

CHAPTER IV: RESULTS

4.1 Introduction

This chapter analyzes the results obtained from the objectives stated in Chapter 1. The first objective is to compute the claim ratio, amount of RBC, and the components of VAIC value of the fifteen takaful operators involved in this study. The second and third objectives are to compare the performance of those operators and the relationship between the three approaches with ROA and ROE using regression analysis. The results will be categorized according to each fund operated by takaful operators.

4.2 Descriptive Analysis

Table 4.1: Descriptive Statistics of Family Takaful

Company		ROA	ROE	CR	VAIC	RBC	Company		ROA	ROE	CR	VAIC	RBC
AIA	Mean	-0.0061	-0.0172	0.6703	1.9045	0.4304	Prudential BSN	Mean	0.0789	0.1446	0.1391	8.9835	0.6117
	Std. Dev	0.0342	0.0740	0.0434	3.6283	0.2093		Std. Dev	0.0359	0.0615	0.0161	4.4322	0.4534
	Min	-0.0665	-0.1243	0.6293	-1.1447	8.0614		Min	0.0258	0.0503	0.2928	4.1861	0.1200
	Max	0.0501	0.0714	0.7401	8.0614	0.6876		Max	0.1110	0.2014	0.3326	14.7487	1.0262
AmMetLife	Mean	-0.1698	-0.2676	0.7439	0.9794	0.7558	Sun Life	Mean	0.0458	0.1870	0.6053	5.1860	1.2491
	Std. Dev	0.0610	0.1106	0.0740	0.3408	0.3052		Std. Dev	0.0106	0.0300	0.1472	0.6427	0.2190
	Min	-0.2353	-0.4221	0.6250	0.6502	0.4532		Min	0.0309	0.1445	0.4914	4.2177	0.8793
	Max	-0.1062	-0.1645	-0.8278	1.3748	1.1535		Max	0.0587	0.2216	0.8471	5.8064	1.4282
Etika	Mean	0.0849	0.1282	0.8438	20.7250	3.2930	STMKB	Mean	0.1780	0.2592	0.5575	2.1271	1.6890
	Std. Dev	0.0240	0.0385	0.1561	4.0070	1.1348		Std. Dev	0.0206	0.0291	0.0987	1.5401	1.7249
	Min	0.0599	0.0928	0.7026	16.1531	2.1472		Min	0.1564	0.2325	0.4165	0.9253	1.3198
	Max	0.1241	0.1928	1.0870	26.5394	4.8275		Max	0.2060	0.2920	0.6612	4.6910	1.8397
FWD	Mean	0.0001	0.0303	0.7686	4.0449	3.4659	Takaful Ikhlas	Mean	0.0137	0.0154	0.8961	1.7522	0.2950
	Std. Dev	0.0901	0.0993	0.2661	5.7664	0.4765		Std. Dev	0.0673	0.0902	0.1615	1.7377	0.0762
	Min	-0.1560	-0.1305	0.5681	1.2210	2.9761		Min	-0.0861	-0.1198	0.7069	-0.5288	0.2119
	Max	0.0687	0.1272	1.2330	14.3487	3.9749		Max	0.0807	0.1050	1.1186	3.8119	0.3962
Great Eastern	Mean	-0.0841	-0.1602	0.5172	1.1274	0.3223	Zurich Takaful	Mean	-0.0424	-0.0667	0.6048	-1.4738	4.4261
	Std. Dev	0.0690	0.1416	0.1045	0.3757	0.1440		Std. Dev	0.0496	0.0837	0.0927	3.6457	2.7139
	Min	-0.1701	0.3463	0.4408	0.6462	0.0853		Min	-0.1015	-0.1873	0.5177	-7.6305	1.3267
	Max	0.0189	0.0512	0.6999	1.5823	0.4547		Max	0.0114	0.0168	0.7309	1.9221	8.6618
Hong Leong MSIG	Mean	0.0040	0.0057	0.7689	0.6027	1.1544							
	Std. Dev	0.0502	0.0657	0.0499	0.8892	0.3226							
	Min	-0.0714	-0.0918	0.6938	-0.2453	0.8021							
	Max	0.0690	0.0925	0.8524	1.7665	1.6291							

Table 4.1 shows the descriptive analysis on both dependent and independent variables towards family takaful funds from 2015 until 2019. The dependent variables are ROA and ROE, whereby the remaining are independent variables. The mean value for both dependent and independent variables for AIA are -0.0061, -0.0172, 0.6703, 1.9045 and 0.4304 accordingly with standard deviation about 0.0342, 0.0740, 0.0434, 3.6283 and 0.2093. On behalf of AmMet Life, the average ROA and ROE are -0.1698 and -0.2676, with standard deviations of 0.0610 and 0.1106. the average CR is 0.7439, which implies that 74.39% of the company's financial performance was influenced by the claim ratio, with a standard deviation of 0.0740. The mean and standard deviation of VAIC and RBC are 0.9794, 0.3408, 0.7558, and 0.3052, respectively. ROA and ROE have mean values of 0.0849 and 0.1282 during this 5-year period for Etiqa. Accordingly, CR's average and standard deviation, 0.8438 and 0.1561, indicated that Etiqa depends on CR approximately 15.61% of its financial performance. Likewise, the mean of VAIC is about 20.7250, indicating that the financial performance of this company was affected by intellectual capital throughout those study periods. Also, the average and standard deviation for RBC are 3.2930 and 1.1348 accordingly.

The mean value for both dependent and independent variables for FWD is -0.0001, 0.0303, 0.7686, 4.0449, and 3.4659 accordingly, with a standard deviation of about 0.0901, 0.0993, 0.2661, 5.7664, and 0.4765. As for Great Eastern, the average ROA and ROE are -0.0841 and -0.1602, with standard deviations of 0.0690 and 0.1416. The average CR, which is 0.5172, implied that 51.72% of the company's financial performance was influenced by the claim ratio, with a standard deviation of 0.1045. The mean and standard deviation of VAIC and RBC are 1.1274, 0.3757, 0.3223, and 0.1440, respectively. ROA and ROE have mean values of 0.0040 and 0.0057 during this 5-year

period for Hong Leong MSIG. The average and standard deviation of CR, 0.7689 and 0.0499 accordingly, indicated that Hong Leong MSIG depends on CR approximately 76.89% of its financial performance. Likewise, the mean of VAIC, which is about 0.6027, indicates that this company's financial performance was affected by intellectual capital throughout those study periods. Also, the average and standard deviation for RBC are 1.1544 and 0.3226 accordingly.

The mean value for both dependent and independent variables for Prudential BSN are 0.0789, 0.1446, 0.3191, 8.9835 and 0.6117 accordingly with standard deviation about 0.0359, 0.0615, 0.0161, 4.4322 and 0.4534. On behalf of Sun Life, the average ROA and ROE are 0.0458 and 0.1870, with a standard deviation of 0.0106 and 0.03. The average CR, which is 0.6053, implied that 60.53% of the company's financial performance was influenced by the claim ratio, with a standard deviation of 0.1472. The mean and standard deviation of VAIC and RBC are 5.1860, 0.6427, 1.2491, and 0.2190, respectively. ROA and ROE have mean values of 0.1780 and 0.2592 during this 5-year period for STMKB. CR's average and the standard deviation are 0.5575 and 0.0987, indicated that STMKB depends on CR approximately 55.75% of its financial performance. Likewise, the mean of VAIC is about 2.1271, indicating that the financial performance of this company was affected by intellectual capital throughout those study periods. Also, the average and standard deviation for RBC are 1.6890 and 1.7249 accordingly.

For Takaful Ikhlas, the average ROA and ROE are 0.0137 and 0.0154, with a standard deviation of 0.0673 and 0.0902. The average CR is 0.8961, implying that 89.61% of the company's financial performance was influenced by the claim ratio, with a standard deviation of 0.1615. The mean and standard deviation of VAIC and RBC are 1.7522, 1.7377, 0.2950, and 0.0762, respectively. ROA and ROE have mean values of

-0.0424 and -0.0667 during this 5-year period for Zurich Takaful. The average and standard deviation of CR, which is 0.6408 and 0.0927 accordingly, indicating that Zurich Takaful depends on CR approximately 64.08% of its financial performance. Likewise, the mean of VAIC is about -1.4738, indicating that the financial performance of this company was not affected by intellectual capital throughout those study periods. Also, the average and standard deviation for RBC are 4.4261 and 2.7139 accordingly.

