

1 Performance of Conventional and Islamic Banks

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5

6 **Abstract**

7 This paper investigates the differences in mean cost, revenue, and profit efficiency of
8 conventional and Islamic banks based on size and location by using three sets of samples over
9 the 1992â?"2007 period from 54 countries. The study uses financial ratio analysis. The results
10 showed that Islamic banks in both samples are more cost efficient than the conventional
11 banks. While, the results of revenue efficiency (ROAE) ratio reveal that conventional banks
12 are more profitable. However, the results of profit efficiency were inclusive.

13

14 **Index terms**— cost, revenue, and profit efficiency of conventional and Islamic banks.

15 **1 Introduction**

16 The literature on the performance of Islamic banks is still in its initial stages. Recent empirical efforts have begun
17 to change this, but the findings in the literature are mixed and inconclusive. The analysis in this study addresses
18 the gap in the literature on the comparative performance of Islamic and conventional banks. This paper mainly
19 addresses the effects of bank size and location on the efficiency of conventional and Islamic banks operating in
20 OIC countries by using two samples, a sample including all conventional and Islamic banks in OIC countries and
21 a sample constrained to the countries in which both banking types operate. Some studies only concentrate on
22 countries with both banking types, and other studies use a mixed sample. By using two samples, the outcomes
23 of this study can give a better view of the performance of both banking types.

24 **2 II.**

25 **3 Literature Review**

26 According to Bader et al. (2007), efficiency has been examined in a number of different contexts: (a) cross-
27 country comparisons or country-specific conditions, (b) foreign-owned banks versus domestic owned banks, (c)
28 comparisons of bank type (e.g. large or small, specialized or diversified, retail or wholesale), (d) government
29 ownership versus private ownership, (e) new versus old bank, (f) before and after mergers or acquisitions, (g)
30 before and after a financial crisis (e.g., the 1997 Asian crisis), and (h) analyses of the effects of deregulation
31 and liberalization. This paper analyzes and compares the efficiency (cost, profit and revenue) of conventional
32 and Islamic banks. Also, the analysis is conducted based on size and location of both bank types. Bader et
33 al. (2007) examines the cost, revenue, and profit efficiency of 43 Islamic banks and 37 conventional banks in 21
34 OIC countries from 1990 to 2005. Attention is given to bank size, age, and location. The profitability ratios are
35 ROAA and ROAE. The revenue-efficiency category also consists of two ratios: NIM and other operating income
36 to average assets divided by average assets. Finally, cost efficiency is represented by cost-income ratio (overhead
37 divided by pre-provision income) and non-interest expenses ratio (the ratio of non-interest expenses or overhead
38 plus provisions to the average value of assets). The results show no significant differences between Islamic and
39 conventional banking systems on these indicators. The same results are obtained when the banks are grouped
40 into small and large size based on their total assets. This indicates that the size of the banks in Bader et al.
41 (2007) does not affect their cost, profit, or revenue efficiencies. Furthermore, the authors group banks based on
42 their age. The results reveal no significant differences between the cost efficiencies of old and new conventional
43 and Islamic banks. However, the NIM ratio for new conventional banks is significantly higher than the NIM ratio

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44 for new Islamic banks. There are no significant differences between old conventional banks and old Islamic banks
45 in terms of revenue and profit efficiency. Finally, the study concludes that location does not impact the efficiency
46 of conventional and Islamic banks.

47 Hassan, Mohamad and Bader (2009) explore the effects of size and age on the cost, revenue, and profit
48 efficiencies of a sample of 40 banks ??18 conventional and 22 Islamic) in 11 countries from 1990 to 2005. Those
49 countries are OIC members located in the MENA region. The study uses a Data Envelope Analysis (DEA)
50 non-parametric approach. The results suggest that there are no significant differences in the cost, revenue,
51 or profit efficiencies of both bank types. Furthermore, the results reveal that large versus small banks, large
52 conventional versus large Islamic, and small conventional versus small Islamic banks are no different in terms
53 of efficiency. The study also indicates that large conventional banks and large Islamic banks are more revenue
54 efficient than their small counterparts but small Islamic banks are more profit efficient. Nevertheless, these
55 results are not significant. Moreover, there are no significant differences in efficiency between old conventional
56 and old Islamic banks. The cost and profit efficiencies of old conventional banks are slightly better than they
57 are for old Islamic banks. Old Islamic banks are more revenue efficient than old conventional banks though.
58 The profit Abdul-Majid, Saal and Battisti (2010) compare the efficiency of Islamic and conventional banks using
59 a sample of 23 Islamic and 88 conventional banks from 10 countries from 1996 to 2002. The authors use an
60 output distance function, and the results indicate that the potential efficiency outputs of Islamic banks are lower
61 than the potential outputs for conventional banks. The authors argue that constrained opportunities in terms
62 of investments are the cause for the lower efficiencies in Islamic banks. Similarly, Abdul-Majid (2010) examines
63 the efficiency of conventional and Islamic banks in 10 countries that have both banking types from 1996 to 2002.
64 The sample consists of 23 Islamic and 88 conventional banks, and cost and output distance functions are used
65 for the estimates. The results show that Islamic banks have higher input requirements than do conventional
66 banks. Ariss (2010) analyzes the competitive conditions prevailing in Islamic and conventional global banking
67 markets and investigates the differences in profitability between conventional and Islamic banks using a sample of
68 58 Islamic and 192 conventional banks across 13 countries from 2000 to 2006. Ariss uses a multi-variate analysis
69 method and does not find differences in profitability levels across Islamic and conventional banks. In a smaller
70 sample of banks with similar macroeconomic conditions, Srairi (2010) investigates the profit and cost efficiencies
71 of 48 conventional and 23 Islamic banks from 1999 to 2007 in GCC countries. A stochastic frontier analysis is
72 used, and the results indicate that conventional banks are better than Islamic banks in terms of profit and cost
73 efficiency.

74 Beck, Demirgürç-Kunt and Merrouche (2010) compare conventional and Islamic banks, controlling for other
75 bank and country characteristics. They use two samples-large and small-for the 1995-2007 period. The large
76 sample includes 2,857 conventional banks and 99 Islamic banks across 141 countries. The smaller sample includes
77 397 conventional banks and 89 Islamic banks across 20 countries. The authors use z scores and a linear fixed-
78 effects model to assess the difference between the two banking systems. The variables in their study are grouped
79 into four categories: business model, efficiency, assets quality, and stability. The business model consists of
80 three variables: fee income to total operating income, non-deposit funding to total funding, and gross loans to
81 total loans. The efficiency category has two variables: overhead to total assets and cost to income ratio. The
82 asset-quality effect is captured by the ratios of loan-loss reserves to total gross loans, loanloss provision to total
83 gross loans, and non-performing loans to total gross loans. Finally, stability is measured by z scores, returns on
84 assets, an equity-to-asset ratio, and maturity matching.

