DETERMINANTS OF COMMERCIAL BANK PROFITABILITY IN MALAYSIA

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ABSTRACT

Why are some commercial banks more successful than others? To what extent, are the profitability performance disparities due to variations in management controllable internal factors and to what extent; do environment related external factors influence the profitability performance of these institutions? This research paper was initiated by a series of questions such as these. It attempts to identify the determinants of successful commercial banks in order to provide practical guides for improved profitability performance of these institutions.

INTRODUCTION

This paper is the result of an attempt to find answers to a series of questions, including: Why are some commercial banks more successful than others? To what extent, are the profitability performance disparities due to variations in management controllable internal factors? To what extent do environment related external factors influence the profitability performance of these institutions? In order to identify the determinants of successful commercial banks in an effort to provide practical guides for improved profitability performance of these institutions. To this extent, the paper first provides a brief background. Second, potential determinants of commercial profitability are identified. Third, the model used is described and the related variables are specified. Fourth, the findings of the study are reported and finally, conclusions and recommendations are made.

BACKGROUND OF THE STUDY

Recent trends in financial deregulation, technological and financial innovation and globalization are certainly posing new challenges for market participants in the Malaysian financial sector. To this extent, advances in computer technology and telecommunications are expanding the frontiers of electronic banking and internet based financial services. These developments are certainly reshaping the structure of the financial institutions in regards to internal operations, interactions with customers, and inter-institutional relationships. In addition, there has been a proliferation of new financial services and overlapping of markets between bank and non-bank financial intermediaries. All these developments would surely have implications on the costs and revenues and hence on the profitability of Malaysian commercial banks. To this extent, Foyston and Almeida (1992) have indicated that there are fundamental shifts taking place in the Malaysian banking industry, which are being driven by changes in both supply, and demand. Supply side changes are influenced by radical deregulation, internationalization of local banks and increasing legitimacy of capital markets. On the other hand, the demand side changes are influenced by rapid economic growth, expanding middle-class society and the rise of consumerism. The suppliers have responded by expanding branch networks and new products whereas the consumers have responded by reducing their savings rate, disintermediating and shifting from low to high yielding deposits. As a result, commercial bank profits may be under pressure from lower loan yields and higher cost of funds.

In this context, it is also worth noting that the weaken in the commercial banks' percentage share of the total funds mobilized in the Malaysian economy from 23.1% in 1991 to 17.5% in 1996 is a clear indication of trends towards disintermediation. This may lead to competition for funds, which may in turn increase the cost of deposits and hence squeeze commercial bank margins and profitability. The message is thus clear, which is even louder after the recent financial crisis of the banking sector in this region in 1997. Commercial banks in Malaysia will have to review the way they have been doing business in the past and they would need to understand the internal and external factors, which influence their profitability performance. Such an understanding of the dynamics of the operating relationships would not only be useful for sustaining high profitability but would also be essential for the survival of these commercial banks by enabling them to hedge against the adversities of external shocks. A great deal of earlier research on bank profitability had focused on the impact of market structure, in particular of market attentiveness on bank profitability. This preoccupation was derived from the importance accorded to the Structure-Conduct-Performance (SCP) hypothesis, which asserts that banks in highly concentrated markets have a tendency to collude and

as a result earn monopoly profit. Subsequent studies had focused on the testing of the validity of alternative market structure hypotheses such as the efficient-structure hypothesis and the risk-aversion hypothesis.

A review of literature and cross-references obtained there from reveals many studies by researchers who have explicitly studied the determinants of commercial bank profitability (Haslem, 1968; Haslem, 1969; Ryan, 1972; Short, 1979; Bourke, 1989; Molyneux and Thornton, 1992). Ryan (1972) had focused on medium sized banks whereas Bourke (1989) and Molyneux and Thornton (1992) had focused on large banks. In the Malaysian context too, there has been extensive research in the area of banking and finance (e.g., Lee, 1981; Lin, 1985; Lin, 1988; Shanmugam, 1988; Pang, 1995; Haron, 1996; Balachandher and Shanmugam, 1997). To this extent, it is worth noting that only Haron (1996) and Balachandher and Shanmugam (1997) had focused on an explicit analysis of the profitability determinants of Malaysian commercial banks. However, the scope of Haron (1996) was only confined to Islamic banks. Thus, an explicit analysis of the determinants of commercial bank profitability in Malaysia is indeed lacking. Hence, it is hoped that this study will serve to expand the existing literature on banking and finance in Malaysia particularly in the context of commercial bank profitability.