Table 4.2: Descriptive Statistics of General Takaful

Company		ROA	ROE	CR	VAIC	RBC
Etiqua	Mean	0.1109	0.1521	-0.5942	116.2536	4.5325
	Std. Dev	0.0375	0.0404	0.0352	160.9995	2.7336
	Min	0.0599	0.0928	-0.6381	-0.4770	0.7878
	Max	0.1466	0.1928	-0.5559	327.2944	7.6750
Hong Leong MSIG	Mean	0.0040	0.0057	-0.2692	0.5775	3.0737
	Std. Dev	0.0502	0.0657	0.0946	0.8509	0.5205
	Min	-0.0714	-0.0918	-0.3662	-0.2738	2.2961
	Max	0.0690	0.0925	-0.1772	1.5896	3.3932
Prudential BSN	Mean	0.0789	0.1446	-5.7376	1.6373	1.5035
	Std. Dev	0.0359	0.0615	11.3265	0.3971	0.1140
	Min	0.0258	0.0503	-22.7273	-2.1231	1.3364
	Max	0.1110	0.2014	-0.0350	-1.1883	1.6035
STMAB	Mean	0.1712	0.2845	-0.4111	1.1561	2.8297
	Std. Dev	0.0170	0.0636	0.0941	0.9688	0.3054
	Min	0.1564	0.2325	-0.4914	0.4158	2.5096
	Max	0.1983	0.3605	-0.2649	2.7567	3.2178
Takaful Ikhlas	Mean	0.0137	0.0154	-0.4831	3.3728	1.5870
	Std. Dev	0.0673	0.0902	0.1300	0.8178	0.4326
	Min	-0.0861	-0.1198	-0.6093	2.4261	0.8428
	Max	0.0807	0.1050	-0.3052	4.3176	1.9263
Zurich Takaful	Mean	-0.0201	-0.0406	-0.6845	1.3711	4.7618
	Std. Dev	0.0752	0.1119	0.0368	1.0606	4.2343
	Min	-0.1015	-0.1873	-0.7181	-0.1945	1.1612
	Max	0.0612	0.0732	-0.6369	2.7819	12.0225

Table 4.2 shows the descriptive analysis on both dependent and independent variables towards general takaful funds from 2015 until 2019. The dependent variables are ROA and ROE, whereby the remaining are independent variables. The mean value

for both dependent and independent variables for Etiqa are 0.1109, 0.1521, -0.5942, 116.5236 and 4.5325 accordingly with standard deviation about 0.0375, 0.0404, 0.0352, 160.9995 and 2.7336. On behalf of Hong Leong MSIG, the average ROA and ROE are 0.0040 and 0.0057, with a standard deviation of 0.0502 and 0.0657. The average CR is -0.2692, and it implied that 26.92% of the company's financial performance was not influenced by the claim ratio, with a standard deviation of 0.0946. The mean and standard deviation of VAIC and RBC are 0.5775, 0.8509, 3.0737, and 0.5205, respectively. ROA and ROE have mean values of 0.0789 and 0.1446 during this 5-year period for Prudential BSN. CR's average and standard deviation, which is -5.7376 and 11.3265, indicated that Prudential BSN does not depend on CR, approximately 11.33% of its financial performance. Likewise, the mean of VAIC, which is about -1.6373, indicates that this company's financial performance was not affected by intellectual capital throughout those study periods. Also, the average and standard deviation for RBC are 1.5035 and 0.1140 accordingly.

The mean values for both dependent and independent variables for STMAB are 0.1712, 0.2845, -0.4111, 1.1561 and 2.8297 accordingly with standard deviation about 0.0170, 0.0636, 0.0941, 0.9688 and 0.3054. As for Takaful Ikhlas, the average ROA and ROE are 0.0137 and 0.0154, with a standard deviation of 0.0673 and 0.0902. The average CR is -0.4831, which implies that 48.31% of the company's financial performance was not influenced by the claim ratio, with a standard deviation of 0.13. The mean and standard deviation of VAIC and RBC are 3.3728, 0.8178, 1.5870, and 0.4326, respectively. ROA and ROE have mean values of -0.0201 and -0.0406 during this 5-year period for Zurich Takaful. CR's average and the standard deviation are -0.6845 and 0.0368, indicating that Zurich Takaful does not depend on CR for approximately 68.49% of its financial performance. Likewise, the mean of VAIC, which is about 1.3711, indicates that this

company's financial performance was affected by intellectual capital throughout those study periods. Also, the average and standard deviation for RBC are 4.7618 and 4.2343 accordingly.

4.3 Claim Ratio Analysis

An insurance company is considering good performance by clients, investors, or existing policyholders whenever the claim ratio incurred by that particular insurance company is higher. This will build trust from policyholders and investors in that company's achievement. However, from the insurer's perspective, a high claim ratio indicates they gain lower profits based on their company's performance, which might affect their future progress. Thus, it is important to evaluate the claim ratio made by takaful operators to keep them updated on which takaful funds need to undergo improvements on the contributions and claims paid.

Table 4.3: Claim Ratio of 15 Takaful Operators

Company	Year	Claim Ratio		Company	Year	Claim Ratio	
		Family Takaful	General Takaful			Family Takaful	General Takaful
AIA	2015	62.93%		Prudential BSN	2015	29.28%	3.35%
	2016	65.51%			2016	31.54%	10.01%
	2017	68.13%			2017	32.96%	8.95%
	2018	64.55%			2018	32.49%	2272.73%
	2019	74.01%			2019	33.26%	NA
AmMetLife	2015	62.50%		Sun Life	2015	54.04%	
	2016	82.78%			2016	50.67%	
	2017	76.04%			2017	64.11%	
	2018	76.52%			2018	49.14%	
	2019	74.10%			2019	84.71%	
Etika	2015	70.26%	63.81%	Syarikat Takaful Malaysia Berhad	2015	66.12%	26.49%
	2016	79.50%	55.59%		2016	64.21%	36.94%
	2017	90.26%	56.79%		2017	53.89%	45.90%
	2018	73.17%	58.65%		2018	52.90%	49.14%
	2019	108.70%	62.28%		2019	41.65%	47.08%
FWD	2015	63.61%		Takaful Ikhlas Berhad	2015	77.35%	40.65%
	2016	67.80%			2016	111.86%	60.15%
	2017	56.81%			2017	94.52%	49.32%
	2018	72.79%			2018	70.69%	60.93%
	2019	123.30%			2019	93.62%	30.52%
Great Eastern	2015	44.08%		Zurich Takaful Berhad	2015	70.10%	70.84%
	2016	46.08%			2016	56.77%	71.81%
	2017	49.61%			2017	73.09%	NA
	2018	48.86%			2018	51.77%	63.69%
	2019	69.99%			2019	68.69%	67.46%
Hong Leong MSIG	2015	79.49%	17.72%				
	2016	77.99%	26.43%				
	2017	75.07%	36.62%				
	2018	69.38%	NA				
	2019	82.54%	NA				

Table 4.3 shows that incurred claim ratio for Prudential BSN company is lowest for family takaful fund, which means this company gains relatively high profit and does not suffer big loss after paying the claim amount throughout the five-year interval. In 2015, Prudential BSN, Hong Leong MSIG, and Syarikat Takaful Malaysia Am Berhad encountered a low claim ratio which indicates they do not face huge loss due to paying claims with 3.35%, 17.72%, and 26.49% accordingly. Besides, for family takaful, AmMet Life, Etiqa, and Takaful Ikhlas faced a high claim ratio in 2016 and 2017, which are 82.78%, 90.26%, and 111.86%, respectively, where it contrasted with other family takaful operators as they faced high claim ratio problem in recent years. However, for the general fund, Prudential BSN is considered to be in great loss in the year 2018 as the incurred claim ratio is highest among ratios that have been evaluated. This is because the number of claims received by the company is greater than the contributions. Apart from that, Etiqa Berhad, Hong Leong MSIG, FWD, and Takaful Ikhlas Berhad encounter lower profits since the incurred claim ratio for family takaful fund are higher. The result supports high claim ratio causes great loss by Abdou (2014).

