# EFFICIENCY OF ISLAMIC BANKS:
# A COMPARISON BETWEEN MALAYSIA AND BAHRAIN

By

**MAZLEENA BINTI MOHD TAJUDDIN**

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## ABSTRACT

Malaysia and Bahrain are leading as Islamic financial hubs and play a vital role to other countries. In competitive industry, both countries should enhance the perfornance in terms of efficiency. Hence, the main purpose of this study is to examine the efficiency level of Islamic banks in Malaysia and Bahrain over the period 2008 to 2012. The sample consists of 16 Islamic banks in Malaysia and 15 Islamic banks in Bahrain. Specifically, the aim of the study is to calculate overall technical efficiency (OTE) and its decomposition which are pure technical efficiency (PTE) and scale efficiency (SE) of Islamic banks between Malaysia and Bahrain. A non-parametric based Data Envelopment Analysis (DEA) was used to estimate the efficiency and this study were analyzed based on intermediation approach. Then, a series of parametric and non-parametric test is utilized in order to compare the efficiency level between Malaysia and Bahrain. As a result, Islamic banks in Bahrain were more efficient compared to Islamic banks in Malaysia.



**Keywords**: Efficiency, Islamic Financial Hubs, Data Envelopment Analysis

## ABSTRAK

Malaysia dan Bahrain merupakan negara terkemuka sebagai hab kewangan Islam dan memainkan peranan yang penting terhadap negara-negara lain. Dalam industri yang berdaya saing, kedua-dua negara perlu meningkatkan prestatsi dari segi kecekapan. Justeru, tujuan kajian utama ini adalah untuk mengkaji tahap kecekpan bank-bank Islam di Malaysia dan Bahrain dalam tempoh 2008 hingga 2012. Sampel kajian terdiri daripada 16 buah bank-bank Islam di Malaysia dan 15 buah bank-bank Islam di Bahrain. Secara khusus, tujuan kajian ini adalah untuk mengira kecekapan keseluruhan teknikal (OTE), kecekapan teknikal tulen (PTE) dan kecekapan skala (SE) bank-bank Islam antara Malaysia dan Bahrain. Kaedah bukan parametrik berasaskan Data Envelopment Analisis (DEA) telah digunakan dan kajian ini telah dianalisa berdasarkan pendekatan pengantaraan. Seterusnya, satu siri ujian parametrik dan bukan parametrik digunakan untuk membandingkan tahap kecekapan antara Malaysia dan Bahrain. Hasilnya, bank-bank Islam di Bahrain lebih cekap berbanding dengan bank-bank Islam di Malaysia.



**Kata Kunci**: kecekapan, hab kewangan Islam, Data Envelopment Analisis

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Mazleena binti Mohd Tajuddin
Islamic Business School
Universiti Utara Malaysia

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| BCR | Banker Charnes Cooper |
| BIMB | Bank Islam Malaysia Berhad |
| BMMB | Bank Muamalat Malaysia Berhad |
| BNM | Bank Negara Malaysia |
| CBB | Central Bank of Bahrain |
| CCR | Charnes Cooper Rhodes |
| CRS | Constant Return to Scale |
| DEA | Data Envelopment Analysis |
| DFA | Distribution Free Approach |
| DMU | Decision Making Unit |
| DRS | Decreasing Return to Scale |
| FDH | Free Disposable Hull |
| GCC | Gulf Cooperation Council |
| IBS | Islamic Business Scheme |
| IRS | Increasing Return to Scale |
| OIC | Organization of Islamic Conference |
| OTE | Overall Technical Efficiency |
| PTE | Pure Technical Efficiency |
| RTS | Return to Scale |
| SE | Scale Efficiency |
| SFA | Stochastic Frontier Approach |
| SPSS | Statistical Package for the Social Sciences |
| TFA | Thick Frontier Approach |
| VRS | Variable Return to Scale |

# CHAPTER 1

# INTRODUCTION

## 1.1 Introduction

An Islamic banking is a financial institution that operates with the objective to implement and realize the principles of economics and finance in the banking sector. The Organization of Islamic Conference (OIC) defined an Islamic bank as a financial institution whose statutes, rules and procedures expressly state its commitment to the principles of Islamic Shariah and to the banning of the receipt and payment of interest on any of its operations.

