

# EVALUATING THE IMPACT OF A RAPIDLY CHANGING ECONOMIC ENVIRONMENT ON BANK FINANCIAL PERFORMANCE USING THE DUPONT SYSTEM OF FINANCIAL ANALYSIS

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## ABSTRACT

This paper presents a model for the financial analysis of a bank in a rapidly changing environment based on the DuPont system of financial analysis. The DuPont system of financial analysis is based on analysis of return on equity which is disaggregated into net profit margin, total asset turnover and the equity multiplier. AFFIN Bank Malaysia is one of the largest banks in Malaysia and is one of the core banks from the consolidation process of the banking industry in response to the Southeast Asian economic crisis in 1997-98. The analysis covers begins in 1999 which is the year that AFFIN Bank was formed until 2006. The DuPont system of financial analysis shows the impact of the Asian financial crisis and the restructuring of the banking industry in Malaysia on the financial performance of AFFIN Bank and the gradual recovery of AFFIN Bank to return to steady performance over the past eight years.

**Key words:** DuPont, banking, Asian financial crisis, ROE, ROA

**JEL codes:** G3, G30, M41

## I. INTRODUCTION

Corporate financial management is the efficient acquisition and allocation of funds. The efficient acquisition of funds is the acquisition of funds at the lowest possible cost and the efficient allocation of funds is the allocation of funds at the highest possible return. The objective of corporate financial management is to maximize the value of the firm and the value of the firm is the total market capitalization, shares outstanding time price per share, of the firm and is a function of the risk and return characteristics of the firm. The risk and return characteristics of a firm are determined by the decisions (investment decisions and financial decisions) made by corporate financial.

Investment decisions affect the left-hand side of the balance sheet through asset purchases. Investment decisions determine the type of assets used by the firm, the industry in which the firm operates, and the degree of operating leverage of the firm. Financing decisions affect the right-hand side of the balance sheet which shows the financial structure of the firm through security issues and retained earning. Financing decisions determine the capital structure of the firm and the degree of financial leverage.

The result of the decisions made by corporate financial managers is the stream of expected future cash flows of the firm. A corporate financial manager can estimate the probability distribution of future cash flows – both the expected value and the standard deviation of the future cash flows using the financial statements that reflect the decision made by corporate financial managers. The estimates of future cash flows allow the decision maker to estimate the value of the firm and evaluate the effect that changes in assets and changes in financial structure have on the firm's value. Treating cash flows as no-growth perpetuities, the value of the firm is equal to the expected cash flow derived from the probability distribution of future cash flows divided by the required rate of return that is estimated based on the riskiness of future cash flows.

Decision makers estimate the probability distribution of future cash flows based on financial accounting information provided by the firm's financial managers in financial statements. To be useful, accounting information must influence decisions. Beaver, Kennelly and Voss (1968) contend that accounting information meets the definition of being useful if the information has predictive ability – can be used to estimate future cash flows. The managerial accounting information set is the total set of information that is available to corporate insiders and includes financial information and material, non-public information that is only available to corporate decision makers. Constructive insiders, *de facto* insiders, are individuals who have access to material, non-public information such as commercial loan officers, investment bankers, attorneys, and auditors. The financial accounting information set is the sub-set of information provided to external decision makers, such as customers and suppliers, bond holders, and stock holders. Each group of individuals use the accounting

information set to decide whether to provide credit, buy bonds, or buy stock, respectively.

Bank managers use the same model as corporate financial managers, except that the product is different - banks provide lending services. The stock price of a bank is determined by the risk and return characteristics of the bank. The risk and return characteristics of the bank are determined by the decisions made by the bank managers. Bank asset investment decisions determine the portfolio of loans and other assets held by the bank. Bank financing decisions determine the capital structure of the bank. A financial analyst determines the prices of a share of bank stock from the estimated probability distribution of future cash flows based on the financial information provided in the financial statements of the bank.

Bank stock price is influenced by environmental factors such as current economic conditions, market demand, the political environment, and the legal environment, Fraser, Gup, and Kolari (2001). The legal and political environments determine the regulatory environment and public confidence in the banking structure. Economic conditions and market demand influence the banks market share. These are external environmental factors over which bank managers have no control. Bank planning, the use of technology, personnel development, and bank condition are internal performance factors over which bank managers do have control. These factors are controlled by investment and financing decisions that maximize the value of the firm. The goal of financial information reporting is to insure that complete information is provided to external decision makers who can properly value the firm.