Determinants of Commercial Bank Profitability

The determinants of commercial bank profitability can be divided into two main categories namely those that are management controllable and those that are beyond the control of management. Those factors, which are management controllable, are classified as internal determinants and those beyond the control of management are referred to as external determinants. The internal determinants basically reflect on the differences in bank management policies and decisions in regards to sources and uses of funds management, capital and liquidity management and expenses management. The management-induced effects on profitability can be analysed by examining the balance sheet and profit and loss accounts of these institutions. The balance sheet items would illustrate the banks' management policies and decisions in relation to the sources, composition and uses of funds.

On the other hand, the management's efficiency in generating revenues and controlling costs would be reflected in the profit and loss accounts. The management controllable internal determinants considered in this study are similar to those considered in research on bank profitability (Bourke, 1989; Molyneux and Thornton, 1992; Williams, *et al,* 1994; Molyneux, *et al,* 1994). The internal determinants include capital ratios, liquidity

ratios, assets and liability portfolio mix and overhead expenses. In contrast, the external determinants of commercial bank profitability can be further subdivided into environment related factors and firm specific factors. The environment related factors considered by Short (1979), Bourke (1989) and Molyneux and Thornton (1992) include market structure, regulation, inflation, interest rate, and market growth. On the other hand, the firm specific factors include firm size and ownership.

RESEARCH METHODOLOGY

The general consensus from the literature reviewed on bank profitability was that the appropriate functional form for analysis is the linear form. To this extent, Short (1979), and Bourke (1989) had considered several functional forms and concluded that the linear model produced results as good as any other functional form. In support of this, Williams, *et al,* (1994) and Molyneux, *et al,* (1994) had also considered a linear model in their studies on bank profitability. Thus, in this study as well we have considered a linear model to analyse pooled cross-section time series data to isolate the profitability determinants of Malaysian commercial banks. However, some banks may enjoy firm specific competitive advantages due to corporate image or customer relationships, which may not be easily quantifiable and hence may not be accounted for by the variables included in the study.

Furthermore, the profitability of commercial banks may also be affected, by economic booms and recessionary periods. In this circumstance, the varying economic conditions from one year to another can also be expected to have an impact on the profitability of these institutions. Thus, the regression parameters of the linear profitability model may change over time and may differ between cross-sectional units. An effort is made in this study to capture the effect of temporal and cross-sectional differences on commercial bank profitability by including dummy variables in the linear model. The implicit assumption in this model is that the effect of the temporal and cross-sectional differences, are limited to the intercept term. This is a necessary assumption because if the slopes were to vary as well over time and cross-sectional units, then according to Pindyck and Rubinfeld (1991) each separate cross-section regression, would involve a distinct model and pooling would be inappropriate.

In line with the foregoing discussion, the general unrestricted model for this study where the intercepts are not restricted to be equal over time and cross-sectional units may be stated as follows:

$$Y_{it} = \beta_0 + \sum_{i=2}^{N} \gamma_i D_{it} + \sum_{t=2}^{T} \lambda_i W_{it} + \sum_{k=1}^{K} \beta_k X_{kit} + \varepsilon_{it} \quad (1)$$

Where,

X_{kit} = the k-th independent variable for firm - i in year - t
Y_{it} = the profitability measure of firm – i in year – t
D_{it} = the dummy variable to account for cross-sectional differences
W_{it} = the dummy variable to account for temporal differences
N = the total number of commercial banks included in the sample
T = the total number of time periods
K = the total number of independent or predictor variables
ε_{it} = the error term

The firm specific dummy variable, D_{it} assumes a value of one for the i-th firm and zero otherwise, for the time period t=2 to T. On the other hand, the dummy variable, W_{it} assumes a value of one for the t-th year and zero otherwise for i = 2 to N. At, this point it is worth noting that only N-1 dummy variables are included to account for cross-sectional differences and T-1 dummy variables for temporal differences. The reason for this is to avoid the problem of perfect multicollinearity among the dummy variables. A further necessary assumption for the model is that the ε_{it}'s are independently and identically distributed as N $(0, \sigma^2)$. Before applying the ordinary least squares (OLS) regression techniques, the general unrestricted model represented by equation (1) was tested for temporal and cross-sectional stability. If evidence could be found for temporal stability then the dummy variables accounting for temporal differences in the intercept would not be jointly significant and hence could be removed to yield the following model:

$$Y_{it} = \beta_0 + \sum_{i=2}^{N} \gamma_i D_{it} + \sum_{k=1}^{K} \beta_k X_{kit} + \varepsilon_{it} \quad (2)$$

Similarly, in the absence of temporal stability but presence of cross-sectional stability the appropriate model would be represented as follows:

$$Y_{it} = \beta_0 + \sum_{t=2}^{T} \lambda_i W_{it} + \sum_{k=1}^{K} \beta_k X_{k\,it} + \varepsilon_{it} \qquad (3)$$