4.4 Risk-Based Capital Analysis

Table 4.4 shows the level of capital required by BNM for each takaful fund of either family takaful or general takaful according to the fifteen listed takaful operators.

Table 4.4: RBC Level of 15 Takaful Operators

Company	Risk Based Capital (RBC)										
	Family Takaful					General Takaful					
	2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	Average
AIA	35.99%	24.89%	23.91%	68.76%	61.64%	43.04%	-	-	-	-	-
AmMet Life	100.48%	115.35%	61.30%	55.47%	45.32%	75.58%	-	-	-	-	-
Etiqa	342.84%	482.75%	384.56%	221.61%	214.72%	329.30%	528.58%	767.50%	610.23%	78.78%	496.27%
FWD	299.18%	297.61%	349.21%	389.46%	397.49%	346.59%	-	-	-	-	-
Great Eastern	29.93%	45.47%	36.83%	40.37%	8.53%	32.22%	-	-	-	-	-
Hong Leong MSIG	162.91%	126.23%	91.96%	80.21%	115.90%	115.44%	229.61%	332.58%	339.32%	327.96%	307.37%
Prudential BSN	12.05%	12.00%	102.62%	95.14%	84.02%	61.17%	156.86%	160.35%	157.45%	143.45%	154.53%
Sun Life	142.82%	135.74%	87.93%	135.30%	122.75%	124.91%	-	-	-	-	-
Syarikat Takaful Malaysia Berhad	171.71%	173.90%	175.74%	139.18%	183.97%	168.90%	250.96%	321.78%	307.73%	260.53%	285.25%
Takaful Ikhlas	39.62%	34.67%	28.23%	21.19%	23.78%	29.50%	192.63%	159.66%	84.28%	175.96%	153.13%
Zurich Takaful	132.67%	332.83%	866.18%	500.14%	381.24%	442.61%	116.12%	258.58%	1202.55%	374.46%	487.93%

The table above shows that Etiqa Berhad, Syarikat Takaful Malaysia Berhad, and Zurich Takaful Berhad for both general and family takaful business achieved the satisfied amount of capital required by BNM in RBC frameworks which is 130%. Meanwhile, for a company that only provides family business, Zurich Takaful, FWD, Etiqa, and Syarikat Takaful Malaysia Berhad is considered to follow the supervisory target capital level requirement with the average CAR amount of 442.61%, 346.59%, 329.30%, and 168.90% accordingly. However, the other family takaful operators are unable to follow the BNM's requirement whereby the RBC average levels fall below 130%, especially Takaful Ikhlas, Great Eastern, AIA, Prudential BSN, Hong Leong MSIG, and Sun Life. Their RBCs' levels are too low because TCR is greater than TCA, which indicates that the capital available does not suffice as it requires. For general business, the average CAR amount for a five-year interval is considered suitable for every general takaful operator since they can achieve the minimum capital required by having more than 130% of capital. Basically, among family operators, Etiqa held twice the highest CAR in 2015 and 2016, Zurich holds higher CAR in the year 2017 and 2018, and in recent years, it is shown by FWD. Early observations show that Prudential BSN had lower RBC levels in 2015 and 2016; however, its CAR amount boosted up starting in 2017 by 102.62%. This result supports Lazam (2012) findings, which indicate takaful

operators are aware and realize their solvency level is getting better after implementing the RBC framework.

4.5 Value-Added Intellectual Capital Analysis

In VAIC analysis, the top performer is entitled to which company gained high VAIC scores, indicating that it can efficiently use its knowledge assets and human capital. Table 4.5, Table 4.6, Table 4.7, Table 4.8, and Table 4.9 display the VAIC values and its three components' values according to funds made by takaful operators from the year 2015 until 2019.

Table 4.5: VAIC Score (2015)

Year	Company	Value Added Intellectual Capital (VAIC)							
		Family Takaful				General Takaful			
		VACA	VAHU	SCVA	VAIC	VACA	VAHU	SCVA	VAIC
2015	AIA	-0.7074	1.0791	0.0733	0.4450	-	-	-	-
	AmMet Life	-1.1029	1.4769	0.3229	0.6968	-	-	-	-
	Etiqa	-0.5593	15.7758	0.9366	16.1531	-1.4269	254.2975	0.9961	253.8667
	FWD	-	1.1820	0.1540	1.3360	-	-	-	-
	Great Eastern	-2.2987	2.5533	0.6083	0.8629	-	-	-	-
	Hong Leong MSIG	-	1.1708	0.1459	1.3166	-	1.3374	0.2523	1.5896
	Prudential BSN	9.7954	-2.8051	1.3565	8.3469	-2.8202	1.0377	0.0363	-1.7461
	Sun Life	0.3436	4.2571	0.7651	5.3658	-	-	-	-
	Syarikat Takaful Malaysia Berhad	-3.2809	3.4926	0.7137	0.9253	-1.6330	1.7383	0.4247	0.5301
	Takaful Ikhlas	0.4017	1.5165	0.3406	2.2588	2.3288	1.6100	0.3789	4.3176
	Zurich Takaful	-2.4818	1.0317	0.0307	-1.4194	-	1.1430	0.1251	1.2681

In the year 2015, referring to the family takaful fund table, Etiqa surpassed all other 10 takaful operators with the VAIC score of 16.1531. They were followed by Prudential BSN and Sun Life with the score of 8.3469 and 5.3658 respectively. Meanwhile, amongst 6 general takaful operators, Etiqa is the top performer with a score of 253.8667, followed by Takaful Ikhlas and Hong Leong MSIG with a score of 4.3176 and 1.5896, respectively. The VAIC score for Etiqa General Takaful is the highest because the cost of human capital allocated is lower than any of the remaining years.

According to the above analysis, the top performer for both types of funds amongst

takaful operators remain with Etiqa; therefore, this company outshined other takaful operators by showing the highest score of VAIC for both categories.

Table 4.6: VAIC Score (2016)

Year	Company	Value Added Intellectual Capital (VAIC)							
		Family Takaful				General Takaful			
		VACA	VAHU	SCVA	VAIC	VACA	VAHU	SCVA	VAIC
2016	AIA	-0.5393	0.8313	-0.2030	0.0891	-	-	-	-
	AmMet Life	-0.5990	1.2604	0.2066	0.8680	-	-	-	-
	Etiqa	-0.6408	19.9595	0.9499	20.2685	-1.8119	328.1093	0.9970	327.2944
	FWD	-	1.2152	0.1771	1.3923	-	-	-	-
	Great Eastern	-2.3071	2.3744	0.5788	0.6462	-	-	-	-
	Hong Leong MSIG	-1.5914	1.1879	0.1582	-0.2453	-1.4990	1.1189	0.1063	-0.2738
	Prudential BSN	5.7804	-1.8155	1.5508	5.5157	-3.0294	1.0900	0.0826	-1.8569
	Sun Life	0.3052	3.8484	0.7401	4.8937	-	-	-	-
	Syarikat Takaful Malaysia Berhad	-3.0742	3.3172	0.6985	0.9416	-1.3424	1.4485	0.3096	-0.4158
	Takaful Ikhlas	-0.7188	-1.4839	1.6739	-0.5288	0.9680	1.8440	0.4577	3.2697
	Zurich Takaful	-0.0062	1.5666	0.3617	1.9221	-	1.3332	0.2499	1.5831

In the year 2016, referring to the family takaful fund section, Etiqa leads the VAIC score with a record of 20.2685. Go along with Etiqa is Prudential BSN with a score of 5.5157 and Sun Life with a score of 4.8937. Moreover, for the general takaful fund, Etiqa remains the top performer, with a score of 327.2944. The cost of human capital spent by this operator is lower than in further years. Followed by Takaful Ikhlas and Zurich Takaful with the score of 3.2697 and 1.5831 respectively. Based on the above result, the top performer for 2016 remains with Etiqa for both types of funds amongst takaful operators since this company shows an outperformed VAIC score.