85 Beck, Demirgürç-Kunt and Merrouche (2010) show few significant differences in business orientation, efficiency,
86 asset quality, and stability. Islamic banks are more cost efficient than conventional banks in the large sample,
87 but not more profitable. The results for the smaller sample indicate that there is no difference in profitability
88 between conventional and Islamic banks. However, the conventional banks are more cost effective compared to
89 Islamic banks. Conventional banks that operate in countries with a higher market share of Islamic banks are less
90 stable but more cost efficient. The study compares the effect of the recent financial crisis on both of the banking
91 systems. The authors conclude that Islamic banks performed better than conventional banks during the financial
92 crisis. The authors attribute this to the higher capitalization and liquidity reserves of Islamic banks.

93 In another cross-country study, Kaouther, Viviani and Belkacem (2011) examine the differences between
94 conventional and Islamic banks with a particular focus on leverage and profitability. Using a sample of 109 banks
95 (50 Islamic and 59 conventional) from 18 countries from 2004 to 2008 from the Thomson ONE database, they
96 conduct t tests, binary logistic regressions, and a discriminant analysis using leverage and profitability ratios and
97 their determinants. The findings show that ROA and ROE ratios are slightly higher (although not significant)
98 for Islamic banks. However, the net-margin ratio shows that Islamic banks are less profitable than conventional
99 banks, and the results are significant at the 5% level.

100 Olson and Zoubi (2011) compare accountingbased and economic-based measures of efficiency and profitability
101 of 83 banks from 10 MENA countries from 2000 to 2008. The analysis, with country dummy variables, shows
102 that GCC conventional banks are more cost efficient than non-GCC conventional banks and GCC Islamic banks.
103 Also, the results reveal that Islamic banks in the GCC region are more profitable (ROE) than GCC and non-GCC
104 conventional banks but are less cost efficient. Based on the overall results of their study, Olson and Zoubi argue
105 that accounting-based and economics-based approaches give similar measures of relative bank performance but
106 explain that they do measure different aspects of financial performance.

107 In an earlier study, Olson and Zoubi (2008) use 26 financial ratios to examine whether it is possible to
108 distinguish between conventional and Islamic banks in GCC countries on the basis of financial characteristics
109 alone. The financial ratios fall into five general categories: profitability, efficiency, asset quality, liquidity, and
110 risk. The data period spans from 2000 to 2005. However, the number of banks differ from one year to another,
111 with 25 banks (13 conventional and 12 Islamic) in 2000, 28 banks (14 conventional and 14 Islamic) in 2001, 47
112 banks (29 conventional and 18 Islamic) in both 2002 and 2003, 46 banks (28 conventional and 18 into logit,
113 neural-network, and k-means nearest neighbor classification models to distinguish between conventional and
114 Islamic banks. The results reveal that Islamic banks are more profitable than conventional banks. The findings
115 for interest or commission income divided by average total assets show that the efficiency ratios are significantly
116 smaller for Islamic banks and that net non-interest margins are significantly smaller for conventional banks. Also,
117 asset-quality ratios vary between the two banking systems. The provision for loan losses to average total loans
118 and advances, allowances for loan losses at the end of the year over average total loans, and advances used as
119 asset-quality ratios are all smaller for Islamic banks. In contrast, the liquidity ratios are not significantly different
120 between conventional and Islamic banks. However, the risk ratios indicate a significant difference between the two
121 banking systems. The loans-to-deposits ratio is larger for Islamic banks, and the reverse is true for the ratio of
122 liabilities to shareholder capital. The results from the risk indicators are consistent with the notion that Islamic
123 banks are riskier than conventional banks. Metwally (1997) compares the performance of 15 conventional banks
124 and 15 Islamic banks from all over the world in terms of liquidity, leverage, credit risk, profit, and efficiency by
125 using logit, probit, and discriminant analyses. The findings suggest that, compared to conventional banks, Islamic
126 banks rely on their equity to finance their activities and face more difficulties in attracting deposits. Second,
127 Metwally finds that Islamic banks are more conservative in their lending and therefore have higher cash-deposit
128 ratios than conventional banks. Finally, the study shows that profitability and efficiency are not different between
129 conventional and Islamic banks.

130 In another cross-country study, Johnes, Izzeldin and Pappas (2009) use a financial-ratio analysis and a DEA
131 to investigate the efficiency of conventional and Islamic banks in the GCC region from 2004 to 2007. For the
132 financial-ratio analysis, the authors adopt the same ratios as Bader et al. (2007). The results reveal that Islamic
133 banks are more revenue and profit efficient but less cost efficient than conventional banks. Specifically, ROAA
134 is always higher for Islamic banks throughout the entire study period. However, the ratios of cost to income
135 and non-interest expenses to average assets are higher for Islamic banks compared to conventional banks. The
136 revenue-efficiency variables of NIM and other-operating income to average assets are higher for Islamic banks, but
137 the results are only significant for other operating income. The findings of the econometric method indicate that
138 gross efficiency is higher for conventional banks. In general, the findings show that the financial-ratio analysis
139 and the econometric methods are complements rather than substitutes.

140 Iqbal (2001) compare the performance of conventional and Islamic banks operating in a dual-bank system.
141 The sample consists of 12 banks for each bank type from seven countries from 1990 to 1998. The study uses t
142 tests to compare several financial ratios grouped into five categories: asset quality, liquidity, deployment ratio,
143 cost-to-income ratio, and profitability. The results indicate that Islamic banks are more cost and profit efficient.
144 Akhter et al. (2011) use financial ratios to compare the performance and efficiency of conventional and Islamic
145 banks in Pakistan. The study uses nine financial ratios in the areas of profitability (ROA, ROE, and total cost
146 to total income), liquidity risk (net loans to asset ratio, liquid asset to customer deposits and shortterm funds,
147 and net loans to total deposits and borrowing), and credit risk (equity to total assets, equity to total loans, and
148 impaired loans to gross loans) from 2006 to 2010. The study shows no significant differences between conventional
149 and Islamic banks in terms of profitability. However, there are differences in liquidity and credit performance,
150 both in favor of Islamic banks. In another recent study on Pakistani banks, Hanif et al. (2012) compares
151 the performance of 22 conventional banks and 5 Islamic banks from 2005 to 2009. They also use nine ratios
152 grouped into four categories: profitability (ROA, ROE, and total cost to income), liquidity (net loans to asset
153 ratio, liquid assets to customer deposits and short-term funds, and net loans to total deposits and borrowing),
154 risk management (equity to total assets, equity to total loans, and impaired loans to gross loans), and solvency
155 (Bank-o-meter model). Their findings suggest that conventional banks are more profitable (ROA and ROE) and
156 liquid than Islamic banks. In contrast, Islamic banks are better in terms of credit risk management and solvency
157 maintenance.

