retirement Benefits	5.90	5.00	5.20	5.30

Table 4.10 (Continue): Balance sheet from 2012 – 2015 of IJM Corporation Berhad (IJM).

Deferred Tax Liability Non-Current	388.20	401.50	713.30	780.30
Other Non-Current Liabilities	97.20	256.30	656.70	827.80
TOTAL LIABILITIES	6,933.00	7,818.60	9,448.20	10,155.20
Common Stock	1,381.60	1,382.70	1,427.50	1,500.00
Additional Paid In Capital	1,934.80	1,938.20	2,089.50	2,346.10
Retained Earnings	2,051.80	2,332.00	3,240.40	2,541.80
Treasury Stock	-0.10	-0.10	-0.30	-0.30
Comprehensive Income And Other	-20.10	-45.50	-18.40	2,042.00
TOTAL COMMON EQUITY	5,348.10	5,607.20	6,738.80	8,429.60
TOTAL EQUITY	6,957.70	7,302.70	8,950.30	9,575.50
TOTAL LIABILITIES AND EQUITY	13,890.60	15,121.30	18,398.50	19,730.70
Revenues	4,517.90	4,663.40	6,006.50	5,448.30
TOTAL REVENUES	4,517.90	4,663.40	6,006.50	5,448.30
Cost Of Goods Sold	3,370.00	3,447.10	4,346.20	3,767.40
GROSS PROFIT	1,147.80	1,216.30	1,660.30	1,680.90
Selling General & Admin Expenses, Total	331.50	377.00	461.40	551.50
Other Operating Expenses	18.90	-32.20	-261.10	-170.70
OTHER OPERATING EXPENSES, TOTAL	350.40	344.80	200.30	380.90
OPERATING INCOME	797.40	871.50	1,460.00	1,300.00
Interest Expense	-172.90	-165.80	-192.80	-200.20
Interest And Investment Income	175.10	147.80	159.50	-
NET INTEREST EXPENSE	2.20	-18.00	-33.30	-200.20
Income (Loss) On Equity Investments	2.00	-17.60	-140.40	-30.30
Currency Exchange Gains (Loss)	-	-	-38.40	-50.10
EBT, EXCLUDING UNUSUAL ITEMS	801.60	835.80	1,247.90	1,019.40
Impairment Of Goodwill	-	-	168.40	-
EBT, INCLUDING UNUSUAL ITEMS	801.60	835.80	1,416.30	1,019.40
Income Tax Expense	251.10	273.60	340.70	306.30
Minority Interest In Earnings	-141.40	-141.30	-246.10	-232.10
Earnings From Continuing Operations	550.50	562.20	1,075.70	713.00
NET INCOME	409.10	420.90	829.60	480.90
NET INCOME TO COMMON INCLUDING EXTRA ITEMS	409.10	420.90	829.60	480.90
NET INCOME TO COMMON EXCLUDING EXTRA ITEMS	409.10	420.90	829.60	480.90

Source: http://www.bloomberg.com

Table 4.11: Financial highlight of IJM Corporation Berhad (IJM).

Period	Y/E '12	Y/E '13	Y/E '14	Y/E '15
as of	31/3/2012	31/3/2013	31/3/2014	31/3/2015
Financial Data				
Assets	13,890.60	15,121.30	18,398.50	19,730.70
Liabilities	6,933.00	7,818.60	9,448.20	10,155.20
Equity	6,957.70	7,302.70	8,950.30	9,575.50
Paid-up Capital	1,381.60	1,382.70	1,427.50	1,500.00
Revenue	4,517.90	4,663.40	6,006.50	5,448.30
Net Profit	409.10	420.90	829.60	480.90
EPS (Ringgit)	0.30	0.30	0.58	0.26
Financial Ratio				
ROA(%)	2.95	2.78	4.51	2.44
ROE(%)	5.88	5.76	9.27	5.02
Net Profit Margin(%)	9.06	9.03	13.81	8.83

*From calculation

4.4.1 Balance sheet analysis

● **Total Asset:** IJM Corporation Berhad increases its assets every year. Therefore, a large portion of assets is inventory by total asset is 31.74% of last fiscal year. This means the company has units of completed development properties, vacant industrial and bungalow lots held for sale that are stated at the lower of cost and net realizable value. Whereas cash and equivalent from 2012 (362.20 million ringgit) has increased by 430.81% in 2015 to 1,560.40 million ringgit. It indicates that the company has ability to make high profit.

● **Total Liabilities:** most of liabilities companies' structures are long-term and short-term debt. The debt of a company has more than equity that shows there are not enough liquid assets to satisfy current obligations, operating profits are more than adequate to pay the debt.

● **Total Equity:** IJM Corporation Berhad has 1,500,000,000 ringgits of common stock. The company has ability to make profit every year as it has increased by 36.68% within 2 years (2012-2014) to 2,051.80 million ringgit. In 2015, retained earning has less than that of 2014 by 21.56% to 2,346.10 million ringgit, but it is still increasing. The result shows the increase in equity every year.

4.4.2 Return on Assets analysis: ROA

From ROA value of IJM Corporation, Berhad showed that ROA values decrease every year. The company still has to show that it has the efficiency in asset management and increased profitability. In addition, the results show bad efficiency in asset management although the value of ROA of 2014 has gone up by 4.51%, it has decreased again in the first quarter of 2015.

4.4.3 Return on Equity analysis: ROE

From ROE value of IJM Corporation, Berhad found that ROE values are continuously decreasing. The result shows that the company has profit efficiency. Although ROE value in 2014 jumped to 9.27%, it has decreased again in the year of 2015. Therefore, the result indicates that the company has bad profit efficiency.

Table 4.12: Statistical highlight of IJM Corporation Berhad (IJM).

Statistics as of	31/12/2012	31/12/2013	31/12/2014	2/7/2015
Last Price(Ringgit)	4.98	5.88	6.57	6.82
Market Cap.	6,880.37	8,130.28	9,378.68	10,230.00
F/S Period (As of date)	31/03/2012	31/03/2013	31/03/2014	31/03/2015
P/E	16.60	19.60	11.33	26.23
P/BV	12.77	14.34	13.98	12.18
Book Value per share (Ringgit)	0.39	0.41	0.47	0.56
Dvd. Yield(%)	6.02	5.10	8.83	3.81

*From calculation

4.4.4 Price to Earnings Ratio (P/E Ratio) analysis

From the calculation of P/E ratio of IJM Corporation, Berhad has decreased from 19.60% in 2013 to 11.33% 2014. It means that the lower P/E ratio of the company has increased earnings per share. However, the first quarter of 2015 has high P/E ratio that may wait for fiscal year. Therefore, the investors should buy this stock with lower P/E ratio which shows that this company is really interested in construction group. Hence, the investors should consider many factors before investing.

4.4.5 Price to Book Value Ratio (P/BV Ratio) analysis

From P/BV ratio of IJM Corporation, Berhad shows the decrease in every year meaning that this asset has value lower than current market price. Lower P/BV ratio

means the investors can buy stock less than the book value. Therefore, if the investors consider on P/BV ratio, they should invest in this asset and should consider on many factors before making an investment.

4.4.6 Future outlook of IJM Corporation Berhad (IJM)

RAM rating has reaffirmed the AA3 rating of IJM Corporation Berhad's (the Group) RM3 billion Sukuk program with a stable outlook. The Group's rating reflects its diversified business and resilient performance as well as healthy balance sheet, complemented by the strong financial flexibility afforded by its sizeable land bank. IJM's rating also considers on its exposure to West Coast Expressway (WCE) which carries on with its concentration and execution risks given the sheer size and complexity relative to the other construction projects in its portfolio. The WCE project will also expose IJM to contingent liabilities given the Group's roles as a turnkey contractor and 40%-stakeholder in the concession company (RAM, 2015).

4.5 The financial status stock market of Chip Eng Seng Corporation Limited (CES)

Table 4.13: Balance sheet from 2011 – 2014 of Chip Eng Seng Limited (CES).

Currency in Millions of Singapore Dollars				
	Consolidated Financial Statements			
	Dec-11	**Dec-12**	**Dec-13**	**Dec-14**
Assets				
Cash And Equivalents	134.10	179.40	118.70	220.90
TOTAL CASH AND SHORT TERM INVESTMENTS	134.10	179.40	118.70	220.90
Accounts Receivable	580.20	639.30	1,001.20	1,149.40
Other Receivables	15.30	62.00	60.50	3.30
TOTAL RECEIVABLES	595.50	701.30	1,061.70	1,152.80
Inventory	1.50	1.80	0.30	34.50
Prepaid Expenses	6.30	1.50	1.50	4.40
Restricted Cash	21.60	62.70	165.50	64.10
Other Current Assets	14.20	1.80	11.50	2.80
TOTAL CURRENT ASSETS	773.30	948.60	1,359.20	1,479.50
Gross Property Plant And Equipment	19.00	155.60	174.70	227.60
Accumulated Depreciation	-7.20	-10.30	-12.80	-14.10
NET PROPERTY PLANT AND EQUIPMENT	11.70	145.30	161.90	213.50
Long-Term Investments	14.60	7.10	30.40	15.70
Loans Receivable, Long Term	-	-	0.60	0.40
Other Intangibles	0.10	0.30	0.30	0.30
Other Long-Term Assets	190.90	54.30	186.30	298.90
TOTAL ASSETS	990.50	1,155.60	1,738.80	2,008.30
LIABILITIES & EQUITY				
Accounts Payable	95.60	106.60	91.70	86.40
Accrued Expenses	31.60	48.60	33.90	57.30
Short-Term Borrowings	62.50	-	-	-
Current Portion Of Long-Term Debt/Capital Lease	-	123.00	281.00	2.40
Current Income Taxes Payable	20.50	46.50	12.90	54.50
Other Current Liabilities, Total	2.10	3.70	1.20	3.50
Unearned Revenue, Current	5.70	24.30	302.00	40.20
TOTAL CURRENT LIABILITIES	217.90	352.60	722.70	244.30
Long-Term Debt	347.00	338.80	487.50	938.40
Minority Interest	-	-	-	0.40
Deferred Tax Liability Non-Current	8.20	3.70	14.50	7.80
Other Non-Current Liabilities	-	-	15.20	81.40
TOTAL LIABILITIES	573.10	695.10	1,239.90	1,271.90
Common Stock	79.70	79.70	79.70	79.70
Retained Earnings	344.00	398.80	442.20	697.20
Treasury Stock	-3.20	-10.90	-12.00	-27.40
Comprehensive Income And Other	-3.10	-7.10	-11.10	-13.50

Table 4.13 (Continue): Balance sheet from 2011 – 2014 of Chip Eng Seng Corporation Limited (CES).

TOTAL COMMON EQUITY	417.40	460.50	498.80	736.00
TOTAL EQUITY	417.40	460.50	498.80	736.40
TOTAL LIABILITIES AND EQUITY	990.50	1,155.60	1,738.80	2,008.30
Revenues	360.00	617.10	502.50	1,105.70
TOTAL REVENUES	360.00	617.10	502.50	1,105.70
Cost Of Goods Sold	220.20	487.40	398.40	773.30
GROSS PROFIT	139.70	129.70	104.10	332.50
Selling General & Admin Expenses, Total	31.60	58.50	63.90	62.50
OTHER OPERATING EXPENSES, TOTAL	31.60	58.50	63.90	62.50
OPERATING INCOME	108.10	71.20	40.30	270.00
Interest Expense	-0.20	-1.00	-2.00	-4.50
Interest And Investment Income	2.00	3.80	2.30	1.00
NET INTEREST EXPENSE	1.70	2.80	0.20	-3.50
Income (Loss) On Equity Investments	23.80	2.20	29.90	17.10
Currency Exchange Gains (Loss)	1.80	-	-	-
Other Non-Operating Income (Expenses)	0.50	0.80	1.00	1.60
EBT, EXCLUDING UNUSUAL ITEMS	135.90	77.00	71.50	285.20
Impairment Of Goodwill	-	-	0.20	-
Gain (Loss) On Sale Of Investments	-	0.10	0.20	0.00
Gain (Loss) On Sale Of Assets	0.40	1.20	0.20	0.30
Other Unusual Items, Total	5.60	30.30	13.30	38.20
Other Unusual Items	0.10	0.40	0.30	0.30
EBT, INCLUDING UNUSUAL ITEMS	141.90	108.60	85.30	323.70
Income Tax Expense	18.30	27.30	12.00	42.90
Minority Interest In Earnings	-	-	-	0.00
Earnings From Continuing Operations	123.70	81.30	73.40	280.70
NET INCOME	123.70	81.30	73.40	280.70
NET INCOME TO COMMON INCLUDING EXTRA ITEMS	123.70	81.30	73.40	280.70
NET INCOME TO COMMON EXCLUDING EXTRA ITEMS	123.70	81.30	73.40	280.70

Source: http://www.bloomberg.com

Table 4.14: Financial highlight of Chip Eng Seng Corporation Limited (CES).

Period	Y/E '12	Y/E '13	Y/E '14	Q1 '15
as of	31/12/2012	31/12/2013	31/12/2014	31/3/2015
Financial Data				
Assets	1,155.60	1,738.80	2,008.30	1,971.70
Liabilities	695.10	1,239.90	1,271.90	1,221.80
Equity	460.50	498.80	736.40	749.90
Paid-up Capital	79.70	79.70	79.70	79.70
Revenue	617.10	502.50	1,105.70	167.20
Net Profit	81.30	73.40	280.70	277.30
EPS (Singapore Dollar)	0.12	0.11	0.44	0.43
Financial Ratio				
ROA(%)	7.04	4.22	13.98	14.06
ROE(%)	17.65	14.72	38.12	36.98
Net Profit Margin(%)	13.17	14.61	25.39	165.85

*From calculation

4.5.1 Balance sheet analysis

● **Total Asset:** Chip Eng Seng Company Limited increases its asset every year, for example, in 2014 the company had the asset of 2,008.30 million dollars which was more than in 2011 which was 990.50 million dollars by 50.67%. The company also has more account receivable which is created when a customer has received a product but has not yet paid for that product. During the past 3 years, the average Total Assets Growth Rate was 27.30% per year.

● **Total Liabilities:** most of liability companies' structure is long-term debt. Moreover, the debt of company has more than equity so it shows that they do not have enough liquid assets to satisfy current obligations. However, an examination of near-term assets and liabilities shows that there are enough liquid assets to satisfy current obligations.

● **Total Equity:** Chip Eng Seng Company Limited has 79,700,000 dollars in common stock. The company has ability to make profit every year as in 2014 (697.20 million dollars) has more than in 2011 (344.00 million dollars) by 50.66%. The result shows the increase of equity every year.

4.5.2 Return on Assets analysis: ROA

According to ROA value of Chip Eng Seng Company Limited, it can be found that ROA values are increasing in every year. The result shows that the company has

efficiency in asset management and increased profitability. But in 2013 (4.22%), it was found that ROA had less value than that of 2012 (7.04%) by 2.82% and bounced back to 13.98% in 2014. Currently, the trend is still increasing as shown on the table (See Table 4.14).

4.5.3 Return on Equity analysis: ROE

From ROE value of Chip Eng Seng Company Limited, it is found that ROE values are still increasing. The results show that the company has profit efficiency although ROE value in 2015 has declined.

Table 4.15: Statistical highlight of Chip Eng Seng Company Limited (CES).

Statistics as of	31/12/2012	31/12/2013	31/12/2014	2/7/2015
Last Price(Singapore Dollar)	0.60	0.72	0.85	0.77
Market Cap.	47.82	57.38	67.75	61.37
F/S Period (As of date)	31/12/2012	31/12/2013	31/12/2014	31/03/2015
P/E	5.00	6.55	1.93	1.79
P/BV	0.85	0.94	0.73	0.64
Book Value per share (Singapore Dollar)	0.71	0.77	1.17	1.20
Dvd. Yield(%)	20.00	15.28	51.76	55.84

*From calculation

4.5.4 Price to Earnings Ratio (P/E Ratio) analysis

From P/E ratio calculation of Chip Eng Seng Company Limited, it found the decline in 2012 from 5.0% to 1.79% in 2015. It means that the lower P/E ratio caused from the company's policy to increase earnings per share. Therefore, the investors should buy this stock with lower P/E ratio indicating this company is really interested in construction group. However, the investors should consider many factors before they invest.

4.5.5 Price to Book Value Ratio (P/BV Ratio) analysis

Regarding the value of P/BV ratio of Chip Eng Seng Company Limited, declination can be found every year. It means this asset has lower value than current market price. Accordingly, lower P/BV ratio means the investors can buy stock less than the book value. Therefore, if the investors focus on P/BV ratio, it means they

should invest in this asset but they should consider on many factors before making an investment.

4.5.6 Future outlook of Chip Eng Seng Company Limited (CES)

Chip Eng Seng's share repurchases in the past 12 months certainly have bolstered investor sentiment towards the company. The construction-cum-property developer bought back 18,965,200 shares in the past 12 months. Considering the trading range of the stock, Chip Eng Seng would have got up an estimated $15 million for the shares. Concurrently, the share price has been on an uptrend and, better still, the company has just reported a 283% jump in FY2014 net profit to S$280.7 million. It's a record for the company. Revenue exceeded the S$1 billion mark at S$1.11 billion, up 120% year-on-year (Chip Eng Seng, 2015).