Table 4.7: VAIC Score (2017)

Year	Company	Value Added Intellectual Capital (VAIC)							
		Family Takaful				General Takaful			
		VACA	VAHU	SCVA	VAIC	VACA	VAHU	SCVA	VAIC
2017	AIA	0.0510	-0.1399	8.1503	8.0614	-	-	-	-
	AmMet Life	-0.8462	1.2785	0.2179	0.6502	-	-	-	-
	Etiqa	-0.5298	17.7968	0.9438	18.2108	-1.4770	-	1.0000	-0.4770
	FWD	-	1.5652	0.3611	1.9263	-	-	-	-
	Great Eastern	-1.9551	2.5390	0.6061	1.1900	-	-	-	-
	Hong Leong MSIG	-1.5306	1.2571	0.2045	-0.0689	-1.6257	1.3353	0.2511	-0.0393
	Prudential BSN	16.8877	-3.4306	1.2915	14.7487	-3.1643	1.0208	0.0204	-2.1231
	Sun Life	0.3316	4.5352	0.7795	5.6463	-	-	-	-
	Syarikat Takaful Malaysia Berhad	-3.0142	4.1387	0.7584	1.8829	-0.8784	1.2060	0.1708	0.4985
	Takaful Ikhlas	0.4271	0.6471	-0.5453	0.5289	0.7744	1.6119	0.3796	2.7659
	Zurich Takaful	-1.0731	0.8955	-0.1166	-0.2942	-	1.2300	0.1870	1.4170

In 2017, according to the family takaful fund part, the top performers were Etiqa, Prudential BSN, and AIA, scoring 18.2106, 14.7487, and 8.0614 accordingly. Meanwhile, the weak performers are Hong Leong MSIG and Zurich Takaful. As for the general takaful fund, the top performers are Takaful Ikhlas, Zurich Takaful, with VAIC scores of 2.7659, 1.4170, and 0.4985. Meanwhile, the weak performers are Etiqa, Prudential BSN, and Hong Leong MSIG, with negative VAIC scores. The takaful operators that obtained negative VAIC scores indicate that they are not able to manage well in human and knowledge resources.

Table 4.8: VAIC Score (2018)

Year	Company	Value Added Intellectual Capital (VAIC)							
		Family Takaful				General Takaful			
		VACA	VAHU	SCVA	VAIC	VACA	VAHU	SCVA	VAIC
	AIA	0.1776	-0.6483	2.5424	2.0718	-	-	-	-
	AmMet Life	-0.7455	1.7064	0.4140	1.3748	-	-	-	-
	Etiqa	-0.5561	26.1337	0.9617	26.5394	-1.8588	2.3754	0.5790	1.0957
	FWD	-0.6101	1.4985	0.3327	1.2210	-	-	-	-
	Great Eastern	-1.6103	2.3852	0.5807	1.3557	-	-	-	-
2018	Hong Leong MSIG	-1.1945	1.2433	0.1957	0.2445	-1.1638	1.2161	0.1777	0.2300
	Prudential BSN	4.8258	-2.1129	1.4733	4.1861	-2.5613	1.1549	0.1341	-1.2723
	Sun Life	0.3357	4.6842	0.7865	5.8064	-	-	-	-
	Syarikat Takaful Malaysia Berhad	-2.2309	3.6959	0.7294	2.1945	-0.2086	2.2331	0.5522	2.5767
	Takaful Ikhlas	1.1898	2.0986	0.5235	3.8119	0.8406	1.3347	0.2508	2.4261
	Zurich Takaful	-0.0272	0.1147	-7.7180	-7.6305	-0.1533	0.6068	-0.6480	-0.1945

In 2018, the VAIC scores of 26.5394, 5.8064, and 4.1861 lead Etiqa, FWD, and Prudential BSN were the top performers for family takaful fund. Etiqa and Prudential BSN have remained top performers since 2016; meanwhile, this is the first year FWD became the top performer. However, Zurich Takaful is considered inefficient in managing knowledge and human capital due to a negative score. On the other hand, for general takaful fund, Syarikat Takaful Malaysia Berhad, Takaful Ikhlas and Etiqa are the top performers with scores on VAIC about 2.5767, 2.4261 and 1.0957. For both categories, Etiqa has remained the top performer since 2016.

Table 4.9: VAIC Score (2019)

Year	Company	Value Added Intellectual Capital (VAIC)							
		Family Takaful				General Takaful			
		VACA	VAHU	SCVA	VAIC	VACA	VAHU	SCVA	VAIC
2019	AIA	-0.0791	0.4048	-1.4704	-1.1447	-	-	-	-
	AmMet Life	-0.8311	1.7199	0.4186	1.3074	-	-	-	-
	Etiqa	-0.8448	22.3426	0.9552	22.4531	-1.5152	1.8842	0.4693	0.8382
	FWD	13.3360	1.0064	0.0064	14.3487	-	-	-	-
	Great Eastern	-1.0464	2.1040	0.5247	1.5823	-	-	-	-
	Hong Leong MSIG	0.1048	1.3842	0.2775	1.7665	0.0325	1.1893	0.1592	1.3810
	Prudential BSN	16.8787	-5.9184	1.1690	12.1292	-2.5638	1.2052	0.1703	-1.1883
	Sun Life	0.2964	3.2308	0.6905	4.2177	-	-	-	-
	Syarikat Takaful Malaysia Berhad	-2.8669	6.7069	0.8509	4.6910	-0.3084	1.6673	0.4002	1.7592
	Takaful Ikhlas	0.6643	1.6368	0.3890	2.6901	2.4136	1.3905	0.2808	4.0849
	Zurich Takaful	0.0863	-306.6216	1.0033	0.0532	-0.7510	2.8801	0.6528	2.7819

In 2019, the top performers for family takaful funds remained, with Etiqa, FWD, and Prudential BSN having VAIC scores 22.4531, 14.3487, and 12.1292. Meanwhile, for general takaful, based on 4.0849, 2.7819, and 1.7592 of VAIC scores, the top performers are Takaful Ikhlas, Zurich Takaful, and Syarikat Takaful Malaysia Berhad. In conclusion, a higher VAIC score indicates that takaful operators have excellent management stewardship since they manage to utilize their resources efficiently.

4.6 Return on Assets (ROA) Analysis

This ratio illustrates how well a corporation does by measuring the benefit it makes to the money it spends on assets. In using economic tools, the higher the return, the more efficient and profitable management is.

Table 4.10: ROA Level of 15 Takaful Operators

Company	Return on Assets (ROA)											
	Family Takaful						General Takaful					
	2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average
AIA	-0.0665	-0.0230	-0.0038	0.0127	0.0501	-0.0061						
AmMet Life	-0.1411	-0.2353	-0.1062	-0.2349	-0.1313	-0.1698						
Etiqa	0.0599	0.0839	0.1241	0.0728	0.0838	0.0849	0.0599	0.0839	0.1241	0.1466	0.1402	0.1109
FWD	0.0687	0.0525	0.0127	0.0227	-0.1560	0.0001						
Great Eastern	-0.1057	-0.1701	-0.0989	-0.0647	0.0189	-0.0841						
Hong Leong MSIG	0.0047	-0.0714	0.0014	0.0690	0.0164	0.0040	0.0047	-0.0714	0.0014	0.0690	0.0164	0.0040
Prudential BSN	0.0258	0.1110	0.1020	0.0974	0.0585	0.0789	0.0258	0.1110	0.1020	0.0974	0.0585	0.0789
Sun Life	0.0525	0.0444	0.0513	0.0587	0.0309	0.0476						
Syarikat Takaful Malaysia Berhad	0.1772	0.1564	0.1606	0.1898	0.2060	0.1780	0.1772	-0.1564	0.1606	0.1636	0.1983	0.1712
Takaful Ikhlas	0.0447	-0.0861	-0.0222	0.0807	0.0516	0.0138	0.0447	-0.0861	-0.0222	0.0807	0.0516	0.0138
Zurich Takaful	-0.0208	-0.0882	-0.1015	-0.0127	0.0114	-0.0424	-0.0208	-0.0882	-0.1015	0.0487	0.0612	-0.0201

A company that faces loss in assets they invest in are Great Eastern Takaful, Zurich Takaful Berhad, and AIA Takaful Berhad, with ROA values in negative. Based on Table 4.10 above, Syarikat Takaful Malaysia Berhad is interpreted to have the highest ROA for family takaful fund of 0.1780 or 17.80%. On average, for every RM1 of the company's assets, it will return RM0.1780 of net profit. On the contrary, AmMet Life encounters loss in the assets they invest on with a negative average ROA value of about -0.1698 or 16.98%, which indicates that every RM1 of assets this company invests on will receive about RM0.1698 of net loss. Meanwhile, for the general fund, Syarikat Takaful Malaysia Berhad also recorded a high ROA value throughout the five-year study period, followed by Etiqa General Takaful with 0.1712 and 0.1109, respectively, which means they will receive profits of RM0.1712 and RM0.1109 in return for their asset investments.