158 Samad and Hassan (1999) use financial ratios to compare the profitability performance of one Islamic bank,
159 Bank Islam Malaysia Berhad, with eight conventional banks in the same country from 1984 to 1997. These ratios
160 are grouped into four categories: profitability (ROA, ROE, and profit over total expenses), liquidity (cash-deposit
161 ratio, loan-deposit ratio, current assets to current liabilities, and current assets to total assets), risk and solvency
162 (dept-equity ratio, debt-to total-asset ratio, equity multiplier, and loan-to-deposit ratio), and commitment to
163 the domestic and Muslim community (long-term loans to total loans, deposit invested in government bonds
164 over total deposits, and mudaraba-musharaka to total loans). The study finds no significant differences in
165 profitability between Bank Islam Malaysia Berhad and the conventional banks. Also, risk and insolvency ratios
166 and commitment to the domestic and Muslim community ratios did not show any significant differences. Muslim
167 community ratios include long-term loans to total loans, deposits invested in government bonds over total deposits,
168 and mudarabamusharaka to total loans. However, the study indicates that Bank Islam Malaysia Berhad is more
169 liquid than conventional banks. Safiullah (2010) replicates Samad and Hassan (1999) with some modifications to

170 examine the Bangladeshi banking system. He uses a financialratio analysis to compare the ratios of profitability,
171 liquidity, and solvency; business development, efficiency, and productivity; and commitment to economy and
172 community of conventional and Islamic banks from 2004 to 2008. This study documents the superiority of
173 Islamic banks in the areas of business development, profitability, liquidity, and solvency. Also, Samad (2004)
174 uses a financial-ratio analysis to examine the comparative performance of Islamic and conventional commercial
175 banks in Bahrain during the post-Gulf War period with respect to profitability, liquidity risk, and credit risk.
176 The author uses nine financial ratios over the period from 1999 to 2001 for 15 conventional banks and six Islamic
177 banks to compare the performance of both banking systems. The paper concluded that there is a significant
178 difference in credit performance (equity-to-asset ratio, equity-to-net-loan ratio, and non-performing loans to gross
179 loans), as the performance of Islamic banks is superior to that of conventional banks. Samad (2004) argues that
180 this was probably largely due to the higher rates of equity per capita that the Islamic banks maintain in his study.
181 The indicators of profitability (ROA, ROE, and cost-to-income ratio) and liquidity (net loans over total assets,
182 liquid assets over customer deposits, and short-term funds and net loans over total deposits and borrowings)
183 show no significant differences.

184 In a more recent study, this one on the Malaysia banking system, Masruki et al. (2011) compare the
185 performance of two Islamic Banks (Bank Islam and Bank Muamalat) against benchmarks of conventional banks
186 from 2004 to 2008. The authors use four financial ratios: profitability, liquidity, risk, solvency, and efficiency
187 (NIM and net financing revenue over assets). The analysis utilizes equality-of-means tests. The findings reveal
188 that Islamic banks are less profitable (ROAA and ROAE) than conventional banks but more liquid. Also, Islamic
189 banks are more efficient than conventional banks. Furthermore, Abdul-Majid, Nor and Said (2003) examine the
190 productive efficiency of conventional and Islamic banks in the country from 1993 to 2000 using a stochastic
191 frontier cost function approach. They conclude that efficiency levels of conventional and Islamic banks are not
192 different. Moreover, their results suggest that bank efficiency is not a function of ownership status (e.g., public
193 or private, foreign or local). In addition, ??okhtar Also, the study reveals that full-fledged Islamic banks are
194 more efficient than Islamic windows, whereas foreign Islamic windows are more efficient than conventional banks.
195 Borkbh (2011) examines a sample of 17 Islamic banks and 15 conventional banks from 2000 to 2008 from eight
196 Middle Eastern countries with dual-bank systems. The author uses a stochastic frontier approach to investigate
197 both banking systems. The findings show that conventional banks are more technical, altercative, and cost
198 efficient than Islamic banks.

199 Scholars have also compared the efficiency and performance of conventional and Islamic banks before, during,
200 and after the recent financial crisis ??2007) ??2008). Bourkhis and Nabi (??11) attempt to answer two questions:
201 "Have Islamic banks been more resistant than their counterparts to the 2007-2008 financial crisis?" and "Could the
202 presence of Islamic banks in a conventional banking system enhance the overall systemic stability?" The authors
203 collect data from 343 conventional banks and 64 Islamic banks in 19 OIC countries from 1993 to 2009 to analyze
204 the financialcrisis effect on both banking systems' soundness indicators, including (capital adequacy, earnings and
205 profitability, asset quality, efficiency and liquidity). The analysis uses equality-of-means tests and z scores. The
206 equality-of-means results show that Islamic banks are more profitable than conventional banks before the crisis.
207 During the crisis, large Islamic banks remain more profitable than the large conventional banks. However, Islamic
208 banks become less profitable after the crisis. Also, their results show that large Islamic banks are more resilient to
209 the financial crisis than small Islamic banks. The second approach shows that conventional banks are financially
210 stronger than Islamic banks through the three periods (before, during, and after the crisis). Furthermore, small
211 Islamic banks are financially stronger than large Islamic banks in the period before the financial crisis, and the
212 reverse is true during and after the crisis. Also, the study reveals surprising results that contradict the notion
213 that Islamic banks are more immune to financial crisis; indeed, in Bourkhis and Nab, conventional banks are
214 more resistant to the 2007-2008 financial crisis than are Islamic banks. Finally, the existence of large Islamic
215 banks enhances the stability of the overall banking system.

216 Hasan and Dridi (2010) examine the trends of profitability, credit and asset growth, and external ratings for
217 120 banks (one quarter were Islamic) before and after the 2007-2008 crisis. Each of the countries in the sample
218 has a dual-bank system and a considerable presence of Islamic banks. The study suggests that the profitability
219 of Islamic banks prior to the crisis (2005-2007) was higher than that of conventional banks, but the period from
220 2008 to 2009 shows similar results for both banking systems. Also, large Islamic banks

221 4 C

222 outperformed small Islamic banks. The credit and asset growth of Islamic banks are higher than the rates for
223 conventional banks during the crisis ??2008) ??2009). Also, external rating agencies are in favor of Islamic banks
224 during the crisis. Parashar and Venkatesh (2010) compared conventional banks and Islamic banks in the GCC
225 region over the 2006-2009 period based on five performance parameters: capital adequacy (capital as defined
226 by Basel divided by risk weighted assets), efficiency (cost-to-income ratio), profitability (ROAA and ROAE),
227 liquidity (liquid assets over total assets), and leverage (equity over total assets). The authors use equality-of-
228 means tests. The analysis for the full study period shows that Islamic banks outperform conventional banks in
229 terms of capital adequacy, ROAA, ROAE, and leverage. The results for before and during the crisis reveal that
230 ROAA is significantly higher for Islamic banks than for conventional banks. ROAE do not show any differences
231 between the two bank types during the crisis; however, this ratio was higher for Islamic banks before the crisis.

232 Also, the analysis shows that conventional banks' ROAE, ROAA, and liquidity declined during the crisis, whereas
233 capital adequacy ratio, ROAE, and leverage declined for Islamic banks.