## **II. AFFIN BANK**

In 1975, several Malaysian parties got together with Habib Bank Ltd. of Pakistan (HBL) with the idea of creating a bank in Malaysia. In October of the same year, Perwira Habib Bank (PHB) was incorporated, with HBL holding a 33% stake in the new bank. From that point on, PHB charted its course through the Malaysian financial landscape, as it witnessed the growth of Malaysia. Then in 1992, a capital restructuring exercise was conducted in an effort to reposition PHB in the bank market in Malaysia. The exercise saw Affin Holdings Berhad emerging as the biggest shareholder of PHB.

It was not until April 1994 that PHB became PAB, or Perwira Affin Bank. This was a reflection of the 100% stake that AFFIN Holdings now has in PAB. This restructuring marked the beginning of a new chapter in the history of PAB. Along with other companies under the AFFIN group, AFFIN now became a complete financial services provider.

On April 5, 1999 Perwira Affin Merchant Bank Berhad (PAMB) announced the signing of memorandum of understanding for the proposed merger between Perwira Affin Bank Berhad and BSN Commercial Bank (M) Berhad. A year later, on August 30, 2000, the agreement for the merger between PAB and BSN Commercial Bank (M) BHD was signed, paving the way for the formation of the new entity AFFIN Bank. AFFIN

Bank commenced operations in January 2001 with a network of 110 branches nationwide.

### III. A FINANCIAL ANALYSIS MODEL FOR FINANCIAL INSTITUTIONS

Saunders (2000) provides a model of financial analysis for financial institutions that is based on the Dupont system of financial analysis return on equity model. The return on equity model disaggregates performance into the three components that determine return on equity: net profit margin, total asset turnover, and the equity multiplier. The profit margin allows the financial analyst to evaluate the income statement and the components of the income statement. Total asset turnover allows the financial analyst to evaluate the left-hand side of the balance sheet which is composed of the asset accounts. The equity multiplier allows the financial analyst to evaluate the right-hand side of the balance sheet which is composed of liabilities and owners equity.

Return on equity analysis provides a system for planning (budgeting) in addition to analyzing the financial institution's performance. The net profit margin allows the analyst to develop a *pro forma* income statement. An abbreviated income statement would be composed of net income equal to revenues minus expenses. The financial planner can determine the projected revenue level needed to meet the target net income level. The total asset turnover ratio permits the analyst to determine the total asset level needed to generate the projected total revenue level. The total asset requirement can be used to project the *pro forma* levels of all of the asset accounts based on the target current asset to fixed asset level. The fundamental equation of accounting is that assets equal liabilities plus owners equity. The equity multiplier ratio can be used to determine the *pro forma* financial needs and the financial structure of the financial institution.

Return on equity, ROE, is first decomposed into return on asset, ROA, and the equity multiplier, EM. Return on assets is decomposed into net profit margin and total asset turnover:

$$ROE = (ROA) (EM)$$

$$ROA = (NPM) (TAT)$$

Where,

ROE = return on equity

ROA = return on assets

EM = the equity multiplier

NPM = net profit margin

TAT = total asset turnover

Return on equity is net income divided by total equity capital and return on assets is net income divided by total assets. The equity multiplier is the ratio of total assets and total equity capital.

$$ROE = (NI) / (TEC)$$

$$ROA = (NI) / (TA)$$

$$EM = (TA) / (TEC)$$

Where,

NI = net income

TA = total asset

TEC = total equity capital

Net profit margin can be decomposed into both the income and expense components. Total asset turnover can be decomposed into interest and non-interest income components

The net profit margin ratio can be used to develop a *pro forma* income statement. The total asset turnover ratio can be used to estimate the pro forma left-hand side of the balance sheet. The equity multiplier ratio can be used to estimate the pro forma right-hand side of the balance sheet. Thus, the DuPont system of financial analysis can be used to construct a financial plan for the bank. The DuPont system of financial analysis provides a means for the firm to monitor performance through the planning period and to post-audit the planning process.