Previously, the term “Islamic banking business” under “Islamic Banking Act 1983” was generally defined as the operations of banking activities whose not involve in any forbidden element which is clearly not allowed in Islam. Islamic Financial Services Act 2013 defined “Islamic banking business” as an activities of accepting Islamic deposits either on current, deposit and saving account. It also includes of accepting money under investment account, financial provisions and such other activities.

Nowadays, the Islamic banking industry is seen as a viable alternative in offering a wide range of products and services and expands in all parts of the world. Initially, it was developed to meet the needs of Muslims and now it is widely accepted even among non-Muslims. This industry became as one of the rapid growing sector and across the global banking industry.

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# APPENDIX A

# DATA ENVELOPMENT ANALYSIS

# TEST

## APPENDIX A : DATA ENVELOPMENT ANALYSIS TEST

### a) Efficiency of Islamic Banks in Malaysia (2008)

EFFICIENCY SUMMARY:

| firm | crste | vrste | scale | |
|---|---|---|---|---|
| 1 | 1.000 | 1.000 | 1.000 | - |
| 2 | 0.678 | 1.000 | 0.678 | drs |
| 3 | 1.000 | 1.000 | 1.000 | - |
| 4 | 0.133 | 1.000 | 0.133 | drs |
| 5 | 0.350 | 1.000 | 0.350 | drs |
| 6 | 0.093 | 0.317 | 0.292 | drs |
| 7 | 0.171 | 0.723 | 0.237 | drs |
| 8 | 0.194 | 0.393 | 0.493 | irs |
| 9 | 0.684 | 1.000 | 0.684 | drs |
| 10 | 0.216 | 1.000 | 0.216 | drs |
| 11 | 0.383 | 1.000 | 0.383 | drs |
| 12 | 1.000 | 1.000 | 1.000 | - |
| 13 | 1.000 | 1.000 | 1.000 | - |
| 14 | 0.127 | 0.320 | 0.397 | drs |
| 15 | 1.000 | 1.000 | 1.000 | - |
| mean | 0.535 | 0.850 | 0.591 | |

Note: crste = technical efficiency from CRS DEA
vrste = technical efficiency from VRS DEA
scale = scale efficiency = crste/vrste

### b) Efficiency of Islamic Banks in Malaysia (2009)

EFFICIENCY SUMMARY:

| firm | crste | vrste | scale | |
|---|---|---|---|---|
| 1 | 1.000 | 1.000 | 1.000 | - |
| 2 | 0.526 | 1.000 | 0.526 | irs |
| 3 | 1.000 | 1.000 | 1.000 | - |
| 4 | 1.000 | 1.000 | 1.000 | - |
| 5 | 1.000 | 1.000 | 1.000 | - |
| 6 | 0.671 | 1.000 | 0.671 | drs |
| 7 | 0.017 | 0.366 | 0.046 | irs |
| 8 | 0.052 | 0.239 | 0.217 | irs |
| 9 | 0.387 | 0.679 | 0.571 | irs |
| 10 | 1.000 | 1.000 | 1.000 | - |
| 11 | 0.229 | 0.403 | 0.569 | irs |
| 12 | 0.110 | 0.223 | 0.494 | irs |
| 13 | 0.066 | 0.312 | 0.212 | irs |
| 14 | 0.325 | 0.344 | 0.944 | irs |
| 15 | 0.817 | 1.000 | 0.817 | drs |
| 16 | 0.889 | 0.903 | 0.984 | irs |
| mean | 0.568 | 0.717 | 0.691 | |

