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01. January 2012

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Abstract

Islamic banking is consistent with Islamic law and guided by Islamic economics. They are prohibited from charging or paying interest, and can operate only on the basis of the profit-sharing arrangements. Islamic banking has been gaining momentum on a global scale for the last 30 years. It is estimated that the assets of Islamic banks in Turkey will exceed US$25 billion in the next decade and will make up 10% of the total banking system. Therefore, this study compares Islamic banks with interest-based banks to measure their profitability. It also investigates how Islamic financing techniques are used by Islamic Banks.

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I. INTRODUCTION

A central feature of the Islamic banking system is that, consistent with Islamic moral principles, banks should not charge interest for their loans or pay interest to depositors. Islamic banking has been gaining momentum on a global scale for the last 30 years. The general issue approached in this paper is how interest-free banking as developed in Islamic countries differs in operation from interest-based banking in those countries, and how interest-free banks can operate if they don't charge or pay interest.

The normal assumption of neo-classical economic thinking is that interest amounts to a fee paid to lenders, which motivates them to make their money available to those who want to borrow it. It is based on economic "rational man" thinking that financial rewards need to be attached to the contributions that economic actors make. Without these rewards, economic activity would languish, the argument goes.   How can interest-free banking provide the incentives for people to put their money into banks and for banks to lend this money for entrepreneurial activity? Perhaps interest-free banking is consistent with the moral precepts of the Islamic faith, but potentially inconsistent with capital formation and investment, to the detriment of economic development in the countries that practice it. This paper will approach this issue by examining one small part – namely, whether interest-free banking is consistent with sustained bank profitability, on the assumption that profit is an indicator of ability to operate efficiently and effectively and thus according to economic rationality.

Full investigation of this issue would involve studying interest-free banking in a variety of countries. Doing so would require a very broad study and introduce potentially confounding effects of multiple national cultures and institutions. Thus we focus this study on just one

country, namely Turkey, for several reasons. First, this country has begun to develop a significant interest-free banking sector while retaining a strong traditional interest-charging sector. Second, two of the authors are Turkish nationals and thus have considerable inside knowledge of Turkish institutions. A third reason is pragmatic: banking data could readily be obtained.

A great portion of the activities taking place in Turkish money and capital markets is carried out by banks and other financial institutions. At present, there are 46 banks operating in Turkey, 13 of them are investment and development banks, and the remainders are commercial banks. Of the banks operating in Turkey, 35 are commercial banks (depository), and 13 are non-depository banks. Three of the commercial banks and two of the development and investment banks are state-owned and 18 are privately owned. In order to establish a free market economy, A new liberal economic policy implemented in 1980 so that Turkish economy can integrate with the world economy. As a result of this policy, the 1980s witnessed continuous changes and developments in the banking sector. Finance houses in Turkey began transacting business according to Islamic banking principles in 1984. Since 1984 Islamic banking system became part of the financial system. Albaraka Turk, Anadolu Finance, Asya, Fisal, Ihlas, and Kuveyt Finance are some of them. At present there are eight Islamic banks operating in Turkey. The proscription against charging interest presents a challenge to Islamic banks. How can they compensate for their lack of interest income to operate profitably in a modern economy? The purpose of this paper is to examine this issue. Specifically, we study the level and determinants of profitability among Islamic and traditional banks in Turkey during the period from 2002 to 2008.

II. ISLAMIC BANKING

a. Background

The first Islamic financial institution in Malaysia was the Muslim Pilgrims Savings Corporation set up in l963 to help people save for performing hajj (pilgrimage to Mecca and Medina). In l969, this body evolved into the Pilgrims Management and Fund Board or the Tabung Haji as it is now popularly known (Ariff, 1988). The success of the Tabung Haji, however, provided the main impetus for establishing Bank Islam Malaysia Berhad (BIMB) that represents a full fledged Islamic commercial bank in Malaysia and contributed l2.5 percent of BIMB's initial capital of M$80 million (Ariff, 1988). Islamic banking was first introduced to Turkey in 1985 after the government passed special legislation on interest-free banking in December, 1983. Islamic Banks have been established in Turkey since 1985.