However, in the presence of both temporal and cross-sectional stability, the intercept would be equal over time and cross-sectional units and thus the dummy variables W_{it} and D_{ot} would be irrelevant and hence could be removed to yield the following model:

$$Y_{it} = \beta_0 + + \sum_{k=1}^{K} \beta_k X_{k\,it} + \varepsilon_{it} \qquad (4)$$

The decision whether or not to include the dummy variables in the profitability model was based on statistical testing which engages the comparison of the error or residual sum of squares (RSS) of the unrestricted and the restricted models by using the following F –test (Doran and Guise, 1984 and Pinyck and Rubenfeld, 1991):

$$F = \frac{[\,RSS_R - RSS_{UR}\,] / M}{RSS_{UR} / (NT - K)}$$

Where,

RSS_R = Residual sum of squares of the restricted model
RSS_{UR} = Residual sum of squares of the unrestricted model
M = Number of linear constraints in the restricted model
NT = Total number of observations
K = Number of parameters in the unrestricted model

The objective of the above test is basically to determine the joint significance of the omitted variables in the restricted model. Suppose the omitted variables have no significant effect on the dependent variable then the error sum of squares of the restricted model will not be very different from the error sum of squares of the unrestricted model. In this case the value of $[RSS_R - RSS_{UR}]$ will be small and hence result in a small F-value which would indicate that the omitted variables are jointly and statistically not significant. Thus, the decision rule will be to reject the restricted model at the α % significance level only if the computed F exceeds the critical value $F_{\alpha, M, NT-K}$. In this context, the restricted model in equation (2) will be compared with the

unrestricted model in equation (1) to test for temporal stability. In the event of temporal stability the profitability model indicated by equation (2) will be used. The next step would be to test for cross-sectional stability by comparing the restricted model in equation (2) with the even more restricted model in equation (4). On the other hand, if in the first place there appears to be absence of temporal stability then equation (1) will be compared with equation (3) to test for cross-sectional stability.

Variable Specification: Dependent Variable

The dependent variable in the model specified is some measure of commercial bank profitability. In line with earlier studies on bank profitability, ratios will be used as measures of bank profitability since they are inflation invariant that is they are not affected by changes in the general price level. This is so since the numerator and the denominator in the period-t profitability ratios would be measured in monetary terms based on period-t price levels. Thus, deflating for prices using some based period price index would leave the ratios unchanged. This is especially significant in a time series analysis such as this, where the real value of profits may be distorted by the time varying inflation rates. The choice of the profitability ratio will depend on the objective of the profitability measure. The return on assets (ROA), which is the ratio of net income to total assets, measure how profitably and efficiently the management, is using the company's total assets. In addition deflating the net income by total assets also takes account of the variation in the absolute magnitude of the profits, which may be size related. On the other hand, the return on equity (ROE), which is the ratio of net income to total equity would indicate returns to shareholders on the book value of their investments. In line with Bourke (1989) and Molyneux and Thornton (1992), total equity is assumed to include shareholders capital and reserves, which are, actually undistributed net profits. Another problem that needs to be resolved is that the total assets and equity capital may not remain constant throughout the year. To this extent, in line with Frame and Holder (1994), average values of consecutive year-end balance sheet figures were used in the study. Further controversy concerning net incomes is the choice between pre-tax and post-tax profits. In a study such as this which is confined to the boundaries of one nation, the choice between pre and post–tax profits may not seem to be very significant since all banks would be subjected to the same corporation tax. However, if taxation were considered as a cost to the firms then after tax profits would certainly represent a more appropriate measure of bank performance. However, net income is usually aggregated with expense items such as provision for loans and staff costs, which are tax deductible and hence it would not be rational to mingle these costs with after tax profits. Thus, both the pre and post-tax profits are considered in this study to analyse the impact of taxation of bank profitability. In line with the above discussion,

the following measures of profitability are considered as alternative measures for the dependent variable in this study:

BTTA	= Net income before tax as a percentage of total assets
ATTA	= Net income after tax as a percentage of total assets
BTCR	= Net income before tax as a percentage of shareholders capital and reserves
ATCR	= Net income after tax as a percentage of shareholders capital and reserves

Variable Specification: Independent Variables

Before we proceed to specify the independent variables, it would certainly be useful to consider a brief discussion of the factors both internal and external to the bank, which may affect bank profitability. In the context, of the factors within the control of management the immediate factors, which would have an impact on bank profitability, would be those factors, which affect a banks net interest income, that according to Vong (1996) accounts for about 80% of Malaysian commercial banks total income. To this extent, the interest rates charged on loans and the numerous forms of deposits could be expected to have an impact on profitability. However, since such rates are not easy to obtain and even data on individual banks total interest income and interest expenditure are only found reported in the more recent annual repots of these banks. Thus, the volume of loans and the volume of the various forms of deposits held are used as proxy to measure the efficiency of asset and liability portfolio management respectively.