4.6 The fianacial status stock market of Low Keng Huat Limited (LKH)

Table 4.16: Balance sheet from 2012 – 2015 of Low Keng Huat Limited (LKH).

Currency in Millions of Singapore Dollars				
	Consolidated Financial Statements			
	Jan-12	**Jan-13**	**Jan-14**	**Jan-15**
Assets				
Cash And Equivalents	32.90	205.50	194.10	276.00
Short-Term Investments	0.50	1.00	2.30	2.50
Trading Asset Securities	4.10	6.20	4.30	5.40
TOTAL CASH AND SHORT TERM INVESTMENTS	37.50	212.70	200.70	284.00
Accounts Receivable	40.10	39.10	42.10	167.50
Notes Receivable	0.00	0.00	0.00	0.00
Other Receivables	0.60	0.40	0.10	1.00
TOTAL RECEIVABLES	40.70	39.50	42.30	168.50
Inventory	791.90	873.00	1192.10	246.10
Prepaid Expenses	0.70	1.00	0.60	1.10
Other Current Assets	0.00	0.30	0.40	7.40
TOTAL CURRENT ASSETS	870.90	1,126.60	1,436.00	707.00
Gross Property Plant And Equipment	121.80	117.40	109.90	113.30
Accumulated Depreciation	-56.00	-51.40	-50.10	-53.60
NET PROPERTY PLANT AND EQUIPMENT	65.80	66.00	59.80	59.80
Long-Term Investments	209.80	217.80	211.20	224.10
Deferred Tax Assets, Long Term	0.60	3.30	3.40	0.30
Other Long-Term Assets	9.30	8.60	14.40	283.90
TOTAL ASSETS	1,156.30	1,422.30	1,724.80	1,275.00
LIABILITIES & EQUITY				
Accounts Payable	103.10	84.20	88.50	134.40
Accrued Expenses	18.60	6.20	9.70	15.90
Short-Term Borrowings	23.00	-	5.00	-
Current Portion Of Long-Term Debt/Capital Lease	2.00	0.50	54.20	9.30
Current Income Taxes Payable	18.10	9.90	6.60	44.40
Other Current Liabilities, Total	6.90	6.20	36.10	11.70
Unearned Revenue, Current	0.20	243.20	494.10	2.60
TOTAL CURRENT LIABILITIES	172.00	350.10	694.20	218.30
Long-Term Debt	578.90	559.90	538.30	396.60
Minority Interest	14.20	13.30	13.30	39.50
Deferred Tax Liability Non-Current	0.00	0.00	0.10	0.00
Other Non-Current Liabilities	0.70	22.90	0.20	0.70
TOTAL LIABILITIES	751.60	932.90	1,232.80	615.50
Common Stock	161.90	161.90	161.90	161.90
Retained Earnings	215.30	295.50	310.40	448.80
Comprehensive Income And Other	13.30	18.80	6.50	9.30
TOTAL COMMON EQUITY	390.50	476.10	478.80	619.90
TOTAL EQUITY	404.70	489.40	492.10	659.50

Table 4.16 (Continue): Balance sheet from 2012 – 2015 of Low Keng Huat Limited (LKH).

TOTAL LIABILITIES AND EQUITY	1,156.30	1,422.30	1,724.80	1,275.00
Revenues	136.40	126.40	79.70	1,258.90
TOTAL REVENUES	136.40	126.40	79.70	1,258.90
Cost Of Goods Sold	29.20	70.00	50.20	997.70
GROSS PROFIT	107.20	56.40	29.50	261.30
Selling General & Admin Expenses, Total	21.70	38.10	19.10	34.10
Other Operating Expenses	4.00	2.10	-0.50	-0.40
OTHER OPERATING EXPENSES, TOTAL	25.70	40.10	18.50	33.70
OPERATING INCOME	81.50	16.20	11.00	227.60
Interest Expense	-2.60	-0.80	-1.00	-2.60
Interest And Investment Income	3.00	2.60	3.00	5.40
NET INTEREST EXPENSE	0.40	1.80	2.00	2.90
Income (Loss) On Equity Investments	26.70	94.80	39.50	11.00
Currency Exchange Gains (Loss)	-3.90	-1.30	-0.80	0.10
EBT, EXCLUDING UNUSUAL ITEMS	104.80	111.50	51.70	241.50
Gain (Loss) On Sale Of Investments	-1.50	4.10	-0.30	-3.60
Gain (Loss) On Sale Of Assets	0.50	0.00	3.60	0.00
Other Unusual Items, Total	-1.20	-0.10	-1.10	-1.30
EBT, INCLUDING UNUSUAL ITEMS	102.60	115.40	53.90	236.70
Income Tax Expense	14.30	5.90	5.50	46.30
Minority Interest In Earnings	-2.40	0.20	-1.30	-29.00
Earnings From Continuing Operations	88.30	109.60	48.30	190.30
NET INCOME	85.90	109.70	47.10	161.30
NET INCOME TO COMMON INCLUDING EXTRA ITEMS	85.90	109.70	47.10	161.30
NET INCOME TO COMMON EXCLUDING EXTRA ITEMS	85.90	109.70	47.10	161.30

Source: http://www.bloomberg.com

Table 4.17: Financial highlight of Low Keng Huat Limited (LKH).

Period	Y/E '12	Y/E '13	Y/E '14	Y/E '15
as of	31/1/2012	31/1/2013	31/1/2014	31/1/2015
Financial Data				
Assets	1,156.30	1,422.30	1,724.80	1,275.00
Liabilities	751.60	932.90	1,232.80	615.50
Equity	404.70	489.40	492.10	659.50
Paid-up Capital	161.90	161.90	161.90	161.90
Revenue	136.40	126.40	79.70	1,258.90
Net Profit	85.90	109.70	47.10	161.30
EPS (Singapore Dollar)	0.12	0.15	0.07	0.22
Financial Ratio				
ROA(%)	7.43	7.71	2.73	12.65
ROE(%)	21.23	22.42	9.57	24.46
Net Profit Margin(%)	62.98	86.79	59.10	12.81

*From calculation

4.6.1 Balance sheet analysis

● **Total Asset:** Low Keng Huat Limited increases its asset every year except in 2015 which has less than 2014 by 26.08%. The company has decreased its inventory from 2014 (1,192.10 million Singapore dollars) to 2015 (246.10 million Singapore dollars). However, the revenue has increased from79.70 million Singapore dollars in 2014 to1,258.90 million Singapore dollars in 2015. This statement means that the company could sell goods from its inventory more than last fiscal year. Therefore, Low Keng Huat Limited has decreased its assets but increased revenue by selling goods in the inventory.

● **Total Liabilities:** most of the liabilities companies' structures are long-term and short-term debt. By comparing with the equity, it shows that the debt to equity ratio is not high. Therefore, the company has ability to repay debt. In order to proof that, the company has decreased liabilities from 1,232.80 million Singapore dollars in 2014 to 615.5 million Singapore dollars in 2015 as it came from high revenue from the last fiscal year.

● **Total Equity:** Low Keng Huat Limited has 161,900,000 Singapore dollars of common stock. The company has ability to make profit every year as in 2015 has more than 2012 by 38.64%. This results in the increase of equity every year.

4.6.2 Return on Assets analysis: ROA

According to ROA value of Low Keng Huat Limited on the table, it is found that ROA values increase every year. The result shows that the company has efficiency in asset management and increasing profitability. In 2014, it was found that ROA showed up at less than in 2012 mainly due to lower profits from development and construction segments. However, it has bounced back again in 2015 showing that the trend is still increasing.

4.6.3 Return on Equity analysis: ROE

From ROE value of Low Keng Huat Limited, the ROE values show the increasing trend and the company has high efficiency to make profits. Although ROE value in 2014 decreased, the trend is still increasing.

Table 4.18: Statistical highlight of Low Keng Huat Limited (LKH).

Statistics as of	31/12/2012	31/12/2013	31/12/2014	2/7/2015
Last Price(Singapore Dollar)	0.59	0.69	0.67	0.68
Market Cap.	95.52	111.71	108.47	110.09
F/S Period (As of date)	31/01/2012	31/01/2013	31/01/2014	30/04/2015
P/E	4.92	4.60	9.57	3.09
P/BV	1.11	1.19	1.03	0.80
Book Value per share (Singapore Dollar)	0.53	0.58	0.65	0.85
Dvd. Yield(%)	20.34	21.74	10.45	32.35

*From calculation

4.6.4 Price to Earnings Ratio (P/E Ratio) analysis

From P/E ratio calculation of Low Keng Huat Limited, it shows the decrease from 4.92% in 2012 to 3.90% in 2015. It means that the lower P/E ratio caused by the increase in earnings per share of the company. Therefore, the investors should buy this stock with lower P/E ratio, which indicates that the company is interested in the construction business. Moreover, the investors should consider about different factors before they make an investment.

4.6.5 Price to Book Value Ratio (P/BV Ratio) analysis

From P/BV ratio of Low Keng Huat Limited decreases every year as a result of the lower value of asset than the current market price. Lower P/BV ratio means the investors can buy stock at the price less than book value. Therefore, the investors should consider investing in asset by looking at P/BV ratio. In addition, they should consider about factors before they make an investment.

4.6.6 Future outlook of Low Keng Huat Limited (LKH)

Low Kheng Huat reported that the company has obtained more than six times increase in third quarter earnings from last year. For the third quarter of 2015, the earnings rose 523% to $65.1 million, or 8.81 cents per share, from $10.4 million in the same period of time in 2014. Revenue rose to $408.5 million from $22.2 million for the same quarter. For nine months ended in Oct, earnings rose by 102% to $83.5 million from $41.4 million. Revenue came in at $459.3 million, up from $57.7 million. Construction revenue increased to $52.7 million due to the increase in construction activity at Genting Hotel on Jurong Town Hall Road. Revenue for hotel & F&B businesses decreased to $33.8 million from $38 million during the previous year. Development revenue came in at $372.6 million due to the recognition of revenue from Parkland Residences, a DBSS development which obtained its top on Oct 29th. In its outlook, Low Kheng Huat said the cooling measures introduced by the Singapore government and the release of more land for development to cool the residential market continues to slow down the already sluggish property market. Finally, Low Kheng Huat closed flat at 66 cents today.

Secondary, Bivariate Extreme Value analysis of construction industry stock price and stock exchange in ASEAN

4.7 Unit root test by Augmented Dickey-Fuller test (ADF test) and Phillips-Perron test (PP test)

The data in this study is time series data, so the data can either be stationary or non-stationary. However, those data needs to get stationary test with Augmented Dickey-Fuller test (ADF test) and Phillips-Perron test (PP test) by E-view program. In the test, the resultants of the test considerate from Probability values of Significant level at 99% critical value level, 95% critical value, and 90% critical value ($\alpha = 0.01$, $\alpha = 0.05$, and $\alpha = 0.1$).

Table 4.19: The Unit root test of construction industry stock price and stock exchanges in ASEAN.

Variable	t-statistic Unit root test by ADF and PP test		Level
	ADF	PP	
SET	-20.82712*** (0.0000)	-20.82904*** (0.0000)	I(0)
SCC	-21.78145*** (0.0000)	-21.10613*** (0.0000)	I(0)
SCCC	-21.10692*** (0.0000)	-21.91610*** (0.0000)	I(0)
MYX	-20.21068*** (0.0000)	-20.17845*** (0.0000)	I(0)
GAM	-25.02942*** (0.0000)	-25.05708*** (0.0000)	I(0)
IJM	-23.44550*** (0.0000)	-24.29335*** (0.0000)	I(0)
SGX	-20.57362*** (0.0000)	-20.61105*** (0.0000)	I(0)
CES	-21.18666*** (0.0000)	-21.54942*** (0.0000)	I(0)
LKH	-23.18773*** (0.0000)	-23.15904*** (0.0000)	I(0)

*From calculation, *Probability value shows in parenthesis, ***Critical value at significant level 0.01.

From Unit root test or stationary test by Augmented Augmented Dickey-Fuller test (ADF test) and Phillips-Perron test (PP test) shown on **Table 4.17,** it is found that following institutes: Stock price indices of Stock Exchange of Thailand (SET), Bursa Malaysia (MYX), and Singapore Exchange (SGX) have t-statistic values from calculation lower than critical values at significant level of 0.01. Stock price of Siam Cement Public Company Limited (SCC), Siam City Cement Public Company Limited (SCCC), Gamuda Berhad (GAM), Ijm Corporation Berhad (IJM), Chip Eng Seng Corperation Limited (CES), and Low Keng Huat Limited (LKH) have t-statistic values from calculation lower than critical values at significant level of 0.01. Therefore, both of stock price indices and stock prices have t-statistic values from calculation lower than critical values at significant level of 0.01 that rejects H_0 and accepts H_1. In addition, stock price indices of Stock Exchange of Thailand (SET), Bursa Malaysia (MYX), Singapore Exchange (SGX), and stock price of Siam Cement Public Company Limited (SCC), Siam City Cement Public Company Limited (SCCC), Gamuda Berhad (GAM), Ijm Corporation Berhad (IJM), Chip Eng Seng Corperation Limited (CES), Low Keng Huat Limited (LKH) have stationary level at level I(0). According to the result, the stationary data can be used in Bivariate Extreme Value analysis of construction industry stock price and stock exchange in ASEAN.

4.8 Bivariate Generalized Extreme Value Distribution (BGEV)

From Bivariate Generalized Extreme Value Distribution (BGEV), the method used is Bivariate Block Maxima Method in analysis as follows;

4.8.1 Stock price index of Stock Exchange of Thailand (SET) and stock price of Siam Cement Public Company Limited (SCC).

The used data is returned data of stock price indices of SET and stock price of SCC, 964 data **Figure 4.1:** Bivariate relationship between stock price indices of SET and stock price of SCC.

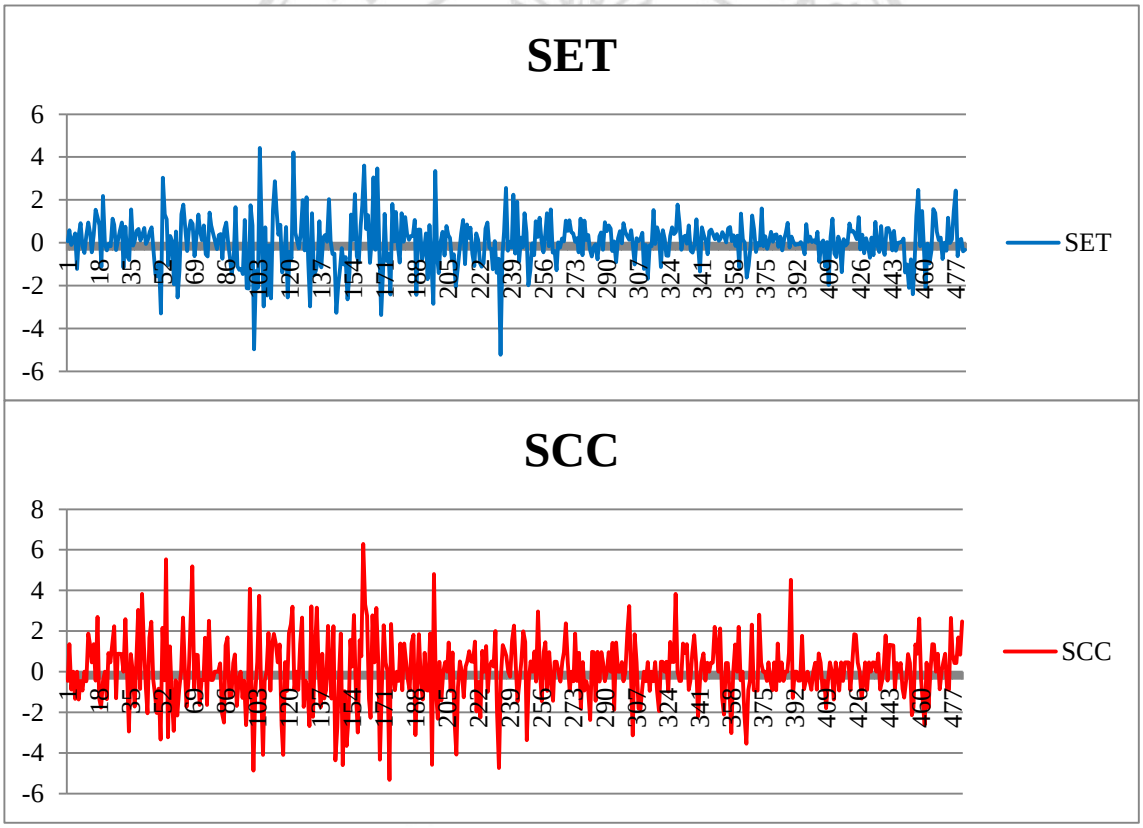


Figure 4.1: Bivariate relationship between stock price indices of SET and stock price of SCC by Bivariate Block Maxima Method.