### A. Balance Sheet Items

Affin Bank has four major categories of assets – cash, customer loans, securities and fixed/other assets. Cash has fluctuated from RM<sup>1</sup> 1.65 billion in 1999 to a low of RM 5.3 in 2006 with an average of RM 2.6 billion. The customer loan account has increased from a low of RM9.6 billion in 1999 to RM15.7 billion in 2001 and an average of RM12.3 billion. Securities and deposits are lowest, at RM3.5 billion, in 1999 and increased steadily to RM 6.4 billion in 2003 before falling to RM3.8 billion in 2004 and with an average of RM 4.87 billion. Fixed assets increased from a low of RM 0.26 billion in 1999 to RM 0.13 billion in 2006 and with an average of RM 0.4.8.

Affin Bank has three major liability accounts – corporate and retail deposits, other liabilities and shareholder funds. Corporate and retail deposits increased from RM 12.4 billion in 1999 to the RM 19.8 billion in 2006 with an average level of RM 15.2 billion. Other liabilities increased from RM 1.2 billion in 1999 to RM 4.2 billion in 2006 with an average of RM 3.5 billion. Shareholder funds decreased from RM 1.4 billion in 1999 to RM 1.0 billion and increased to RM 2.2 billion in 2006.

### B. Income Statement Items

Affin bank has three sources of income – interest income, non-interest income and gains, and net income from Islamic banking. Interest income has fluctuated from RM 832 million in 1999 to RM 1,299 million in 2006. Net income from non-interest income and gains decreased from RM 128 million in 1999 to RM 95 million in 2001 and fluctuated during 2002 to 2006 ending at RM 187 million. Net income from Islamic banking increased from RM 28 million in 1999 to RM 84 million in 2001 and ended the period at RM 13.3 million in 2006.

Affin bank has four expense categories: interest expense, provisions for bad loans, overhead costs, adjustments to owners' equity, and income tax and zakat<sup>2</sup>.

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<sup>1</sup> RM = Ringgit Malaysia

<sup>2</sup> Zakat = Zakat or “alms giving” is one of the Five Pillars of Islam. It is mandatory for all Muslim who possesses the minimum Nisab (measurement). Zakat is compulsory for eligible Muslim in order to help people who are in needs of helps, known as asnaf.

Interest expense has fluctuated from RM 513 million in 1999 to RM 366 million in 2000 to RM 702 million in 2006. Provision for bad loans increased from RM 153 million in 1999 to RM 826 million in 2001 and decreased to RM 153 million in 2006. Overhead costs increased from RM 232 million in 1999 to RM 432 million in 2001 and decreased to RM 396 million in 2006. Income tax and zakat were negative in every year except 2002 and 2003.

### C. Discussion of Financial Ratios

As a percent of total assets, cash averages 12.2% of total assets with a high of 20.3% in 2006 and a low of 6.3% in 2001. Customer loans average 60.9% of total assets with a high of 67.4% in 2001 and a low of 50.6% in 2000. Net securities average 24.7% with a high of 30.9% in 2002 and a low of 14.4% in 2006. Fixed assets average 2.2% with a high of 5.1% in 2006 and with a low of 1.3% in 2004.

Corporate and retail deposits average 75.7% with a low of 71.4% in 2005 and with a high of 83.1% in 2000. Other liabilities average 16.7% with a low of 8.1% in 1999 and with a high of 21.3% in 2003. Shareholder funds average 7.6% with a low of 5.1% in 2001 and with a high of 9.6% in 1999.

### D. DuPont Analysis of Affin Bank

Return on equity for Affin Bank for the study period averages -5, 1% but with a range from -68% in 2001 to 15.8% in 2004. Net profit margin averages -2.8% with a range of -68.2% in 2003 to 15.8% in 1999. Total asset turnover averages 0.057 times with a range from 0.052 times in 2000 to 0.066 times in 1999. The equity multiplier averages 13.7 times with a range from 10.4 times in 1999 to 19.5 times in 2001.

Return on equity volatility results from significant variability in net profit margin and the equity multiplier. The equity multiplier has increased steadily from 10.44 times in 1999 to 19.5 times in 2001 but decreased to 11.8 times in 2006. Net profit margin fluctuates from the lowest -68.2% in 2001 to 15.8% in 2004. The most dramatic effect in total asset turnover occurs during the recovery period after the economic crisis in 1997-1998.