The business of financial intermediation is exposed to various forms of risk such as interest rate risk and credit risk. In this context, the profitability of a bank would be dependent on the management's attitude towards risk. To this extent, the risk inherent in a bank and the management's attitude towards risk can be analysed by examining the capital and reserves a bank chooses to hold and its liquidity management policies. Banks with high capital–asset ratios would be considered relatively safer in the event of loss or liquidation. Thus, high capital–asset ratios are assumed to be indicators of low leverage and hence low risk. The conventional risk-return hypothesis would therefore imply a negative relationship between capital-asset ratio and bank profitability. However, Koehn and Santomero (1980) pointed out that regulations, which increase the capital adequacy requirements would increase the capital–assets ratio and thus reduce risk. This may induce the banks to absorb greater risk in their asset portfolios in the

hope of maximizing expected returns. Thus, there is also the possibility of a positive association between capital-assets ratio and bank profitability.

In terms of liquidity management, since banks are involved in the business of transforming short-term deposits into long-term credit, they would be constantly faced with the risks associated with the maturity mismatch. In order to hedge against liquidity deficits, which can lead to insolvency problems, banks often hold liquid assets, which can be easily converted to cash. However, liquid assets are often associated with lower rates of return. Hence high liquidity would be expected to be associated with lower profitability. Consistent with the foregoing argument Molyneux and Thornton (1992) had also found a weak inverse relationship between liquidity and bank profitability. However, Bourke's (1989) results had indicated a significant positive relationship between liquidity and bank profitability. One possible reason for the conflicting findings may be different elasticity's of demand for loans in the two samples. Another internal factor, which can be expected to have a significant effect on profitability, is efficiency in expenses management. The relationship between expenditure and profits may appear to be very straightforward. However, this may not essentially be so especially if higher expenditure is associated with higher volume of business activity and hence higher revenues as well. Thus, in order to assess a bank's efficiency at expenses- management, it would be necessary to deflate the expenditure to reflect variations in activity levels. To this extent, in line with Steinherr and Huveneers (1994), the bank's total expenditure would be deflated by total assets to measure the firm specific expense management efficiency by measuring the cost incurred per monetary unit of assets.

In addition to these internal factors, a bank's profitability can also be affected by external factors. For instance the market for deposits and loans may be affected by an economic slowdown and this would certainly have an impact on profitability. As far as banks and other financial intermediaries are concerned these changing market conditions can be measured from either the asset or the liability side. In this context, since the banks' asset portfolios are dependent on their liability portfolio for financing purposes, the market growth is proxied by growth in the M3 component of money supply which, in Malaysia is defined as the aggregate of currency in circulation and savings and fixed deposits, net issues of NCD and REPO transactions of commercial banks, finance companies, merchant banks, and discount houses. Bourke (1989) had suggested that growth in total market, if particularly associated with entry barriers, might produce potential for banks to earn higher profits. In this context, it is worth noting that the number of commercial banks in Malaysia had not increased over the last ten years but has in fact decreased due to mergers and take-over activities. However, the economy has been expanding at annual average growth rate of about eight percent

for the last eight years prior to the 1997 economic crisis. Thus, in line with Bourke's (1989) argument, market growth can be expected to have a positive impact on Malaysian commercial bank profitability.

Furthermore, the market share of individual banks may also change as a result of competitive behaviour in the banking industry. A change in the market share would certainly have implications on the profit potentials of these institutions. However, since both deposits and loans can be considered as bank output, there is a need to make a choice between a deposit or asset measure of market share. In view of the fact, that the asset components may include investment in securities and subsidiaries, which certainly would not be homogenous across firms, the deposit measure of market share is considered to be a more equitable measure of market share for commercial banks. Changing market conditions would also have an impact on the market interest rates, which would certainly have a direct impact on bank profitability. The difficulty however, is in determining the appropriate measure of market interest rate. Since February 1991, all commercial banks in Malaysia were allowed to freely set their own deposit and lending rates (BNM 1995). These rates are however not reported in the annual reports and hence are not easily available for the sample time period. However, the lending rates are based on a base-lending rate (BLR), which is computed for each bank by taking the cost of funds into account. Furthermore, the average annual BLR for all commercial banks in the country is reported in the Central Bank's annual report. Thus, the average annual base-lending rate is used as a proxy for market interest rate in this study.