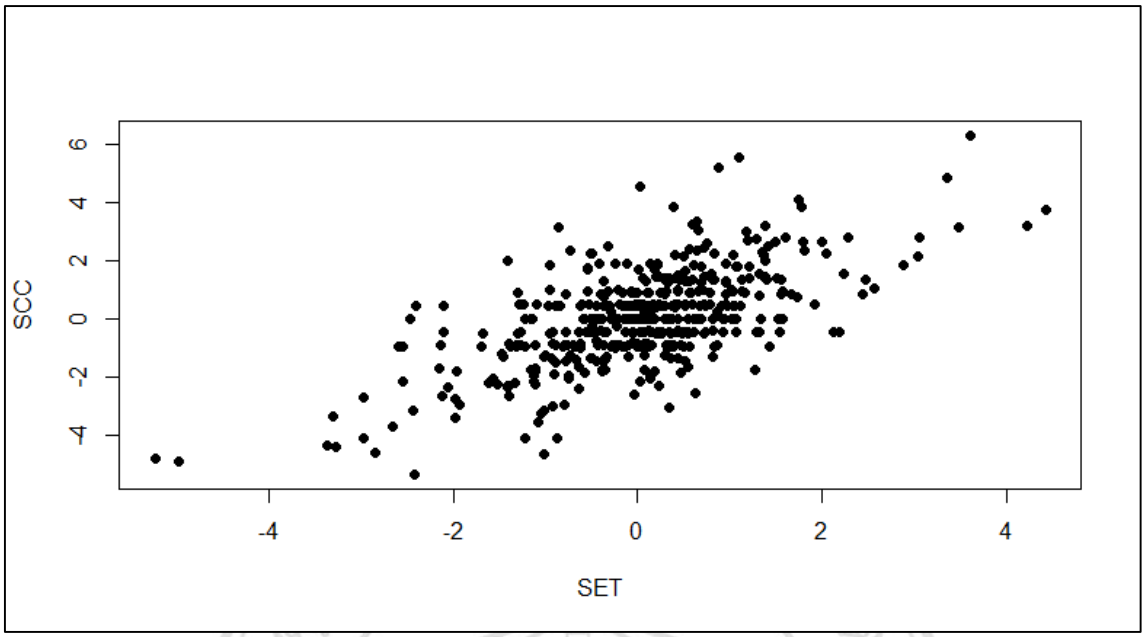


Figure 4.2: The relationship between daily closed price of Stock Exchange of Thailand (SET) and return stock price of Siam Cement Public Company Limited (SCC) by Bivariate Block Maxima Method.

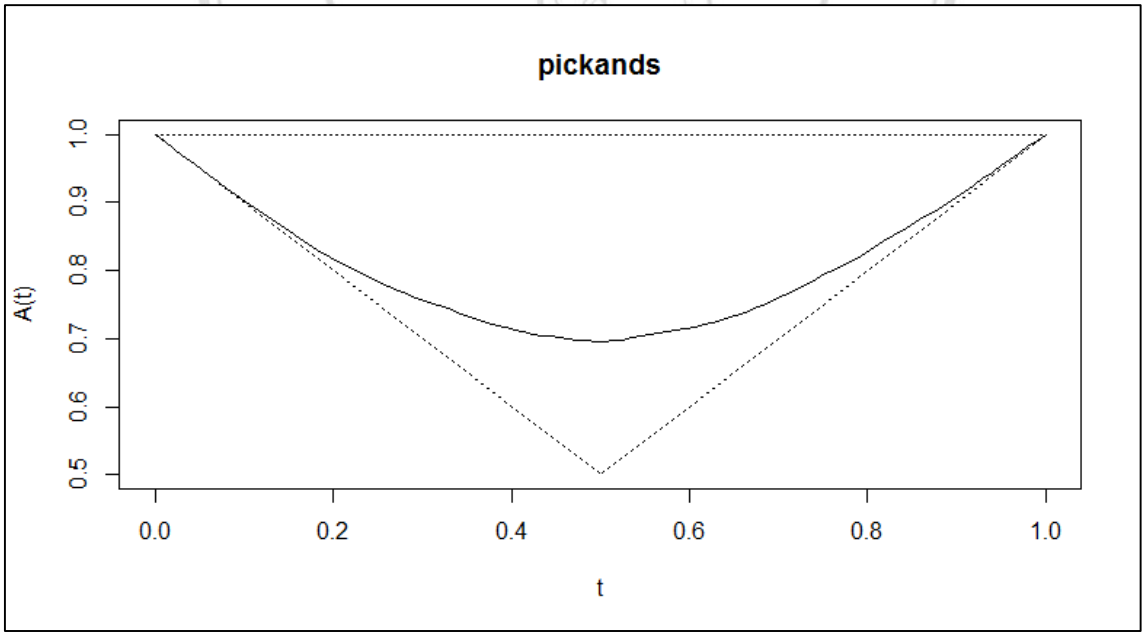


Figure 4.3: Pickands value between stock price index of Stock Exchange of Thailand (SET) and return stock price of Siam Cement Public Company Limited (SCC) by Bivariate Block Maxima Method.

Bivariate Generalized Extreme Value Distribution (BGEV) between stock price index of Stock Exchange of Thailand (SET) and stock price of Siam Cement Public Company Limited (SCC) choose the value from lower model (this result from R-Project and chosen from minimum AIC of 9 models, see all result in **Appendix B**) following **Table 4.20**:

Table 4.20: Bivariate Generalized Extreme Value Distribution (BGEV) between stock price index of Stock Exchange of Thailand (SET) and stock price of Siam Cement Public Company Limited (SCC).

Variable	**BGEV Model**	**AIC**	μ_1	σ_1	ξ_1	μ_2	σ_2	ξ_2	r
SET-SCC	logistic	3138.074	-0.3885	1.2280	-0.2081	-0.5781	1.6898	-0.1722	0.5029

From: run R-Project

Logistic Model (log)

- where $0 < r \leq 1$. This is a specific case of bivariate asymmetric logistic model.
- Complete dependence is obtained from the limit as r approaches zero.
- Independence is obtained as r = 1.

From Logistic Model (log), it could be found that r = 0.5029, which r has been obtained from the limit as r approaches to one. The result means the stock price index of Stock Exchange of Thailand (SET) and the stock price of Siam Cement Public Company Limited (SCC) have Bivariate Extreme relationship in extreme event case. However, the relationship is not strong as **Figure 4.4** shows logistic distribution function between stock price index of Stock Exchange of Thailand (SET) and stock price of Siam Cement Public Company Limited (SCC).

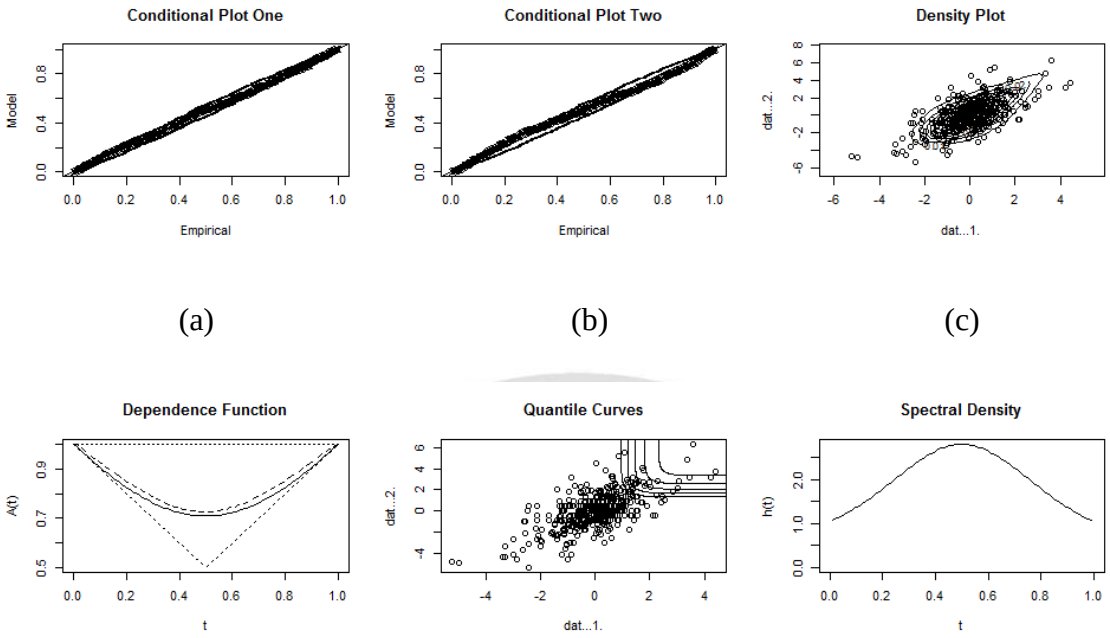


Figure 4.4: Logistic distribution function between stock price index of Stock Exchange of Thailand (SET) and stock price of Siam Cement Public Company Limited (SCC) by Bivariate Generalized Extreme Value Distribution (BGEV).

An explanation of Bivariate Generalized Extreme Value Distribution model (BGEV).

(a) Condition Plot One: shows the relationship between Theoretical Model and Empirical Model that pair both of the data whether they will have trend together or not.

(b) Condition Plot Two: shows the relationship between Theoretical Model and Empirical Model that pair both of the data whether they will have trend together or not.

(c) Density Plot: shows the plot of density and distribution at first data (dat.1), stock price index of SET, second data (dat.2), and stock price of SCC.

(d) Dependent Function: shows complete dependence on data of two variables function, which the curve approaches triangle line that means the two data are higher complete dependence. On the other hand, if the curve approaches straight line, it means that the two data are independence. Solid curve show that the line should be according to the theory of model, but the dotted curve shows estimation line.

(e) Quantile Curve: shows complete dependence on the two data, which the two data is above Quantile line too much so the data is more complete dependence.

(f) Spectral Density

An explanation variables of BGEV model.

μ is location variable; $\mu \in R$ is the variable to show density and distribution of data.

Fσ is scale variable; $\sigma > 0$ is the variable related with time. The distribution changes depending on the time axis that will increase or decrease depend on scale variable.

ξ is shape variable; $\xi \in R$,

by $\xi = 0$ is Gumbel Distribution

$\xi > 0$ is Frechet Distribution

$\xi < 0$ is Weibull Distribution.

These are the variables to show the curve, which tilt left ($\xi < 0$) or right ($\xi > 0$).

4.8.2 Stock price index of Stock Exchange of Thailand (SET) and stock price of Siam City Cement Public Company Limited (SCCC)

The used data is returned data of stock price indices of SET and stock price of SCCC, 964 data. **Figure 4.5** shows Bivariate relationship between stock price indices of SET and stock price of SCCC.

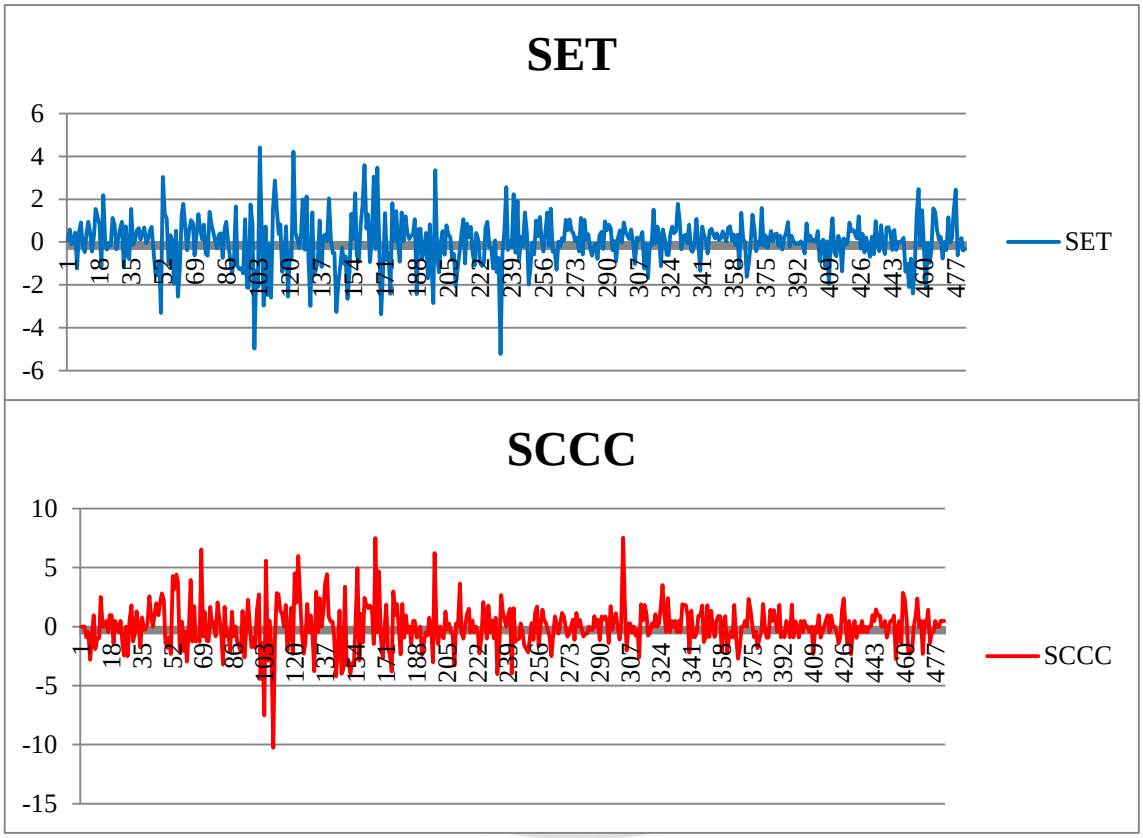


Figure 4.5: Bivariate relationship between stock price indices of SET and stock price of SCCC.

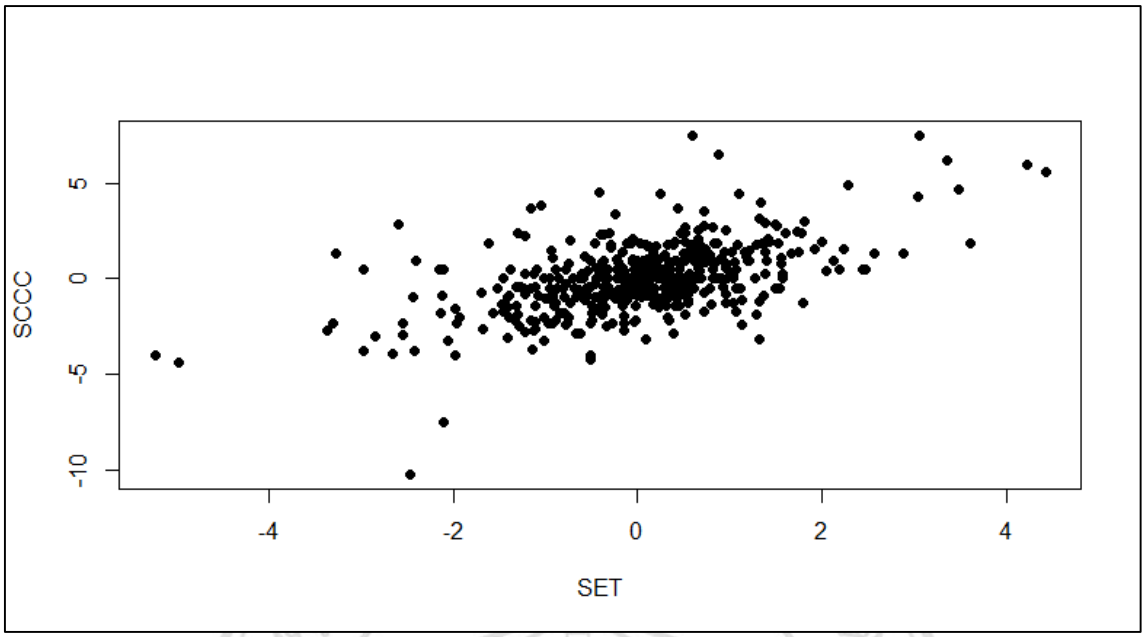


Figure 4.6: The relationship between daily closed price of Stock Exchange of Thailand (SET) and return stock price of Siam City Cement Public Company Limited (SCCC) by Bivariate Block Maxima Method.

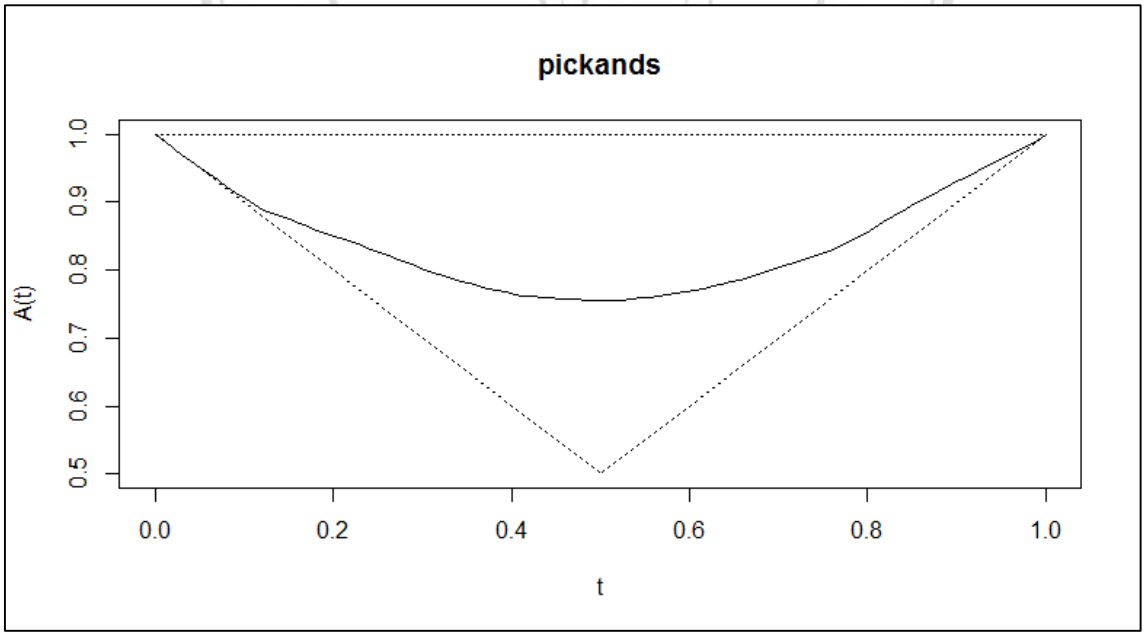


Figure 4.7: Pickands value between stock price index of Stock Exchange of Thailand (SET) and return stock price of Siam City Cement Public Company Limited (SCCC) by Bivariate Block Maxima Method.