Affin bank Malaysia is not listed on Kuala Lumpur Stock Exchange (KLSE), but Affin Holdings began trading in 1996. Figure 6 shows the stock price performance of Affin Holdings share. Affin Holdings stock started to increase from about RM 95 in early 1996 to the highest of almost RM 300 in the middle of 1997 that was during the crisis period. The stock price started to drop to the lowest of almost RM 18 in early 1998. The stock price started to bounce back to RM 128 in early 2000 and decreased to RM 41 in early 2001. Affin Holdings stock price fluctuated but quite stable since early 2001 until December 2003.

#### IV. SUMMARY AND CONCLUSIONS

This paper presents a model for the financial analysis of a bank based on the DuPont system of financial analysis as presented in Saunders (2000). The bank return on equity is decomposed into net profit margin, total asset turnover and the equity multiplier. This model is applied to AFFIN Bank of Malaysia which is one of the largest banks in Malaysia. The DuPont system of financial analysis shows the impact of the Asian financial crisis that hit the region in 1997-98 on the financial performance of AFFIN. The negative impact of the financial crisis is apparent on the AFFIN share prices.

Beginning with 2002, AFFIN Bank had recovered from the financial crisis of 1997-98 and the restructuring of the banking industry in Malaysia. After 2002 until 2006, the financial performance of AFFIN Bank is relatively steady and reflects minimal volatility in the return on equity components. Net profit margin, total asset turnover, and the equity multiplier all exhibit relative stability for the period from 2002 to 2006 with net profit approximately 10 percent, total asset turnover of about 0.05, and the equity multiplier leveled out at about 12 percent.

