M&A Long-Term Performance in Economic Contraction

Mohd Hasimi Yaacob*
Center for Governance, Resilience & Accountability (GRACE),
Faculty of Economics and Management, Universiti Kebangsaan Malaysia
E-mail: mhasimi@ukm.edu.my

Norazlan Alias
Center for Governance, Resilience & Accountability (GRACE),
Faculty of Economics and Management, Universiti Kebangsaan Malaysia
E-mail: norazlan@ukm.edu.my

Siti Nabilah Mohd Shaari
Universiti Teknologi MARA (UiTM)
E-mail: sitin256@uitm.edu.my

* Corresponding Author

Abstract
Purpose: To study the long-term performance of companies following merger and acquisition activities during an economic contraction
Design/methodology/approach: The study examines M&As transactions over the period from 2016 to 2020, during the economic contraction. The wealth effects of companies M&As are assessed using event study frameworks, which is by using mean-adjusted return approach and Fama-French 5-factor Model.
Findings: Results from both methods show that the long-run performance is significantly and consistent shows negative cumulative average abnormal return. This findings show evidence that M&A completions are value-destroying events for acquiring companies in long-term during the during economic contraction.
Research limitations/implications: This research finding consistent with the M&A literature suggest that the long-term negative abnormal returns may be explained by a slow adjustment to the acquisition announcement.
Practical implications: M&A seem not to benefit shareholders in the long-run, because it were achieved at the expense of shareholders. This may be due to information asymmetry in exercising M&A, hance in long-run the overvaluation is corrected and stock experience significant value decline
Originality/value: New investigation on efficient market hypothesis during Malaysian economic contraction setting. Furthermore, this study investigate on stock market speed of adjustment and their stock performance when unexpected news arrives.

Keywords: Merger and acquisition, long-term performance, event studies

Introduction

From last year's (2019) GDP of 3.6%, the most recent announcement[1] by the Central Bank of Malaysia states that while the Covid-19 did, affect the nation's economy, the current outlook of future prospects looks encouraging. This is because more and more countries are beginning to ease their containment measures, allowing manufacturing and trading activities to resume. Furthermore, the nation is also anticipating the governmental stimulus packages to support the recovery period. However, the Central Bank of Malaysia remains cautious due to the possibility of re-emergence of the pandemic.

The Covid-19 pandemic affects the Malaysian economy in two ways: 1) the country is heavily dependent on the countries like China and Singapore for either manufacturing businesses or service sectors, and 2) the domestic businesses are deeply affected by the Movement Control Order (MCO) imposed by the government from 13 March 2020 until 9 June 2020. During this period, local businesses that are not considered essential are not allowed to operate. This creates a higher level of business and individual insolvency (Chia et al., 2020). In the same study, it is observed that the indices returns are not affected by the Covid-19 death, the indices return depend on the size of the company (the larger the size, the minimal is the loss) and Shariah indices suffer less loss compared to its conventional counterpart.

The tourism sector is also significantly affected by the Covid-19 pandemic, specifically in the aviation and hotel industries. There has been a large drop in the number of passengers in Malindo Airlines and Malaysia Airlines have been urging their workers to take unpaid leaves due to their dire financial situation. Similarly, in the hotel industry, 9% of total employees are forced to take pay cuts, 17% are encouraged to take unpaid leave and 4% have been laid off (Karim & Haque, 2020). As it is clear, the 2018 recession year has now continued to 2020 due to the prolonged global health crisis.

While the economic crisis affects companies' performance as a whole, it also evidently affects those in post-M&A. The merger and acquisition (M&A) generate more value for the acquirers, targets, and the combined results during the post-crisis period than pre-crisis (Cleary & Hossain, 2020). There is a higher growth of assets after an M&A deal and increases in employment and sales due to the economic crisis (Stiebale & Wößner, 2019). Thus, it is interesting to see how the performance, specifically in terms of stock market performance of post-M&A companies, in the face of the economic crisis launched by the global pandemic. In addition to that, in the context of Malaysian, very few studies tackle Malaysian companies' long-term performance, using stock market performance, in the period of economic contraction. Thus, this study contributes to the literature gap by discussing the post-M&A long-term performance when the economy is in contraction.

Problem Statement

The studies of M&A often revolve examining the performance of the companies after they have conducted M&A. The M&A performance is examined either in short-term, which is one and 2-day Cumulative Abnormal Return (CAR) after the announcement of the M&A (Cleary & Hossain, 2020) and 1 to 20-day CARs after the announcement (Tampakoudis et al., 2019). For long-term window, Cleary and Hossain (2020) and Rao-Nicholson et al. (2016) use 3-year performance following the M&A. Some studies (Cleary & Hossain, 2020; Stiebale & Wößner, 2019; Tampakoudis et al., 2019) finds negative post-merger performance. Whereas, Rao-Nicholson et al. (2016) and Khong et al. (2015) find that M&A that are completed during the

