CHAPTER 4: RESULTS

4.1 INTRODUCTION

In this chapter, the finding of the empirical investigation of the relationship between share buybacks and the developed hypotheses is discussed. Data analysis was conducted using Statistical Package for Social Sciences (SPSS). Descriptive statistics and factor analysis were the main statistical technique used in the analysis. The discussion is organised as follows; Section 4.2 details the procedures followed in constructing the sample of repurchase and non-repurchasing firms. Section 4.3 provides the descriptive statistics and the correlation matrix for important variables are presented and discussed. Section 4.4 discusses on the methods of analysis, whilst Section 4.4 presents the regression results and examines the resulting implications. Finally, Section 4.5 concludes the chapter of empirical findings.

4.2 METHOD OF ANALYSIS

Univariate and multivariate analysis was employed to investigate the effect and relationship between dependent and independent variables. Specifically, the statistical techniques employed were conducted in order to identify factors that influence the repurchasing activity as well as the different between repurchase and non-repurchase companies.

In this study, the statistical used includes factor analysis, multiple regression independent sample t-test, and logistic regression. As the main objective of this study is to identify the motives of share buybacks, factor analysis was conducted to ascertain the four developed hypotheses of share buybacks. The principal component analysis was used in order to compare the relative effect of each of independent variable on the dependent variable (Hair *et al*. 1987). In similar study, Guffey and Schneider (2004) and Akma (2006) employed factor analysis in identify the factors that influence share buybacks. Accordingly, Pallant (2007) factor analysis takes a large set of variables and looks for a way the data may be reduced or summarized using smaller set of factors or components. Thus, this technique is expected to produce the most appropriate approach to identify the motives of share buybacks.

In this study, the multivariate analysis was initiated with a principal components analysis with an orthogonal rotation. According to Tabanick and Fidell(2007), result of orthogonal (uncorrelated) rotation allows easier interpretation and reporting procedures than oblique (correlated) rotation.

Thus, Varimax (orthogonal rotation method) allows the underlying factors to be independent with each other. Therefore, each factor is independent of all other factors and the correlation between all factors is arbitrarily determined to be zero. In current study, the principal components outcomes were constrained into five factors in order to confirm predetermined five dimension of financial characteristics i.e financial leverage, size and growth, liquidity, profitability and market value ratio. Thus, a sum of five factors loadings generated from the factor analysis is extracted in order to determine the motives of share buybacks. These factor loadings were regressed with each of the independent variables to identify which factor are the most related to the motives of share buybacks. This method allows the variables to be grouped into five factors that provide meaningful interpretation for motives of share buybacks.

Having two group of dependent variable i.e repurchase firm and non-repurchase firms, make it possible to identify the differences between these two groups. Therefore, the general hypotheses assume that the repurchase companies are different from non-repurchase companies. An independent sample t-test (univariate analysis) was employed to understand the differences between these two groups. Pallant (2007) stated that independent-samples t-test allow comparison of the mean score for two different groups of subject. In fact, it enables us to ascertain whether there is statistically difference in the mean score of two groups.

In addition, multivariate analysis was used to develop the model that documents the differences between repurchase and non-repurchase companies. This study follows the methods that employed by Guffey and Schneider (2004) that used logistic regression. In the logistic regression, repurchase and non-repurchase firms are differentiated accordingly. The beta co-efficients generated from the logistic regression are used to develop the model in order to test the four hypotheses and general hypothesis. The rationale to use logistic regression is that this method allows comparison between the two group of repurchase and non-repurchase. It is by the objective of current study that aims to differentiate repurchase and non-repurchase firms. As compared to multiple regression, the beta produced from logistic regression not only provides evidence of whether the anticipated variables significantly differentiates between the two groups, but also identify which variables has the greatest impact (Guffey and Schneider, 2004).

4.2.1 Factor Analysis

The result of factor analysis is presented in following Table 4.1

Table 4.1: Summary of factor structure

Dimension/Financial Variable	**Factor 1** (Financial Leverage)	**Factor 2** (Size and growth)	**Factor 3** (Liquidity)	**Factor 4** (Profitability)	**Factor 5** (Market Value ratio)
Market Value Ratio:	-0.265	0.007	0.391	-0.539	**0.879**

PBV					
Financial Leverage:					
DTA	**0.884**	0.255	0.162	0.018	0.078
DER	**0.924**	0.171	0.010	-0.002	0.084
Profitability:					
CTA	-0.645	0.204	0.408	**0.940**	-0.132
ROA	-0.094	-0.020	0.107	**0.903**	-0.132
Liquidity:					
QR	0.050	-0.159	**0.868**	0.036	0.112
Size and Growth:					
Market Value	0.158	**0.909**	-0.058	-0.007	0.156
Sales	0.078	**0.943**	-0.086	-0.022	0.079
Sales Growth	-0.004	**0.923**	0.153	-0.092	-0.442

Note: The scale item and factor association are in bold.