Note: crste = technical efficiency from CRS DEA
vrste = technical efficiency from VRS DEA
scale = scale efficiency = crste/vrste

**c) Efficiency of Islamic Banks in Malaysia (2010)**

```
EFFICIENCY SUMMARY:

 firm  crste  vrste  scale

    1  0.156  0.893  0.175 irs
    2  0.365  0.832  0.438 irs
    3  0.076  1.000  0.076 irs
    4  0.647  1.000  0.647 drs
    5  1.000  1.000  1.000  -
    6  0.527  0.544  0.968 drs
    7  0.036  0.753  0.048 irs
    8  0.442  1.000  0.442 irs
    9  0.556  0.882  0.630 irs
   10  1.000  1.000  1.000  -
   11  0.313  0.393  0.797 irs
   12  1.000  1.000  1.000  -
   13  0.010  0.496  0.020 irs
   14  1.000  1.000  1.000  -
   15  1.000  1.000  1.000  -

 mean  0.542  0.853  0.616

Note: crste = technical efficiency from CRS DEA
      vrste = technical efficiency from VRS DEA
      scale = scale efficiency = crste/vrste
```

**d) Efficiency of Islamic Banks in Malaysia (2011)**

```
EFFICIENCY SUMMARY:

 firm  crste  vrste  scale

    1  0.452  0.729  0.619 irs
    2  0.190  0.760  0.250 irs
    3  0.450  1.000  0.450 irs
    4  0.391  0.421  0.928 irs
    5  1.000  1.000  1.000  -
    6  0.152  0.264  0.573 irs
    7  0.181  0.542  0.334 irs
    8  0.770  0.857  0.899 irs
    9  0.258  0.470  0.549 irs
   10  0.785  0.913  0.859 irs
   11  0.206  0.611  0.337 irs
   12  1.000  1.000  1.000  -
   13  0.597  0.690  0.866 drs
   14  0.927  1.000  0.927 drs
   15  1.000  1.000  1.000  -

 mean  0.557  0.751  0.706

Note: crste = technical efficiency from CRS DEA
      vrste = technical efficiency from VRS DEA
      scale = scale efficiency = crste/vrste
```

**e) Efficiency of Islamic Banks in Malaysia (2012)**

```
EFFICIENCY SUMMARY:

 firm  crste  vrste  scale

    1  0.241  0.249  0.968 irs
    2  0.205  0.297  0.691 irs
    3  0.270  0.321  0.841 irs
    4  0.042  0.195  0.214 irs
    5  1.000  1.000  1.000  -
    6  0.385  1.000  0.385 drs
    7  0.562  0.565  0.993 irs
    8  0.607  0.618  0.982 irs
    9  0.264  0.272  0.971 irs
   10  0.488  0.501  0.975 irs
   11  1.000  1.000  1.000  -
   12  0.297  0.401  0.739 irs
   13  0.081  0.221  0.367 irs
   14  1.000  1.000  1.000  -
   15  0.168  0.345  0.487 irs

 mean  0.441  0.532  0.774

Note: crste = technical efficiency from CRS DEA
      vrste = technical efficiency from VRS DEA
      scale = scale efficiency = crste/vrste
```

**f) Efficiency of Islamic Banks in Bahrain (2008)**

```
EFFICIENCY SUMMARY:

 firm  crste  vrste  scale

    1  1.000  1.000  1.000  -
    2  0.048  0.279  0.172 irs
    3  0.606  0.916  0.661 irs
    4  0.194  0.230  0.842 irs
    5  0.825  1.000  0.825 drs
    6  0.520  0.537  0.968 drs
    7  1.000  1.000  1.000  -
    8  0.580  0.888  0.653 irs
    9  1.000  1.000  1.000  -
   10  0.389  0.392  0.992 drs
   11  1.000  1.000  1.000  -
   12  1.000  1.000  1.000  -

 mean  0.680  0.770  0.843

Note: crste = technical efficiency from CRS DEA
      vrste = technical efficiency from VRS DEA
      scale = scale efficiency = crste/vrste
```