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[1] The announcement is taken on 10 September 2020, titled "Monetary Policy Statement", retrieved from https://www.bnm.gov.my/index.php?ch=en_press&pg=en_press&ac=5110

financial crisis are more profitable than those implemented before and/or after the crisis. It is interesting to note that their study focused explicitly on ASEAN countries where the other studies use the US and Greece samples. Thus, the results yielded are mixed in recent studies.
In addition to that, it is observed that most M&A studies relate the performance with the economic crisis. Studies by Stournaras, (2019) and Tampakoudis et al. (2019) focus primarily on the case of banking merger in Greece because its recession was prolonged one, unlike any other economic contraction. Both studies found that the banks experienced diminishing value after M&A. This suggests the importance of taking economic crisis into consideration. This is significantly more prominent with the unprecedented, and prolonged global economic contraction arose from the Covid-19 pandemic. The recent studies on M&A in Malaysia focus on short-term stock market performance (Rahim & Pok, 2013), focus on banks (Chong et al., 2006; Khong et al., 2015) and long-term performance without economic contraction (Siew Peng & Isa, 2012). The studies on long-term, post-M&A, using stock market performance during economic contraction using Malaysian sample are scarce to the authors' knowledge. Therefore, the study's objective is to examine the performance of companies following M&A during economic contraction/crisis.

Literature Review
There are many reasons for companies to conduct M&A process. According to Martynova and Renneboog (2008), takeovers usually occur in periods of economic recoveries, such as a following from market crash or economic depression. The M&A waves also often coincide with rapid credit expansion, leading to the rise of external capital markets accompanied by stock market booms. In addition to that, the waves are also fuelled by regulatory changes, driven by industrial and technological shocks. The authors also show that managers' personal objectives can influence the activity, where managerial hubris and herding behaviour increase during takeover waves. Finally, takeover activity is usually affected by a sharp decline in stock markets and a subsequent period of economic recession.
Agrawal and Gershon (1992) observe the inconclusive results of previous studies concerning the post-M&A performance. While the first glance suggests that long-term performance following M&A experiences a loss of wealth, the authors also point out other earlier studies that found insignificant underperformance. These mixed empirical results motivate the authors to conduct their study by controlling for company size and beta risk, which were not done by the previous studies. They have found that acquirer companies did suffer the loss of wealth within five years after the M&A have completed. The negative long-term performance is found in a persistent manner in the subsequent papers (Asimakopoulos & Athanasoglou, 2013; Reddy et al., 2019; Stournaras, 2019)
Recent literature on companies restructuring has begun focusing on the effect of companies restructuring pre, during and post-crisis. In most studies, they focus on M&A as the most common type of structuring and its impact around the period of which crisis occurs. The goal of companies conducting M&A is to obtain synergistic gains. In the most recent study by Cleary and Hossain (2020), they study the effect of M&A on the acquiring and targets by comparing both the short-term and long-term stock market return performances pre-crisis and post-crisis. They aim to investigate whether the value arises from M&A is improved or deteriorated after a crisis occurs. They identify the crisis period as of March 2007 until January 2009, whereas the pre-crisis period is since May 2003 and the post-crisis period is until December 2012. Their study results are that the M&A are more value-enhancing during the post-crisis period for acquirers, targets, and the combined results compared to pre-crisis. They also conclude that companies that are not financially constrained have easier access to

financing even during crisis and targets are more receptive to acquisition during the post-crisis period if they are financially constrained.

In an almost similar study, Stiebale and Wößner (2019) also study the impact of the acquisition on the target companies' financial constraint, growth, and investment and how economic crisis influences their acquisition. By analysing 700 M&A deals amongst European companies for the period that spans from 2003 to 2012, they have found M&A reduces financing constraints and encourage growth in target firms. They also find that acquisition targets hold less cash but increase leverage, suggesting that they obtain better access to capital markets and are less in need of liquid assets for precautionary reasons. Due to financial crises, there is a higher growth of assets after a deal and increases in employment and sales.

A study by Shen et al. (2020) uses banks as their sample of research. Their objective is to conclude whether the banks gain more significant synergistic benefits from the M&A process during the banking crisis or non-banking periods. They hypothesise that 1) the acquirer's (those who engage in M&A) accounting performance will outperform of those non-acquirers during the crisis, especially when the targets are weak; 2) the synergistic gain obtained by the acquirer is most prominent in developed countries as opposed to developing countries and 3) the acquirers will earn more significant synergistic gain if the M&A is conducted locally as opposed to internationally. Their results corroborate their hypotheses.

Stournaras, (2019) and Tampakoudis et al. (2019) also uses banks as their samples. Still, they focus on Greece's representative due to its unique situation as the country is experiencing prolonged economic contraction. Unlike Shen et al. (2020), both studies have found that M&A does not add value to either the acquirer or the target companies. In fact, the M&A is diminishing the shareholders' wealth. Perhaps due to the prolonged economic crisis, it negates any possible synergistic gain that the companies should have attained.