Another significant environmental condition, which may affect both the costs, and revenue of any organization including the banking firms, is changes in the general price level or inflationary conditions in the economy. The impact of inflation rates on bank profitability will depend on its effect on bank costs and revenues. Perry (1992) working on banks gains and losses from inflation asserted that the effect of inflation on bank performance depends on whether the inflation is anticipated or unanticipated. If the inflation is fully anticipated and interest rates are attuned accordingly resulting in revenues, which increase faster than costs, then it may have a positive impact on profitability. However, if the inflation is not anticipated and the banks are sluggish in adjusting their interest rates then there is a possibility that bank costs may increase faster than bank revenues and hence adversely affect bank profits and thus bank profitability.

The size of the bank is also included as an independent variable to account for size related economies and diseconomies of scale. To this extent, it is worth noting that earlier researchers such Heggestad (1977) and Smirlock (1985), had also considered

firm size in their profitability model to take account of the possibility of greater loan and product diversification and accessibility of larger banks to asset markets, which may not be available for smaller banks. If indeed this were true in Malaysia, it would imply higher profitability for larger banks. In most literature, the total assets of the banks are used as a proxy for bank size. However, since total assets deflated the other dependent variables in the model such as ROA, it would not be appropriate to include total assets in its absolute terms as an independent variable. Thus, it has to be transformed before being included in the model. Hence the logarithm of the total assets was included in the model to proxy for firm size. This was also necessary to obtain a more meaningful coefficient for bank size in the regression analysis since the other independent variables are all entered as ratios.

Finally, changes in the regulatory conditions in the banking market can also affect the profitability potentials of these institutions. In Malaysia the regulatory conditions in relation to entry barriers have remained largely unchanged over the last decade. This is evident in the number of commercial banks, which has declined from 38 in 1985 to 32 in 1999. Thus there have been no net entrants into the market though new banks may have apparently appeared as a result of mergers and take-over activities, with the merged units having new names. However, a major regulatory reform undertaken in Malaysia over the sample period is the introduction of the Banking and Financial Institutions Act (BAFIA) 1989 which came into effect from 1st October 1989. The objective of the BAFIA was to streamline the control and supervision of the financial institutions. In the same year, several measures were also undertaken to level the playing field for the various market participants. These consist of the introduction of the weighted risk asset approach as the uniform method of assessing capital adequacy requirement (CAR) and the realignment of the statutory reserve requirement (SRR) in an effort to harmonise the cost of funds of the financial institutions. Furthermore, with effect from February 1991, all the financial institutions in Malaysia were free to set their own deposit and lending rates. In view of these developments, the median year 1990 appropriately divides the sample period into two separate regulatory regimes. Thus, in order to capture the effect of these regulatory reforms on the profitability of commercial banks, a dummy variable is included in the model to distinguish between the two regulatory regimes in the sample period. Table 1 further summarises the independent variables employed in this study.

Table 1: Summary of the independent variables employed in the study

Determinants		
Internal	**Variable**	**Description**
Asset composition	Loans and advances of each commercial bank as a percentage of total assets	LOTA
	Investment in subsidiaries of each commercial bank as a percentage of total assets	INTA
	Investments in subsidiaries of each commercial bank as a percentage of total assets	SUBTA
Capital	Capital and reserves of each commercial bank as a percentage of total assets	CRTA
Deposit composition	Current account deposits of each commercial bank as a percentage of total deposits	CATD
	Time and savings deposits of each commercial bank as a percentage of total deposits	TSDR
Expenses Management	Total expenditure as a percentage of total assets	TETA
Liquidity	Loans to deposits ration of each commercial bank	LIQ
External		
Firm size	Logarithm of the total assets of each bank	LOGT
Inflation rate	Annual percentage change in the Malaysian Consumer Price Index	INF
Market growth	Annual growth in the M3 measure of money supply	MON
Market interest	Average annual BLR of all commercial banks	BLR
Market share	Total deposits at each bank as a percentage of all banks' total deposits	MSD
Regulation	A dummy variable which will be assigned a value of "0" for years prior to 1990 and "1" for years 1990 to 1995	REG

Sources of Data

The data relating to the external determinants including market growth, interest rate and inflation rate were obtained from the Malaysian Central Bank's Quarterly Bulletin and the annual reports over the period 1985 to 1998. The data for the internal determinants considered in this study were obtained from the annual reports of the sample banks. Finally, the data from the above sources were supplemented with the information collected from the Money and Banking in Malaysia (1995), and other discussion and research papers published by the Malaysian Central Bank, known as Bank Negara Malaysia (BNM).

FINDINGS

Temporal Stability of the Profitability Model

The test for temporal stability basically involved the test for the joint significance of the dummy variables, which were included in the model to account for temporal variations. In this context, the following hypothesis was tested and the results are presented in Table 2.