Based on the result, the five anticipated dimensions are generally apparent. The factor loadings range from 0.868 to 0.943 and are greater than 0.82. The Eigen Values for the five factor loadings range from 0.807 to 2.665 with four Eigen Values exceeds 1.00. The amount of variance explained by the five factor loadings is 82.12 per cent. Kaiser-Meyer-Olkin Measure of sampling adequacy score is 0.578 where Kaiser (1974) recommends that the acceptance value should be greater than 0.5

From the above result, it is understood that Factor 1 is the most related to financial leverage ratio, Factor 2 is the most related to size and growth, Factor 3 is the most related to liquidity ratio, factor 4 is the most related to profitability ratio and finally Factor 5 is the most related to market value ratio.

In addition to the above result, another five sets of multiple regressions was initiated to confirm the association of financial variables with the five factor loadings. Table 4.2 summarized the result of multiple regression.

Table 4.2: Summary of regression between five factor loadings and the independent variables

Factor loadings (Independent Variables)	**Financial variables (Dependent variables)**								
	PBV	DTA	DER	CTA	ROA	QR	MV	S	SG
Factor 1	-0.265	0.884*	0.924*	-0.645	-0.094	0.050	0.158	0.078	-0.004
Factor 2	0.007	0.255	0.171	0.204	-0.020	-0.159	0.909*	0.943*	0.203*
Factor 3	0.391	0.162	0.010	0.408	0.107	0.868*	-0.058	-0.086	0.153
Factor 4	-0.539	0.018	-0.002	0.054	0.903*	0.036*	-0.007	-0.022	-0.092
Factor 5	-0.442*	0.048	0.078	0.084	-0.132	0.112	0.156	0.079	0.879

*Significant at 0.05 level.

Based on the result of multiple regressions above, it is observed that the results of factor analysis in previous sub-section 4.2.1 are supported and accurate in order to determine the five factors.

The main objective of current study is to identify which dimension of financial variables has the greatest impact on repurchase activity, thus provide the answer to the first research questions of which is the most significant motivation of share buybacks. Therefore, the following model was developed in order to answer the question.

General model:

$$\mathbf{RCAP = \beta_0 + \beta_1 * F1 + \beta_2 * F2 + \beta_3 * F3 + \beta_4 * F4 + \beta_5 * F5 + \varepsilon}$$

Where;

Dependent variable	=	Percentage of the repurchase amount per market Capitalisation (RCAP)
β_0	=	Intercept term
$\beta_1 - \beta_5$	=	Regression co-efficients
F1	=	Factor related to leverage
F2	=	Factor related to size of firms and growth prospects
F3	=	Factor related to liquidity
F4	=	Factor related to profitability
F5	=	Factor related to market value ratio
ε	=	error term

Thus, another multiple regression was run in order to establish the developed model of RCAP. The following Table 4.3 summarized the result of the multiple regression.

Table 4.3: Summary of regression between five factor loadings and the RCAP

Model	Unstandardized co-efficients	Standardized co-efficients	Sig.
	Beta	**Beta**	
Constant	0.17		0.025
F1	-0.187	-0.164	0.000*
F2	0.130	0.112	0.470
F3	0.087	0.093	0.243
F4	0.104	0.101	0.005*
F5	-0.087	-0.069	0.000*

*Significant at 0.05 level

Based on the multiple regression above, it is observed that F1, F2, and F3 are statistically significant in explaining the variation in RCAP. Thus, the result shows that factor relating to financial leverage, profitability and price multiples (market value ratio) respectively are significant factors that influence RCAP. In fact, the most important motivation of share buybacks are coming from the factor related to optimal leverage ratio, followed by factor related to profitability and market value ratio respectively. Therefore, the following model was developed in explain the motivations of share buybacks:

RCAP= 0.17 - 0.187*F1 + 0.104 *F4 - 0.087*F5

4.2.2 Independent-Sample T-Test

The mean of the financial characteristics between repurchase and non-repurchase firms and respective t-statistics are presented in Table 4.4