Recent studies of M&A in Malaysia focuses mainly on banks mergers as well. Chong et al. (2006) study the effect of forced M&A by the Malaysian government in 1999 following the 1997's Asian financial crisis. The study shows that the forced merger scheme has a significant and negative impact on the target banks' stock returns, but a significant and positive effect on the acquirers' stock returns. It shows that the overall value of the Malaysian forced bank merger scheme is significantly negative. Khong et al. (2015) corroborate the findings when they study the long-term accounting performance (2002 to 2010) of banks merged due to Central Bank of Malaysia's mandate during the same financial crisis. The study finds no significant improvement of accounting performance even after the M&A take place. Another study on long-term performance following M&A finds negative

Michael Spence (1972) follow the idea of Akerlof (1970)'s Information Asymmetry Theory by introducing the concept of Market Signalling Theory. In this theory, even though information asymmetry exists, the price of goods can still be determined by the signals or indicators (as coined by Akerlof later) provided by the sellers regarding its quality and usefulness. Rahim and Pok (2013) find a positive, significant value creation following the M&A event, and the finding supports market signalling theory. However, the study is only for short-term stock market performance. Since we focus more on long-term performance, we follow Chong et al. (2006), Siew Peng and Isa (2012), and Khong et al. (2015) and the hypothesis is proposed as follow:

- H1: There is a significant negative abnormal return in long-term, post-merger and acquisition using mean-adjusted return approach
- H2: There is a significant negative abnormal return in long-term, post-merger and acquisition using Fama-French 5-factor Model

Methodology

Sample selected

The data were obtained from Thomson Reuter Datastream database, and they consisted of the sample that announced the M&A activity from 1 January 2016 until 31 August 2020. The companies selected are from companies listed in Bursa Malaysia, Kuala Lumpur, and their Malaysia headquarters. The event date is identified as the date of the M&A announcement. In order for the data to be qualified, the data selected must have a set of completed data of monthly stock prices of 36 months prior the event date, and all deal must have merger value more than RM1 million.

From the period selected, there is a total of 1,180 M&A activities. However, after deducting government-based, joint venture, private companies and individual companies, and excluding samples with missing values, the final number of samples chosen is 226 companies. Below is a summary of the sample selection process.

Table 1 : Sample selection

	Mean-adjusted return	Fama 5-Factor Model
Malaysian Sample	1180	1180
(-) Private, Joint Venture, Investors and Government	(424)	(424)
(-) Unlisted companies	(351)	(351)
(-) Deal Value more than RM1,000,000	(93)	(93)
(-) Missing Value and Delisted Companies	(86)	(126)
	226	186

Figure 1 depicts the trendline of the number of M&A activities that have been announced by the companies for the last five years. While there was a slight increase in number in M&A activities from 2016 to 2017, the market sees a steady decline in the chart from 2018 to August 2020. Since 2018 is a year of crisis, this observation agrees with Martynova and Renneboog, (2008), which observes that takeover activity is usually affected by a sharp decline in stock markets and a subsequent period of economic recession. In addition to that, Cleary and Hossain (2020) also observe a declining number of M&A activities following the crisis. Using 2009 as their crisis year, they report a noticeable decline in the number of deals in the post-crisis period from 2,291 in the pre-crisis period to 1,290, approximately half as many M&A activities. Similarly, we also see the number of mergers and activities is reduced by half from 2017 to 2018 due to the crisis in 2018. The trend continues until August 2020, where only 15 M&A activities are reported. This observation also agrees with the M&A waves shown by Rahim and Pok (2013), where the authors find the first wave occurred between 1988 and 1992 during an economic uptrend. The second wave is from 1993 to 1997 before the Asian economic crash in 1997 before restarting back in 2001 as the third wave. The increment in the number of merger and acquisition activities is due to economic growth in Malaysia. The third wave ended in 2008 at the inception of a global financial crisis. Following their study, Figure 1 shows that the fourth wave ended in 2018, and it seems to prolong to 2020 due to global pandemic.

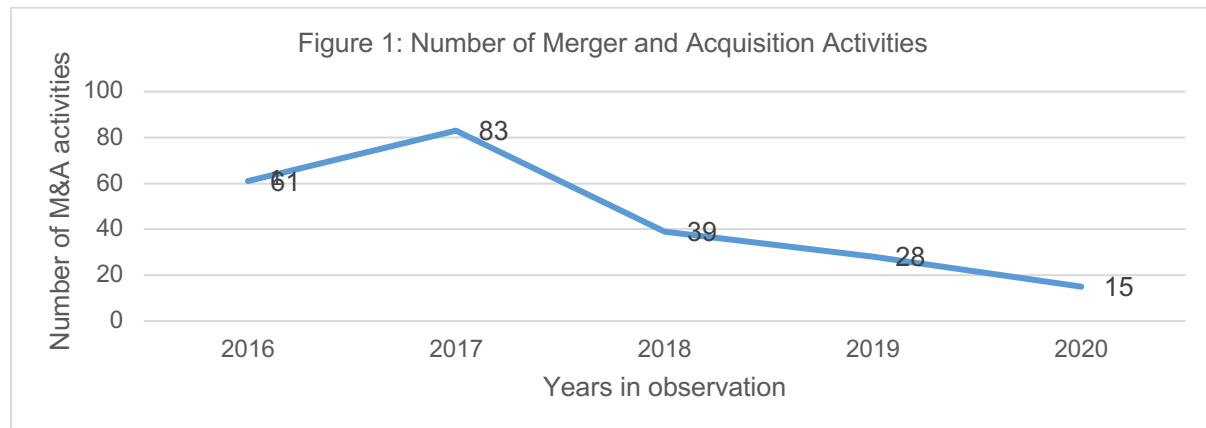Figure 1: Number of Merger and Acquisition Activities

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Table 1: Descriptive summary

	Positive Return	Negative Return	Total
Mean-adjusted approach			
Average Abnormal Return	49.12%	50.88%	100%
Observation (N)	111	115	226
t-stat	-0.907		
p-value (two-tailed)	0.365		
Cumulative Average Abnormal Return	22.12%	78.88%	100%
Observation (N)	50	176	226
t-stat	5.507		
p-value (two-tailed)	0.000***		
Fama-French 5-factor Model			
Average Abnormal Return	46.24%	53.76%	100%
Observation (N)	86	100	186
t-stat	-1.062		
p-value (two-tailed)	0.290		
Cumulative Average Abnormal Return	40.32%	59.68%	100%
Observation (N)	75	111	186
t-stat	0.718		
p-value (two-tailed)	0.474		

*, ** and *** indicate the level of significance of 10%, 5% and 1% respectively.