234 Also, some studies have investigated the efficiency of Islamic banks without comparing them to conventional
235 banks. For example, in a cross-country study, Hassan (2005) examines cost, profit, and xefficiency and finds that
236 Islamic banks are less efficient at containing cost relative to profit generation. His results also reveal that large
237 Islamic banks generated profit more efficiently.

238 **5 III.**

239 Data and Methodology consists of 348 conventional banks (Islamic windows and conversion years were not
240 included) and the third sample are made of 70 Islamic banks, the countries which have a dual banking system in
241 OIC countries are 23 countries, see Table 1, Table 2, and Table 3. The data are collected for 17 years; however,
242 because a 2year moving average is used, the study period is reduced to 16 years. The data are verified and
243 checked for errors. Regarding bank size, in the literature there are no specific amounts of assets that differentiate
244 large, medium, and small banks. However, this study classifies a bank as large if its assets (constant 2005 USD)
245 are greater than USD 500 million. This number is chosen because about 50% of the banks in the sample have
246 assets that are less than or equal to USD 500 million.

247 The use of financial ratios is not a new way to measure efficiency and performance, as it dates back to the end
248 of the 19th century (Horrigan, cited in ??ader pair-wise comparisons for the treatment groups is analyzed using
249 a corrected level of significance in each comparison so that the group wise error does not exceed a preselected
250 significance level, such as $\alpha = .01$. A Levene's test is used to decide whether the population variances are likely
251 to be equal. The p value is used in the same way as it is used in the t test; that is, reject H_0 if $p < \alpha$. The test
252 shows that the samples are homogenized.

253 Six ratios (cost to income, non-interest expenses, net interest margin, return on average assets and return on
254 average equity) are used to compare the performance of conventional and Islamic banks and are categorized into
255 three groups: cost efficiency, revenue efficiency, and profit efficiency.

256 **6 a) Cost Efficiency**

257 Isik and Hassan (cited in Srairi 2010) define cost efficiency as "a measure of how far bank's cost is from the
258 best practice bank's cost if both were to produce the same output under the same environmental conditions"
259 (p. 48). In the present study cost efficiency is measured with cost to income ratio (CTIR) and non-interest
260 expenses ratio (NIER). Cost to income ratio is calculated by dividing overhead by income after provisions. For
261 conventional banks as well as Islamic banks, the items that make up a bank's costs are very similar, consisting
262 mainly of salaries, wages, rent, and so forth. However, Islamic banks typically incur additional costs, such the
263 costs of maintaining a shariah board. Studies find high values for the cost to income ratio for both bank types.
264 The other ratio, non-interest expenses, is measured by non-interest expenses or overhead plus provisions to the
265 average value of assets. This ratio expresses the expense per unit of assets. The lower this ratio, the better the
266 bank's cost efficiency.

267 **7 b) Revenue Efficiency**

268 This measure indicates how well a bank is expected to perform in terms of profit relative to other banks in the
269 same period in producing the same set of outputs (Bader et al. 2007). The ratios that make up this measure are
270 NIM and other operating income to average assets. The NIM for Islamic banks is the income from its investment
271 activities minus the profit distributed to its depositors and investors. This ratio is not adjusted for risk. The other
272 operating income for conventional and Islamic banks indicates the value of other operating income generated for
273 every dollar of assets value (Ariff et al. 2011). The higher this ratio, the more revenue efficient the bank will be.

274 **8 c) Profit Efficiency**

275 This measure is defined as the ratio between the actual profit of a bank and the maximum level that could be
276 achieved by the most efficient bank (Maudos et al., cited in Srairi 2010). The most commonly used ratios to
277 measure profit are ROAA and ROAE. However, ROAE must be interpreted with caution because evidence shows
278 that income smoothing is practiced in many countries (Ariff et al. 2011). The ratios used in this study are shown
279 in Table 4.

280 **9 Category**

281 Financial ratio Description Cost efficiency ratios Cost to income ratio (CTIR)

282 Overhead as a percentage of income generated before provisions. The major cost element of this ratio is
283 normally salaries.

284 **10 Non-interest expenses ratio (NIER)**

285 The ratio of overhead plus provisions to the average value of assets.

286 **11 Revenue efficiency ratios**

287 **12 Net interest margin (NIM)**

288 Net interest revenue divided by average earning assets.

289 **13 Other operating income (OPIR)**

290 Calculated by dividing other operating income by average assets.

291 IV.

292 **14 Empirical Results**

293 The analysis of both samples according to bank size and location is described below.

294 **15 a) Performance of Conventional and Islamic Banks**

295 The analysis begins with the performance of conventional and Islamic banks using the entire sample (Table 5).
296 The t test shows mixed results when cost efficiency ratios are compared for both bank types. The cost to income
297 ratio (CTIR) shows that conventional banks are more cost efficient, and the non-interest expenses ratio (NIER)
298 indicates that Islamic banks are more cost efficient. This may be because Islamic banks pay higher salaries and
299 incur extra costs (e.g., a shariah board), which can lead to a higher CTIR than in conventional banks. The
300 NIER results suggest that Islamic banks allocate small amounts of assets to bad loans due to the nature of some
301 of their transactions, such as ijarah and lease-back schemes, which are less risky than conventional bank loans.
302 However, the NIM values indicate that conventional banks are more revenue efficient, which is consistent with
303 Kaouther, Viviani and Belkacem (2011). On the other hand, there is no significant difference in the mean scores
304 of other operating income ratio (OPIR) between conventional and Islamic banks. This contradicts findings from
305 Hassan, Mohamad and ??ader (2009) 6 shows the effect of bank size on efficiency. The means of cost-efficiency
306 ratios (CTIR and NIER) are lower for big banks than for small banks. In addition, big banks are more profit
307 efficient (ROAE) than small banks. Nevertheless, small banks are more revenue efficient (NIM, OPIR), and both
308 of these results are significant at the 1% level.

309 **16 Category Statistic**

310 Cost Next, the effect of bank size on the performance of conventional and Islamic banks is discussed. The
311 results in Table 7 show that large conventional banks are more cost efficient (CTIR) than small conventional
312 banks, large Islamic banks, and small Islamic banks. However, the findings for the NIER ratio suggest that large
313 Islamic banks are more cost efficient than large conventional banks, small conventional banks, and small Islamic
314 banks. Also, small Islamic banks are more cost efficient than small conventional banks for both of the measuring
315 variables-CTIR and NIER-with a significance of 10% and 1%, respectively. Next, revenue efficiency is analyzed.
316 When NIM is the measuring variable, small conventional banks outperform large conventional and Islamic banks.
317 Also, the t-test shows that small conventional banks is more revenue efficient (NIM). Similarly, small Islamic
318 banks perform better than large conventional and Islamic banks. Also, the results for OPIR show that small
319 conventional banks are more revenue efficient than large banks (conventional and Islamic). Furthermore, the
320 mean for revenue efficiency (OPIR) for small Islamic banks exceeds the means for large conventional and large
321 Islamic banks. Moreover, small Islamic banks perform better than small conventional banks when measured by
322 OPIR; however, this result is not significant. The findings related to NIM and OPIR are in line with Bader et
323 al. (2007), although their findings are not significant. This clearly shows that small banks are more revenue
324 efficient than large banks, and this contradicts Hassan, Mohamad and Bader (2009). The results of Bader et
325 al. (2007), albeit non-significant, show that small banks are more revenue efficient than large banks. Also, the
326 results indicate that small conventional banks outperform small Islamic banks.