4.7 Return on Equity (ROE) Analysis

Through time, a profitable and growing ROE will mean that a business is good at creating shareholder capital since it understands how and when to spend its earnings on improving productivity and income wisely. On the other hand, a diminishing ROE can indicate that the firm makes bad decisions about reinvesting resources in inefficient investments.

Table 4.11: ROE Level of 15 Takaful Operators

Company	Return on Equity (ROE)											
	Family Takaful						General Takaful					
	2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average
AIA	-0.1243	-0.0483	-0.0058	0.0210	0.0714	-0.0172	-	-	-	-	-	-
AmMet Life	-0.1888	-0.3437	-0.1645	-0.4221	-0.2187	-0.2675	-	-	-	-	-	-
Etiqa	0.0928	0.1302	0.1928	0.1107	0.1143	0.1282	0.0928	0.1302	0.1928	0.1771	0.1677	0.1521
FWD	0.1272	0.0942	0.0219	0.0388	-0.1305	0.0303	-	-	-	-	-	-
Great Eastern	-0.1691	-0.3463	-0.1863	-0.1503	0.0512	-0.1601	-	-	-	-	-	-
Hong Leong MSIG	0.0053	-0.0918	0.0018	0.0925	0.0209	0.0057	0.0053	-0.0918	0.0018	0.0925	0.0209	0.0057
Prudential BSN	0.0503	0.2014	0.1768	0.1785	0.1159	0.1446	0.0503	0.2014	0.1768	0.1785	0.1159	0.1446
Sun Life	0.2013	0.1704	0.1973	0.2216	0.1445	0.1870	-	-	-	-	-	-
Syarikat Takaful Malaysia Berhad	0.2325	0.2353	0.2473	0.2891	0.2920	0.2593	0.2325	0.2353	0.2473	0.3471	0.3605	0.2846
Takaful Ikhlas	0.0604	-0.1198	-0.0304	0.1050	0.0616	0.0154	0.0604	-0.1198	-0.0304	0.1050	0.0616	0.0154
Zurich Takaful	-0.0288	-0.1173	-0.1873	-0.0167	0.0168	-0.0667	-0.0288	-0.1173	-0.1873	0.0572	0.0732	-0.0406

Based on table 4.11 above, Syarikat Takaful Malaysia Berhad shows to have the highest ROE for family takaful fund of 0.2593 or 25.93%. On average, for every RM1 of shares the company's shareholder invests in, it will return RM 0.2593 of net profit. However, AmMet Life once again encountered a major loss of about RM0.2675 for every share they put in their company's capital stock. Syarikat Takaful Malaysia Berhad recorded the highest ROE value for the general takaful fund, followed by Etiqa with 0.2846 and 0.1521, respectively. A company that faces loss in stocks they invest in are AIA, Great Eastern, Zurich Takaful, and Zurich Takaful with negative ROE values.

4.8 Correlation

4.8.1 Results of multicollinearity test in Family Takaful

Table 4.12: Correlation Matrix in Family Takaful

AIA	IVs	ROA	ROE	CR	VAIC	RBC	Great Eastern	IVs	ROA	ROE	CR	VAIC	RBC	STMKB	IVs	ROA	ROE	CR	VAIC	RBC
	ROA	1	0.996	0.830	-0.056	0.632		ROA	1	0.986	0.869	0.939	-0.865		ROA	1	0.841	-0.723	0.816	-0.111
	ROE	0.996	1	0.797	0.018	0.603		ROE	0.986	1	0.846	0.887	-0.919		ROE	0.841	1	-0.874	0.833	-0.333
	CR	0.830	0.797	1	-0.098	0.280		CR	0.869	0.846	1	0.781	-0.869		CR	-0.723	-0.874	1	-0.960	-0.101
	VAIC	-0.056	0.018	-0.098	1	-0.418		VAIC	0.939	0.887	0.781	1	-0.665		VAIC	0.816	0.833	-0.960	1	0.242
	RBC	0.632	0.603	0.280	-0.418	1		RBC	-0.865	-0.919	-0.869	-0.665	1		RBC	-0.111	-0.333	-0.101	0.242	1
AmMetLife	IVs	ROA	ROE	CR	VAIC	RBC	Hong Leong MSIG	IVs	ROA	ROE	CR	VAIC	RBC	Takaful Ikhlas Family Berhad	IVs	ROA	ROE	CR	VAIC	RBC
	ROA	1	0.955	-0.518	-0.419	-0.357		ROA	1	1.000	-0.494	0.321	-0.464		ROA	1	0.999	-0.895	0.985	-0.453
	ROE	0.955	1	-0.534	-0.616	-0.067		ROE	1.000	1	-0.508	0.360	-0.048		ROE	0.999	1	-0.908	0.981	-0.434
	CR	-0.518	-0.534	1	0.261	-0.022		CR	-0.494	-0.508	1	0.643	0.691		CR	-0.895	-0.908	1	-0.875	0.242
	VAIC	-0.419	-0.616	0.261	1	-0.592		VAIC	0.321	0.360	0.643	1	0.468		VAIC	0.985	0.981	-0.875	1	-0.521
	RBC	-0.357	-0.067	-0.022	-0.592	1		RBC	-0.464	-0.048	0.691	0.468	1		RBC	-0.453	-0.434	0.242	-0.521	1
Etika	IVs	ROA	ROE	CR	VAIC	RBC	Prudential BSN	IVs	ROA	ROE	CR	VAIC	RBC	Zurich Family Takaful Berhad	IVs	ROA	ROE	CR	VAIC	RBC
	ROA	1	0.985	0.465	-0.146	0.285		ROA	1	0.996	0.587	-0.153	0.331		ROA	1	0.979	-0.101	-0.449	-0.526
	ROE	0.985	1	0.303	-0.206	0.393		ROE	0.996	1	0.612	-0.187	0.329		ROE	0.979	1	-0.232	-0.404	-0.655
	CR	0.465	0.303	1	0.115	-0.310		CR	0.587	0.612	1	0.368	0.829		CR	-0.101	-0.232	1	0.510	0.175
	VAIC	-0.146	-0.206	0.115	1	-0.602		VAIC	-0.153	-0.187	0.368	1	0.435		VAIC	-0.449	-0.404	0.510	1	-0.085
	RBC	0.285	0.393	-0.310	-0.602	1		RBC	0.331	0.329	0.829	0.435	1		RBC	-0.526	-0.655	0.175	-0.085	1
FWD	IVs	ROA	ROE	CR	VAIC	RBC	Sun Life	IVs	ROA	ROE	CR	VAIC	RBC	IVs	ROA	ROE	CR	VAIC	RBC	
	ROA	1	0.983	-0.936	-0.974	-0.743		ROA	1	0.988	-0.828	0.975	0.073	ROA	1	0.988	-0.828	0.975	0.073	
	ROE	0.983	1	-0.870	-0.914	-0.822		ROE	0.988	1	-0.745	0.971	0.056	ROE	0.988	1	-0.745	0.971	0.056	
	CR	-0.936	-0.870	1	0.965	0.633		CR	-0.828	-0.745	1	-0.717	-0.408	CR	-0.828	-0.745	1	-0.717	-0.408	
	VAIC	-0.974	-0.914	0.965	1	0.597		VAIC	0.975	0.971	-0.717	1	-0.150	VAIC	0.975	0.971	-0.717	1	-0.150	
	RBC	-0.743	-0.822	0.633	0.597	1		RBC	0.073	0.056	-0.408	-0.150	1	RBC	0.073	0.056	-0.408	-0.150	1	

Based on Table 4.12, the correlation matrix shows multicollinearity results for independent variables of CR, VAIC, and RBC, affecting the financial profitability of family takaful operators measured by ROA and ROE. The result above shows that in AIA, there are strong positive correlations among CR and RBC towards both of the profitability ratios. As for VAIC, there is a weak negative correlation between ROA and the opposite for ROE. Both ROA and ROE also show a high positive correlation against each other. As for AmMet Life, there is a strong correlation between dependent variables and a weak positive correlation between VAIC and CR. However, among three independent variables, all show a negative correlation towards both profitability ratios. Meanwhile, for Etiqa, a strong positive correlation is detected between ROA and ROE. There is also a weak positive correlation between CR and RBC towards profitability, but VAIC negatively correlates with ROA and ROE. For independent variables, somehow, only VAIC is weakly correlated with CR.