Bivariate Generalized Extreme Value Distribution (BGEV) between stock price index of Stock Exchange of Thailand (SET) and stock price of Siam City Cement Public

Company Limited (SCCC) obtain the value from the model (this result from R-Project and chosen from minimum AIC of 9 models, see all result in **Appendix B**) on Table 4.19.

Table 4.21: Bivariate Generalized Extreme Value Distribution (BGEV) between stock price index of Stock Exchange of Thailand (SET) and stock price of Siam City Cement Public Company Limited (SCCC).

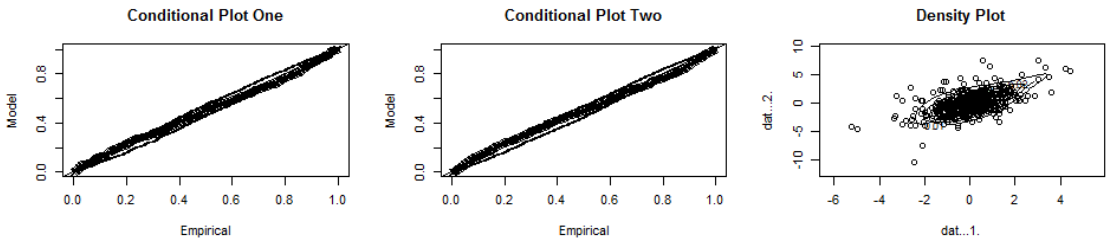
Variable	BGEV Model	AIC	μ_1	σ_1	ξ_1	μ_2	σ_2	ξ_2	θ_1	θ_2	r
SET-SCCC	asymmetric logistic	3326.788	-0.3793	1.2786	-0.2143	-0.6147	1.9847	-0.2167	0.9280	0.7787	0.4271

From run R-Project

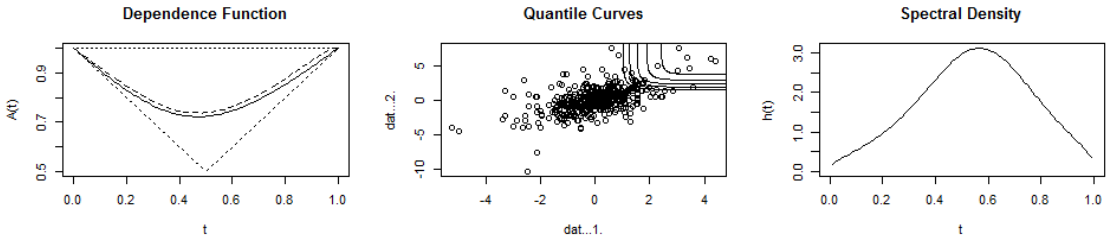
Asymmetric Logistic Model

- $0 < r \leq 1$ and $0 \leq t_{SET}, t_{SCCC} \leq 1$, when $t_{SET} = t_{SCCC} = 1$ asymmetric logistic model will be equal to logistic model.
- Independence is obtained from either $r = 1$, $t_{SET} = 0$ or $t_{SCCC} = 0$.
- Complete dependence is obtained from the limit when $t_{SET} = t_{SCCC} = 1$ and r approaches is zero.
- Different limit occurs when t_{SET} and t_{SCCC} are fixed and r approaches 0.

From asymmetric logistic model (alog), it is found that $r = 0.4271$, which r has been obtained from the limit approaching zero. The result means the stock price index of Stock Exchange of Thailand (SET) and the stock price of Siam City Cement Public Company Limited (SCCC) have Bivariate Extreme relationship in extreme event case. In Figure 4.4, it shows that the logistic distribution function between stock price index of Stock Exchange of Thailand (SET) and stock price of Siam City Cement Public Company Limited (SCCC).



(a) (b) (c)



(d) (e) (f)

Figure 4.8: Asymmetric logistic distribution function between stock price index of Stock Exchange of Thailand (SET) and stock price of Siam City Cement Public Company Limited (SCCC) by Bivariate Generalized Extreme Value Distribution (BGEV).

4.8.3 Stock price index of Bursa Malaysia (MYX) and stock price of Gamuda Berhad (GAM)

The used data is return data of stock price indexes of MYX and stock price of GAM, 964 data, **Figure 4.9:** show Bivariate relationship between stock price indexes of MYX and stock price of GAM

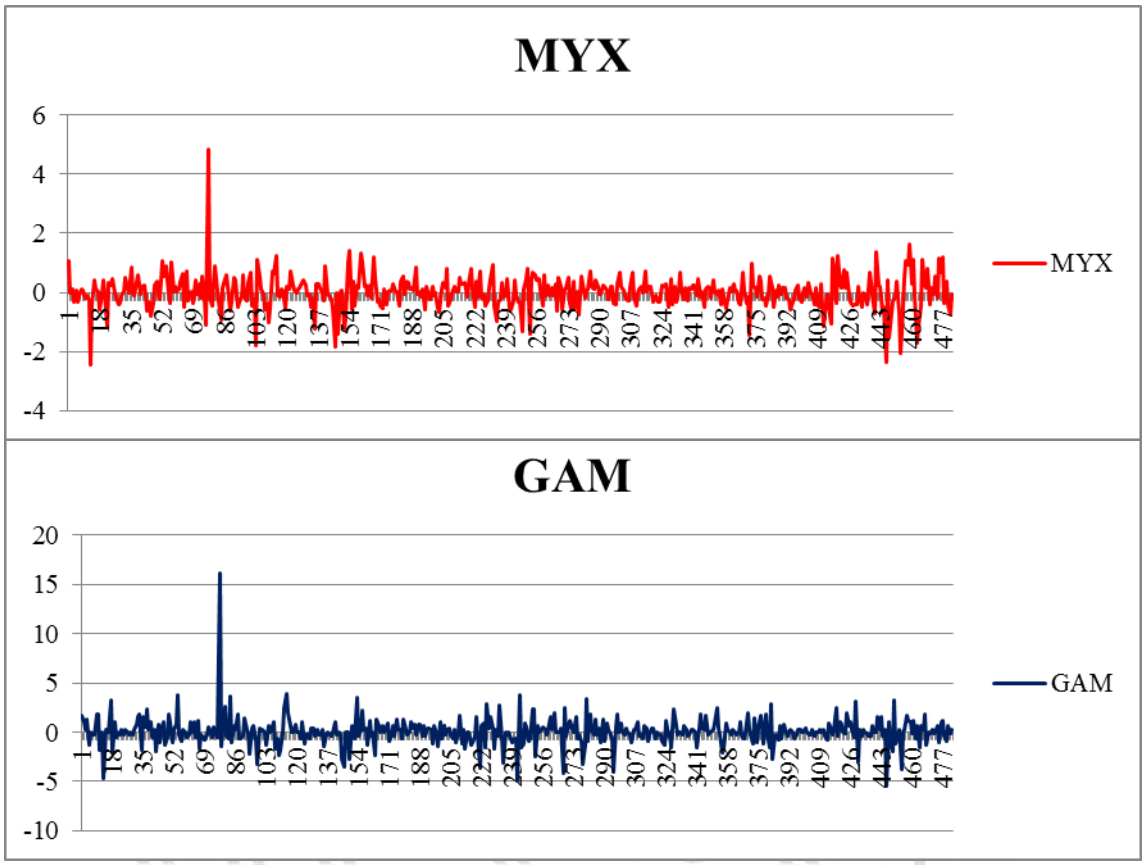


Figure 4.9: Bivariate relationship between stock price indexes of Bursa Malaysia (MYX) and stock price of Gamuda Berhad (GAM).

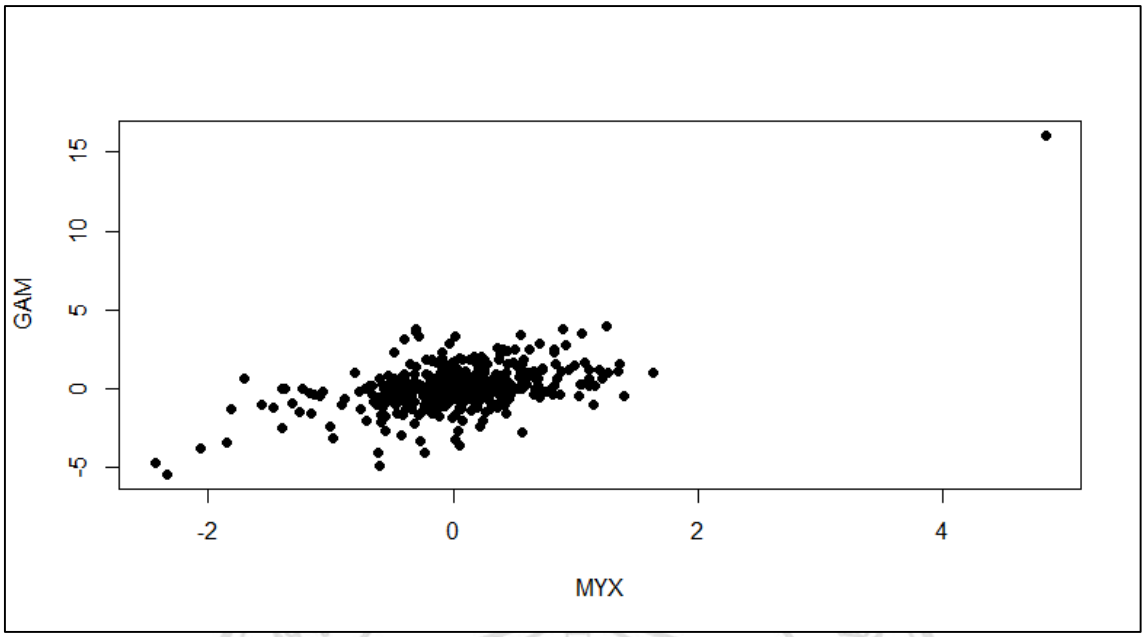


Figure 4.10: The relationship between daily closed price of Bursa Malaysia (MYX) and return stock price of Gamuda Berhad (GAM) by Bivariate Block Maxima Method.

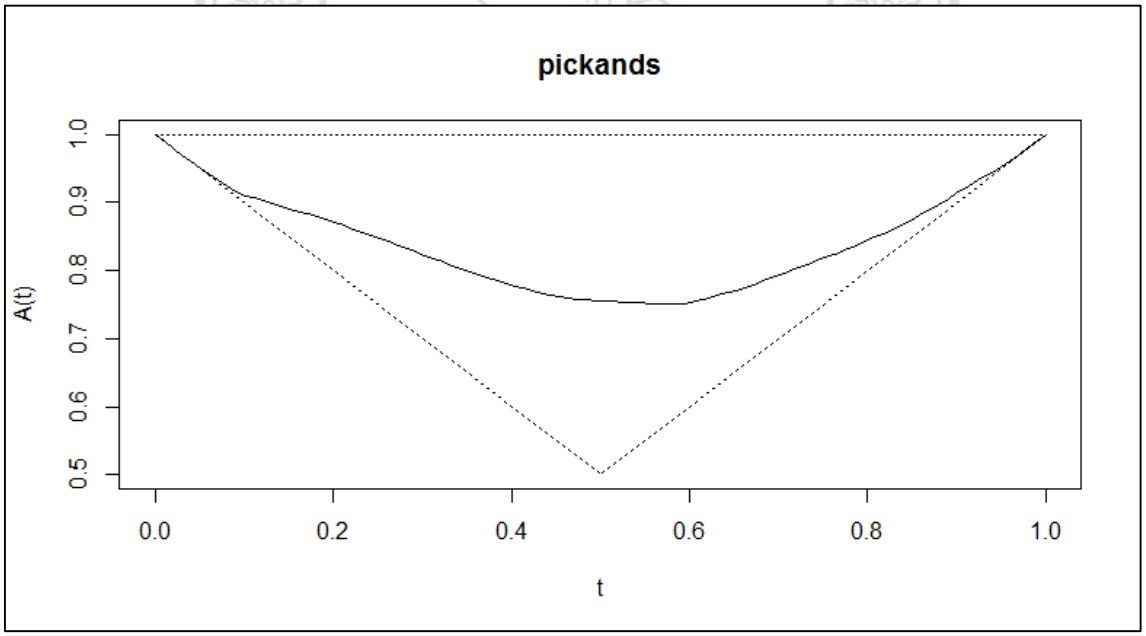


Figure 4.11: Pickands value between stock price index of Bursa Malaysia (MYX) and return stock price of Gamuda Berhad (GAM) by Bivariate Block Maxima Method.

Bivariate Generalized Extreme Value Distribution (BGEV) between stock price index of Bursa Malaysia (MYX) and stock price of Gamuda Berhad (GAM) show the value

from lower model (this result from R-Project and chosen from minimum AIC of 9 models, see all result in **Appendix B**) of **Table 4.22 as follows:**

Table 4.22: Bivariate Generalized Extreme Value Distribution (BGEV) between stock price index of Bursa Malaysia (MYX) and stock price of Gamuda Berhad (GAM).

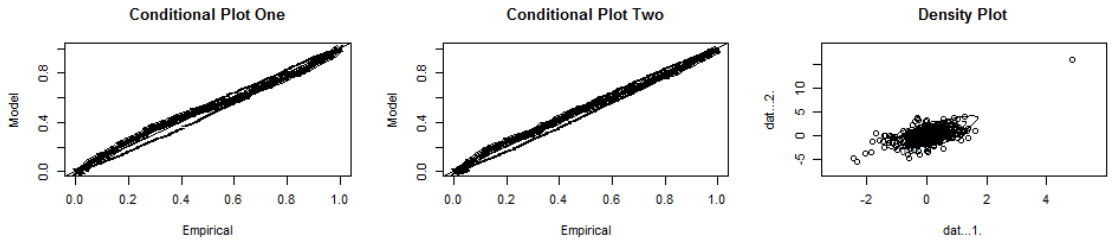
Variable	BGEV Model	AIC	μ_1	σ_1	ξ_1	μ_2	σ_2	ξ_2	r
MYX-GAM	Logistic	2476.389	-0.21859	0.65927	-0.12234	-0.48926	1.51110	-0.07449	0.51831

From run R-Project

Logistic Model (log)

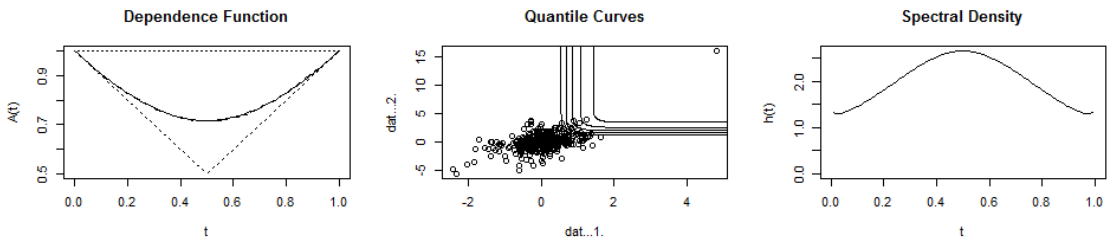
- $0 < r \leq 1$. This is a specific case of bivariate asymmetric logistic model.
- Completed dependence is obtained in the limit as r approaches zero.
- Independence is obtained as r = 1.

From logistic model (log), it is found that r = 0.51831, which r has been obtained from the limit as r approaches one. The result means the stock price index of Bursa Malaysia (MYX) and the stock price of Gamuda Berhad (GAM) that has Bivariate Extreme relationship in extreme event case. However, the relationship is not strong. In Figure 4.4: there implies logistic distribution function between stock price index of Bursa Malaysia (MYX) and stock price of Gamuda Berhad (GAM).



(a) (b) (c)

Figure 4.12: Logistic distribution function between stock price index of Bursa Malaysia (MYX) and stock price of Gamuda Berhad (GAM) by Bivariate Generalized Extreme Value Distribution (BGEV).



(d) (e) (f)

Figure 4.12 (Continue): Logistic distribution function between stock price index of Bursa Malaysia (MYX) and stock price of Gamuda Berhad (GAM) by Bivariate Generalized Extreme Value Distribution (BGEV).

4.8.4 Stock price index of Bursa Malaysia (MYX) and stock price of IJM Corporation Berhad (IJM).

The used data is returned data of stock price indices of MYX and stock price of IJM, 964 data. **Figure 4.9** shows Bivariate relationship between stock price indices of MYX and stock price of IJM.