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328 Using multiple comparison tests, the results of profit efficiency (ROAA) show that large Islamic banks are more
329 profit efficient than large conventional banks, small conventional banks, and small Islamic banks. This finding
330 is in line with Bader et al. (2007), although their results are not significant. On the other hand, the results for
331 ROAE suggest that large and small conventional banks are more profit efficient than large and small Islamic
332 banks, respectively. Also, large conventional banks are more profitable than small conventional banks and small
333 Islamic banks. Furthermore, a t test shows that large Islamic banks are more profitable when Next, a general
334 analysis is conducted for the entire sample of banks in the 54 countries on the basis of location (Table 8). The
335 results from multiple comparison tests show that Asian banks are more cost efficient than banks in Africa and
336 Middle East and Turkey, and the results are significant (CTRI). However, the NIER ratio indicates that banks in
337 the Middle East and Turkey are more cost efficient than banks in the other regions. On the other hand, African
338 banks are more revenue efficient (in terms of NIM and OPIR) than banks operating in Asia and the Middle
339 East and Turkey. This in line with Bader et al. (2007) and here their results are significant in case of OPIR.
340 In contrast, the profit efficiency results are inconclusive. Specifically, the multiple-comparison tests reveal that

341 the banks in the Middle East and Turkey are more profit efficient than the banks in Asia when ROAA is the
342 measuring variable but that the banks in Africa become the most profit efficient when ROAE is the variable.
343 This is in line with Bader et al. (2007), and their findings are almost significant in the case of ROAA.

344 For the next analysis, conventional and Islamic banks are separated (Table 9). The cost-efficiency analysis
345 shows that Islamic banks are more cost efficient than conventional banks. However, the results vary by region:
346 When the measuring variable is CTIR, Islamic banks in Asian countries score better than The results show that
347 African conventional banks are more cost efficient (CTIR), whereas Islamic banks are more revenue efficient
348 (OPIR). Furthermore, the test provides evidence that the mean scores of ROAA and ROAE are significantly
349 better for conventional than for Islamic banks, although the results are only significant for ROAE. This identical
350 to Bader et al. (2007) findings. Moving to Asia, the results reveal that Islamic banks have the lowest costs (CTIR
351 and NIER); however, conventional banks have more revenue (NIM, OPIR) and profit (ROAA, and ROAE). The
352 results for the Asian region are all significant at the 1% level. The results for banks in the Middle East and
353 Turkey are inconclusive for cost efficiency. For instance, the findings for CTIR reveal that conventional banks are
354 more cost efficient, whereas the NIER results show the opposite. Also, the results of revenue efficiency are not
355 uniform: Islamic banks are more efficient at generating profit (OPIR) but not for NIM. However, conventional
356 banks outperform Islamic banks when it comes to profitability (ROAE). The results of Middle East and Turkey
357 region are identical to that of Bader et al. (2007) although here it is significant.

358 The analysis of the entire sample shows some differences between the two bank types. This contradicts Bader
359 et al. (2007); Hassan, Mohamad and Bader (2009); and Ariss (2010). However, the present findings are in line
360 with Beck, Demirguc-Kunt and Merrouche (2010).

361 18 b) Performance of Conventional and Islamic Banks (Dual- 362 Bank System)

363 Table 10 shows the results for Islamic and conventional banks that operated in countries with a dual-bank system.
364 The results indicate that Islamic banks are more cost efficient than conventional banks on CTIR and NIER. This
365 in line with Iqbal (??001 ??007), the effect of profit efficiency is not significant, but in the present study,
366 conventional banks are more profitable in terms of ROAE ratio, whereas the opposite is the case in Bader et al
367 (2007). Also, the results of revenue efficiency are the same in both studies. However, the results of cost efficiency
368 are mixed in Bader et al. (2007), but in this study the results indicate that Islamic banks are more cost efficient
369 for both of the measuring variables.

370 The effect of bank size on the performance of conventional and Islamic banks in dual-bank systems is analyzed
371 next. Table 11 summarizes these results. The multiple-comparison tests indicate that large Islamic banks are
372 more cost efficient (CTIR) than large and small conventional banks, and the same findings are obtained for small
373 Islamic banks. Also, both large and small Islamic banks fare better than large and small conventional banks on
374 NIER but worse on NIM. For the other revenue ratio (OPIR), the mean value for small Islamic banks is higher
375 than the mean value of large and small conventional banks, although those comparisons do not reach significance.
376 In terms of profit efficiency, the table shows that there are no significant differences between conventional and
377 Islamic banks when ROAA is the measuring variable. However, this changes when ROAE is the measuring
378 variable, as large and small conventional banks outperform large and small Islamic banks. The results here differ
379 from the results of the whole sample in the case of cost efficiency only. The results of the dual-banking sample
380 are consistent, showing that large Islamic banks are more cost efficient. In the total sample, although large banks
381 are more cost efficient, the results are mixed. Furthermore, the results obtained here are consistent with Bader
382 et al.'s (2007) finding that large banks are more cost and profit efficient than small banks, whereas small banks
383 are more revenue efficient (the results in the present study are significant). In addition, the present study shows
384 that large Islamic banks are more cost efficient, whereas Bader et al. (2007) indicates that large conventional
385 banks are more cost efficient than small conventional and Islamic banks (the outcomes for revenue efficiency are
386 identical in both studies). The results for revenue efficiency (ROAA) are the same in both studies; however, the
387 results for ROAE are different (for small Islamic and conventional banks). For instance the costefficiency results
388 show mixed outcomes in Bader et al. (2007), which contrasts with our findings. Also, the ROAA results differ
389 between the two studies, but the revenue-efficiency (NIM and OPIR) results are the same. Next, the analysis
390 turns to the performance of conventional and Islamic banks by location for the dualbank countries (Table 12).
391 The results for the cost efficiency is identical for that of the entire sample as Asian Islamic banks are more cost
392 efficient when CTIR is the measuring variable. However, the results for revenue efficiency (NIM and OPIR) differ
393 from the results for the entire sample in that here African conventional banks are more efficient, whereas in the
394 entire sample African Islamic banks are the most efficient. For profit efficiency (ROAA) the outcome is the same,
395 whereas for ROAE African conventional banks are the more profit efficient. When Islamic and conventional
396 banks compared within the same region the outcome differs than that of the entire sample. For instance, African
397 Islamic banks are more cost efficient than conventional banks, but in the analyses of the entire sample, African
398 Islamic banks have a higher mean CTIR and NIER than their counterparts. The results for revenue efficiency
399 do not show significant differences between the two banking systems (in Africa), but in the entire sample Islamic
400 banks are more revenue efficient for both of the measuring variables. The findings for profit efficiency in both
401 samples are identical, which confirms that conventional banks are better than Islamic banks at generating profit