H_0: $\lambda_1 = \lambda_2 = . \ . \ . = \lambda_t = 0$
(There is statistical evidence of temporal stability in the profitability model)

H_1: *Not all the* λ*'s* $=0$
(There is no statistical evidence of temporal stability in the profitability model)

Table 2: Statistical test for temporal stability

Dependent Variable	*RSS_{UR}	**RSS_R	F-Stats	Critical F-value at the 5% level	Conclusion
BTTA	41.89	46.68	1.47	≈ 2.02	Accept H_0
ATTA	37.04	40.07	1.05	≈ 2.02	Accept H_0
BTCR	16822	21225	4.83	≈ 2.02	Reject H_0
ATCR	16155	19061	2.32	≈ 2.02	Reject H_0

*RSS_{UR} = RSS of the Unrestricted Model
**RSS_R = RSS of the Restricted Model

The results indicate temporal stability only in the case of the return on asset (ROA) measures of profitability with ATTA and BTTA as the dependent variable, thus

implying that the dummy variables for temporal variations are not required in these models.

Cross-Sectional Stability o the Profitability Model

Based on the above results, the profitability models were further tested for cross-sectional stability by testing for the joint significance of the dummy variables accounting for inter-firm cross-sectional differences and the results are presented in Table 3.

H_0: $\gamma_1 = \gamma_2 = \ldots = \gamma_t = 0$
(There is statistical evidence of cross-sectional stability in the profitability model)

H_1: *Not all the* γ*'s* $= 0$
(There is no statistical evidence of cross-sectional stability in the profitability model)

Table 3: Statistical test for cross–sectional stability

Dependent Variable	*RSS_{UR}	**RSS_R	F-Stats	Critical F-value at the 5% level	Conclusion
BTTA	46.68	87.13	6.70	≈ 1.75	Reject H_0
ATTA	40.07	62.44	4.22	≈ 1.75	Reject H_0
BTCR	16822	23999	3.09	≈ 1.75	Reject H_0
ATCR	16155	21261	2.29	≈ 1.75	Reject H_0

*RSS_{UR} = RSS of the Unrestricted Model
**RSS_R = RSS of the Restricted Model

The results indicate that there is no evidence of cross-sectional stability in the profitability models with all four measures of bank profitability. This would imply that the appropriate profitability model for the ROA measures of profitability is that represented by equation (2) whereas equation (1) is the appropriate model for the ROE measures of profitability.

Adequacy of the Internal Variables

One of the questions that arise in relation to the internal and external determinants is whether the internal determinants alone are adequate for explaining commercial bank profitability. If that is so then the management alone would be accountable for the

performance of banks at least as far as profitability is concerned. In order to test for the adequacy of the internal determinants, the following models were compared for the ROA measures of profitability:

$$Y_{it} = \beta_0 + \sum_{i=2}^{N} \gamma_i D_{it} + \sum_{k_I=1}^{K_I} \beta_k X_{k\,it} + \sum_{k_E=1}^{K_E} \beta_k X_{k\,it} + \varepsilon_{it} \qquad (5)$$

$$Y_{it} = \beta_0 + \sum_{i=2}^{N} \gamma_i D_{it} + \sum_{k_I=1}^{K_I} \beta_k X_{k\,it} \qquad (6)$$

Note equation (5) is simply equation (2) with the independent variables further split into the internal and external components. Similarly, the adequacy of the internal variables can be tested for the ROE measures of profitability by comparing the following models:

$$Y_{it} = \beta_0 + \sum_{i=2}^{N} \gamma_i D_{it} + \sum_{t=2}^{T} \lambda_i W_{it} + \sum_{k_I=1}^{K_I} \beta_k X_{k\,it} + \sum_{k_E=1}^{K_E} \beta_k X_{k\,it} + \varepsilon_{it} \qquad (7)$$

$$Y_{it} = \beta_0 + \sum_{i=2}^{N} \gamma_i D_{it} + \sum_{t=2}^{T} \lambda_i W_{it} + \sum_{k_I=1}^{K_I} \beta_k X_{k\,it} + \varepsilon_{it} \qquad (8)$$

Where,
K_I = Number of Internal Variables
K_E = Number of External Variables

Note that equation (7) is simply equation (1) with the independent variables further subdivided into the internal and external components. For both the asset and capital based measures of profitability models, the test for the adequacy of the internal variables will involve the test for the joint significance of the external variables by using the F-test. This basically implies the following hypothesis test:

H_0: The internal variables alone are adequate in explaining bank profitability

H_1: The internal variables alone are not adequate in explaining bank profitability