**g) Efficiency of Islamic Banks in Bahrain (2009)**

EFFICIENCY SUMMARY:

| firm | crste | vrste | scale | |
|---|---|---|---|---|
| 1 | 0.479 | 1.000 | 0.479 | irs |
| 2 | 0.599 | 0.621 | 0.965 | irs |
| 3 | 1.000 | 1.000 | 1.000 | - |
| 4 | 1.000 | 1.000 | 1.000 | - |
| 5 | 0.633 | 1.000 | 0.633 | drs |
| 6 | 1.000 | 1.000 | 1.000 | - |
| 7 | 1.000 | 1.000 | 1.000 | - |
| 8 | 1.000 | 1.000 | 1.000 | - |
| 9 | 0.867 | 0.933 | 0.929 | irs |
| 10 | 1.000 | 1.000 | 1.000 | - |
| 11 | 0.498 | 0.499 | 0.998 | irs |
| 12 | 1.000 | 1.000 | 1.000 | - |
| mean | 0.840 | 0.921 | 0.917 | |

Note: crste = technical efficiency from CRS DEA
vrste = technical efficiency from VRS DEA
scale = scale efficiency = crste/vrste

**h) Efficiency of Islamic Banks in Bahrain (2010)**

EFFICIENCY SUMMARY:

| firm | crste | vrste | scale | |
|---|---|---|---|---|
| 1 | 1.000 | 1.000 | 1.000 | - |
| 2 | 0.148 | 0.175 | 0.848 | irs |
| 3 | 1.000 | 1.000 | 1.000 | - |
| 4 | 0.432 | 0.692 | 0.624 | irs |
| 5 | 1.000 | 1.000 | 1.000 | - |
| 6 | 0.475 | 0.556 | 0.854 | irs |
| 7 | 0.886 | 1.000 | 0.886 | irs |
| 8 | 0.379 | 0.731 | 0.518 | irs |
| 9 | 0.544 | 0.549 | 0.991 | drs |
| 10 | 1.000 | 1.000 | 1.000 | - |
| 11 | 1.000 | 1.000 | 1.000 | - |
| 12 | 1.000 | 1.000 | 1.000 | - |
| mean | 0.739 | 0.809 | 0.893 | |

Note: crste = technical efficiency from CRS DEA
vrste = technical efficiency from VRS DEA
scale = scale efficiency = crste/vrste

**i) Efficiency of Islamic Banks in Bahrain (2011)**

```
EFFICIENCY SUMMARY:

 firm  crste  vrste  scale

    1  1.000  1.000  1.000  -
    2  0.062  0.189  0.328 irs
    3  1.000  1.000  1.000  -
    4  0.523  0.550  0.951 irs
    5  1.000  1.000  1.000  -
    6  0.695  0.708  0.981 irs
    7  0.465  0.648  0.718 drs
    8  0.246  0.396  0.620 irs
    9  1.000  1.000  1.000  -
   10  0.338  0.351  0.964 irs
   11  1.000  1.000  1.000  -

 mean  0.666  0.713  0.869

Note: crste = technical efficiency from CRS DEA
      vrste = technical efficiency from VRS DEA
      scale = scale efficiency = crste/vrste
```

**j) Efficiency of Islamic Banks in Bahrain (2012)**

```
EFFICIENCY SUMMARY:

 firm  crste  vrste  scale

    1  1.000  1.000  1.000  -
    2  1.000  1.000  1.000  -
    3  1.000  1.000  1.000  -
    4  0.441  0.456  0.967 irs
    5  1.000  1.000  1.000  -
    6  0.512  1.000  0.512 drs
    7  0.937  1.000  0.937 drs
    8  1.000  1.000  1.000  -
    9  0.128  0.316  0.403 irs
   10  0.822  1.000  0.822 irs
   11  1.000  1.000  1.000  -

 mean  0.804  0.888  0.876

Note: crste = technical efficiency from CRS DEA
      vrste = technical efficiency from VRS DEA
      scale = scale efficiency = crste/vrste
```