The market shares of the Islamic banks were close to 20 percent in Egypt, Kuwait and Sudan and roughly l0 percent in Jordan and Qatar (Ariff, 1988). By contrast, in Turkey, Islamic banks accounted for less than 1 percent of the market in 1988 (Nienhaus 1988). The Islamic finance sector (referred to in Turkey as Participation Banks) as of September 2006 possessed about 340 branch offices (up from 290 branches at the end of 2005), and is projected to grow at a rate of 50 new units per year. Overall, personnel grew from 5,740 at the end of 2005 to 6,340 in June 2006. Compared to 2005, deposits and investment accounts have grown 25 percent (Wouters, 2007).

b. Theory of Islamic Banking

Although it is often claimed that Islamic banking contributes towards a more equitable distribution of income and wealth and increased equity participation in the economy (Chapra

l982), there is no place for the institution of interest in the Islamic order. Furthermore, in Islamic banking practices, investment funds are not to be involved in the production of armaments, alcohol or tobacco, engage in offensive advertising, or practice cruelty to animals (Dusuki & Abdullah, 2007). Islamic banking does not support the making of a profit in any way that violates religious law or is harmful to the stakeholders inherent in the business or economic activity (Patel, 2006). Islam prohibits Muslims from taking or giving interest (riba) regardless of the purpose and this is mentioned in four different revelations in the Qur'an[1] (Ariff, 1988). The Prophet Muhammed (pbuh) condemned those who take interest, those who give interest, and those who record or witness the transaction, saying that they are all alike in guilt[2], (Khan and Mirakhor, 1991).

The capital is not free in an Islamic system. Islam recognizes capital as a factor of production but it does not allow the factor to make a prior or predetermined claim on the productive surplus in the form of interest (Ariff, 1988). The question is that what will then replace the interest rate mechanism in an Islamic framework? There have been suggestions that profit-sharing can be a viable alternative (Kahf l982a and l982b). In the profit-and-loss sharing paradigm, Islamic banks are required to put in more effort to distinguish good customers from bad ones because they have more to lose than conventional banks as they have to monitor their investments and borrowers closely (Chong & Liu, 2008).

Islamic law allows the owners of capital a share in a surplus but investors and borrowers have no right to demand a fixed rate of return. Banks and customers are considered partners and profits or losses are shared according to agreement. These banks operate in three broad

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[1] Chapter 30, verse 39; Chapter 39, verse l6l. See Yusuf Ali's Translation of the Qur'an.
[2] Hadith compiled by Muslims (Kitab al-Musaqat).

categories of account: current, savings, and investment. The current account gives no return to the depositors. It is a safekeeping (*alwadiah*) arrangement between the depositors and the bank. Depositors can withdraw their money at any time. The savings account is also operated on an *alwadiah* basis but the bank may at its discretion pay the depositors a positive return periodically, depending on its own profitability (Ariff, 1988). Such payment is considered lawful. Savings account holders are allowed to withdraw their money at any time. The profit-sharing ratio varies from bank to bank and from time to time depending on supply and demand conditions (3) and the rate of return could be positive or negative. For example, Bank Islam Malaysia Berhad has been offering a 70:30 profit sharing ratio in favor of depositors (Man, l988).

According to Irshad (l964), the mudaraba (partnership where one provides the capital and the other the entrepreneurial expertise with the profits being shared) is the basis of Islamic banking and all losses would be either recovered from the Reserve Fund or borne by the shareholders of the bank. Siddiqi (l988) classified the operations of an Islamic bank into three categories: services based on fees, commissions or other fixed charges; financing on the basis of mudaraba and partnership; and services provided free of charge.