Table 4.4: Means and Univariate Statistics

Financial Variable	Non-repurchase Firms	Repurchase Firms	T-Statistics	Sig. (2-tailed)
Debt-to-Total Asset(DTA)	0.3286	0.2023	-4.284	0.000*
Debt-to-Total Equity(DER)	0.4729	0.2708	-5.608	0.000*
Market Value(MV) (in millions)	1586.9827	644.1447	1.053	0.293
Sales(S) (in millions)	855.2969	511.2046	1.054	0.293
Sales Growth(SG)	0.2231	0.2467	-0.354	0.724
Quick Ratio(QR)	1.4376	1.9389	1.410	0.159

Cash Flow-to-Total Asset(CTA)	0.0912	0.0832	0.886	0.376
Return on Asset(ROA)	0.0661	0.0958	2.762	0.006*
Price to Book Value(PBV)	0.9716	0.4760	-6.051	0.000*

*Significant at 0.05 level

Based on the t-statistics above, statistically significant differences exist between repurchase and non-repurchase firms in terms of DTA, DER, ROA, and PBV. The results indicate that repurchase firms are undervalued, under leverage and are more profitable than non-repurchase firms. Therefore, the above results support hypothesis 1, hypothesis 4 and hypothesis 5. In addition, the result also revealed that repurchase and non-repurchase firms are not statistically different in term of size and growth, as well liquidity.

4.2.3 Logistic Regression

Logistic regression is used to test whether repurchase companies differ from the non-repurchasing companies. In this study, the developed logistic regression model is developed to test for differences between the two groups. Table 4.5 present the result of the logistic regression.

Table 4.5: Logistic regression model

	β	**Sig.**

Intercept	2.453	0.000
PBV	-3.715	0.000*
DTA	-2.975	0.017*
DER	-3.156	0.007*
CTA	11.556	0.118
ROA	16.504	0.037*
QR	0.112	0.188
MV	0.024	0.725
S	0.035	0.434
SG	-0.051	0.888

* Significant at 0.05 level

Based on the logistic regression above, statistically significant differences exist between repurchase and non-repurchase firms in terms of DTA, DER, ROA, and PBV. These results indicate that repurchase firms are undervalued, indebtedness and are more profitable than non-repurchase firms. Therefore, the above results support hypothesis 1, hypothesis 4 and hypothesis 5. In addition, the results are consistent with the univariate t-test.

In order to express the difference between repurchase and non-repurchase firms, the following model is developed accordingly:-

General Model:

Dependent Variable= $\beta_0 + \beta_1$*DTA+ β_2 *DER+ β_3 *MV+ β_4 *S+ β_5 *SG+ β_6 *QR+

β_7 *CTA+ β_8 *ROA+ β_9 *PBV+ ε

Where;

Dependent variable	=	Percentage of the repurchase amount per market Capitalisation (RCAP)
β_0	=	Intercept term
$\beta_1 - \beta_9$	=	Co-efficients regression
ε	=	error term

Logistic Regression Model:

RCAP= 2.453 - 2.975 *DTA - 3.156*DER + 16.504*ROA - 3.715* PBV

Based on the logistic regression above, the sign of all predictors are consistent with developed hypotheses. In other words, the impacts of all of the predictors towards RCAP is well support and as per hypothesized.

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4.3 DISCUSSION OF RESULTS

4.3.1 Most significant motivations of share buybacks

The statistical techniques applied to explain the significant motive of share buyback and the result shows that the significant motives are mostly related to (1) factor related to financial leverage, (2) factor related to profitability, and (3) factor related to market value ratio respectively. Thus, the most important motive of share buyback among the firms was to adjust their capital structure in attempt to achieve optimal capital structure, followed by to distribute excess cash to shareholders and to increase the share price.

The result revealed that the most import motive of share buybacks among firms was to adjust their capital structure. By repurchase, it enables the firms to adjust their capital structure and enable them to enjoy the interest tax shield from the additional leverage resulting from the decreased equity financing. Skjeltorp and Segaard(2004) suggests that when the firms are below their optimal capital structure, then share repurchase will increase the financial leverage and increase tax shield and thus improve firms' value. Another possible reason is that, the firms may motivate to repurchase in order to balance the equity position resulting employee share option scheme (ESOS) offered to their employees. Firms may announce share buybacks in order to offset "dilution" from employee and executive stock options incentive plans (Fenn and Liang, 2001), Jolls (1998) and Weisbenner (1998). In addition, Lee and Adam (2004) found a positive correlation between repurchase decision and the exercisable stock options. Interestingly, they find that repurchasing firms have higher percentage of treasury shares than non-repurchasing firms before repurchase decision. Furthermore, their evidence suggests that the firms repurchase stock to offset the dilution of Earnings per Share (EPS).