21 CONCLUSION

402 in Africa. There is no change in the results between the total sample and the dual-bank sample when it comes
403 to Asia, although the significance levels are weaker for the dual-bank sample. Regarding the Middle East and
404 Turkey, the dual sample shows that Islamic banks are more cost efficient (CTIR and NIER), and this contradicts
405 Olson and Zoubi (2011). In the present study, there is no variation by bank type for the entire sample. The
406 revenue-efficiency outcome is the same in both samples. However, profitability shows significant changes in the
407 dual-bank analysis; specifically, in the whole sample conventional banks outperform Islamic banks (ROAE), but
408 the ROAE means are not significantly different for conventional and Islamic banks in the dual-bank sample. For
409 the ROAA ratio, the results in both analyses indicate that Islamic

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413 The results indicated that, on average, the Islamic banks in both samples are more cost efficient than the
414 conventional banks. Also, based on the results of cost efficiency it can be said that Islamic banks can reduce their
415 CTIR by controlling their operational expenses and conventional banks can reduce their NIER with better risk
416 management. Moreover, the mean variable, the conventional banks outperform the Islamic banks. In contrast,
417 the results of the other revenueefficiency variable (OPIR) show that the Islamic banks are more efficient. This
418 could mean that Islamic banks depend more on investments contracts (e.g., murabaha,

419 The effect of location on Islamic and conventional bank performance (dual-banking sample) are significant in
420 this study but not in Bader et al. (2007). For example, the results for cost efficiency (CTIR and NIER) here
421 indicate that Asian Islamic banks are the most cost efficient, whereas Bader et al. (2007) shows mixed results.
422 Also, the results of revenue efficiency are different; in Bader et al. (2007) African Islamic banks are the more
423 revenue efficient, but in the present study African conventional banks are the more revenue efficient. The results
424 for revenue efficiency are the same in both studies, but in the present study they are

425 The results for profitability are in line with Olson and Zoubi (2008) and Olson and Zoubi (2011). banks
426 are more profitable, but the results are only significant (although weak) for the dual-bank sample. banks, and
427 small conventional banks when ROAE is the measuring variable. In addition, the results show that small Islamic
428 banks are more cost efficient than small conventional banks, but the latter are more revenue and profit efficient.
429 Although small Islamic banks should be encouraged to merge, in general the results here are almost identical in
430 both of the samples.

431 Also, the analysis shows that, on average, Asian Islamic banks are more cost efficient than all other banks (in
432 Africa and the Middle East and Turkey), conventional or Islamic. The revenue-efficiency analysis reveals that
433 African banks are more revenue efficient than banks in other regions. However, the results differ between the two
434 samples: Islamic banks prevail on NIM and OPIR in the total sample, whereas conventional banks are stronger
435 on both outcomes in the dual-bank sample. With respect to profitability, Islamic banks in the Middle East and
436 Turkey are the most profitable in both samples when ROAA is the measuring variable. On the other hand, the
437 ROAE variable shows mixed results. In the dual-bank sample, conventional banks in the Middle East and Turkey
438 are the most profitable. For the entire sample, conventional banks in Africa are the most profitable. All of these
439 results are significant at the 1% level.

440 Furthermore, the results related to Asian region reveal hat conventional banks are more revenue and profit
441 efficient compared to its counterpart. On the other hand, the results of the African region show, in large, that
442 Islamic banks are more cost and revenue efficient than conventional banks, however its profit efficiency is lower.
443 Meanwhile, the efficiency analysis of conventional and Islamic banks in the Middle East and Turkey region did not
444 give a conclusive results concerning revenue and profit efficiency, this because the outcome of the both samples
445 (whole and dual-bank) are different. However the results of cost efficiency generally indicate the Islamic banks
446 are more cost efficient.

447 It is worth noting that when only Islamic banks in the three regions are compared, African banks are the
448 most revenue efficient, Asian banks are the most cost efficient, and banks in the Middle East and Turkey are
449 the most profitable; these findings are consistent with Bader et al. (2007). This is true for the total sample
450 and the dual-bank sample. When conventional banks are compared with one another, for the most part there
451 are no significant variations by region. This shows that location plays an important role in the performance
452 of the Islamic banking industry. This could be attributed to regulations, differences in GDP growth and GDP
453 per capita, development of capital markets, and level of economic activity. Also, the analysis of both samples
454 confirmed that Islamic banks were superior to conventional banks in controlling costs. However, there is a room
455 for Islamic banks to improve their revenue efficiency. On the other hand, the results for profit efficiency are
456 not conclusive-Islamic banks do better on ROAA, and conventional banks do better on ROAE. But, if income
457 smoothing practices taken into account it can be said that Islamic banks are more profitable.

458 Finally, the results of the entire sample are almost identical to Bader et al. (2007), but both are slightly
459 different from the results of the dual-banking system sample, where Islamic and conventional banks are compared
460 based on size and location. No. ??country/year 1992 ??country/year 1993 ??country/year 1994 ??country/year
461 1995 ??country/year 1996 ??country/year 1997 ??country/year 1998 ??country/year 1999 ??country/year



Figure 1:

$$F = \frac{\overline{x_1} - \overline{x_2}}{\sqrt{(\overline{s_1}^2/n_1) + (\overline{s_2}^2/n_2)}} \quad (3)$$

Figure 2:

Where S_1^2 and S_2^2 are the standard deviation, n the sample size, and \bar{x}_1 and \bar{x}_2 are the sample means.

Alpha chosen to be 0.10 ($\alpha = 0.10$)

Figure 3:

The ANOVA F statistic tests (equation 4):

$$H_0: \mu_1 = \mu_2 = \dots = \mu_I$$

$$H_a: \text{the } \mu_i \text{ do not all equal 0.}$$

$$F = \frac{MSG}{MSE} = \left[\frac{\left(\frac{SSG}{I-1} \right)}{\left(\frac{SSE}{I-1} \right)} \right] \quad (4)$$

$$MSG = \frac{n_1(\bar{x}_1 - \bar{x})^2 + n_2(\bar{x}_2 - \bar{x})^2 + \dots + n_I(\bar{x}_I - \bar{x})^2}{I-1}$$

MSG, the mean square for groups, measures how different the individual means are from the overall mean (~ weighted average of square distances of sample averages to the overall mean). SSG is the sum of squares for groups.

$$MSE = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2 + \dots + (n_I - 1)s_I^2}{N - I}$$

Figure 4:

MSE, the mean square for error is the pooled sample variance s_p^2 and estimates the common variance σ^2 of the I populations (~ weighted average of the variances from each of the I samples). SSE is the sum of squares for error. Where

$$s_i = \sqrt{\frac{\sum_{j=1}^{n_i} (y_{ij} - \bar{y}_i)^2}{n_i - 1}}$$

Figure 5:

Tukey's honest square difference test (HSD; equation 5):

$$HSD = \frac{M_1 - M_2}{\sqrt{MS_w \left[\frac{1}{n} \right]}} \quad (5)$$

Here M_1 and M_2 are the mean values, MS_w mean square width, and n number per mean. Alpha are equal 0.10 ($\alpha = 0.10$).