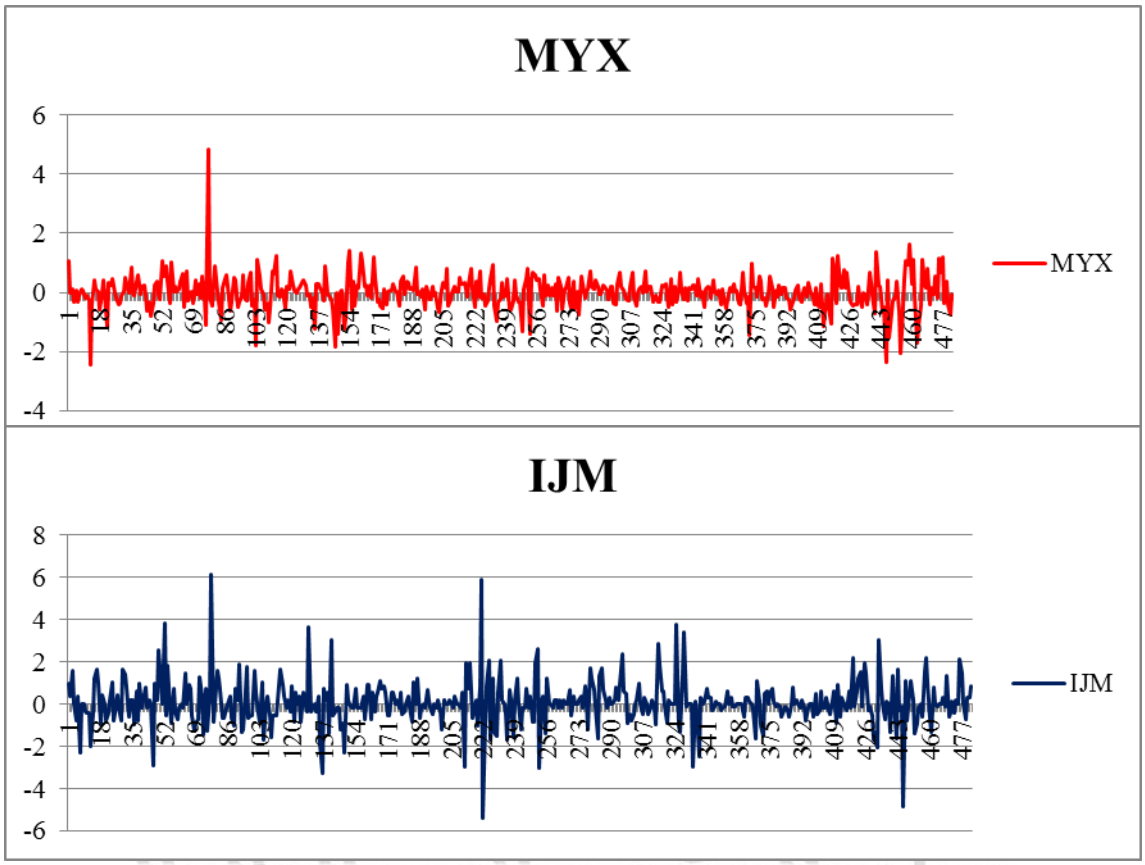


Figure 4.13: Bivariate relationship between stock price indices of Bursa Malaysia (MYX) and stock price of IJM Corporation Berhad (IJM).

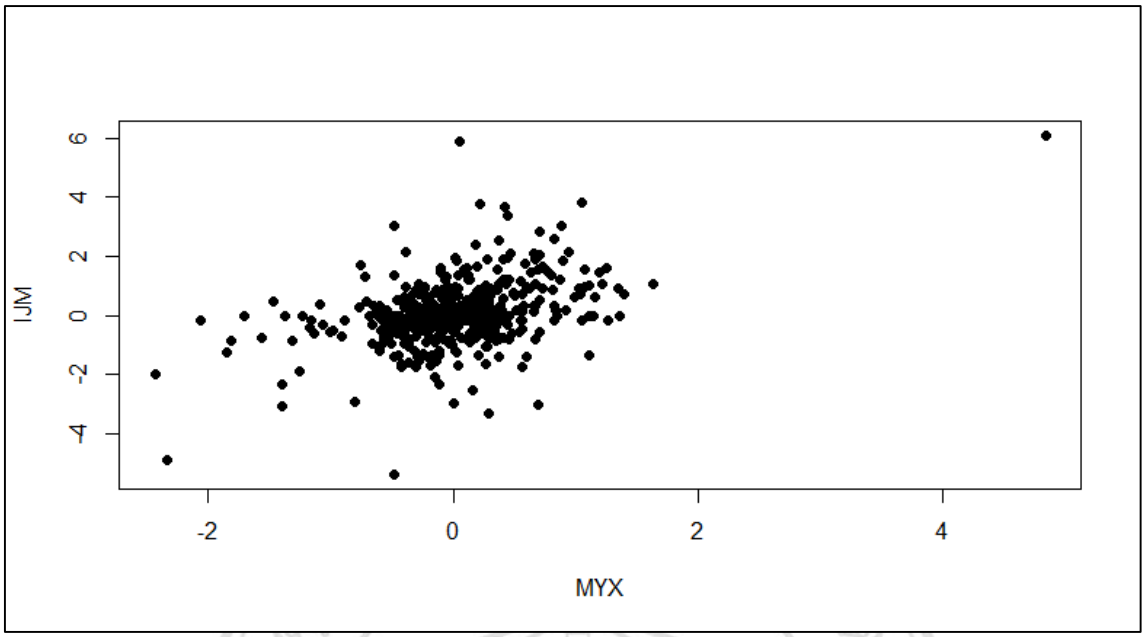


Figure 4.14: The relationship between daily closed price of Bursa Malaysia (MYX) and return stock price of IJM Corporation Berhad (IJM) by Bivariate Block Maxima Method.

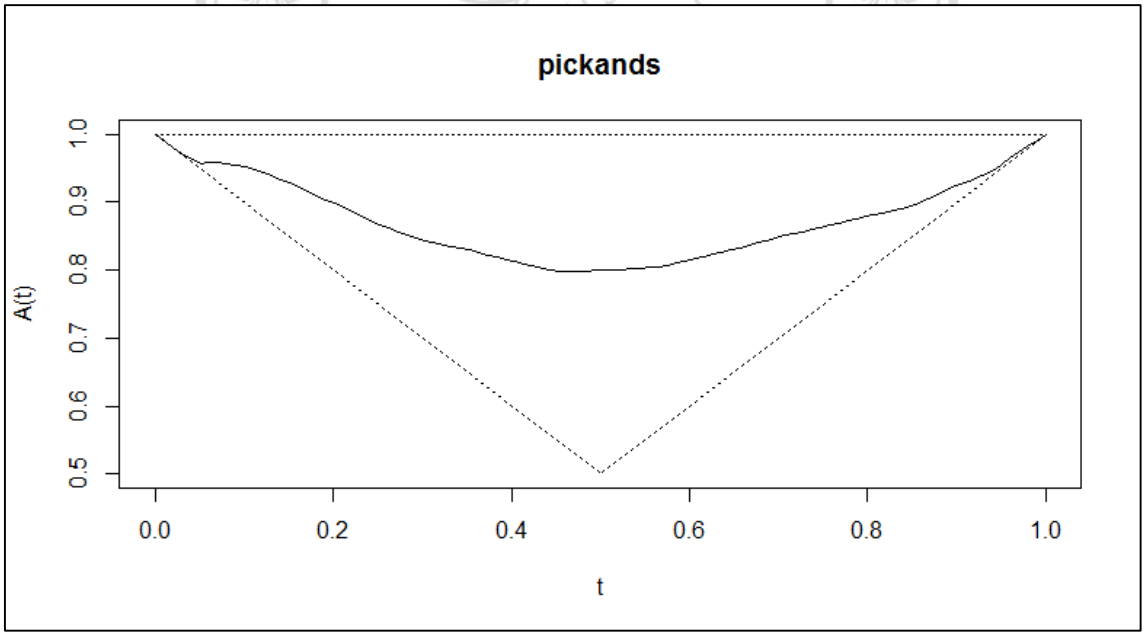


Figure 4.15: Pickands value between stock price index of Bursa Malaysia (MYX) and return stock price of IJM Corporation Berhad (IJM) by Bivariate Block Maxima Method.

Bivariate Generalized Extreme Value Distribution (BGEV) between stock price index of Bursa Malaysia (MYX) and stock price of IJM Corporation Berhad (IJM) that

obtained the value from lower model (this result from R-Project and chosen from minimum AIC of 9 models, see all result in **Appendix B**) on **Table 4.23 as follows:**

Table 4.23: Bivariate Generalized Extreme Value Distribution (BGEV) between stock price index of Bursa Malaysia (MYX) and stock price of IJM Corporation Berhad (IJM).

Variable	**BGEV Model**	**AIC**	μ_1	σ_1	ξ_1	μ_2	σ_2	ξ_2	θ_1	θ_2	r
MYX-IJM	asymmetric logistic	2296.072	-0.2245	0.6610	-0.1125	-0.3306	1.2040	-0.1783	0.8127	0.7560	0.4396

From run R-Project

Asymmetric Logistic Model

- $0 < r \leq 1$ and $0 \leq t_{MYX}, t_{IJM} \leq 1$, when $t_{MYX} = t_{IJM} = 1$ asymmetric logistic model will be equal to logistic model.
- Independence is obtained either from $r = 1$, $t_{MYX} = 0$ or $t_{IJM} = 0$.
- Completed dependence is obtained from the limit when $t_{MYX} = t_{IJM} = 1$ and r approaches zero.
- Different limit occurs when t_{MYX} and t_{IJM} are fixed and r approaches 0.

From asymmetric logistic model (log) found that $r = 0.4396$, which is r has been obtained from the limit as r approaches zero. The result means that stock price index of Bursa Malaysia (MYX) and the stock price of IJM Corporation Berhad (IJM) have Bivariate Extreme relationship in extreme event case. In Figure 4.16, it shows logistic distribution function between stock price index of Stock Bursa Malaysia (MYX) and stock price of IJM Corporation Berhad (IJM).

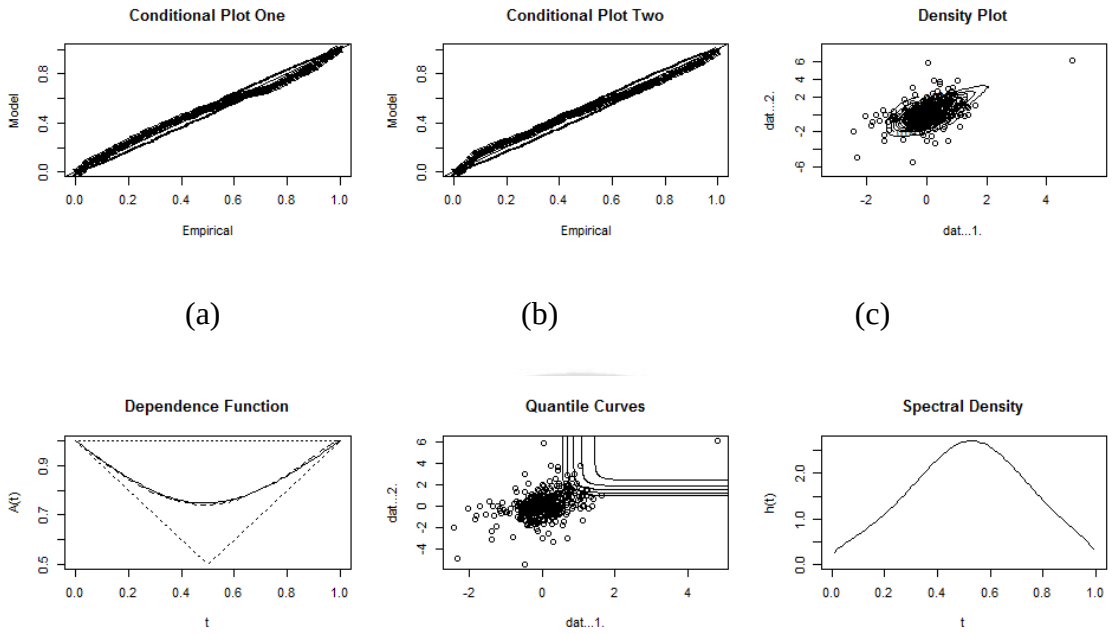


Figure 4.16: Logistic distribution function between stock price index of Bursa Malaysia (MYX) and stock price of IJM Corporation Berhad (IJM) by Bivariate Generalized Extreme Value Distribution (BGEV).

4.8.5 Stock price index of Singapore Exchange (SGX) and stock price of Chip Eng Seng Corperation Limited (CES).

The used data is returned data of stock price indices of SGX and stock price of CES, 964 data. **Figure 4.17** shows Bivariate relationship between stock price indices of SGX and stock price of CES.

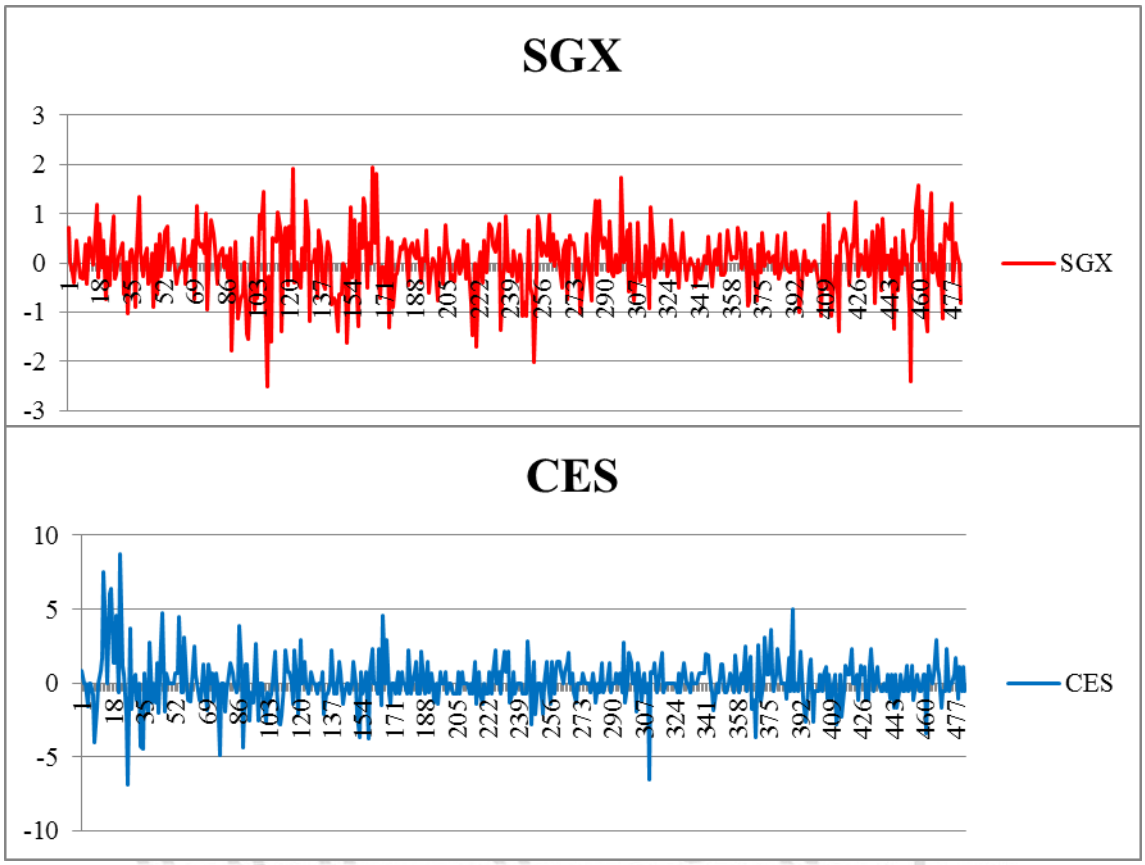


Figure 4.17: Bivariate relationship between stock price indices of Singapore Exchange (SGX) and stock price of Chip Eng Seng Corperation Limited (CES).

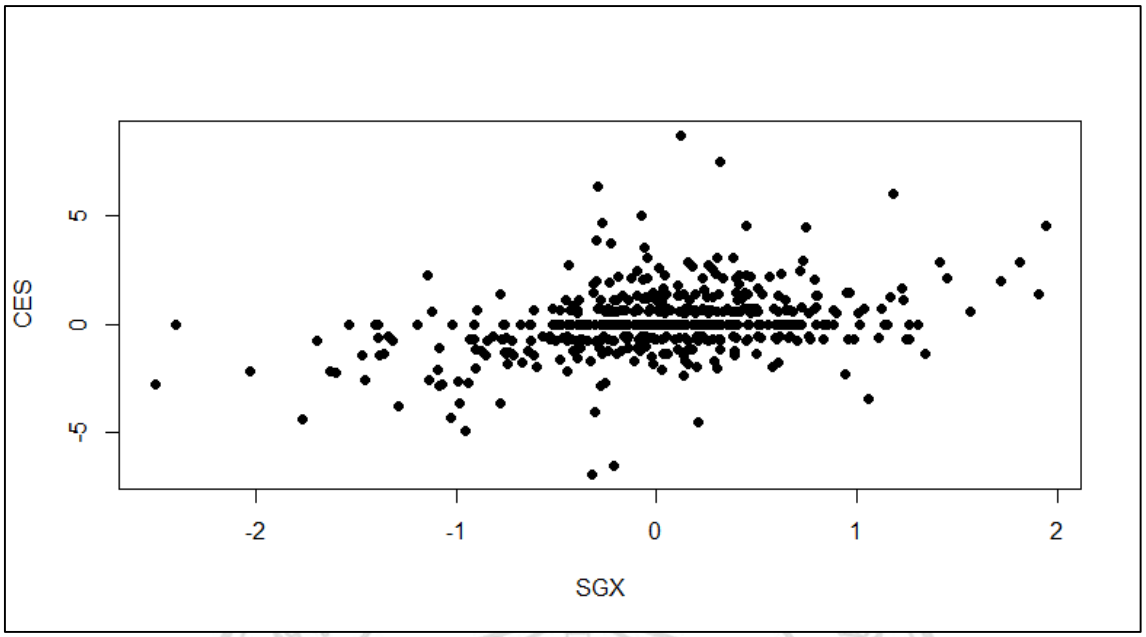


Figure 4.18: The relationship between daily closed price of Singapore Exchange (SGX) and return stock price of Chip Eng Seng Corperation Limited (CES) by Bivariate Block Maxima Method.