The second most important motive of buybacks is related to the profitability. The possible explanation is that the firms may opt to repurchase in order to rewards the shareholders. In directly, it may indicate that the firms are unable to find profitable investment opportunities thus it is better to return the excess cash to shareholders. The decision may result in tax saving to the shareholders since the tax on the capital gain is slightly lower as compared to tax charged on the dividend income. In addition, the

shareholder may favour repurchase if the repurchased shares are distributed in terms of bonus issue, stock dividend or redistributed in future. Jensen (1976) suggests that share repurchases may contribute to a more responsible use of free cash flows. He claims that when the managers return excess cash to shareholders via repurchase it may indicate that the managers are acting in the best interest of shareholders by not using the funds for unwise diversifications or negative net present value investments. Thereby, the managers may increase the trust and confidence of the shareholders and thus reduced the agency cost.

Finally, the last motive of share buybacks is related to the undervaluation theory. The result shows that the firms' stock are undervalued and repurchase may convey the information to the public about undervaluation. The result shows that, when the firms' price is undervalued by the market analysts, the firms are motivated to undertake share buybacks. While the previous literature shows that undervaluation is the most cited reason for repurchase (Vermaelen, 1981; D'mello and Shroff, 2000; Nasruddin and Angappan, 2003; and Akma, 2006) but surprisingly this study found that undervaluation appear to be the least important motive of share buybacks. The possible explanation may due to the fact that most of the firms undertake share buybacks for the other reason rather than undervaluation motive. In addition, the economic condition and financial market during period of study is quite good and healthy.

However, this study fails to provide any significant result that may explain the anti-takeover motive from repurchase. The result is consistent with the finding of Dittmar (2000) that failed to find evidence that take-over deterrence is a motive for open market share repurchase. Thus, it indicates that repurchase may not be a weapon for take-over deterrence in Malaysian environment or perhaps another variables might be consider in order to ascertain take-over deterrence motive of share buybacks. Nevertheless, this may open up further investigation to clarify the issue.

4.3.2 Significant difference between repurchase and non-repurchase firms

In univariate t-test as well as logistic regression, the significant results in comparing repurchase and non-repurchase firm only supports the DTA, DER, ROA and PBV. Thus, the results support optimal leverage ratio hypothesis, free cash flow hypothesis and information signalling hypothesis. However, is observed that CTA is not statistically significant in explaining the different between repurchase and non-repurchase firms. Thus it might violate the free cash flow hypothesis. On the other hand, the results reveal that repurchase and non-repurchase firms are not statistically different in term of size and growth, and liquidity. In term of size and growth, it is possible to explain that there is no different between repurchase and non-repurchase firms because majority of the firms are listed in the Main Board of Bursa Malaysia. These firms are characterized by large and enjoy growth opportunities at par of their industry peers. In term of liquidity, both of two groups may have adequate cash in hand prior to distribute the excess cash to shareholders. Young (1969) also finds no distinct differences between repurchase and

non-repurchase firms in term of liquidity positions. In addition, the results of multivariate analysis through logistic regression are consistent with independent-sample t-test.

4.3 CONCLUSION

From the developed model, the impacts of all predictor variables are well support the hypotheses and the results are per what is expected. However, the result reveals that there was a change in the trend of share buybacks. Akma (2006) documented that the main motives of share buybacks are to support undervaluation and followed by to support for the improvement in the operating performance. However, the result in current study reveals that the most important motives of share buybacks is to adjust the capital structure while undervaluation motives fall to the last motive. In other words, it may indicate that the most optimal leverage ratio hypothesis is more important than information signalling hypothesis. The result from factor analysis and logistic regression are also consistent whereby both methods support Hypothesis 1, hypothesis 3 and hypothesis 4 and find no evidence to support Hypothesis 2.

As indicated in the beginning of this chapter, the goal of this study is to determine the most important motive of share buybacks and to find out should there is any differences of financial characteristics between repurchase and non-repurchase firms. The results of analysis confirm that repurchasing firms are under leverage, thus optimal financial

leverage is the most important motive as compared to other motives. In comparison between repurchase and non-repurchase firms, the significant different only exist for market value, financial leverage and profitability, thus this indicates that repurchase firms are undervalued, indebtedness and profitable as compared to non-repurchasing firm. In addition, the results from all the statistical analysis show the consistencies of the regression results.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter presents the conclusion and practical implications from this current research. In addition, limitations are also discussed and suggestions for future research are also highlighted. This chapter is organised as follows; Section 5.2 discussed on