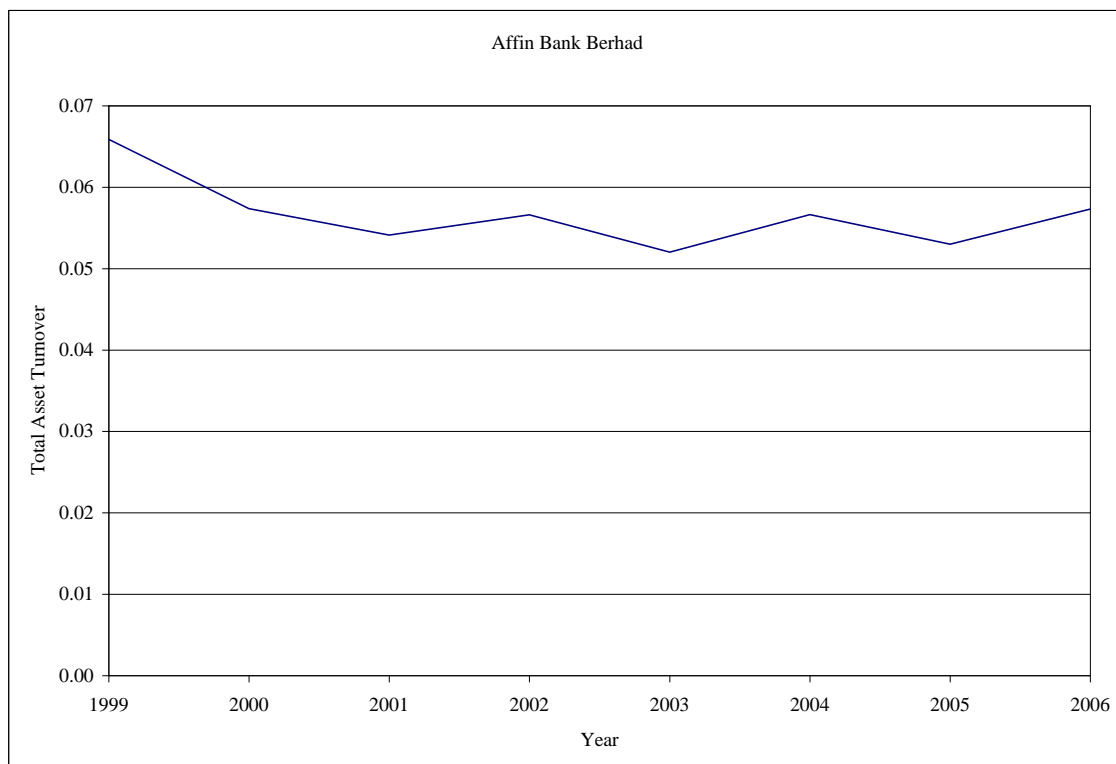
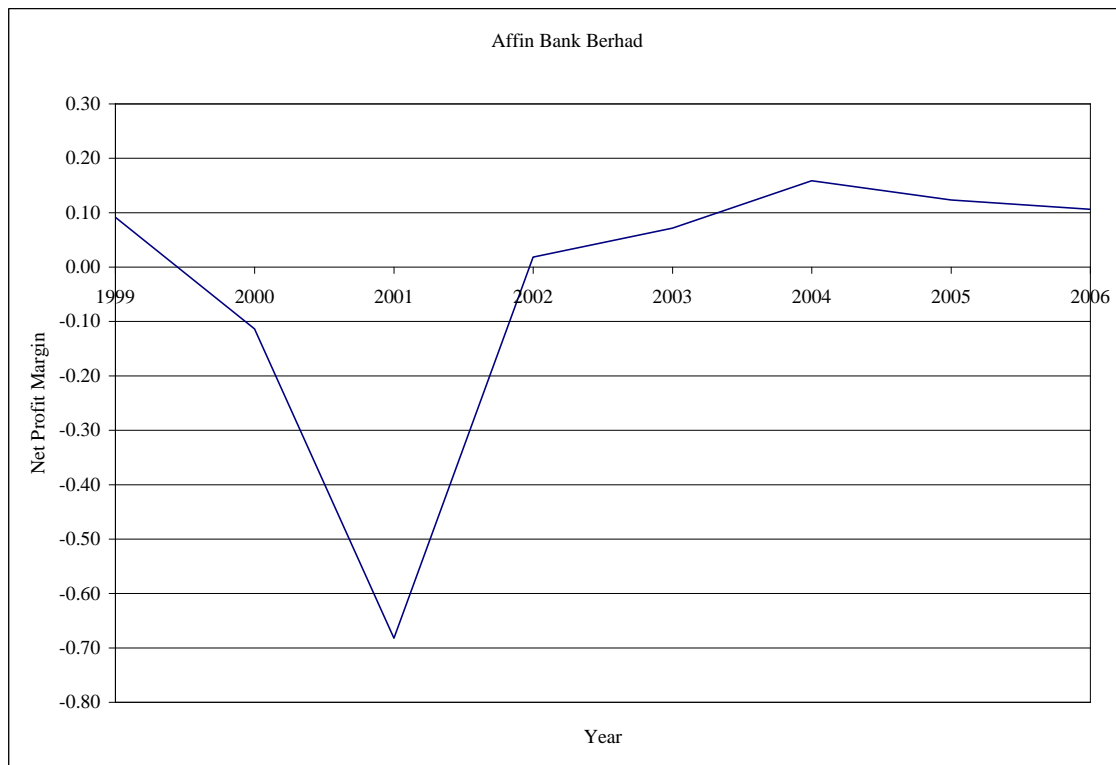
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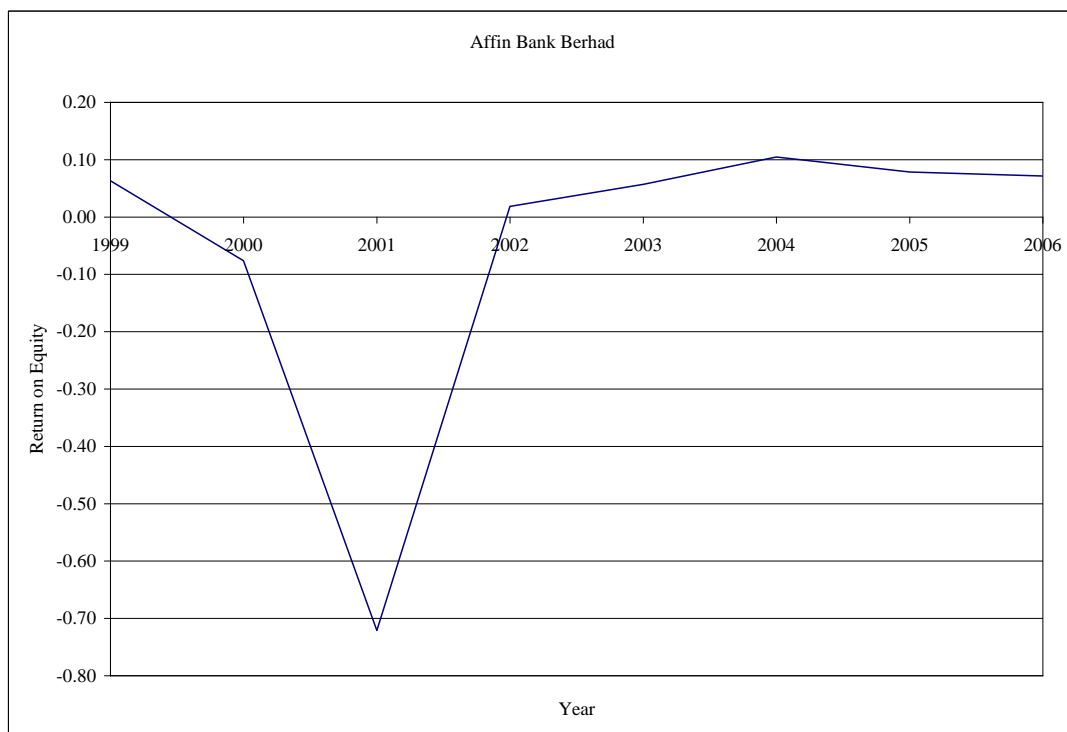
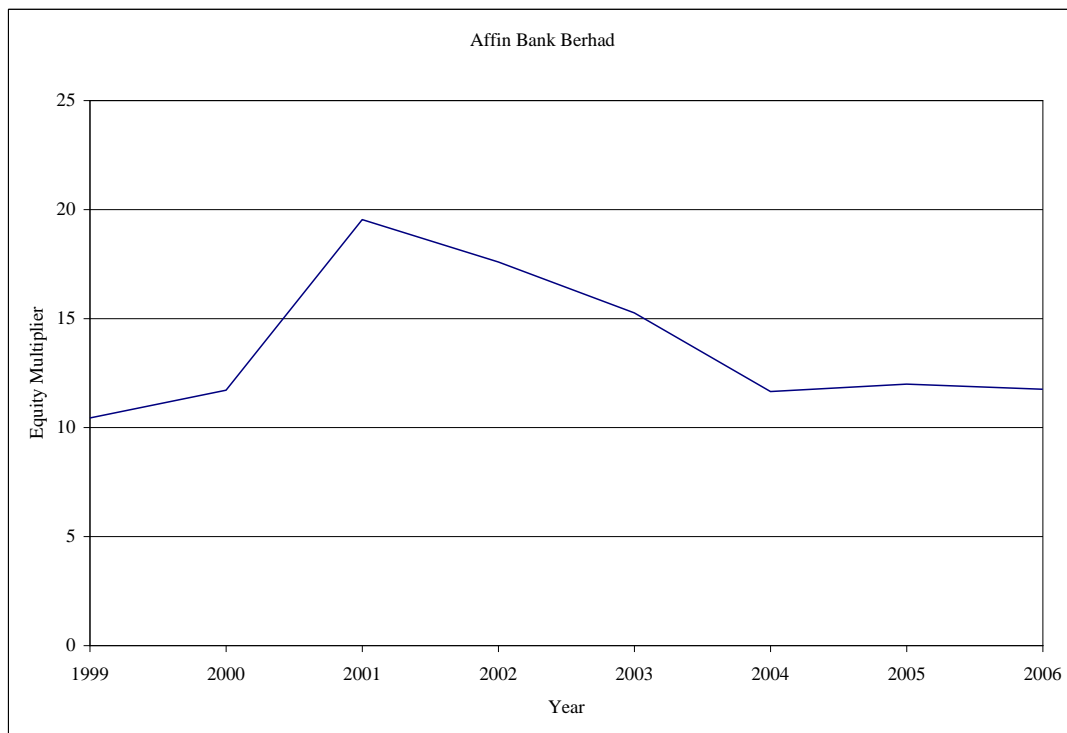
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| <b>Table 1</b>                     |             |             |             |             |             |             |             |             |                |
|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------|
| <b>Affin Bank Berhad</b>           |             |             |             |             |             |             |             |             |                |
| <b>Financial Statements zakat</b>  |             |             |             |             |             |             |             |             |                |
| <b>(Ringgit Malaysia '000)</b>     |             |             |             |             |             |             |             |             |                |
| <b>Income Statement - Income</b>   | <b>1999</b> | <b>2000</b> | <b>2001</b> | <b>2002</b> | <b>2003</b> | <b>2004</b> | <b>2005</b> | <b>2006</b> | <b>Average</b> |
| Interest income                    | 832175      | 753342      | 916970      | 931291      | 885031      | 775798      | 1040165     | 1299125     | 929237         |
| Non-interest Income and Gains      | 128640      | 110242      | 95140       | 179095      | 134518      | 171167      | 209565      | 187534      | 151988         |
