MEASURING EFFICIENCY AS INTERMEDIATION APPROACH BETWEEN CONVENTIONAL AND SHARIA BANKS IN INDONESIA

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Abstract
As a financial intermediary, a bank accepted deposits and channels loans. However, the loans disbursed by bank were hard to be liquidated compared to deposits which were easier to be liquidated. If the asset side fluctuates, customers would take their deposit away and create a bank run. On the other side, Islamic Bank used profit and loss sharing pattern to their loans and deposits. With this pattern, Islamic bank’s cost of funds was a function of their asset. With this pattern, there are possibilities that Islamic Banks’ revenue would fluctuate more compared to conventional banks that were based on interest. The purpose of this research was to compare the efficiency between Islamic banks and conventional banks without trying to look whether the cause of inefficiency was able to be allocated or technical inefficiency. To measure efficiency, we used De Young’s argument (1997), pooled leased square with intermediation approach and alternative profit efficiency model. The unit analysis in this research were commercial banks with 102 conventional banks and 3 Islamic Banks that operated in Indonesia using their quarterly annual report between 2002-2007. The finding from this research showed that 3 Islamic Banks were among the 20% most efficient bank in Indonesia in doing intermediation function.

Key words: financial intermediary, alternative profit efficiency, conventional bank, Islamic bank.
lems will be concerning on how economics allocate their resources efficiently based on available technological and individual preferences (Mayes, Harris & Lansburry, 1994).

Usage of efficiency score in measuring banks’ performance have expanded largely. Relations between banks’ asset and liabilities, banks’ treatment on debt as raw material, and also differences on business scope has caused usage of efficiency approach for intermediary company.

Damodaran (2002) mentioned in measuring value of a company, is usually conducted by valuing its asset rather than their equities. But in financial institution’s case, debt have different connotation. Most financial corporation will treat their debts as raw material rather than sources of capital.

Whereas De Young (1997) have noted that comparing cost ratios between two banks was improper to do because there are some differences on product mix, size, market conditions, and other characteristics that able to influence banks’ cost. Although ratios was easy to formed, but De Young argue that ratios was hard to be interpreted. Myopic analyses on the expenditures can be misleading. For example, further reductions on labour cost, physical building or materials, do not guarantee banks will be more efficient, and larger expenditures do not signals inefficiency. While cutting abundant part of expenses can break the quality of service, quality of portfolios, and earnings.

De Young (1997) used stochastic cost frontier analysis that formed the best hypothetical bank in the population as a benchmark. By using this method will overcome the problem of grouping banks and can be done/conducted for hundreds or even thousands of bank. Stochastic cost frontier alone represents development conception on efficiency (input-output) in economics.

There are two methods in measuring efficiency, that is parametric statistical methods and non parametric statistical method. Next each method utilized based on different approach that is: (1) non parametric statistical efficiency methods is utilized for the production or service provision approach using deposits as an output. With this approach banks serve their monetary transaction, giving loan, taking care of deposit, liquefying cheque, etc. This represents a production flow concept. (2) Parametric statistical efficiency methods is utilized for the asset or intermediation approach. With this approach banks accept client’s deposit and channels it as loan to debtors. With this approach banks mobilize and distribute their resources efficiently to make economic investment activity smooth. The asset approach have two sub groups, they are: (1) Profit Approach : Economic efficiency generally use profit approach method or cost approach. On profit approach, the role of bank’s manager is to maximize profit function of the bank. So that manager has to evaluate entire cost and earnings in course of production, and measures inefficiency at the input or output side. (2) Risk Management Approach: This approach evaluate various risk coherent risk at the bank’s asset. Risk management approach interpret output and input by considering management decision-making processes and its application on the input or output side.

To get a picture of intermediation role on both bank’s group (Islamic and conventional), based on some opinions above, hence approach that will be used in this study the profit approach (parametric method). The profit function that is developed by Berger & Di Patti (2003) or Berger & Mester (1997), evaluate how near a company in obtaining profit as obtained by the best company within the same exogent condition. So that company’s profit represents a function from input, output, and environment variables:

$$\ln (\pi) = f_\delta (y, w, v) + \ln u + \ln \epsilon$$

Where $\delta$ represents profit variable, $y$ represents output variable, $w$ represents input variable, and $v$ represents environmental variable that can influence company performance. $u$ represents ontrollable factors that may influence efficiency, while
9 represents uncontrollable factors or random error. So that Alternative Profit Efficiency model can be depicted as follows:

\[
\text{APEFF} = \frac{ax^2}{ax^\text{max}} \left[ \exp \{ f'_{ax} (w', y', v') \} x \exp (\ln u_{ax}) \right] \]

Berger & Di Patti (2003) also developed Standard Profit Efficiency model. The difference among standard an alternative profit efficiency is the output variable (y) at Standard Profit Efficiency will be replaced by the price (p) of the output.