Table 4: Statistical test for cross–sectional stability

Dependent Variable	RSS_{UR}	RSS_R	F-Stats	Critical F-value at the 5% level	Conclusion
BTTA	46.68	48.63	0.84	≈ 2.45	Accept H_0
ATTA	40.07	43.31	1.63	≈ 2.45	Accept H_0
BTCR	16822	20700	4.46	≈ 2.45	Reject H_0
ATCR	16155	18575	2.90	≈ 2.45	Reject H_0

Table 4 concludes that the external variables do not significantly affect the asset measures of bank profitability, which actually measures management's efficiency in employing the available resources to generate profits. Thus, the internal variables alone are adequate for explaining these asset-based measures of profitability. In other words sound management alone appears to be the main contributor towards the asset based measures of profitability. However, this was not the case with the capital based measures of profitability. The external variables, which are, actually time dependent are also significant factors which affect the ROE measures of profitability. This may be so since the decisions to adjust shareholders funds may be influenced by these external factors. Thus, it is not surprising that the dummy variables accounting for temporal differences were also significant for the models with ROE as a measure of profitability.

Determinants of Asset Based Measures of Profitability

Table 5 indicates that the only asset component, which significantly contributes towards profitability, is the loan component. This may be so due to the volatility of the Malaysian stock market and hence the risk associated with the investment in securities and also the regulatory constraints imposed on loans to finance securities, which may make investment in securities less profitable. On the face of liability, the most profitable component was the current account deposits probably due to the fact no direct interest is paid on current account deposits though banks are now offering payments on current account deposits by linking theses accounts to other savings account and allowing funds to be transferable from one account to the other. The time and savings deposits, which, involves explicit interest payments, were found to be less profitable. The liquidity variable (LIQ) was found to exhibit the expected negative relationship though it was not very significant except in the ATTA model. However, poor expenses-management was certainly found to be a main contributor to poor profitability performance. This is evident in the highly significant coefficient of the total expenditure to total assets variable (TETA) in both the BTTA and ATTA variable.

Table 5: Asset based profitability model regression results

Independent variable	Dependent variable					
	BTTA			ATTA		
	Coefficient	t-value	p-value	Coefficient	t-value	p-value
CATD	6.449	3.13	0.002	5.251	2.72	0.007
CRTA	-0.017	-0.82	0.412	-0.010	-0.51	0.614
INTA	0.009	0.72	0.471	0.02	0.18	0.858
LIQ	-0.164	-0.24	0.807	-1.005	-1.72	0.088
LOTA	0.049	4.32	0.000	-0.85	5.51	0.000
SUBTA	-0.101	-0.46	0.648	-0.172	-0.85	0.398
TETA	-0.703	-8.59	0.000	-0.662	-8.71	0.000
TSDR	0.009	0.94	0.351	0.014	1.64	0.104
R-square	0.675			0.593		
F-stats	11.01			8.09		
p-value	0.000			0.000		

Determinants of Capital Based Measures of Profitability

The findings (see Table 6) in relation to the capital based measures of bank profitability indicates that all the external variables included in the model except LOGTA and MSD was found to be highly significant. Inflation was found to have a positive impact on profitability. This may indicate that bank management may have anticipated the inflation rate. The market interest rate variable (BINT) was also found to have a positive impact on bank profitability. This may reflect on the elasticity for loans, which may be quite inelastic in view of the then expanding economy, coupled with the prevailing business confidence at that time. On the other hand, only the variables LOTA, INTA, TETA and CRTA were statistically significant and they also had the expected signs. On the assets side, both the loan component and the investment in securities were found to have a positive impact on profitability. Once again, the efficiency in expenses management was found to be a highly significant contributor towards bank profitability performance. High capital and reserves to total assets ratio would imply low leverage and hence low risk and thus would be expected to be associated with low returns. Correspondingly, the CRTA variable had a significantly negative coefficient in both the BTCR and ATCR profitability models.

Table 6: Capital based profitability model regression results

Independent variable	Dependent variable					
	BTCR			ATCR		
	Coefficient	t-value	p-value	Coefficient	t-value	p-value
BINT	453.82	4.94	0.000	351.56	3.91	0.000
CATD	59.36	1.17	0.243	39.74	0.80	0.424
CRTA	-1.00	-2.36	0.020	-0.87	-2.09	0.039
INF	257.38	4.82	0.000	200.00	3.82	0.000
INTA	0.46	1.75	0.083	0.42	1.60	0.113
LIQ	8.36	0.49	0.624	4.14	0.25	0.804
LOGTA	-10.49	-1.41	0.162	-6.22	-0.85	0.396
LOTA	0.57	2.32	0.022	0.59	2.41	0.017
MON	-74.85	-4.83	0.000	-58.86	-3.88	0.000
MSD	-0.05	-0.04	0.966	-0.41	-0.37	0.711
SUBTA	-0.14	-0.03	0.976	0.485	0.11	0.913
TETA	-11.46	-6.11	0.000	-10.28	-5.60	0.000
TSDR	-0.01	-0.03	0.975	-0.05	-0.27	0.790
R-square	0.507			0.431		
F-stats	5.43			4.27		
p-value	0.000			0.000		