On behalf of FWD, once again, a strong positive correlation between financial profitability ratios was detected and among independent variables of CR, RBC, and VAIC. But for correlations between independent variables towards both profitability ratios, no serious correlations were found. Apart from that, Great Eastern shows that CR and VAIC are highly correlated with ROA and ROE, but not RBC, since they show strong negative correlations towards both ROA and ROE. Also, for independent variables such as CR and VAIC, they were highly correlated against each other. For Hong Leong MSIG, a perfect correlation was found between ROA and ROE. Among independent variables with ROA and ROE, only VAIC shows a weak positive correlation, but not for CR and RBC. The three independent variables were also found to have a high correlation amongst them.

In addition, a strong positive relationship was again found between both profitability ratios for Prudential BSN, Sun Life, STMKB, Takaful Ikhlas Family Berhad, and Zurich Family Takaful Berhad. As for Prudential BSN, CR and RBC positively correlate to financial performance; meanwhile, it contrasts for VAIC. Also, there is a weak positive correlation among all independent variables. For Sun Life, CR found a strong negative correlation with ROA, ROE, CR, and RBC. However, VAIC shows a strong positive correlation towards profitability, but it contradicts RBC as RBC shows a weakly positive correlation. For STMKB, there is a negative correlation between CR and RBC towards both ROA and ROE. It is the opposite for VAIC as it showed a strong positive correlation towards ROA and ROE. Among independent variables, only VAIC and RBC have a weak correlation towards each other. As for CR and VAIC towards both profitability ratios, there are negative correlations on behalf of Takaful Ikhlas Family Berhad and Zurich Family Takaful Berhad. Somehow for VAIC, a negative correlation was found in Zurich Family Takaful Berhad, but not in Takaful Ikhlas Family Berhad. Therefore, the three independent variables are directly included in both ROA and ROE models in order to perform panel data regression analysis.

4.8.2 Results of multicollinearity test in General Takaful

Table 4.13: Correlation Matrix in General Takaful

Etiqua	IVs	ROA	ROE	CR	VAIC	RBC	STMAB	IVs	ROA	ROE	CR	VAIC	RBC
	ROA	1	0.908	0.187	-0.900	-0.698		ROA	1	0.552	-0.037	0.299	-0.531
	ROE	0.908	1	0.454	-0.854	-0.385		ROE	0.552	1	-0.728	0.925	-0.420
	CR	0.187	0.454	1	0.061	0.387		CR	-0.037	-0.728	1	-0.661	-0.165
	VAIC	-0.900	-0.854	0.061	1	0.689		VAIC	0.299	0.925	-0.661	1	-0.527
	RBC	-0.698	-0.385	0.387	0.689	1		RBC	-0.531	-0.420	-0.165	-0.527	1
Hong Leong MSIG	IVs	ROA	ROE	CR	VAIC	RBC	Takaful Ikhlas General Berhad	IVs	ROA	ROE	CR	VAIC	RBC
	ROA	1	1.000	-0.007	0.316	-0.078		ROA	1	0.999	0.367	0.113	0.483
	ROE	1.000	1	-0.013	0.300	-0.065		ROE	0.999	1	0.359	0.110	0.473
	CR	-0.007	-0.013	1	0.775	-0.871		CR	0.367	0.359	1	0.792	0.223
	VAIC	0.316	0.300	0.775	1	-0.975		VAIC	0.113	0.110	0.792	1	0.542
	RBC	-0.078	-0.065	-0.871	-0.975	1		RBC	0.483	0.473	0.223	0.542	1
Prudential BSN	IVs	ROA	ROE	CR	VAIC	RBC	Zurich General Takaful Berhad	IVs	ROA	ROE	CR	VAIC	RBC
	ROA	1	0.996	-0.229	-0.262	0.216		ROA	1	0.985	0.837	-0.035	-0.431
	ROE	0.996	1	-0.263	-0.188	0.153		ROE	0.985	1	0.833	-0.035	-0.578
	CR	-0.229	-0.263	1	-0.895	0.979		CR	0.837	0.833	1	-0.482	0.693
	VAIC	-0.262	-0.188	-0.895	1	-0.904		VAIC	-0.035	-0.035	-0.482	1	0.065
	RBC	0.216	0.153	0.979	-0.904	1		RBC	-0.431	-0.578	0.693	0.065	1

Based on Table 4.13, on behalf of Etiqa, a strong positive correlation between financial profitability ratios was detected. But for correlations between independent variables towards both profitability ratios, only CR shows a positive correlation. Meanwhile, both VAIC and RBC were

found negatively correlated with ROA and ROE. Apart from that, Hong Leong MSIG again shows the perfect correlation of 1 between the profitability.

There are also weak negative correlations between CR and RBC towards both ROA and ROE, but it turned out contrast result for VAIC. Also, CR and VAIC were found to have a high correlation against each other for independent variables. For Prudential BSN, ROA seems to have a strong positive correlation with ROE. CR and VAIC show a weak negative correlation on profitability; meanwhile, a positive correlation is detected for RBC. Among independent variables, RBC was found to have a high positive correlation with CR. As for STMAB, repeated results were found since CR and RBC do not positively correlate with ROA and ROE. There are also negative correlations between independent variables. In contrast, all independent and dependent variables were found to have a positive correlation against each other for Takaful Ikhlas General Berhad. Lastly, for Zurich General Takaful Berhad, there is a weak negative correlation between VAIC and RBC towards the financial profitability measured by ROA and ROE.

4.9 Regression

4.9.1 Regression results for ROA model in Family Takaful

Table 4.14: Statistical Tests for The Best Model Selection ROA Family Takaful

Test	Estimation Test Approach		p-value	Appropriate Model
Hausman Test	H0: Random Effect Model	Reject H0 when p-value < 0.05	0.2291	REM
	Ha: Fixed Effect Model			
Breusch-Pagan Lagrange Multiplier (LM) Test	H0: Common Effect Model	Reject H0 when p-value < 0.05	0.0000	
	Ha: Random Effect Model			

The first step in analyzing panel data regression is first by running the Hausman test. It is a significant indication for evaluating whether a fixed or random effect model is far more suitable. The Hausman test's p-value for the ROA model is 0.2291, as shown in Table 4.15. The next test often used to distinguish between common and random effect models when autocorrelation exists is the Breusch-Pagan Lagrange Multiplier (LM) test. The rejection of the null hypothesis is when the probability is less than 0.05, indicating that the random effect model is even more relevant for ROA. Since the p-value is 0.0000, this indicates that the random effect model is suitable for the situation. Consequently, the random effect model is used to assess and interpret the results of the ROA model.

Table 4.15: Classical Assumption Test

Cross-sectional Dependence Test (Pesaran's CD-Test)	Reject H0 when probability < 0.05 Probability = 0.0085 (Cross-sectional dependence detected)
Autocorrelation Test (Woolridge Test)	Reject H0 when probability < 0.05 Probability = 0.2906 (Homoscedastic)
Heteroscedasticity Test (Breusch-Pagan/Cook-Weisberg Test)	Reject H0 when probability < 0.05 Probability = 0.6169 (No autocorrelation detected)
Normality Test (Skewness and Kurtosis Test)	CR and RBC are not normally distributed

The existence of cross-sectional dependency, heteroscedasticity, and autocorrelation in REM must be validated in order to regard it as an acceptable model. It is critical to determine whether or not this model is adequate to be employed in preliminary analysis. Pesaran's CD-Test is used to determine cross-sectional dependency. Once the null hypothesis is false, the random effect model seems to have a cross-section dependency issue because the probability is 0.0085, which is lower than 0.05. Both autocorrelation and heteroscedasticity problems were not detected due to null hypothesis rejection with p-values exceeding 0.05. For normality assumption, Skewness and Kurtosis test was used to check the distribution of data for each independent variable, whether it is normally distributed or not. The result showed that data for variable CR and RBC are not normally distributed. In this study, to resolve the cross-sectional dependence problem of the ROA model in family takaful, the PCSE model is considered appropriate

since the cross-section, N and period, t in this study are 11 observations of family takaful operators against a 5-year period which means N is greater than t.