| Net income from Islamic banking    | 28075       | 33724       | 83658       | 52232       | 79943       | 73826       | 74766       | 13286       | 54939          |
| <b>Income statement - Expenses</b> |             |             |             |             |             |             |             |             |                |
| Interest Expense                   | -513041     | -365743     | -518165     | -484287     | -446504     | -398403     | -485857     | -702336     | -489292        |
| Provisions for bad loans           | -152647     | -363085     | -826301     | -242105     | -260891     | -56984      | -202603     | -153019     | -282204        |
| Overhead                           | -232363     | -268471     | -431625     | -409493     | -385389     | -341001     | -399772     | -396237     | -358044        |
| Adjustments to Owners' Equity      |             |             | -67115      | -6645       | 6645        | -44207      | -10940      | -29894      | -25359         |
| Income tax and zakat               | -236        | -2124       | -67         | 1252        | 65225       | -18465      | -61961      | -59435      | -9476          |
| Net Income                         | 90603       | -102115     | -747505     | 21340       | 78578       | 161731      | 163363      | 159024      | -21873         |
| <b>Balance Sheet - Assets</b>      |             |             |             |             |             |             |             |             |                |
| Cash                               | 1649925     | 1553543     | 1274752     | 1498098     | 3701139     | 2206070     | 3217018     | 5306090     | 2550829        |