CONCLUSION AND RECOMMENDATIONS

The findings provide an insight into the characteristics and practices of successful commercial banks in terms of profitability. In view of these findings the following recommendations can be made which may be useful for bank management, policy makers and shareholders. Since the efficiency in expenses-management was found to be one of the most significant determinants of commercial bank profitability, there is possibility for these banks to improve profitability by focusing attention on proper cost control and operating efficiency. The commercial banks should take the necessary actions to increase their current account deposits, which create free funding from floats and contribute positively towards profitability. Thus, in order to secure from the almost nil cost current account deposits, the commercial banks should try to make their current account services as attractive as possible. In this context, the current trends of linking the current accounts with the savings accounts should not be considered as a factor that diminishes bank profitability as a result of the interest payment involved but instead it should be looked on as a strategic tool to compete with other financial institutions such as the finance companies. To this extent, the benefit of the interest bearing current account deposits which also facilitates the transaction needs of the customers would be

more acceptable to depositors, even if the interest payments are low. Thus, volume in regards to demand deposits should be a strategic tool for commercial banks to improve their profitability and at the same time place themselves in a better position with other non-bank financial intermediaries in their competition for deposits. In relation to asset portfolios, the findings indicate that the commercial banks should focus on loans rather than investment in securities and investment in subsidiaries where they lack the necessary business expertise in order to improve their profit performance.

Furthermore, the commercial banks should be prudent in providing credit for the financing of investments in highly volatile sectors such as the stock market and the property market. In this context, lending to the productive sectors with proper monitoring systems and sound credit management is recommended. In the case of investments in subsidiaries, the commercial banks must ensure that they have the knowledge and management expertise to properly supervise and manage the acquired businesses so that they do not affect the profitability of the acquiring bank. The commercial banks should also not over commit in loans, since the liquidity variable as proxied by the loans to deposit ratio was generally found to have a negative impact on bank profitability. One possible reason for this may be the higher cost of funding these loans through the high interest inter-bank borrowings and higher rates of non-performing loans. The individual banks annual reports formed the main source of data for this study. In view of this, the sample size for commercial banks was restricted due, to the inaccessibility of these reports for some of the institutions for the full sample period. This may have affected the reliability of the results in view of the reduced sample size. However, the problem could not have been critical in view of the sample size of 153, observations for the commercial banks.

Another problem was that, the format of financial reports and the extent of disclosure seemed to vary among banks especially during the first half of the sample period namely from 1985 to 1989. However, streamlining of the format of financial reports and extent of disclosure appears to have taken place during the second half of the sample period from 1990 to 1995. As a result, continuous data for the full sample period were not available for some explanatory variables, which had to be estimated for the purpose of this study. Being estimates these figures may have affected the accuracy of the regression results. Finally, in view of the large number of variables included in the profitability models there was a possibility of high inter correlation particularly in relation to the time varying external determinants with similar trends. This may lead to multicollinearity problems. However, in this study the problem of multicollinearity was basically limited to the dummy variables accounting for temporal differences. The MINITAB statistical software dropped some of these dummy variables in estimating the profitability models. Nevertheless, since the coefficients of the profitability models

were not seriously affected in respect to the expected signs and significance, the problem of multicollinearity was generally ignored. In the course of this study, several areas for future research were also identified. These are outlined as follows:

In this study, market interest rate as represented by the base-lending rate was used as a measure of capital scarcity. However, since bank profits depend on interest income and interest expense, the difference between the loan and deposit rates may have been a more appropriate determinant of profitability compared to just one market interest rate. Thus, interest rate spread or margin can be used as an explanatory variable in place of just market interest rates. The impact of the asset components namely, loans and advances, investment in securities and investment in subsidiaries were considered in this study. Since, the loans component was found to be the most significant contributor towards bank profitability, a more thorough analysis of the loans portfolio may be useful for bank management in structuring a sound, stable and profitable asset portfolio. This study had basically focused on the domestic commercial banks. Future research may extend the analysis to include the subsidiaries of foreign banks operating in Malaysia in their samples. To this extent, a comparative analysis of the profitability performance of domestic and foreign banks could be carried out.

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