Table 4.16: ROA Model for Family Takaful

Variables		Common Effect ROA	Fixed Effect ROA	Random Effect ROA	PCSE ROA
CR	Coefficient	-0.1574**	-0.1346**	-0.1466***	-0.1574***
	Standard Error	0.0662	0.0597	0.0570	0.0352
VAIC	Coefficient	0.0051**	-0.0028	-0.0007	0.0051***
	Standard Error	0.0020	0.0025	0.0023	0.0014
RBC	Coefficient	0.0032	-0.0111	-0.0077	0.0032
	Standard Error	0.0080	0.0079	0.0074	0.0048
Constant	Coefficient	0.0880	0.1290	0.1225	0.0880
	Standard Error	0.0453	0.0398	0.0474	0.2464
Observation		55	55	55	55
F-test (p-value)		0.0168	0.0198	0.0261	0.0000
R-squared		0.1799	0.0000	0.0231	0.1799
Number of family takaful operator		11	11	11	11

Note: ***, **, * denotes significant at 1%, 5% and 10% significance levels accordingly

The estimated regression equation as from Table 4.16 will be as follows:

$$ROA_{it} = 0.0880 - 0.1574CR_{it} + 0.0051VAIC_{it} + 0.0032RBC_{it} \quad (4.1)$$

This indicates that an increment in CR, VAIC, and RBC will result in a 0.1574 drop, 0.0051 rises, and 0.0032 rises in ROA model of family takaful accordingly.

Table 4.16 above shows regression results on the common effect model, fixed effect model, random effect model, and PCSE model of the ROA model for family takaful. Based on the regression result for the PCSE model, it shows that CR and VAIC have significant positive effects on ROA at a significance level of 1%. With such a value of -0.1574, there seems to be a negative association between CR and ROA. There is no significance between RBC and ROA for at least at a significance level of 10%.

Throughout the PCSE model, one increment in CR contributes to a 0.1574 unit drop in ROA, as indicated by the negative sign of the CR coefficient.

4.9.2 Regression results for ROE model in Family Takaful

Table 4.17: Statistical Tests for The Best Model Selection ROE Family Takaful

Test	Estimation Test Approach		p-value	Appropriate Model
Hausman Test	H0: Random Effect Model	Reject H0 when p-value < 0.05	0.3158	REM
	Ha: Fixed Effect Model			
Breusch-Pagan	H0: Common Effect Model	Reject H0 when p-value < 0.05	0.0000	
Lagrange Multiplier (LM) Test	Ha: Random Effect Model			

The proper steps for the ROE model in family takaful appear that the first step is by using Hausman test in order to select the appropriate model between random effect and fixed-effect model. The same goes for the second step by analyzing the Breusch-Lagrange Multiplier (LM) test to select the best model amongst common effects, also known as Pooled OLS random effect model. Based on table 4.18, the most suitable model chosen was the random effect model as both p-values conditions sufficed the hypothesis testing for both tests.

Table 4.18: Classical Assumption Test

Cross-sectional Dependence Test (Pesaran's CD-Test)	Reject H0 when probability < 0.05 Probability = 0.0746 (Cross-sectional dependence is not detected)
Autocorrelation Test (Woolridge Test)	Reject H0 when probability < 0.05 Probability = 0.4311 (Homoscedastic)
Heteroscedasticity Test (Breusch-Pagan/Cook-Weisberg Test)	Reject H0 when probability < 0.05 Probability = 0.7752 (No autocorrelation detected)
Normality Test (Skewness and Kurtosis Test)	CR and RBC are not normally distributed

As for heteroscedasticity, autocorrelation, and cross-sectional dependence test are measured using Breusch-Pagan/Cook-Weisberg, Modified Wald, and Pesaran's CD-Test, all probability found to be significant as they were valued greater than 0.05, and thus conclude that all null hypotheses were being accepted. This random effect model fulfilled the required assumptions except for the normality assumption based on the classical assumption. The normality assumption can be fulfilled to transform data into normal distribution by using the PCSE model.

Table 4.19: ROE Model for Family Takaful

		Common Effect	Fixed Effect	Random Effect	PCSE
		ROE	ROE	ROE	ROA
CR	Coefficient	-0.2435**	-0.1492	-0.1749*	-0.2435***
	Standard Error	0.1089	0.0978	0.0929	0.0519
VAIC	Coefficient	0.0091***	-0.0029	0.0003	0.0091***
	Standard Error	0.0033	0.0041	0.0037	0.0021
RBC	Coefficient	0.0051	-0.1929	-0.0139	0.0051
	Standard Error	0.0132	0.0129	0.0121	0.0079
Constant	Coefficient	0.1398	0.1663	0.1613	0.1398
	Standard Error	0.0745	0.0652	0.0776	0.0371
Observation		55	55	55	55
F-test (p-value)		0.0142	0.0000	0.1449	0.0000
R-squared		0.1858	0.0006	0.0265	0.1858
Number of family takaful operator		11	11	11	11

Note: ***,**,* denotes significant at 1%, 5% and 10% significance levels accordingly

Table 4.19 represents the estimated regression equation as follows:

$$ROE_{it} = 0.1398 - 0.2435CR_{it} + 0.0091VAIC_{it} + 0.0051RBC_{it} \quad (4.2)$$

This indicates that an increment in CR, VAIC, and RBC will result in a 0.2435 decrease, 0.0091 rises, and 0.0051 rises in the ROE model of family takaful, respectively.

Table 4.19 shows the regression outcomes for the common effect model, fixed and random effects model, and the PCSE model. The PCSE model indicates that the outcome of regression for ROE and ROA model in family takaful is the same, which is shown by the positive significance, at 1% significance level between CR and VAIC towards ROE. Thus, it implies that a unit rise in CR and VAIC will result in 0.2435 and 0.0091 drops respectively in ROE of family takaful fund. Meanwhile, the regression coefficient value of R² interpreted that 18.58% variation in ROA can be explained by all independent variables, which are claim ratio, risk-based capital, and intellectual capital. Still, those variables are not significant enough to have a relationship with ROA due to the 81.42% variation that cannot be explained.

Based on results obtained in Model 1 and Model 2, CR was found to have a positive significance with financial profitability in family takaful. This result is proven the same as in Pervan (2012) and Abdou (2014), but it contradicts with Awuah (2015). The variable VAIC found significance positively with profitability in family takaful, and this indicates the same result proven in Alipour (2012), Rehman (2013), Syah Aji (2015), and Kweh (2019). However, the result on VAIC contrast with findings from Joshi (2013) and Nasir (2019) since VAIC seems to have a significant relationship with ROA and ROE. As for RBC, it is found to have an insignificant relationship with ROA and ROE for family takaful, which contrasts with most previous studies.

4.9.3 Regression results for ROA model in General Takaful

Table 4.20: Statistical Tests for The Best Model Selection ROA General Takaful

Test	Estimation Test Approach		p-value	Appropriate Model
Chow Test	H0: Common Effect Model	Reject H0 when p-value < 0.05	0.0033	FEM
	Ha: Fixed Effect Model			
Hausman Test	H0: Random Effect Model	Reject H0 when p-value < 0.05	0.0191	
	Ha: Fixed Effect Model			
Breusch-Pagan Lagrange Multiplier (LM) Test	H0: Common Effect Model	Reject H0 when p-value < 0.05	1.0000	Common Effect Model
	Ha: Random Effect Model			

Table 4.20 shows few tests used in choosing the appropriate model for the ROA model in general takaful. Firstly, to select between the common effect and fixed-effect model, the chow test analysis was run. As the probability was lower than 0.05, the best model turned out to be a fixed-effect model. This result is supported by the Hausman, test whereas the probability of 0.0191 leads to the rejection of the null hypothesis.

Even though the Breusch-Pagan LM test found common effect as the best model due to the probability of 1.0000; still, the most appropriate model seemed to be the fixed effect model.