Table 1 summarises companies' long-run performance following M&A activities for each company on the event date (t=0). The average abnormal return results refer to the abnormal return for each company on the event date (T=0), whereas the cumulative average abnormal return refers to the cumulative abnormal return for each company from T=0 until T=36

The average abnormal return (AAR) figures show that companies have a balanced proportion between companies with positive abnormal returns and companies with a negative abnormal return. However, when we look into a long-run performance of M&A activities by using cumulative average abnormal return, the number of companies experience negative abnormal return (78.88%) is much higher than companies with positive abnormal return (22.12%). The long-run negative performance of companies after M&A is a well-documented observation in previous literature (Andre et al., 2011; Siew Peng & Isa, 2012; Tampakoudis et al., 2019). Furthermore, the t-test of the CAAR for each company shows that the abnormal return is more significant (at 1%) in long-run as compared to the short-term abnormal return.

However, when the Fama-French 5-factor model is used, the pattern still holds, but the model loses the long-run performance significant result. Furthermore, the number of companies suffering from negative performance is also increased only slightly, unlike when the mean-adjusted approach is used. The percentage of companies experiencing negative abnormal return increases only from 53.75% to 59.68% in the long-run. The effect of negative abnormal return on the Fama-French 5 Factor model is not as severe as when the mean-adjusted approach is applied.

Event Studies Methodology

This study uses stock market performance to assess post-M&A performance. Abnormal return is then calculated using the returns. There are two approaches used in determining the abnormal returns for robustness purposes. The first approach is the mean-adjusted return approach, and the second one is the Fama-French 5-factor model.

Mean-adjusted return approach

This method is widely used in determining the performance of companies in any event studies. It is used in assessing both short-term performances as well as long-term performance. The mean-adjusted approach is a more simplistic way of determining the abnormal return, and this approach is also widely used in the literature. The mean-adjusted returns model is consistent with the Capital Asset Pricing Model that assumes that security has constant systematic risk. The efficient frontier is stationary, and the Asset Pricing Model also predicts that a security's expected return is constant (Brown & Warner, 1980).

Reddy et al. (2019) use this method to investigate post-M&A performance for companies in China and India. The study uses 61 months before the event date (T= - 61) to determine the expected return, and the post-M&A assessed is 12 months after the event date (T = +12). Another relatively recent study is from Tarabay and Hammoud (2017), in which the study also focuses on the post-M&A performance for companies in Kuwait stock market. The estimation period for the parameter to determine the expected return is 20 months before the event date and the test period is 20 months after the event date (T = -20 to +20).

Studies by Olowe (2008), which the parameter used is 12 months before the event date until 12 months after (T = -12 to +12); Lambertides (2009) that assesses short-term performance (T= -350 days to +350 days); and Delaney and Wamuziri (2004) that also studies short-term performance (T= -240 days to +20 days). An obvious advantage of CARs over BHARs and calendar time returns is that it is easy to investigate sub-periods and the total event period. (Knif et al., 2013)

To determine the average abnormal return and cumulative abnormal return for each of the monthly event ($t_{i,n}$), we conduct the step-by-step calculations as follows.

1) Based on the companies' monthly stock prices that we have retrieved from the Thomson Reuter Database, they are used to obtain monthly stock returns. The return for each company is calculated as such:

$$R_{i,t} = \frac{(P_{t=1} - P_{t=-1})}{P_{t=-1}}$$

2) The sample consists of companies that have stock return data for Month -36 until Month 0. The 36-month period prior to event month (T=-36 until T=0) is the estimation period for parameters of the mean-adjusted model used in determining expected return (ER), and thus, used to determine abnormal returns.

$$ER = \frac{1}{N}\sum_{i=1}^{N} R_{t,i}$$

3) Abnormal return (AR) is calculated by determining the difference between the return on the event date (T=0) with the expected return calculated previously. Then, abnormal return is also determined for up to 36 months, beginning in the event month (T=0 until T=+36). This is known as the test period. However, if the company's announcement date for M&A doesn't qualify it to have the 36-month post-event data availability, the abnormal return is estimated for as many months as data are available (Kothari & Warner, 1997).

$$AR_{t,i} = R_{t,i} - ER$$

4) From abnormal return (AR), the average abnormal return (AAR) for each month post-event is calculated. This aggregates the abnormal returns for all stocks to find the average abnormal return at each month so that any abnormality arises from an individual company can be eliminated.

$$AAR = \frac{1}{N}\sum_{i=1}^{N} AR_{t,i}$$

5) Then, the cumulative average abnormal return (CAAR) is the sum of the average abnormal return (AAR) for each month. Brown and Warner (1980) show that compounding daily or monthly AR can create bias in the results. Thus, another comparable return that is CAAR$_t$, is used to summarise the average price percentage changes over the period (Agrawal & Gershon, 1992) and AAR$_t$

$$CAAR = \sum_{t=1}^{T} AAR_t$$

Table 2 shows the breakdown of positive and negative long-run performance (AAR and CAAR) for each month post-event date.