# APPENDIX B

# PARAMETRIC AND

# NON-PARAMETRIC TEST

## APPENDIX B : PARAMETRIC AND NON-PARAMETRIC TEST

### a) Overall Technical Efficiency (OTE)

#### i) Parametric Test (T-Test)

**Group Statistics**

| | COUNTRY | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| OTE | 1 | 76 | .2188 | .26404 | .03029 |
| | 0 | 58 | .3970 | .30140 | .03958 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| OTE | Equal variances assumed | 5.790 | .017 | -3.641 | 132 | .000 | -.17824 | .04896 | -.27508 | -.08140 |
| | Equal variances not assumed | | | -3.577 | 113.686 | .001 | -.17824 | .04984 | -.27697 | -.07951 |

## ii) Non Parametric Test (Mann-Whitney Test)

**Ranks**

| | COUNTRY | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| OTE | 0 | 58 | 84.01 | 4872.50 |
| | 1 | 76 | 54.90 | 4172.50 |
| | Total | 134 | | |

**Test Statistics[a]**

| | OTE |
|---|---|
| Mann-Whitney U | 1246.50 |
| Wilcoxon W | 4172.50 |
| Z | -4.300 |
| Asymp. Sig. (2-tailed) | .000 |

a. Grouping Variable: COUNTRY

## b) Pure Technical Efficiency (PTE)

### i) Parametric Test (T-Test)

**Group Statistics**

| | COUNTRY | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| PTE | 1 | 76 | .3141 | .31725 | .03639 |
| | 0 | 58 | .5335 | .35020 | .04598 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| PTE | Equal variances assumed | 8.133 | .005 | -3.792 | 132 | .000 | -.21940 | .05786 | -.33386 | -.10494 |
| | Equal variances not assumed | | | -3.741 | 116.137 | .000 | -.21940 | .05864 | -.33555 | -.10326 |

## ii) Non Parametric Test (Mann-Whitney Test)

**Ranks**

| | COUNTRY | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| PTE | 0 | 58 | 83.19 | 4825.00 |
| | 1 | 76 | 55.53 | 4220.00 |
| | Total | 134 | | |

**Test Statistics[a]**

| | PTE |
|---|---|
| Mann-Whitney U | 1294.00 |
| Wilcoxon W | 4220.00 |
| Z | -4.098 |
| Asymp. Sig. (2-tailed) | .000 |

a. Grouping Variable: COUNTRY

## c) Scale Efficiency (SE)

### i) Parametric Test (T-Test)

**Group Statistics**

| | COUNTRY | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| SE | 1 | 76 | .6288 | .26451 | .03034 |
| | 0 | 58 | .7244 | .22553 | .02961 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| SE | Equal variances assumed | 1.678 | .197 | -2.208 | 132 | .029 | -.09562 | .04332 | -.18131 | -.00994 |
| | Equal variances not assumed | | | -2.255 | 130.331 | .026 | -.09562 | .04240 | -.17950 | -.01175 |

## ii) Non Parametric Test (Mann-Whitney Test)

**Ranks**

| | COUNTRY | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| SE | 0 | 58 | 75.41 | 4373.50 |
| | 1 | 76 | 61.47 | 4671.50 |
| | Total | 134 | | |

**Test Statistics[a]**

| | SE |
|---|---|
| Mann-Whitney U | 1745.50 |
| Wilcoxon W | 4671.50 |
| Z | -2.059 |
| Asymp. Sig. (2-tailed) | .039 |

a. Grouping Variable: COUNTRY