Table 4.21: Classical Assumption Test

Cross-sectional Dependence Test (Pesaran's CD-Test)	Reject H0 when probability < 0.05 Probability = 0.3700 (Cross-sectional dependence is not detected)
Autocorrelation Test (Woolridge Test)	Reject H0 when probability < 0.05 Probability = 0.0000 (Heteroscedastic)
Heteroscedasticity Test (Modified Wald Test)	Reject H0 when probability < 0.05 Probability = 0.0114 (Autocorrelation detected)
Normality Test (Shapiro-Wilk Test)	Reject H0 when p-value of each independent variable > 0.05 (Data for variables VAIC and RBC are not normally distributed)

On behalf of classical assumption tests, there seems to be quite a lot of problems for the ROA model in general takaful. The autocorrelation is tested using the Woolridge test, which then results in the presence of autocorrelation due to the probability below 0.05. Meanwhile, for heteroscedasticity in the fixed-effect model, the suitable test to detect its presence is by using the Modified Wald test. The result indicated that autocorrelation was detected since the probability fell lower than 0.05. The normality issue appears to

be the same as in previous models, whereby VAIC and RBC do not have normal distributions since the p-values for both variables went under 0.05.

Table 4.22: ROA Model for General Takaful

		Common Effect	Fixed Effect	Random Effect	GLS
		ROA	ROA	ROA	ROA
CR	Coefficient	0.1502	0.1296	0.1502	0.1502
	Standard Error	0.1870	0.1394	0.1870	0.1602
VAIC	Coefficient	-0.0004	-0.0002	-0.0004	-0.0004
	Standard Error	0.0003	0.0002	0.0003	0.0003
RBC	Coefficient	0.0261	-0.0005	0.0261	0.0261*
	Standard Error	0.0161	0.0112	0.0161	0.0138
Constant	Coefficient	0.1122	0.1727	0.1122	0.1122
	Standard Error	0.1012	0.0789	0.1012	0.0866
Observation		15	15	15	15
F-test (p-value)		0.3555	0.0033	0.3085	0.0000
R-squared		0.2464	0.0463	0.2464	0.8596
Number of general takaful operator		3	3	3	3

Note: ***, **, * denotes significant at 1%, 5% and 10% significance levels accordingly

The estimated regression equation as from Table 4.22 will be as follows:

$$ROA_{it} = 0.112 + 0.1502CR_{it} - 0.0004VAIC_{it} + 0.0261RBC_{it} \quad (4.3)$$

This indicates that an increment in CR, VAIC, and RBC will result in a 0.1502 rise, 0.0004 drops, and 0.0261 rises in the ROA model of general takaful, respectively.

Table 4.22 shows the regression outcomes for the common effect model, fixed and random effects model, and GLS model. The GLS model indicates that the outcome of regression for ROA model in general takaful shown only RBC was significant at 1% significance level. Meanwhile, both CR and VAIC were found to be insignificant with ROA in general takaful fund. In the GLS model, one increment in RBC contributes to a 0.0261 increase in ROA, as indicated by the positive sign of the regression coefficients. The R^2 value indicates that the independent variables can explain 85.96% variation in ROA general takaful and p-value which falls below 0.05 showed that GLS

is the most significant model.

4.9.4 Regression results for ROE model in General Takaful

Table 4.23: Statistical Tests for The Best Model Selection ROE General Takaful

Test	Estimation Test Approach		p-value	Appropriate Model
Chow Test	H0: Common Effect Model	Reject H0 when p-value < 0.05	0.0033	FEM
	Ha: Fixed Effect Model			
Hausman Test	H0: Random Effect Model	Reject H0 when p-value < 0.05	0.0191	Common Effect Model
	Ha: Fixed Effect Model			
Breusch-Pagan Lagrange Multiplier (LM) Test	H0: Common Effect Model	Reject H0 when p-value < 0.05	1.0000	Common Effect Model
	Ha: Random Effect Model			

Table 4.23 ran several tests to select the best estimation model for ROE in general takaful. Firstly, to select between common effect and fixed-effect model, the chow test analysis was run. Due to the probability value that was lower than 0.05, the appropriate estimation model turned out to be a fixed-effect model. This result is supported by the Hausman test, whereas the probability of 0.0191 leads to the rejection of the null hypothesis. Even though the Breusch-Pagan LM test found the common effect model as the best model due to the probability of 1.0000, the most appropriate model seemed to be a fixed-effect model.

Table 4.24: Classical Assumption Test

<p>Cross-sectional Dependence Test (Pesaran's CD-Test)</p>	<p>Reject H₀ when probability < 0.05 Probability = 0.3721 (Cross-sectional dependence not detected)</p>
<p>Autocorrelation Test (Woolridge Test)</p>	<p>Reject H₀ when probability < 0.05 Probability = 0.0000 (Heteroscedastic)</p>
<p>Heteroscedasticity Test (Modified Wald Test)</p>	<p>Reject H₀ when probability < 0.05 Probability = 0.1037 (No autocorrelation detected)</p>
<p>Normality Test (Shapiro-Wilk Test)</p>	<p>Reject H₀ when p-value of each independent variable > 0.05 (Data for variables VAIC and RBC are not normally distributed)</p>

On behalf of classical assumption tests, there seem two classical assumption issues for the ROE model in general takaful. Since the probability is less than 0.05, the existence of autocorrelation was discovered using the Woolridge test. Meanwhile, the normality issue appears to be the same as in previous models, whereby VAIC and RBC do not have normal distributions since the p-values for both variables went under 0.05. Therefore, this model resolved the classical assumption problems of having abnormal distribution and autocorrelation by using the GLS model.

Table 4.25: ROE Model for General Takaful

		Common Effect	Fixed Effect	Random Effect	GLS
		ROE	ROE	ROE	ROE
CR	Coefficient	0.2256	0.0098	0.2256	0.2256
	Standard Error	0.3054	0.2278	0.3054	0.2616
VAIC	Coefficient	-0.0007	-0.0003	-0.0007	-0.0007
	Standard Error	0.0005	0.0003	0.0005	0.0004
RBC	Coefficient	0.0447	0.0075	0.0447*	0.0447**
	Standard Error	0.2637	0.0183	0.2637	0.0226
Constant	Coefficient	0.1577	0.1452	0.1577	0.1577
	Standard Error	0.1652	0.1289	0.1652	0.1415
Observation		15	15	15	15
F-test (p-value)		0.3445	0.0033	0.2961	0.0001
R-squared		0.2515	0.0973	0.2515	0.8206
Number of general takaful operator		3	3	3	3

Note: ***, **, * denotes significant at 1%, 5% and 10% significance levels accordingly

Table 4.25 represents the estimated regression equation as follows:

$$ROE_{it} = 0.1577 + 0.2256CR_{it} - 0.0007VAIC_{it} + 0.0447RBC_{it}. \quad (4.4)$$

This indicates that an increment in CR, VAIC, and RBC will result in a 0.2256 increase, 0.0007 decreases, and 0.0447 rises in the ROE model of general takaful, respectively.

Table 4.25 shows the regression outcomes for the common effect model, fixed and random effects model, and GLS model. The GLS model indicates that the outcome of regression for ROE model in general takaful showed a negative relationship between variable CR and VAIC towards ROE in general takaful. Instead, only RBC seems to be significant towards ROE at the significance level of 5%. In this GLS model, each unit increase in RBC 0.0447 increment in ROE, as indicated by the positive sign of the regression coefficients. P-values that fall below 0.05 shows that GLS is the most significant model, with 82.06% variation in ROE can be explained by the independent variables.

RBC's only positively significant variable towards financial performance is based on ROA and ROE models in general takaful fund. The results proved the same as in Lazam

(2012), Lee (2019), and also Tarsono (2020). However, the CR and VAIC variables were insignificant towards the financial performance of general takaful funds, at least at a 10% significance level. This result opposed the findings of most previous studies but somehow supported a study by Joshi (2013), who indicated that, since insurance companies depend more on physical capital, the VAIC approach that considers human and institutional capital as major elements have a lower contribution, meaning that it is insignificant.

4.10 Conclusion

In a nutshell, the variable risk-based capital was found to have a significant relationship with the profitability of takaful operators in terms of ROA and ROE for general takaful business. Somehow, the claim ratio and intellectual capital were found to be negatively associated with the profitability of takaful operators in both ROA and ROE for general takaful funds. For intellectual capital and claim ratio, they were found positively significant towards family takaful operators, meanwhile have negative relationship towards general takaful operators.