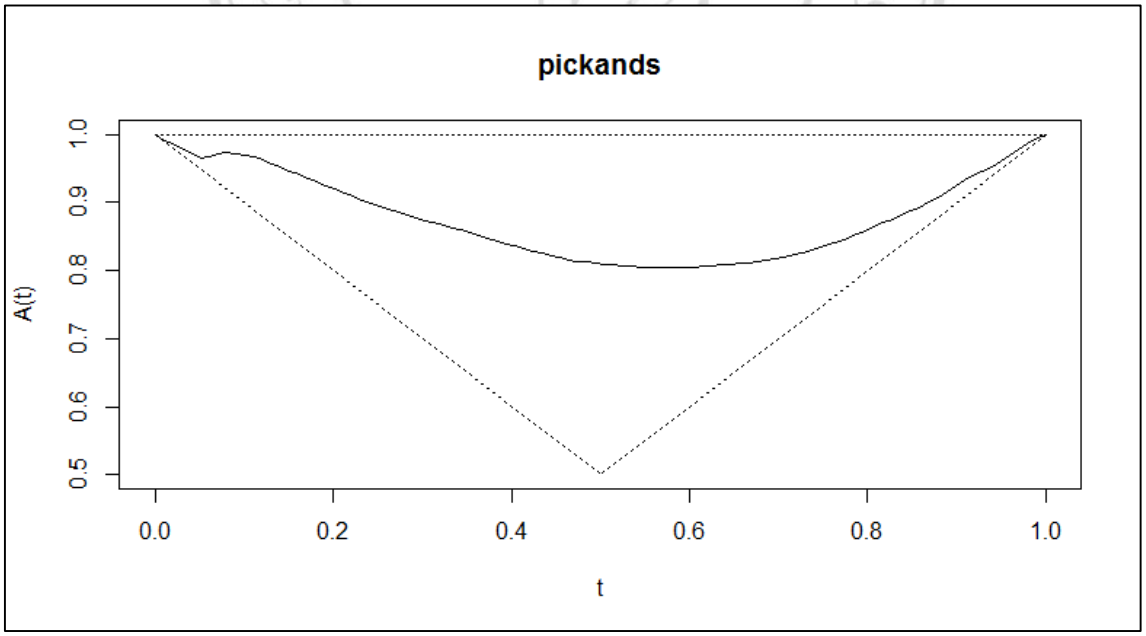


Figure 4.19: Pickands value between stock price index of Singapore Exchange (SGX) and return stock price of Chip Eng Seng Corperation Limited (CES) by Bivariate Block Maxima Method.

Bivariate Generalized Extreme Value Distribution (BGEV) between stock price index of Singapore Exchange (SGX) and stock price of Chip Eng Seng Corperation Limited (CES) obtained the value (this result from R-Project and chosen from minimum AIC of 9 models, see all result in **Appendix B**) from the following **Table 4.24** as follows**:**

Table 4.24: Bivariate Generalized Extreme Value Distribution (BGEV) between stock price index of Singapore Exchange (SGX) and stock price of Chip Eng Seng Corperation Limited (CES).

Variable	**BGEV Model**	**AIC**	μ_1	σ_1	ξ_1	μ_2	σ_2	ξ_2	α	β
SGX-CES	asymmetric mixed	2740.547	-0.19416	0.68900	-0.26110	-0.50939	1.66190	-0.15738	0.87736	-0.08182

From run R-Project

Asymmetric Mixed Model

- α and α is + 3β, this is non-negative and when α + β and α + 2β are less than or equal to 1.
- These constraints imply that beta lies in the interval [-0.5,-0.5] and when α line in the interval [0,1.5], which α can only be greater than 1 if beta is negative.
- Independence is obtained when both parameters are 0.
- Completed dependence cannot be obtained.
- The strength of dependence increases for increasing alpha (for fixed beta).
- For the definition of a dependence function, see above.

From asymmetric mixed model (amix), it is found that α + β and α + 2β are less than 1, which means beta lies in the interval [-0.5,-0.5] and α lies in the interval [0,1.5]. The result means the stock price index of Singapore Exchange (SGX) and the stock price of Chip Eng Seng Corperation Limited (CES) have Bivariate Extreme relationship in extreme event case. Because of both α and β are not 0, it means that the two variables are obtained to complete dependence.

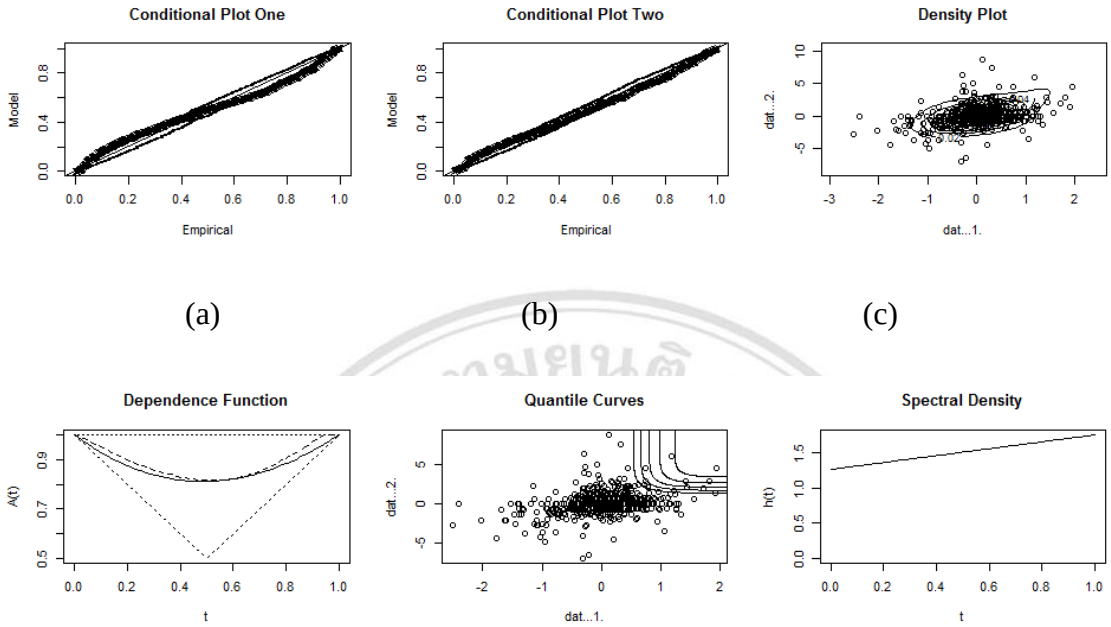


Figure 4.20: Asymmetric mixed distribution function between stock price index of Singapore Exchange (SGX) and stock price of Chip Eng Seng Corperation Limited (CES) by Bivariate Generalized Extreme Value Distribution (BGEV).

4.8.6 Stock price index of Singapore Exchange (SGX) and stock price of Low Keng Huat Limited (LKH).

The used data is returned data of stock price indices of SGX and stock price of LKH, 964 data. **Figure 4.21** shows Bivariate relationship between stock price indices of SGX and stock price of LKH.

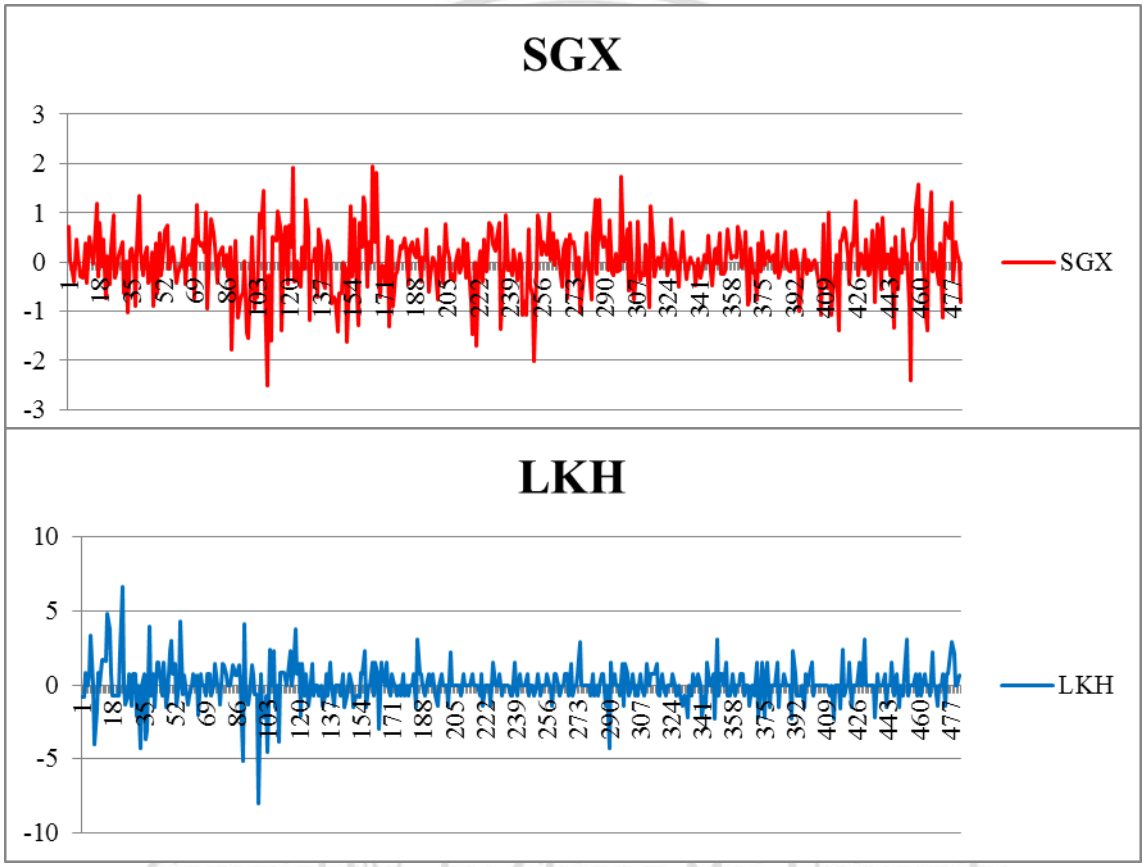


Figure 4.21: Bivariate relationship between stock price indexes of Singapore Exchange (SGX) and stock price of Low Keng Huat Limited (LKH).

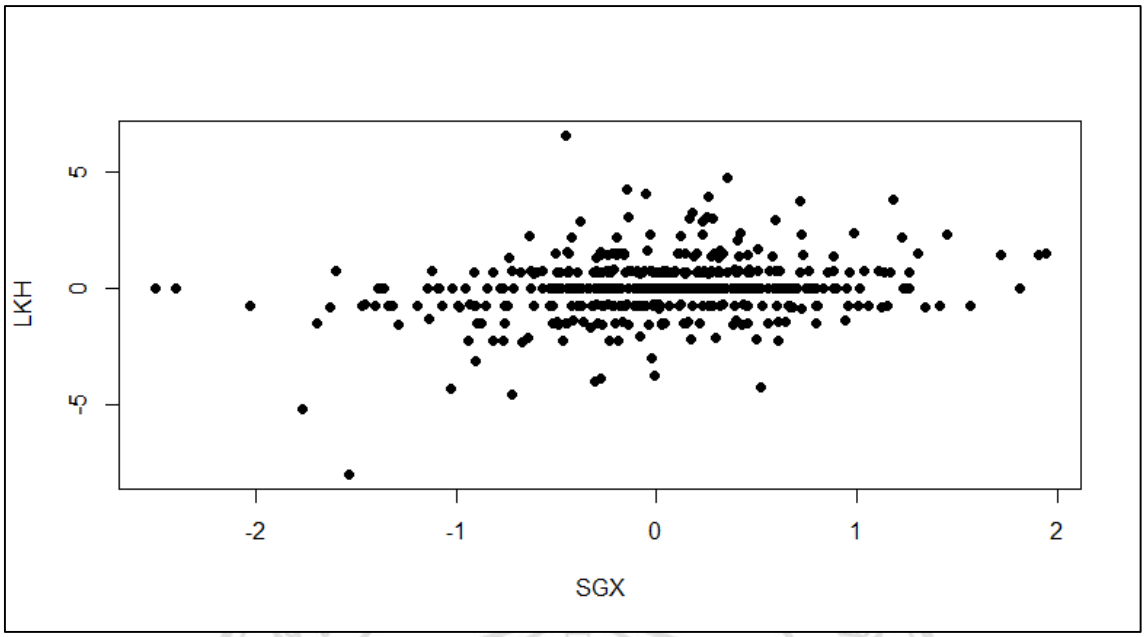


Figure 4.22: The relationship between daily closed price of Singapore Exchange (SGX) and return stock price of Low Keng Huat Limited (LKH) by Bivariate Block Maxima Method.

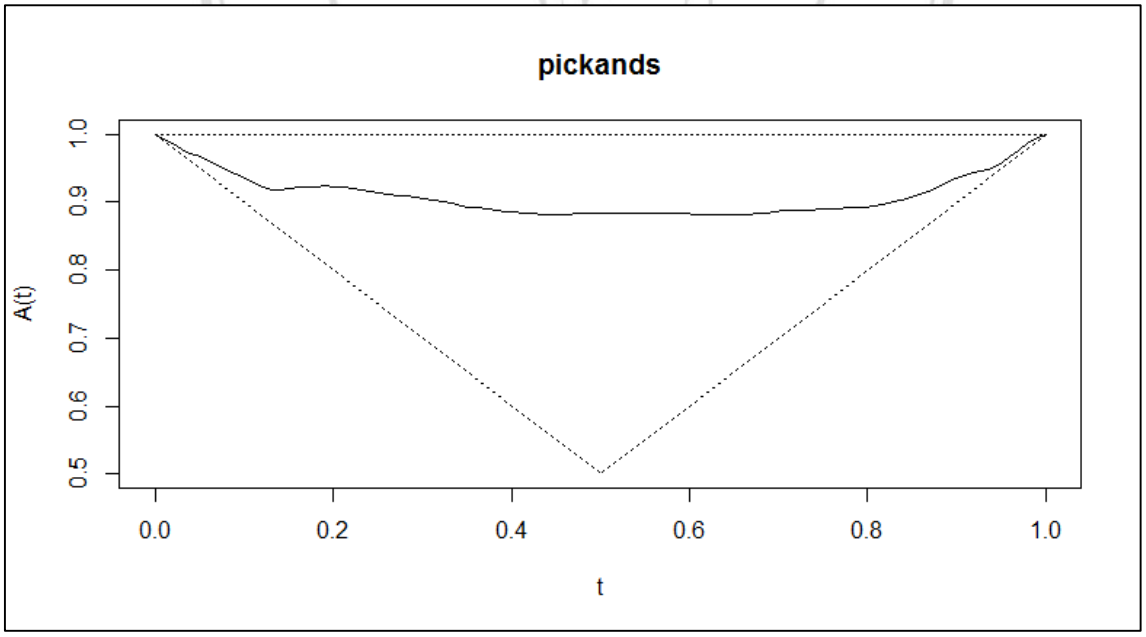


Figure 4.23: Pickands value between stock price index of Singapore Exchange (SGX) and return stock price of Low Keng Huat Limited (LKH) by Bivariate Block Maxima Method.

Bivariate Generalized Extreme Value Distribution (BGEV) between stock price index of Singapore Exchange (SGX) and stock price of Low Keng Huat Limited (LKH) obtained from the following model (this result from R-Project and chosen from minimum AIC of 9 models, see all result in **Appendix B**) on **Table 4.25:**

Table 4.25: Bivariate Generalized Extreme Value Distribution (BGEV) between stock price index of Singapore Exchange (SGX) and stock price of Low Keng Huat Limited (LKH).

Variable	**BGEV Model**	**AIC**	μ_1	σ_1	ξ_1	μ_2	σ_2	ξ_2	α	B
SGX-LKH	asymmetric mixed	2635.882	-0.189205	0.672042	-0.283603	-0.444247	1.499537	-0.200744	0.460327	0.006993

From run R-Project

Asymmetric Mixed Model

- α and α is + 3β, this is non-negative and when α + β and α + 2β are less than or equal to 1.
- These constraints imply that beta lies in the interval [-0.5,-0.5] and α lies in the interval [0,1.5], which α can only be greater than 1 if beta is negative.
- Independence is obtained as both parameters are 0.
- Completed dependence cannot be obtained.
- The strength of dependence increases for increasing alpha (for fixed beta).
- For the definition of a dependence function, see above.