The model specification of profit function which is used in this research is a translog model (Berger and [In] Patti, 2003) as follows:

\[
\ln \pi (w, y, v, t) = \alpha + \sum_{i=1}^{3} \beta_i \ln y_i + \frac{1}{2} \sum_{i=1}^{3} \beta_{ik} \ln y_k \ln y_i \\
+ \sum_{j=1}^{3} \gamma_j \ln w_{jt} + \frac{1}{2} \sum_{j=1}^{3} \gamma_{jm} \ln w_{jt} \ln w_{mt} \\
+ \sum_{i=1}^{3} \delta_{ij} \ln y_i \ln w_{jt} + \eta_i \ln v_i + \frac{1}{2} \eta_2 (\ln v_i)^2 \\
+ \sum_{i=1}^{3} \tau_i \ln y_{jt} \ln v_i + \sum_{j=1}^{3} \zeta_j \ln w_{jt} \ln v_i + \theta_1 t \\
+ \frac{1}{2} \theta_2 t^2 \sum_{i=1}^{3} \Phi_i \ln y_{jt} + \sum_{i=1}^{3} \omega_i \ln w_{jt} + \lambda t \ln v_i + \epsilon_i (1)
\]

Di Patti (2000) have noted that profit efficiency can be associated with company’s value maximization concept. Where value of the firm represents a sum of present value of expected profit in the future. So that failure in company’s value maximization will be related to failure for the profit maximization with certain risk. Further, profit efficiency is a relative performance concept that compare companies with the best company in industry as the optimal frontier.

So if a company cannot reach the optimal value, things can be measured. If we compare with value of the firm concept, changes of value of the firm reflects fluctuation of performance to expectation and not to their potency. So it could not be an indication of existence of agency cost problem. For example, higher leverage will improve value of the firm because the improvement cannot be predicted. But higher leverage that will push the higher performance, reduction of company’s facility consumption, or cheaper resources’ expense, will improve profit efficiency.

Other reason is that the changes on company’s stock market price will reflect differences of market price, where companies have only limited control over it. While profit efficiency was calculated to measure how a company’s position compared to the best company in industry facing the same condition.

Hereinafter this research use profit efficiency approach with the following reasons: (1) profit efficiency represents approach based by bank intermediation function, where bank mobilize and distribute resources efficiently to investment activity in economy smoother, and manager play a part in maximizing profit function. Islamic Bank and conventional bank have the same intermediation role in gathering and channeling people’s funds. But these two groups have a different operation in “nature” (that is being based on profit sharing and based on interest). Lacewell (2001) argued that efficiency remains an important aspect for banks although have a different operation in nature. (2) According to De Young’s opinion (1997) that comparing cost ratio between two imprecise bank is not appropriate because some differences in product mix, size, market condition, and other characteristics that can influence bank’s cost. That way also with Islamic bank and conventional bank which have different characteristics but have same intermediation role. (3) Profit efficiency counts not only how managers control the company’s expense, but also on how they manage revenue productively by using the most efficient company as a benchmark. So this will take care the effect of market price and also other exogenous factors (Berger & DiPatti, 2003).

**METHOD**

Unit analysis in this research is commercial banks which conducted by census to the 102 conven-
tional banks and 3 Islamic banks in Indonesia. Where according to data from Central Bank of Indonesia data (www.bi.go.id) noted there are 151 conventional banks and 3 Islamic Banks that operate in Indonesia. Some banks that do not included into research data are: (1) Conventional banks that runs an Islamic banks business units, because their financial statement were joined. (2) Conventional banks that do merger or taken over by other bank during research period.

Research conducted to both group of banks, because even each group have different method on calculation of earnings, but both have same financial intermediation characteristics in the form of gathering funds and channeling loans. Adjustment of variables which were used in this research for the Islamic banks according to Indonesian Guidance of Islamic Bank Accountancy (2003) as follows:

Interest income = Earnings from financing
Interest Expenses = Profit sharing cost to Investor’s Fund + Cost from Wadia current account
Third Party Fund = Current accounts, Savings and Deposits, including Wadia current account. Wadia current account and wadia current account bonus were reckoned in efficiency because they were included in Islamic Banks’ cash flow (PAPSI, 2003).