Figure 6:

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[Note: 2016C]

Figure 7: Table 4 :

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Figure 8: Table 5 :

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	M	CTIR	efficiency	Revenue	efficiency	Profit	efficiency	ROAA	ROAE
			NIER		NIM	OPIR			
Big banks	M	150.35	2.96		3.25	1.70	1.05	12.26	
	SD	101.38	3.56		2.97	1.54	2.51	6.70	
Small banks	M	189.69	4.87		4.68	3.45	1.16	11.03	
	SD	167.66	4.79		4.74	3.16	4.29	10.08	
	t-test	10.89	17.29		14.65	28.65	1.31	5.55	

Figure 9: Table 6 :

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Figure 10: Table 7 :

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		Cost efficiency		Revenue efficiency		Profit efficiency	
Region	Statistic	CTIR	NIER	NIM	OPIR	ROAA	ROAE
Africa	M	220.18	5.53	5.24	3.94	1.23	13.00
	SD	163.88	4.10	4.06	3.01	1.63	10.70
Asia	M	147.88	3.86	3.40	2.46	1.01	11.00
	SD	114.98	5.80	3.34	2.49	1.85	8.09
Middle	M	149.28	2.71	3.51	1.64	1.27	11.47
East and	SD	112.52	2.20	4.25	1.64	1.23	7.00
Turkey							
ANOVA p	Between groups	.000	.000	.000	.000	.000	.000
		Cost efficiency		Revenue efficiency		Profit efficiency	
Bank category	Statistic	CTIR	NIER	NIM	OPIR	ROAA	ROAE
African conventional	M	215.65	5.58	5.15	3.84	1.23	13.29
	SD	153.43	4.16	3.751	2.99	3.10	11.00
African Islamic	M	272.22	4.91	5.66	5.00	1.13	11.05
	SD	211.19	2.91	6.02	3.23	1.83	7.76
Asian conventional	t-test	4.59	1.71	1.66	5.51	0.42	2.64
	M	149.55	4.00	3.50	2.60	1.06	11.10
Asian Islamic	SD	118.05	6.12	3.41	2.66	2.75	7.94
	M	109.44	2.34	2.06	1.31	0.21	6.06
Middle East and Turkey conventional	SD	128.31	1.50	2.05	0.85	1.55	10.54
	t-test	3.63	2.64	4.52	5.777	3.33	6.31
Middle East and	M	153.30	3.01	3.97	1.60	1.25	11.74
Turkey conventional	SD	114.05	2.47	4.85	1.73	3.13	7.32
Middle East and	M	167.91	2.33	2.80	2.04	1.37	10.60
Turkey Islamic	SD	151.83	1.50	1.94	2.10	1.73	7.23
ANOVA p	t-test	2.11	4.85	4.82	4.65	0.75	2.76
	Between groups	.000	.000	.000	.000	.000	.000

Figure 11: Table 8 :

9

Figure 12: Table 9 :

11

size	Category	Statistic	Cost efficiency		Revenue efficiency		Profit efficiency	
			CTIR	NIER	NIM	OPIR	ROAA	ROAE
Big Conventional bank	M		158.58	3.31	3.60	1.79	0.84	11.18
	SD		121.72	4.32	4.16	1.71	4.82	7.25
	Islamic bank M		137.91	2.45	2.51	1.98	1.98	9.38
	SD		109.93	1.63	1.90	2.26	2.15	7.32
	t-test		3.34	3.80	5.48	1.25	0.78	2.96
	Small Conventional bank	M	155.15	3.32	3.61	1.18	0.86	11.15
ANOVA p	SD		117.11	4.33	4.17	1.72	4.84	7.22
	Islamic bank M		138.17	2.46	2.49	1.99	1.02	9.35
	SD		109.66	1.63	1.88	2.61	2.14	7.35
	t-test		2.85	3.84	5.64	2.14	0.73	2.98
	Between groups		.000	.000	.000	0.02	0.77	0.01

Figure 13: Table 11 :

10

Category	Statistic	Cost efficiency		Revenue efficiency		Profit efficiency		
		CTIR	NIER	NIM	OPIR	ROAA	ROAE	
Conventional banks	Mean	182.09	3.30	3.60	1.80	0.85	10.00	
	SD	121.97	4.30	4.15	1.72	4.80	35.74	

Figure 14: Table 10 :

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Figure 15: Table 12 :

21 CONCLUSION

1

No.	Country	Islamic banks	Conventional banks	Total no. of banks a
1	Afghanistan	3	3	3
2	Albania	11	11	
3	Algeria	1	12	13
4	Azerbaijan		16	17
5	Bahrain	6	6	17
6	Bangladesh	5	27	33
7	Benin		8	8
8	Brunei	1	1	2
9	Burkina Faso		9	
10	Cameroon		11	11

[Note: Source: Author's calculations based on Bank Scope data a Includes the windows of conventional banks and the years before and during conversion (see above).]

Figure 16: Table 1 :

2

35	Nigeria	2	4	6	10	12	13	13	14	15	18	18	17	16	18	18	19	18	5	5
36	Oman	1		5	5		5	5	5	5		5			5	5	5	5	5	5
37	Pakistan	3	13	13	16	17	17	17	17	17	16	16	20	22	25	29	29	29		
38	Palestine	0		0	1		1	1	1	1		1			1	1	1	1	2	2
39	Qatar	0		5	5		6	6	6	6		6			6	7	7	7	7	7
40	Saudi Arabia	1	10	10	10	10	10	10	10	10	10	11	11	11	11					
41	Senegal	0		3	4		4	7	6	5		6			6	7	9	9	9	9
42	Sierra Leon	2		3	3		3	3	3	3		4			4	4	4	4	4	4
43	Sudan	2		3	3		4	5	8	8		9	14	14	17	15	11	14	18	23
44	Suriname	0		2	2		2	2	2	2		2			2	2	2	2	2	2
45	Syria	1		1	1		1	1	1	1		1			1	1	1	1	1	4
46	Tajikistan	0		0	0		0	0	0	0		0			0	0	0	0	1	3
47	Togo	0		0	0		4	4	3	3		2			1	2	3	3	2	2
48	Tunisia	4	13	13	13	13	13	15	15	16	16	15	14	14	15	15	15	15		
49	Turkey	3		5	7		7	7	8		9	22	22	26	30	31	35	34	35	34
50	Turkmenistan	0		0	0		0	0	0	0		1			1	1	1	1	1	1
51	Uganda	0		3	4		5	9	8	8		9	10	11	11	11	11	11	11	11
52	UAE	1	14	16	16	17	17	18	18	17	18	20	20	19	20	20	20	20		
53	Uzbekistan	0		1	1		1	2	3	4		6			8	9	8	11	11	10
54	Yemen	1		3	3		3	4	4	5		5			5	6	8	8	8	8
	Total	84	235	280	321	361	381	399	441	466	490	507	532	553	588	605	625	597		

[Note: Source: Author's calculations based on Bank Scope data.2016 C]

Figure 17: Table 2 :

3

2007 2008

[Note: Source: Author's calculations based on Bank Scope data.]