According to the asymmetric mixed model (amix), it is found that α + β and α + 2β are less than 1, which means beta lies in the interval [-0.5,-0.5] and α lies in the interval [0,1.5]. The result means the stock price index of Singapore Exchange (SGX) and the stock price of Low Keng Huat Limited (LKH) have Bivariate Extreme relationship in extreme event case. Due to both α and β are not 0, the two variables are obtained to complete dependence.

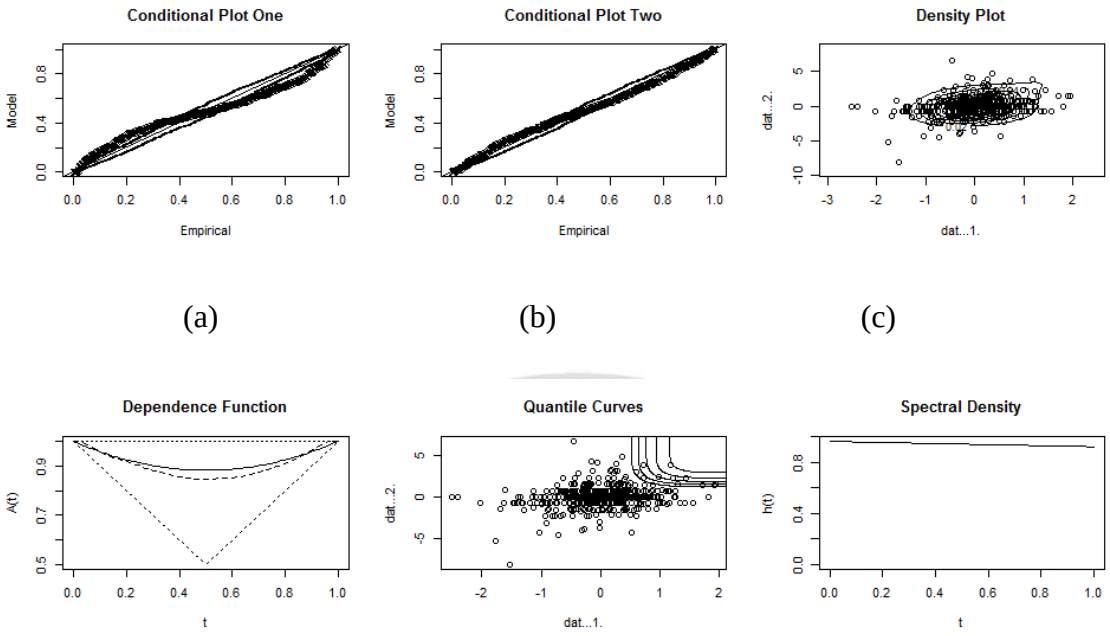


Figure 4.24: Asymmetric mixed distribution function between stock price index of Singapore Exchange (SGX) and stock price of Low Keng Huat Limited (LKH) by Bivariate Generalized Extreme Value Distribution (BGEV).

From the results of Bivariate Generalized Extreme Value Distribution (BGEV) found that the best (Minimum AIC) model from 9 model (Minimum AIC) of Siam Cement Public Company Limited (SCC) with Stock Exchange of Thailand (SET) is Logistic Model (AIC = 3138.074), Siam City Cement Public Company Limited (SCCC) with Stock Exchange of Thailand (SET) is Asymmetric Logistic Model (AIC = 3326.788), Gamuda Berhad (GAM) with Bursa Malaysia (MYX) is Logistic Model (AIC= 2476.389), IJM Corporation Berhad (IJM) with Bursa Malaysia (MYX) is Asymmetric Logistic Model (AIC = 2296.072), Chip Eng Seng Corperation Limited (CES) with Singapore Exchange (SGX) is Asymmetric Mixed Model (AIC = 2740.547), and Low Keng Huat Limited (LKH) with Singapore Exchange (SGX) is Asymmetric Mixed Model (AIC = 2635.882).

4.9 Bivariate Generalized Pareto Distribution (BGPD)

From Bivariate Generalized Pareto Distribution (BGPD), the method was done by using Bivariate Threshold Exceedances to set Threshold value of each data, which is choosing the data (higher than Theshold value) to estimate. The estimation is as the following:

4.9.1 Stock price index of Stock Exchange of Thailand (SET) and stock price of Siam Cement Public Company Limited (SCC).

Table 4.26: Bivariate Generalized Pareto Distribution (BGPD) between stock price index of Stock Exchange of Thailand (SET) and stock price of Siam Cement Public Company Limited (SCC).

Variable	BGPD Model	AIC	σ_1	ξ_1	σ_2	ξ_2	r
SET-SCC	Husler and Reiss	1207.201	0.70290	0.05977	0.82180	0.13833	1.13904

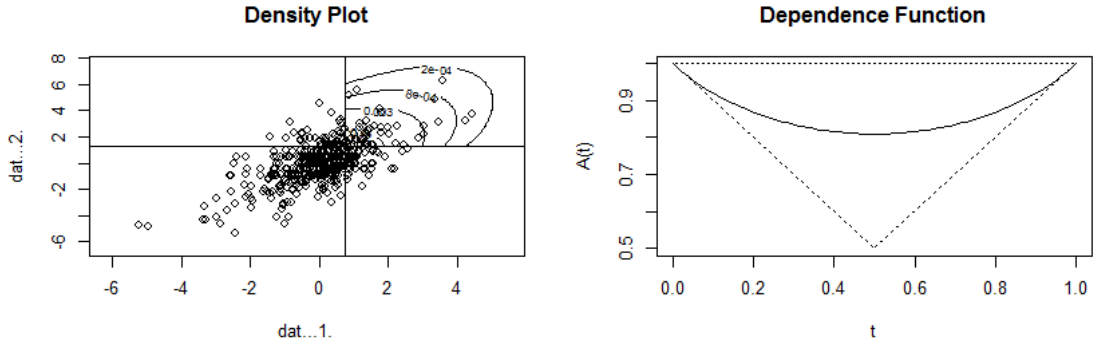
From run R-Project

The result from estimation at significant level = 80%, Theshold made from R-Project are $\mu_1 = 0.7373644$ and $\mu_2 = 1.3032185$.

Husler – Reiss's Model

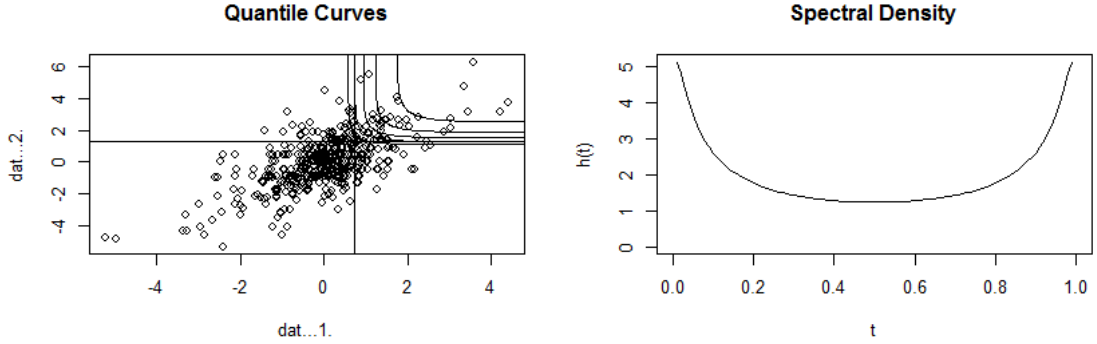
- Where $\emptyset$ is standard normal distribution function and $r > 0$.
- Independence is obtained in the limit as r approaches 0.
- Completed dependence is obtained when r tends to be infinity.

From the estimation of Husler – Reiss' Model found that $r = 1.13904$, which $r > 0$ is standard normal distribution. Therefore, r tends to be infinity means stock price index of Stock Exchange of Thailand (SET) and stock price of Siam Cement Public Company Limited (SCC) has complete dependence and Bivariate Extreme relationship. **Figure 4.25** shows Husler – Reiss' distribution function between stock price index of Stock Exchange of Thailand (SET) and stock price of Siam Cement Public Company Limited (SCC) by Bivariate Generalized Pareto Distribution (BGPD).



(a)

(b)



(c)

(d)

Figure 4.25: The Husler – Reiss' distribution function between stock price index of Stock Exchange of Thailand (SET) and stock price of Siam Cement Public Company Limited (SCC) by Bivariate Generalized Pareto Distribution (BGPD).

An explanation model of Bivariate Generalized Pareto Distribution (BGPD).

(a) Density Plot: show the plot of density and distribution at first data (dat.1), stock price index of SET, second data (dat.2), and stock price of SCC.

(b) Dependence Function: shows complete dependence on data of two variables function, which the curve approaches triangle line that means the two data are higher than completed dependence. Another way, if the curve approaches straight line, it means that the two data is independence. Solid curve shows that the line should be according to the theory of model but the dotted curve shows estimation line.

(c) Quantile Curve: shows complete dependence on the two data, which the data is much above Quantile, implying the data is more completed dependence.

(d) Spectral Density

4.9.2 Stock price index of Stock Exchange of Thailand (SET) and stock price of Siam City Cement Public Company Limited (SCCC).

Table 4.27: Bivariate Generalized Pareto Distribution (BGPD) between stock price index of Stock Exchange of Thailand (SET) and stock price of Siam City Cement Public Company Limited (SCCC).

Variable	BGPD Model	AIC	σ_1	ξ_1	σ_2	ξ_2	α	β
SET-SCCC	Coles and Town	1284.287	0.725659	0.007718	1.304650	0.016240	0.240009	1.234463

From run R-Project

The result from estimation at significant level = 80%, Threshold made from R-Project are $\mu_1 = 0.7373644$ and $\mu_2 = 1.1461318$.

Coles-Town's Model

- $q=\frac{\alpha y_{SCCC}}{\alpha y_{SCCC}+\beta y_{SET}}$ and Be(q; α,β), this is the beta distribution function evaluated at q with shape 1 = α and shape 2 = β.
- Independence is obtained as α = β approaches 0.
- Completed dependence is obtained in the limit as α = β tends to be infinity and when one of α, β is fixed and the other approaches are 0.
- Different limit occurs when one of α, β fixed and the other tends to be infinity.

From estimation of Coles and Town distribution function found that α = 0.240009 and β = 1.234463. The result means the stock price index of Stock Exchange of Thailand (SET) and the stock price of Siam Cement Public Company Limited (SCC) have Bivariate Extreme relationship or complete dependence. In contrast, the relationship is not strong because α ≠ β and β tends to be infinity. **Figure 4.26** shows Coles-Town's distribution function between stock price index of Stock Exchange of Thailand (SET) and stock price of Siam City Cement Public Company Limited (SCCC) by Bivariate Generalized Pareto Distribution (BGPD).

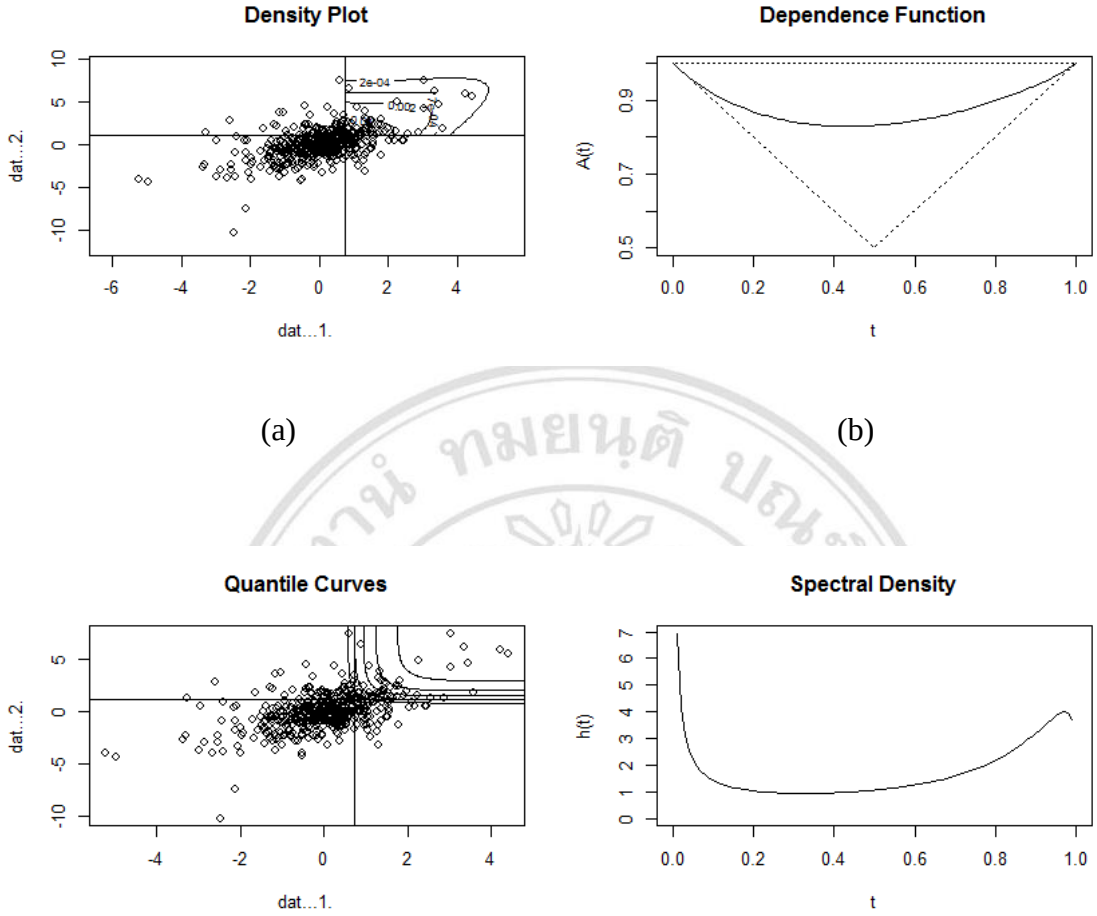


Figure 4.26 The Coles-Town's distribution function between stock price index of Stock Exchange of Thailand (SET) and stock price of Siam City Cement Public Company Limited (SCCC) by Bivariate Generalized Pareto Distribution (BGPD).

4.9.3 Stock price index of Bursa Malaysia (MYX) and stock price of Gamuda Berhad (GAM).

Table 4.28: Bivariate Generalized Pareto Distribution (BGPD) between stock price index of Bursa Malaysia (MYX) and stock price of Gamuda Berhad (GAM).

Variable	BGPD Model	AIC	σ_1	ξ_1	σ_2	ξ_2	r
MYX-GAM	Husler and Reiss	1113.964	0.35045	0.05705	0.84746	0.12484	0.93861

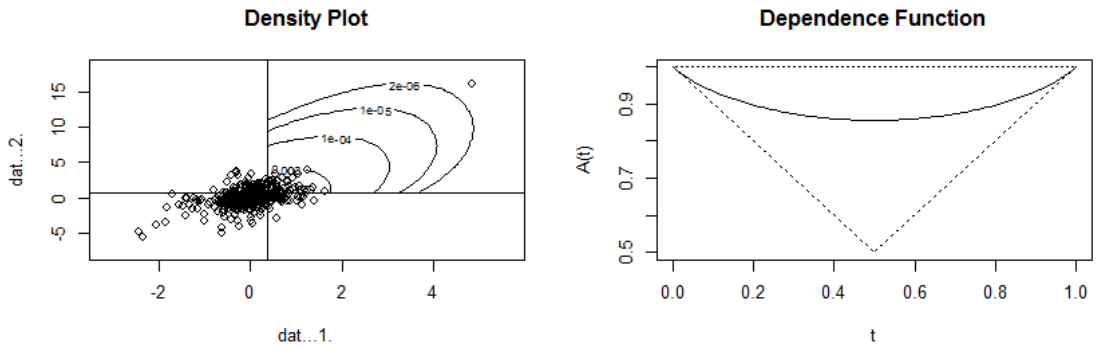
From run R-Project

The result from estimation at significant level of 80%, Theshold made from R-Project are $\mu_1 = 0.3718665$ and $\mu_2 = 0.8244029$.

Husler – Reiss' Model

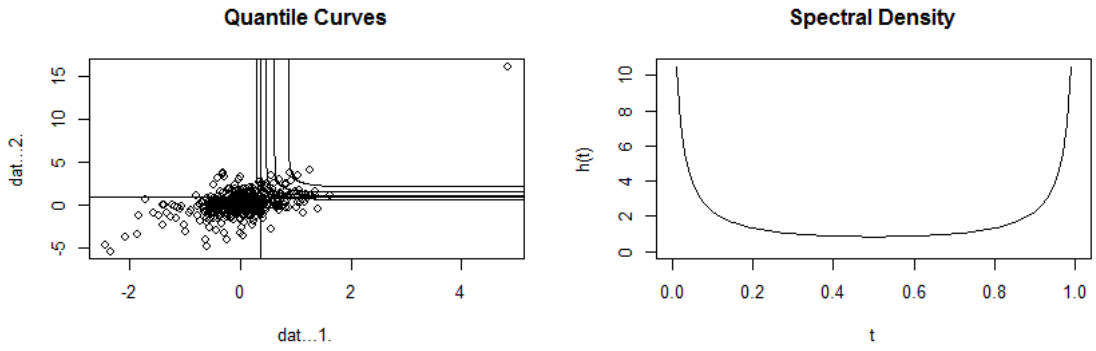
- Ø is standard normal distribution function and r > 0.
- Independence is obtained in the limit as r approaches 0.
- Completed dependence is obtained when r tends to be infinity.