| Customer loans                     | 9636154     | 9295361     | 13639197    | 12365091    | 10698851    | 10689274    | 16423069    | 15746648    | 12311706       |
| Securities and deposits            | 3469827     | 4524382     | 5010934     | 6355135     | 6440799     | 4903202     | 4523882     | 3767814     | 4874497        |
| Fixed and other assets             | 255793      | 270565      | 323644      | 324626      | 297179      | 228036      | 829436      | 1346511     | 484474         |
| Total assets                       | 15011699    | 15643851    | 20248527    | 20542950    | 21137968    | 18026582    | 24993405    | 26167063    | 20221506       |
| <b>Balance Sheet - Liabilities</b> |             |             |             |             |             |             |             |             |                |
| Deposits                           | 12359176    | 13007787    | 15089250    | 15391093    | 15252926    | 12952948    | 17842071    | 19772740    | 15208499       |
| Other liabilities                  | 1214856     | 1300512     | 4122776     | 3984454     | 4499597     | 3526458     | 5066335     | 4168320     | 3485414        |
| Shareholder funds                  | 1437667     | 1335552     | 1036501     | 1167403     | 1385445     | 1547176     | 2084999     | 2226003     | 1527593        |
| Total L & S/ Holders fund          | 15011699    | 15643851    | 20248527    | 20542950    | 21137968    | 18026582    | 24993405    | 26167063    | 20221506       |