Figure 18: Table 3 :

3

No.	Country/year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
1	Algeria	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Bahrain	0	3	3	3	3	3	3	3	3	3	3	3	4	4	5	5	5
3	Bangladesh	1	1	1	3	2	3	2	3	2	4	4	4	4	4	4	4	4
4	Brunei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Egypt	0	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
6	Gambia	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	1
7	Indonesia	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	2	2
8	Iraq	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
9	Jordan	0	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
10	Kuwait	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
11	Lebanon	0	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0
12	Malaysia	0	0	0	1	1	1	1	1	1	2	3	3	3	3	2	5	1
13	Mauritania	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1
14	Pakistan	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	5
15	Palestine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
16	Qatar	0	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
17	Saudi Arabia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
18	Senegal	0	0	0	0	1	1	0	0	0	0	0	0	1	1	1	1	0
19	Syria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	Tunisia	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
21	Turkey	1	1	1	1	1	1	1	1	1	1	1	1	4	4	4	4	4
22	UAE	0	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4
23	Yemen	0	0	0	0	1	1	2	2	2	2	2	4	4	4	4	4	4
	Total	3	13	13	18	19	21	24	25	25	30	37	40	41	50	61	66	67

Figure 19: Table 3 :

464 [Kaouther et al. (2012)] 'A comparison of leverage and profitability of Islamic and conventional banks' T
465 Kaouther , Viviani , Belkacem . <http://papers.ssrn.com/sol3/paper.cfm?abstract_id=1836871> 28th International Conference of the French Finance Association Proceedings, Montpellir, 11-
466 13 May, viewed 15 January 2012.

467

468 [Borkbh ()] 'Assessing the operational efficiency of Islamic banks: an empirical study' (in Arabic). S Borkbh
469 . the Eighth International Conference on Islamic Economics and Finance Proceedings, Faculty of Islamic
470 Studies, (Doha) 2011. 18-20 December, viewed 11 January 2012. (<<http://conference.qfis.edu.qa>>)

471 [Sabi ()] 'Comparative analysis of foreign and domestic bank operation in Hungary'. M Sabi . *Journal of
472 Comparative Economics* 1996. 22 p. .

473 [Ariss ()] 'Competitive conditions in Islamic and conventional banking: a global perspective'. R Ariss . *Review
474 of Financial Economics* 2010. 19 p. .

475 [Bader et al. ()] 'Cost, revenue, and profit efficiency of Islamic versus conventional banks: international evidence
476 using financial ratios approach', Islamic Banking and Financial Industry'. M Bader , M Shamsher , Ariff , H
477 Taufiq . *Review of Islamic Economics* 2007. 11 p. . (special issue on performance analysis)

478 [Metwally ()] 'Differences between the financial characteristics of interest-free banks and conventional banks'. M
479 Metwally . *European Business Review* 1997. 97 p. .

480 [Olson and Zoubi ()] 'Efficiency and bank profitability in MENA countries'. D & Olson , T A Zoubi . *Emerging
481 Markets Review* 2011. 12 p. .

482 [Akhter et al. ()] 'Efficiency and performance of Islamic banking: the case of Pakistan'. W Akhter , A Raza , &
483 Orangzab , M Akram . *Far East Journal of Psychology and Business* 2011. 2 p. .

484 [Abdul-Majid et al.] 'Efficiency in Islamic and conventional banking: an international comparison'. M Abdul-
485 Majid , Saal , Battisti . *Journal of Productivity Analysis* 34 p. .

486 [Mokhtar ()] 'Efficiency of Islamic banking in Malaysia: a stochastic frontier approach'. H Mokhtar , Abdullah ,
487 N & Al-Habshi . *Journal of Economic Cooperation* 2006. 27 p. .

488 [Masruki et al.] 'Financial performance of Malaysian founder Islamic banks versus conventional banks'. R Masruki
489 , Ibrahim N Osman , E & Wahab . *Journal of Business and Policy Research* 6 p. .

490 [Parashar and Venkatesh] *How did Islamic banks do during global financial crisis? Banks and Bank Systems*, S
491 & Parashar , Venkatesh . 5 p. .

492 [Rouse et al. ()] 'Integrated performance measurement design: insights from an application in aircraft mainte-
493 nance'. P Rouse , M & Putterill , D Ryan . *Management Accounting Research* 2002. 13 p. .

494 [Beck et al. (2011)] *Islamic vs. conventional banking: business model, efficiency and stability*, T Beck , Demirgüç-
495 Kunt , Merrouche . <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1694335> November
496 2011. World Bank. (Working paper series)

497 [O'connor ()] 'On the usefulness of financial ratios to investors in common stock'. O'connor . *Accounting Review*
498 1973. 48 p. .

499 [Samad ()] 'Performance of interest-free Islamic banks vis-à-vis interest-based conventional banks of Bahrain'. A
500 Samad . *IIUM Journal of Economics and Management* 2004. 12 p. .

501 [Ariff et al.] 'Performance of Islamic banks and conventional banks'. M Ariff , M Badar , M & Shamsher , Hassan
502 . *The foundations of Islamic banking theory*, M Ariff , & M Iqbal (ed.) (Cheltenham) p. .

503 [Safiullah ()] 'Superiority of conventional banks & Islamic Banks of Bangladesh: a comparative study'. M
504 Safiullah . *International Journal of Economics and Finance* 2010. 2 p. .

505 [Bourkhis and Nabi ()] 'The efficiency of Islamic and conventional banks in the Gulf Cooperation Council (GCC)
506 countries: an analysis using financial ratios and data envelopment analysis', Working paper series'. K &
507 Bourkhis , Nabi . *financial crisis?* in the 17th Economic Research Forum Annual Conference Proceedings,
508 17. Johnes, J , Izzeldin, M & Pappas, 2007. 2008. 2009. Lancaster University Management School (Have
509 Islamic banks been more resistant than conventional banks to the)

510 [Abdul-Majid] 'The input requirements of conventional and shariah-compliant banking'. Abdul-Majid . *Internation-
511 al Journal of Banking and Finance* 7 (4) .

512 [Samad and Hassan ()] 'The performance of Malaysian Islamic bank during 1984-1997: an exploratory study'. A
513 Samad , M Hassan . *International Journal of Islamic Financial Services* 1999. 1 p. .

514 [Olson and Zoubi ()] 'Using accounting ratios to distinguish between Islamic and conventional banks in the GCC
515 region'. D & Olson , T Zoubi . *International Journal of Accounting* 2008. 43 p. .