Table 2: T-test analysis using the mean-adjusted approach

t	Average Abnormal Return			Cumulative Average Abnormal Return			N
	Mean	t-stat	p-value	Mean	t-stat	p-value	
0	1.39%	0.907	0.365	1.39%	0.907	0.365	226
1	-0.32%	-0.379	0.705	0.92%	0.548	0.584	226
2	1.38%	0.944	0.346	2.38%	1.095	0.274	225
3	-1.44%	-1.674	0.096*	1.07%	0.448	0.654	222
4	0.66%	0.757	0.450	1.71%	0.677	0.499	220
5	-1.06%	-1.171	0.243	0.06%	0.022	0.982	217
6	-0.65%	-0.511	0.610	-0.96%	-0.331	0.741	216
7	-0.64%	-0.592	0.554	-2.91%	-0.899	0.369	213
8	-1.31%	-1.907	0.058*	-4.15%	-1.155	0.249	211
9	-1.29%	-1.318	0.189	-5.51%	-1.362	0.174	211
10	-1.45%	-1.705	0.090*	-7.04%	-1.651	0.099*	209
11	-1.86%	-2.234	0.027**	-11.00%	-2.966	0.003***	207

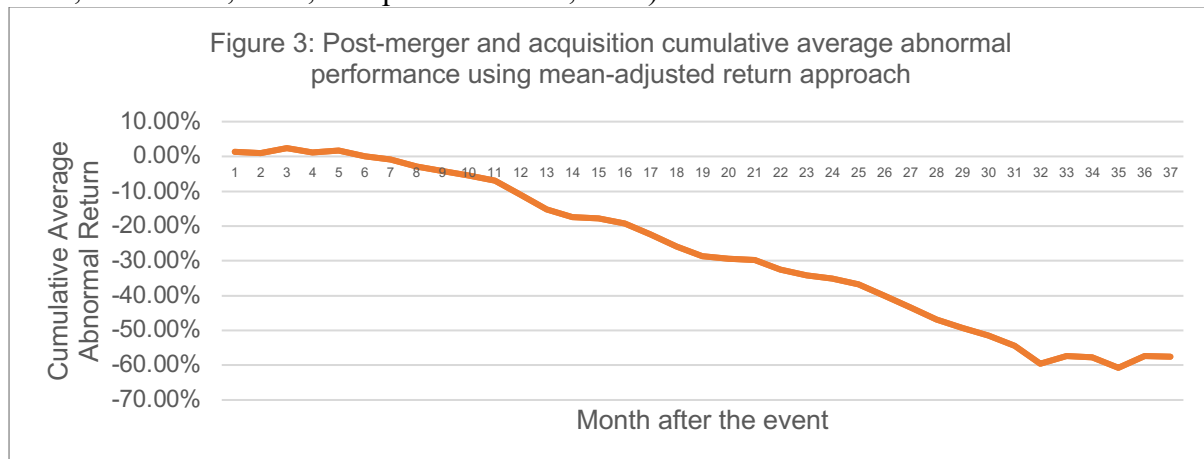|							
12	-1.76%	-1.736	0.084*	-15.28%	-4.878	0.000***	204
13	-1.48%	-2.119	0.035**	-17.41%	-5.396	0.000***	203
14	-0.54%	-0.386	0.700	-17.89%	-5.114	0.000***	203
15	-1.33%	-1.782	0.076*	-19.19%	-5.493	0.000***	203
16	-3.36%	-2.583	0.010***	-22.34%	-5.603	0.000***	202
17	-3.61%	-3.294	0.001***	-25.91%	-6.397	0.000***	199
18	-1.38%	-1.339	0.182	-28.65%	-7.626	0.000***	197
19	-0.24%	-0.252	0.801	-29.34%	-7.532	0.000***	195
20	-0.54%	-0.355	0.723	-29.76%	-7.206	0.000***	195
21	-2.79%	-2.623	0.009***	-32.46%	-8.003	0.000***	195
22	-1.84%	-1.803	0.073*	-34.24%	-8.127	0.000***	195
23	-1.38%	-1.399	0.164	-35.17%	-7.837	0.000***	183
24	-2.33%	-2.173	0.031**	-36.69%	-7.827	0.000***	178
25	-2.80%	-2.707	0.007***	-40.15%	-8.098	0.000***	171
26	-2.29%	-1.801	0.074*	-43.35%	-8.559	0.000***	165
27	-2.79%	-2.016	0.045**	-46.97%	-9.172	0.000***	161
28	-1.47%	-0.941	0.348	-49.33%	-9.578	0.000***	157
29	-1.89%	-1.471	0.143	-51.50%	-9.827	0.000***	156
30	-1.82%	-1.421	0.157	-54.34%	-9.927	0.000***	151
31	-5.66%	-3.716	0.000***	-59.67%	-10.151	0.000***	150
32	2.76%	1.213	0.227	-57.39%	-9.642	0.000***	147
33	-0.30%	-0.122	0.903	-57.72%	-9.322	0.000***	144
34	1.05%	0.534	0.594	-60.75%	-9.983	0.000***	136
35	3.57%	1.747	0.083*	-57.37%	-8.816	0.000***	132
36	-0.09%	-0.030	0.976	-57.57%	-7.891	0.000***	128

*, ** and *** indicate the level of significance of 10%, 5% and 1% respectively.