Channelled credit = channelled loan that have allowance for bad debt, that is : murabaha receivable, salam receivable, istishna receivable, ijara, qardh, mudharaba and musyaraka financing.

RESULT

Estimation on Bank’s Profit Model

By using pooled least square regression from translog alternative profit efficiency (1) above, hence this research follow the approach which looking into bank’s intermediation role in using raised funds from society and channels it in the form of credit to maximize profit. To prevent negative value, a constant added to the variable profit, and to eliminate heteroskedasticity influence we used white heteroskedasti-

| 504 |
Result from regression above shows estimation model of factors that influence bank’s variable profit. From the result we can conclude that some independent variables, that is given credit ($Y_1$), marketable securities (including bonds) ($Y_2$), and labour expenses ($W_1$), have a significant effect on bank’s variable profit. While for some independent variables quarterly inflation rate (INF) and time index (T) do not have a significant effect on bank’s variable profit. But according to Koetter opinion (2005), that with interaction of some variables at the same time, hence interpretation from each variable becomes not directly. Hence we only consider some variables that has significant effect and compare it to some former research:

### Statistical F-test

This statistical test conducted to see the existence of and how big influence from independent variables to dependent variables in the model concurrently (multiple), or at least there is one independent variable that able to explain the dependent variable. The equation in this test is conducted with regression according to ordinary least square assumption.

**Table 1. F-stat value of Panel Data Regression**

<table>
<thead>
<tr>
<th>F-Stat</th>
<th>H₀ Hypotesis</th>
<th>Kesimpulan</th>
</tr>
</thead>
<tbody>
<tr>
<td>275.9092</td>
<td>H₀ rejected</td>
<td>Significant at $\alpha = 0.01$</td>
</tr>
</tbody>
</table>

Based on F-Stat value are larger value than F-Table value, hence F test above indicates that independent variables concurrently influence dependent variable significantly by 99%.

### Profit Efficiency Score for All Banks

As we have obtained the regression output between some input and output variables to bank profit, next the error term obtained from every bank regression were used to count the profit efficiency score of each bank by using equation: $EFF = \exp \left[ Y - \max(\hat{Y}) \right]$ where $\hat{Y}$ represents residual estimation from regression output to every bank. The profit efficiency score for all banks are as follows (Table 3).
0.603799 = 0.173165. Standard Chartered Bank represents a bank in which during the research period are the most profit efficient, whereas Bank Sulawesi Tengah has the lowest profit efficiency score.

If we group all banks based on the owner status, descriptive statistics of the profit efficiency score above are as follows (Table 5).

Based on ownership, on average foreign banks groups represent is the most efficient bank in Indonesia in allocating their entire inputs and outputs resources in running their intermediation function to yield profit. The next most efficient groups are bank campuran, foreign exchange private banks, non foreign exchange private banks, regional banks and government banks. This result is came close to the research conducted by Hadad, Santoso & Mardanugraha (2003) which were using stochastic frontier approach method (SFA). Where according to their research, for the year of 2000–2003 foreign banks groups represent the most efficient bank in Indonesia.

DISCUSSIONS

Given Credit output variable (Y1)

From the regression result we can see that coefficient of the given credit output variable is equal to 1.458401. Positive coefficient number indicate that given credit and bank’s profit growth have a positive relation. This has a same result with research conducted by Illieva (2003) and Santos (2007) that found a positive relation with bank’s profit function. While Koetter (2005) who have separated between com-

**Table 4. Descriptive Statistics on Profit Efficiency Score Year 2002-2007**

<table>
<thead>
<tr>
<th>Item</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.603799</td>
</tr>
<tr>
<td>Skewness</td>
<td>1.199675</td>
</tr>
<tr>
<td>Min</td>
<td>0.513134</td>
</tr>
<tr>
<td>Max</td>
<td>0.776964</td>
</tr>
<tr>
<td>N</td>
<td>105</td>
</tr>
</tbody>
</table>

From the descriptive statistics table above, we can conclude that with maximum score equal to 0.776964, and average profit efficiency score of 0.603799, hence other banks can maximize their profit by allocating their inputs and outputs more efficient, on average by the price of 0.776964 –