From the estimation of Husler – Reiss' Model found that $r = 0.93861$, which $r > 0$ is standard normal distribution. Therefore, r tends to be infinity means stock price index of Bursa Malaysia (MYX) and stock price of Gamuda Berhad (GAM) have complete dependence and Bivariate Extreme relationship. The relationship is not strong as **Figure 4.27** shows Husler – Reiss' distribution function between stock price index of Bursa Malaysia (MYX) and stock price of Gamuda Berhad (GAM) by Bivariate Generalized Pareto Distribution (BGPD).



(a) (b)

Figure 4.27: The Husler – Reiss's distribution function between stock price index of Bursa Malaysia (MYX) and stock price of Gamuda Berhad (GAM) by Bivariate Generalized Pareto Distribution (BGPD).



(c) (d)

Figure 4.27 (Continue): The Husler – Reiss's distribution function between stock price index of Bursa Malaysia (MYX) and stock price of Gamuda Berhad (GAM) by Bivariate Generalized Pareto Distribution (BGPD).

4.9.4 Stock price index of Bursa Malaysia (MYX) and stock price of IJM Corporation Berhad (IJM).

Table 4.29: Bivariate Generalized Pareto Distribution (BGPD) between stock price index of Bursa Malaysia (MYX) and stock price of Ijm Corporation Berhad (IJM).

Variable	BGPD Model	AIC	σ_1	ξ_1	σ_2	ξ_2	r
MYX-IJM	neglog	1070.489	0.3290	0.1930	0.7004	0.1935	0.6516

From run R-Project

The result from estimation at significant level is equal to 80%, threshold made from R-Project are $\mu_1 = 0.3718665$ and $\mu_2 = 0.7015086$.

Bivariate Negative Logistic Model

- where r > 0, this is a special case of the bivariate asymmetric negative logistic model.
- Independence is obtained in the limit as r approaches 0.
- Complete dependence is obtained when r tends to infinity cited in Galambos's model (1975, Section 4).

From the estimation of Bivariate Negative Logistic Model, it is found that $r = 0.6516$, which $r > 0$ is a special case of the bivariate asymmetric negative logistic

model. Consequently, *r* tends to be infinity means the stock price index of Bursa Malaysia (MYX) and stock price of IJM Corporation Berhad (IJM) has dependence and Bivariate Extreme relationship but the relationship is not strong. **Figure 4.28:** shows Bivariate Negative Logistic distribution function between stock price index of Bursa Malaysia (MYX) and stock price of IJM Corporation Berhad (IJM) by Bivariate Generalized Pareto Distribution (BGPD).

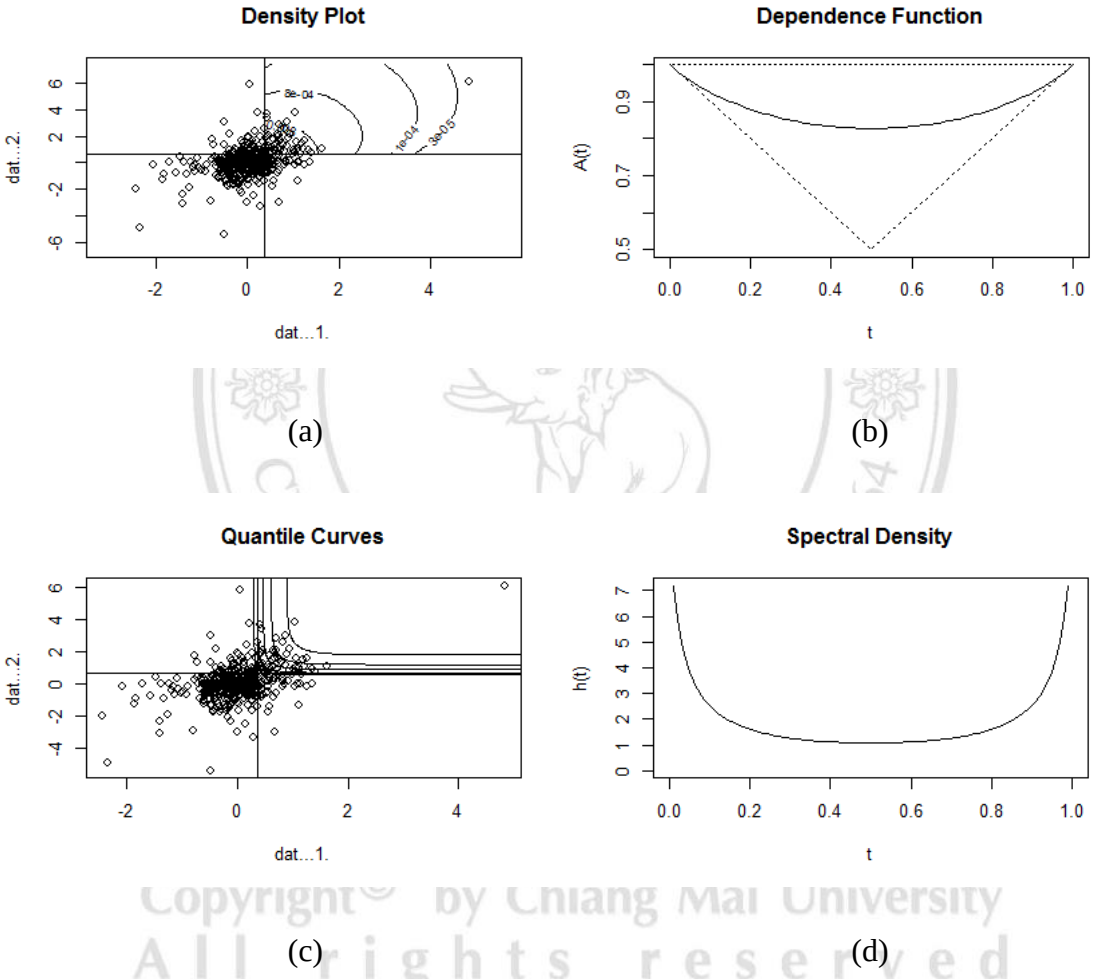


Figure 4.28: The Bivariate Negative Logistic distribution function between stock price index of Bursa Malaysia (MYX) and stock price of IJM Corporation Berhad (IJM) by Bivariate Generalized Pareto Distribution (BGPD).

4.9.5 Stock price index of Singapore Exchange (SGX) and stock price of Chip Eng Seng Corperation Limited (CES).

Table 4.30: Bivariate Generalized Pareto Distribution (BGPD) between stock price index of Singapore Exchange (SGX) and stock price of Chip Eng Seng Corperation Limited (CES).

Variable	BGPD Model	AIC	σ_1	ξ_1	σ_2	ξ_2	α	β
SGX-CES	Coles and Town	1221.309	0.43228	-0.15825	1.33590	0.01810	0.02424	22.33887

From run R-Project

The result from estimation at significant level = 80%, threshold made from R-Project are $\mu_1 = 0.4531370$ and $\mu_2 = 0.8424908$.

Coles-Town's Model

- $q = \frac{\alpha y_{CES}}{\alpha y_{CES} + \beta y_{MYX}}$ and Be (q; α,β), this is the beta distribution function evaluated at q with shape 1 = α and shape 2 = β.
- Independence is obtained as α = β as approaches 0.
- Completed dependence is obtained in the limit as α = β tends to be infinity and when one of α, β is fixed and the other approach is 0.
- Different limit occurs when one of α, β fixed and the other tends to be infinity.

From estimation of Coles and Town distribution function found that α = 0.02424 and β = 22.33887. The result means the stock price index of Singapore Exchange (SGX) and the stock price of Chip Eng Seng Corperation Limited (CES) have Bivariate Extreme relationship or complete dependence. In contrast, the relationship is not strong because α ≠ β and β tends to be infinity. **Figure 4.29** shows Coles-Town's distribution function between stock price index of Singapore Exchange (SGX) and stock price of Chip Eng Seng Corperation Limited (CES) by Bivariate Generalized Pareto Distribution (BGPD).

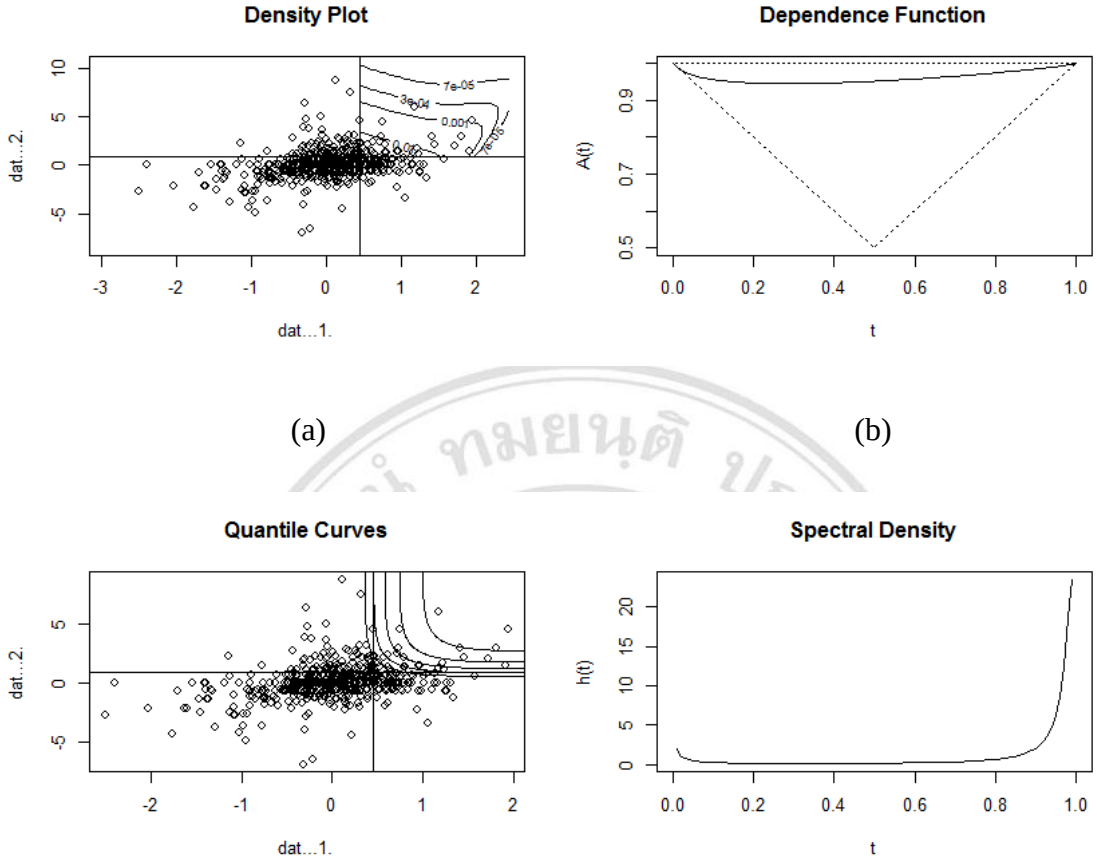


Figure 4.29: The Coles-Town's distribution function between stock price index of Singapore Exchange (SGX) and stock price of Chip Eng Seng Corperation Limited (CES) by Bivariate Generalized Pareto Distribution (BGPD).

4.9.6 Stock price index of Singapore Exchange (SGX) and stock price of Chip Eng Seng Corperation Limited (CES).

Table 4.31: Bivariate Generalized Pareto Distribution (BGPD) between stock price index of Singapore Exchange (SGX) and stock price of Low Keng Huat Limited (LKH).

Variable	BGPD Model	AIC	σ_1	ξ_1	σ_2	ξ_2	α	β
SGX-LKH	Bilogistic	1153.715	0.4413	-0.1719	0.8757	0.1185	0.1009	0.9916

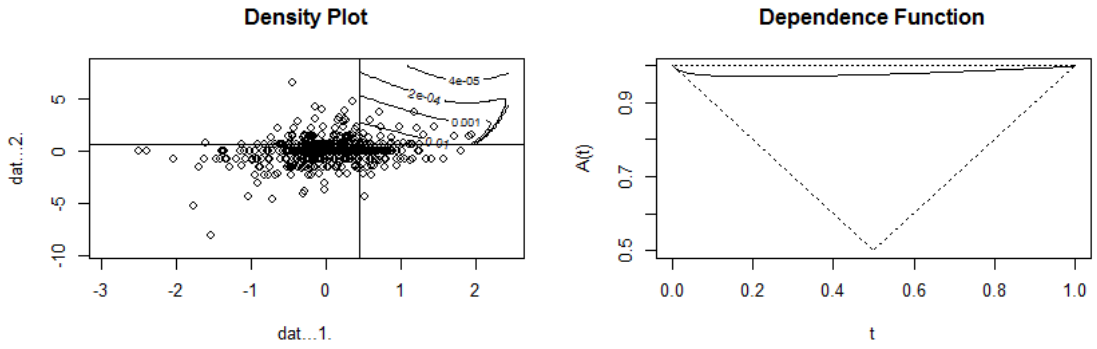
From run R-Project

The result from estimation at significant level = 80%, threshold made from R-Project are $\mu_1 = 0.4531370$ and $\mu_2 = 0.7462687$.

Bilogistic Model

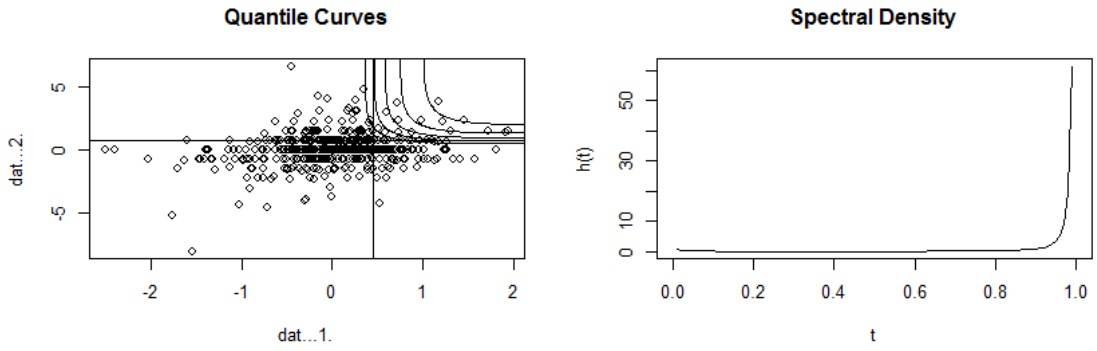
- $0 < \alpha, \beta < 1$, when $\alpha = \beta$ the bilogistic model equal to logistic model with the dependence parameter dep = $\alpha = \beta$.
- Completed dependence is obtained from the limit as $\alpha = \beta$ approaches 0.
- Independence is obtained when $\alpha = \beta$ as approaches 1and when one of α, β is fixed and the other approach 1.
- Different limit occurs when one of α, β fixed and the other approaches 0, this bilogistic model is fitted in Smith (1990), who first introduced.

From estimation of The bilogistic distribution function, it is found that $\alpha = 0.1009$ and $\beta = 0.9916$. The result means the stock price index of Singapore Exchange (SGX) and the stock price of Low Keng Huat Limited (LKH) have Bivariate Extreme relationship or complete dependence. However, the relationship is not strong because $\alpha \neq \beta$, which β tends to be infinity and α approaches 0. **Figure 4.30** shows the bilogistic distribution function between stock price index of Singapore Exchange (SGX) and stock price of Low Keng Huat Limited (LKH) by Bivariate Generalized Pareto Distribution (BGPD).



(a) (b)

Figure 4.30: The bilogistic distribution function between stock price index of Singapore Exchange (SGX) and stock price of Low Keng Huat Limited (LKH) by Bivariate Generalized Pareto Distribution (BGPD).



(c) (d)

Figure 4.30 (Continue): The bilogistic distribution function between stock price index of Singapore Exchange (SGX) and stock price of Low Keng Huat Limited (LKH) by Bivariate Generalized Pareto Distribution (BGPD).

From the results of Bivariate Generalized Pareto Distribution (BGPD) found that the best model from 9 model (Minimum AIC) of Siam Cement Public Company Limited (SCC) with Stock Exchange of Thailand (SET) is Husler and Reiss' Model (AIC = 1207.201), Siam City Cement Public Company Limited (SCCC) with Stock Exchange of Thailand (SET) is Coles-Town's Model (AIC = 1284.287), Gamuda Berhad (GAM) with Bursa Malaysia (MYX) is Husler and Reiss' Model (AIC = 1113.964), IJM Corporation Berhad with Bursa Malaysia (MYX) is Husler and Reiss's Model (AIC = 1070.489), Chip Eng Seng Corperation Limited (CES) with Singapore Exchange (SGX) is Coles-Town's Model (AIC = 1221.309), and Low Keng Huat Limited (LKH) with Singapore Exchange (SGX) is Bilogistic Model (AIC = 1153.715).