The event window for long-term performance is 36 months after the event. If the company doesn't have the 36-month post-event data availability, the abnormal return is estimated for as many months as data are available.

The first column illustrates the t-test analysis of monthly average abnormal return (AAR) for the companies in T=1 until T=36, relative the expected return calculated. The t-statistic and p-value are also presented accordingly. The result shows significant, negative average abnormal returns on T=3, T=8, T=12, T=15, T=22, T = 26 and T=36 at 10%. The negative average abnormal returns are found on T=11, T=13, T=24 and T=27 at a 5% significant level and significant at 1% on T=16, T=17, T=21, T=25 and T=31. Even though the results do not consistently yield significant levels, the average abnormal return is consistently negative, starting on the fifth month after the M&A take place. Before the fifth month, the M&A activities yield gain from the positive abnormal return, albeit it is not significant. Figure 2 show the graphical representation of the movements of average abnormal returns for the 36-month event window.

Figure 2: Post-merger and acquisition average abnormal performance using mean-adjusted return approach
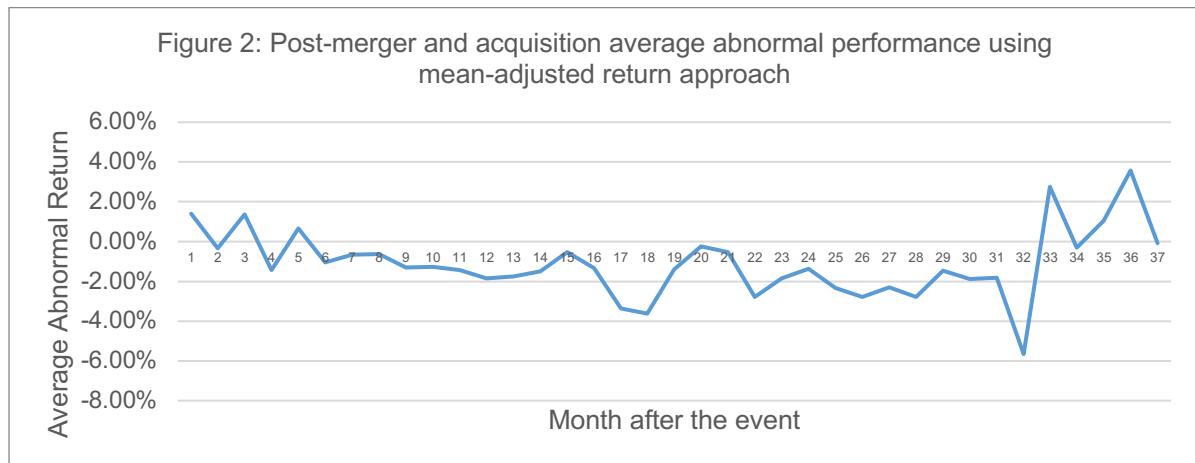
The second column shows the t-test analysis of the monthly cumulative average abnormal return (CAAR) for companies 36 months after the event date. The mean column indicates that the companies enjoy a positive abnormal return for five months after the event date; however, the results are not significant. The companies start suffering from negative cumulative average abnormal return on the sixth month. The result begins to show its significance on T=10, which is significant at 10% and then proceeds to have a significant negative cumulative average abnormal return on T=11 until T=36. This result corroborates with empirical results from past researchers (Agrawal & Gershon, 1992; Chong et al., 2006; Lee & Isa, 2012; Reddy et al., 2019; Stournaras, 2019; Tampakoudis et al., 2019).

Figure 3: Post-merger and acquisition cumulative average abnormal performance using mean-adjusted return approach

The negative long-term performance is mostly due to the market's perception that the cost of integrating acquirer and target companies are higher than the synergistic gains (Lee & Isa, 2012). Furthermore, since the study includes the period of economic distress (2018 – 2020), the results also corroborate with Stournaras (2019) and Tampakoudis et al.(2019), which also find negative post-M&A performance. The argument is that due to the prolonged economic crisis, the situation negates any possible synergistic gains that the companies should have attained from the M&A. Figure 3 shows the graphical representation of the movements of cumulative average abnormal returns for the 36-month event window.

Fama-French 5-factor Model

This method is introduced by Fama & French (2015) corrected the inadequacies of the Sharpe-Lintner CAPM by introducing an expanded form of the CAPM. Integrating profit factor (RMW) and investment factor (CMA) into the original three-factor model of Size (market capitalisation) and book-to-market equity ratio (B/M), and finally formed the five-factor model:

$$R_{it} - R_{Ft} = a_i + b_i(R_{Mt} - R_{Ft}) + s_i SMB_t + h_i HML_t + r_i RMW_t + c_i CMA_t + e_{it}$$