| <b>Table 2</b>                     |             |             |             |             |             |             |             |             |                |
|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------|
| <b>Affin Bank Berhad</b>           |             |             |             |             |             |             |             |             |                |
| <b>Ratio Computations</b>          |             |             |             |             |             |             |             |             |                |
| <b>Balance Sheets Assets</b>       | <b>1999</b> | <b>2000</b> | <b>2001</b> | <b>2002</b> | <b>2003</b> | <b>2004</b> | <b>2005</b> | <b>2006</b> | <b>Average</b> |
| Cash                               | 11.0%       | 9.9%        | 6.3%        | 7.3%        | 17.5%       | 12.2%       | 12.9%       | 20.3%       | 12.2%          |
| Customer loans                     | 64.2%       | 59.4%       | 67.4%       | 60.2%       | 50.6%       | 59.3%       | 65.7%       | 60.2%       | 60.9%          |
| Securities, net                    | 23.1%       | 28.9%       | 24.7%       | 30.9%       | 30.5%       | 27.2%       | 18.1%       | 14.4%       | 24.7%          |
| Fixed and other assets             | 1.7%        | 1.7%        | 1.6%        | 1.6%        | 1.4%        | 1.3%        | 3.3%        | 5.1%        | 2.2%           |
| Total assets                       | 100%        | 100%        | 100%        | 100%        | 100%        | 100%        | 100%        | 100%        | 100.0%         |
| <b>Balance Sheet - Liabilities</b> |             |             |             |             |             |             |             |             |                |
| <b>Balance Sheet - Liabilities</b> | <b>1999</b> | <b>2000</b> | <b>2001</b> | <b>2002</b> | <b>2003</b> | <b>2004</b> | <b>2005</b> | <b>2006</b> | <b>Average</b> |
| Deposits                           | 82.3%       | 83.1%       | 74.5%       | 74.9%       | 72.2%       | 71.9%       | 71.4%       | 75.6%       | 75.7%          |
| Other liabilities                  | 8.1%        | 8.3%        | 20.4%       | 19.4%       | 21.3%       | 19.6%       | 20.3%       | 15.9%       | 16.7%          |
| Shareholder funds                  | 9.6%        | 8.5%        | 5.1%        | 5.7%        | 6.6%        | 8.6%        | 8.3%        | 8.5%        | 7.6%           |
| Total L & S/ Holders Fund          | 100%        | 100%        | 100%        | 100%        | 100%        | 100%        | 100%        | 100%        | 100.0%         |
| <b>Income Statement Items</b>      |             |             |             |             |             |             |             |             |                |
| <b>Income Statement Items</b>      | <b>1999</b> | <b>2000</b> | <b>2001</b> | <b>2002</b> | <b>2003</b> | <b>2004</b> | <b>2005</b> | <b>2006</b> | <b>Average</b> |
| Interest expense                   | 51.9%       | 40.8%       | 47.3%       | 41.7%       | 40.6%       | 39.0%       | 36.7%       | 46.8%       | 43.1%          |
| Provision for loan losses          | 15.4%       | 40.5%       | 75.4%       | 20.8%       | 23.7%       | 5.6%        | 15.3%       | 10.2%       | 25.9%          |
| Staff and overhead                 | 23.5%       | 29.9%       | 39.4%       | 35.2%       | 35.1%       | 33.4%       | 30.2%       | 26.4%       | 31.6%          |
| Adjustments to Owners' Equity      | 0.0%        | 0.0%        | 6.1%        | 0.6%        | -0.6%       | 4.3%        | 0.8%        | 2.0%        | 1.7%           |
| Taxes                              | 0.0%        | 0.2%        | 0.0%        | -0.1%       | -5.9%       | 1.8%        | 4.7%        | 4.0%        | 0.6%           |
| Profit margin                      | 9.2%        | -11.4%      | -68.2%      | 1.8%        | 7.1%        | 15.8%       | 12.3%       | 10.6%       | -2.8%          |
| Total - Income Statement           | 100%        | 100%        | 100%        | 100%        | 100%        | 100%        | 100%        | 100%        | 100.0%         |
| <b>Dupont Ratios</b>               |             |             |             |             |             |             |             |             |                |
| <b>Dupont Ratios</b>               | <b>1999</b> | <b>2000</b> | <b>2001</b> | <b>2002</b> | <b>2003</b> | <b>2004</b> | <b>2005</b> | <b>2006</b> | <b>Average</b> |
| Profit Margin (PM)                 | 0.0916      | -0.1138     | -0.6822     | 0.0184      | 0.0715      | 0.1584      | 0.1233      | 0.1060      | -0.0283        |
| Asset Utilization (TAT)            | 0.0659      | 0.0574      | 0.0541      | 0.0566      | 0.0520      | 0.0566      | 0.0530      | 0.0573      | 0.0566         |
| Equity Multiplier (EM)             | 10.4417     | 11.7134     | 19.5355     | 17.5971     | 15.2572     | 11.6513     | 11.9873     | 11.7552     | 13.7423        |
| Return on Equity (ROE)             | 0.0630      | -0.0765     | -0.7212     | 0.0183      | 0.0567      | 0.1045      | 0.0784      | 0.0714      | -0.0507        |
| Return on equity (ROE)             | 0.0630      | -0.0765     | -0.7212     | 0.0183      | 0.0567      | 0.1045      | 0.0784      | 0.0714      | -0.0507        |





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