**Table 5. Descriptive Statistic Profit Efficiency Score By Bank’s Owner Year 2002-2007**

<table>
<thead>
<tr>
<th>Item</th>
<th>Government Banks</th>
<th>Private Forex Banks</th>
<th>Private Non Forex Banks</th>
<th>Regional Banks</th>
<th>Mixing Banks</th>
<th>Foreign Banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.5539</td>
<td>0.5941</td>
<td>0.5778</td>
<td>0.5636</td>
<td>0.6641</td>
<td>0.7047</td>
</tr>
<tr>
<td>Skewness</td>
<td>1.7696</td>
<td>(2.576)</td>
<td>(0.5758)</td>
<td>0.3351</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>0.5539</td>
<td>0.5391</td>
<td>0.5237</td>
<td>0.5131</td>
<td>0.5154</td>
<td>0.6445</td>
</tr>
<tr>
<td>Max</td>
<td>0.5539</td>
<td>0.7279</td>
<td>0.7006</td>
<td>0.5832</td>
<td>0.7613</td>
<td>0.7770</td>
</tr>
<tr>
<td>N</td>
<td>1</td>
<td>29</td>
<td>33</td>
<td>17</td>
<td>16</td>
<td>9</td>
</tr>
</tbody>
</table>

*Including 3 Islamic Banks*
commercial loan and interbank’s loan found a positive relation between interbanks loan and bank’s profit, but this relation become negative for commercial loan. Other result came from research by Fitzpatrick, Trevor & Mc Queen, (2005) who found the relation was not significant.

The high level of coefficient of channelled credit variable compared to other output variable coefficient, indicate that credit is a potential variable to improve bank’s profit efficiency. The same opinion came from research conducted by Had dad et. al (2003) where one of their concluded that channelled credit play important role in determining bank’s profit efficiency.

** Marketable Securities (Including Bonds)**

**Output Variable (Y2)**

From regression result we can see significant but negative relation between marketable securities variable with bank’s profit. Where the coefficient from the variable equals to -0.295751. Negative coefficient indicate if marketable securities grow higher, then the bank’s profit will fall. This result differs from Santos’ (2007) research who found significant and negative relation but with bank’s cost function (not bank’s profit) with coefficient -0.99%. Research from Koetter (2005) found positive relation with bank’s profit with coefficient 0.790.

**Price of Labour Input Variable (W1)**

Coefficient from labour price variable is significant and equal to -1.630558. Negative coefficient number indicates that higher labour price have negative impact on bank’s profit. This output matches result from Koetter (2005) with coefficient -0.387. While two other researches give different result. Research from Fitzpatrick, Trevor & Mc Queen (2005) and Illieva (2003) found a positive and significant relation of this variable with bank’s profit.

**Estimating Coefficient of Determination (R²)**

Coefficient of determination (R²) resulted from the regression equals to 0.942823, meaning that 94.282% of bank’s variable profit influenced by determinant variables in the model, while 5.718% is influenced by other variables outside the model.

**CONCLUSION AND SUGGESTION**

**Conclusions**

From this research we can obtain some findings related in gaining profit efficiency and also some variables that can influence them as follows: (1) By using pooled least square method to estimate translog profit efficiency model, some variables that influence significantly to bank’s profit are: channelled credit (have a positive effect), marketable securities (negative effect), labour cost (have a negative effect). While other variables do not have significant effect. (2) Based on residual estimation, average profit efficiency score to the entire banks equal to 60.38%, whereas maximum profit efficiency score equal to 77.70%. Thereby on average banks in the sample still have room to improve their resources allocation to increase profit by 77.70% – 60.38 = 17.32%. (3) Standard Chartered Bank has the highest profit efficiency score (77.70%) while Bank Sulawesi Tengah has the lowest score (51.30%). (3) From the entire 105 banks, the three Islamic banks ranked in the 20% most profit efficient, that Bank Syariah Mandiri (rank 8), Bank Muamalat Indonesia (rank 12) and Bank Mega Syariah (rank 21). So that although there are some phenomenons related to the earnings [of] sharing holder burden and defrayal and also on their relatively low ROE at some banks, but descriptively can be said that Islamic banks can manage their input and output variables good enough in yielding profit.

**Suggestions**

There are some potencies and weaknesses to be developed to continue this research related to conventional and Islamic bank’s profit efficiency, this research still disregard from bank’s size effect which on some literatures can influence different efficiency level. Islamic Bank in Indonesia is relatively new to expand, with only small populations, compare to their conventional peers with 102 banks.
REFERENCE