In the formula, R_{it} is the rate of return of portfolio I in the T period, while R_{Ft} represents a risk-free interest rate. The market factor $R_{Mt} - R_{Ft}$ is calculated by subtracting the risk-free interest rate (R_{Mt}) from the market value-weighted average market rate of return reflecting market risk premium. SMB_t represents market value factor, calculated by the difference between small market value and large market value stock returns. The book-to-market ratio factor (HML_t) is the difference between the high book-to-market return rate and the stock portfolio's low book-to-market ratio. RMW_t is a profitability factor, which is equal in value to the difference between a stock portfolio's return with a high operating profit margin and low operating profit margin. The investment style factor (CMA_t) refers to the stock portfolio, which is grouped according to the conservative and radical investment style. This factor is equal to the difference in the return of the two portfolio types. Consistent with the methods adopted by Fama and French (2015), this paper tests the data by 2x2x2x2 classification method. First, all stocks divide into two groups (2x2 grouping): small market value (S) and large market value (B) according to the median of stock market value. Second, all quartile stocks are grouped according to the book-to-market value ratio and divided into two groups: high (H) group and low (L) group. Then, the process continues by replacing the book-to-market ratio with operating profit margin and investment style. The above steps are repeated. The operating profit margin is stable (M); the profit margin is weak (W) conservative investment style and aggressive investment style. Thus on this basis of the 2x2 method, 16 stock portfolios are obtained by crossing four indexes at the same time.

Table 3 shows the breakdown of positive and negative long-run performance (AAR and CAAR) for each month post-event date.

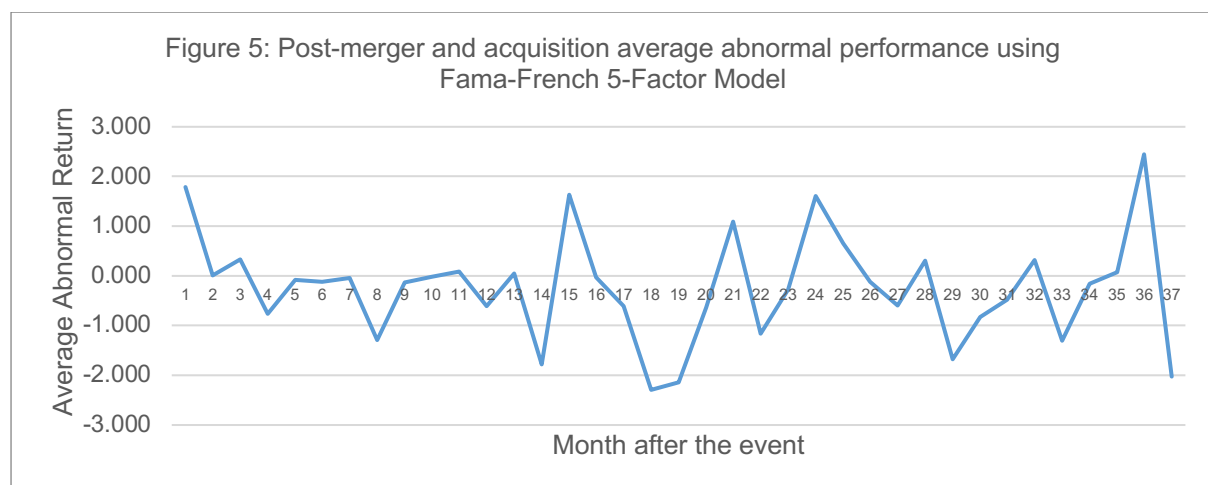Table 3: T-test analysis using the Fama-French 5-factor Model

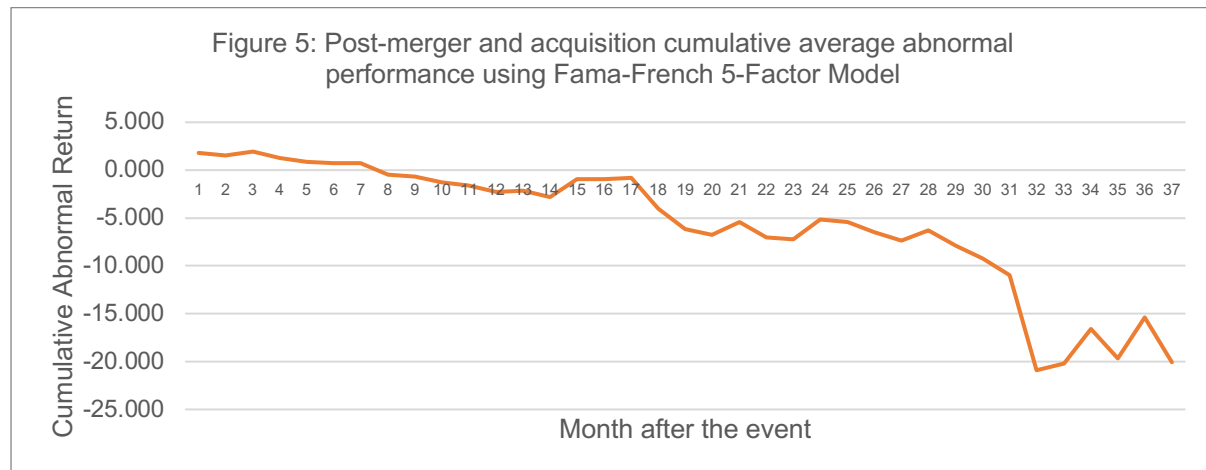| t	Average Abnormal Return			Cumulative Average Abnormal Return			N
	Mean	t-stat	p-value	Mean	t-stat	p-value	
0	1.788	1.062	0.290	1.788	1.062	0.290	186
1	0.006	0.007	0.995	1.558	0.836	0.404	184
2	0.331	0.329	0.742	1.940	0.946	0.345	183
3	-0.762	-0.901	0.369	1.255	0.580	0.563	180
4	-0.082	-0.094	0.925	0.878	0.371	0.711	179
5	-0.117	-0.133	0.894	0.762	0.298	0.766	179
6	-0.046	-0.049	0.961	0.716	0.271	0.787	179
7	-1.290	-1.830	0.069*	-0.502	-0.178	0.859	178
8	-0.133	-0.192	0.848	-0.653	-0.226	0.821	175
9	-0.011	-0.011	0.991	-1.262	-0.406	0.685	173
10	0.086	0.111	0.912	-1.639	-0.508	0.612	171
11	-0.613	-0.729	0.467	-2.252	-0.665	0.507	171
12	0.046	0.048	0.962	-2.149	-0.607	0.544	170
13	-1.783	-2.436	0.016**	-2.802	-0.750	0.454	165
14	1.636	0.979	0.329	-0.941	-0.217	0.828	159
15	-0.023	-0.027	0.979	-0.946	-0.209	0.835	155
16	-0.614	-0.762	0.447	-0.792	-0.165	0.869	151
17	-2.293	-2.932	0.004***	-4.000	-0.785	0.434	147
18	-2.142	-2.959	0.004***	-6.142	-1.200	0.232	147

19	-0.638	-0.687	0.493	-6.780	-1.271	0.206	147
20	1.087	0.732	0.465	-5.427	-0.969	0.334	146
21	-1.163	-1.171	0.244	-7.051	-1.212	0.228	141
22	-0.278	-0.267	0.790	-7.221	-1.178	0.241	140
23	1.608	1.414	0.160	-5.178	-0.816	0.416	137
24	0.651	0.652	0.516	-5.438	-0.843	0.401	134
25	-0.118	-0.118	0.906	-6.517	-0.916	0.361	126
26	-0.596	-0.554	0.581	-7.333	-0.971	0.333	122
27	0.307	0.249	0.804	-6.264	-0.778	0.438	118
28	-1.673	-1.485	0.140	-7.884	-0.930	0.354	115
29	-0.828	-0.718	0.474	-9.224	-0.995	0.322	102
30	-0.478	-0.515	0.608	-10.973	-1.119	0.266	96
31	0.314	0.314	0.754	-20.906	-2.465	0.016**	89
32	-1.306	-1.143	0.257	-20.213	-2.251	0.027**	80
33	-0.160	-0.096	0.923	-16.565	-1.811	0.074*	77
34	0.080	0.046	0.964	-19.689	-2.198	0.031**	72
35	2.446	0.929	0.357	-15.365	-1.410	0.163	65
36	-2.028	-1.165	0.249	-20.067	-1.620	0.111	59

*, ** and *** indicate the level of significance of 10%, 5% and 1% respectively.

The event window for long-term performance is 36 months after the event. If the company doesn't have the 36-month post-event data availability, the abnormal return is estimated for as many months as data are available.

From the results in Table 3, the t-test analysis of monthly average abnormal return (AAR) and cumulative abnormal return (CAAR) relative to the expected return calculated using the Fama-French 5-factor Model. For the first column of average abnormal return. The abnormal return is significant at 1% level on T=17 and T= 18, and 5% level on T=13, whereas on T=7, the abnormal return is significant at the 10% level. Furthermore, all of the significant results show negative abnormal return. Unlike the mean-adjusted return approach, this approach weakens the effect of the long-run performance. The significant negative cumulative abnormal returns start at T=31 until T=34, when after that, the negative cumulative abnormal returns steadies once again. The graphical illustration is shown in Figure 4 and 5.

Figure 5: Post-merger and acquisition average abnormal performance using Fama-French 5-Factor Model

Figure 5: Post-merger and acquisition cumulative average abnormal performance using Fama-French 5-Factor Model

As mentioned previously, the patterns of both approaches coincide with each other. But we can state clearly that the graphical illustration for FF5F Model is not as dramatic as mean-adjusted return approach. But we still see that the in long-run the companies' performance suffers after conducting M&A activities. The synergy that companies are supposed to enjoy following the M&A cannot assist them during economic contraction. The insignificant long-run negative performance is also found by (Cleary & Hossain, 2020).

Conclusion

This paper aims to study the long-term performance of companies following M&A activities during an economic contraction. Following Chong et al. (2006), Siew Peng and Isa (2012), and Khong et al. (2015), we propose that using either of the approaches, there should be a significant negative abnormal return in long-term, post-M&A using mean-adjusted return approach and Fama-French 5-factor Model. The results show that the long-run performance is significantly and consistent using the mean-adjusted return approach, which offers a negative cumulative average abnormal return. On the other hand, while the Fama-French 5-Factor model conforms with the negative cumulative average abnormal return pattern, the result is not significant until later in the window even compared to mean-adjusted return approach. Based on the two tests this study adopts, it is concluded that following M&A activity, the companies experience negative long-run abnormal return. This result conforms with the previous studies (Agrawal & Gershon, 1992; Siew Peng & Isa, 2012; Stournaras, 2019; Tampakoudis et al., 2019).

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