Mohsin (l982) has presented a detailed and elaborate framework of Islamic banking in a modern setting. His model incorporates the characteristics of commercial, merchant, and development banks, blending them in novel fashion and adds various non-banking services such as trust business, factoring, real estate, and consulting, as though interest-free banks could not survive by banking business alone (Ariff, 1988). The model was designed to fit into a capitalist

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environment. Mohsin (1982) argued that interest-free banks could coexist with interest-based banks.

Mohamed Ariff (1988) discusses the question of central banking in an Islamic framework. He says that the general opinion seems to be that the basic functions of a modern central bank are relevant also for an Islamic monetary system, although the mechanisms may have to be different. Uzair (l982) has suggested adjustments in profit-sharing ratios as a substitute for bank rate manipulations by the central bank. Siddiqi (l982) has suggested that variations in the so-called 'refinance ratio' would influence the quantum of short-term credit extended. Siddiqi has also proposed a prescribed 'lending ratio' that can be adjusted by the central bank according to changing circumstances (Ariff,1988).

Iqbal and Mirakhor (l987) say that the multi-purpose and extra-commercial nature of the Islamic banking operation does not seem to pose intractable problems. Naqvi (l98l) has pointed out that there is nothing sacrosanct about the institution of mudaraba in Islam.

c. Islamic Banking in Practice

Khan's study (l983) reported profit rates ranging from 9 to 20 per cent, which were competitive with conventional banks in the corresponding areas.   The rates of return to depositors varied between 8 and l5 percent, which were quite comparable with the rates of return offered by conventional banks (Ariff, 1988).   Iqbal and Mirakhor (l987) study contains interesting empirical observations which are confined to the experience of Iran and Pakistan. After switching to Islamic banking in August l983 with a three-year transition period, the Iranian system allows banks to accept current and savings deposits without having to pay any return. The profit-loss sharing participation accounts are the major earning assets of the banks

constituting around 85-90% of the total funds collected by the Islamic banks than the current accounts (Buyukdeniz, 1995 & Ozsoy 1997). According to Nienhaus (l988), the market shares of many Islamic banks have increased over time, notwithstanding the deceleration in the growth of deposits. Mirakhor, Zaidi, and Iqbal (1988) analyze the long-run effects of Islamic banking on international capital flows and on the economy's capacity to adjust to disturbances. They conclude that monetary policy can be used effectively for stabilization purposes and that disturbances to asset positions are absorbed efficiently in an Islamic financial system.

III. THEORY AND HYPOTHESES

Previous research has shown that Islamic (non-interest charging) banks have been able to maintain good financial performance by using a variety of methods to compensate for lack of traditional interest income. They have also been able to attract depositors by providing economic inducements other than traditional interest-paying accounts. It is likely that both borrowers and depositors have been attracted to Islamic banks in part because of their commitment to Islamic religious principles. Thus Islamic banks have been able to operate profitably.

No single measure for bank profits is universally recognized (Levonian, 1994). Two popular measures in the banking literature are ROA and ROE. ROA (rate of return on assets) is defined as net income divided by total assets. ROE (rate of return on equity) is measured as net income scaled by stockholders' equity. We use the ROA (rate of return on assets) as a measurement of bank profitability

We propose that Islamic banks in Turkey have found ways to be just as profitable as banks that charge and pay interest.

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H1   Islamic (i.e. non-interest charging) banks will be equally as profitable (in terms of return on equity) as interest charging banks

Previous research has identified several sources of bank profitability. One factor is the amount of equity capital to assets. This has been shown to have a positive impact on bank profitability (Lloyd-Williams, Molyneux & Thornton, 1994; Park, 1992; Wall, Dudycha & Hutchinson, 1985; Zhang, 1996). A second source of profits liquidity assets to liabilities (Rose, 1994; Zhang, 1996). A third factor found to enhance profitability is net interest income as a percent of assets (Ganesan, 2001; Spong, Sullivan & DeYoung, 1995; Zhang, 1996). A fourth determinant is net income to stockholder equity (Zhu and Song 2005). Finally, it has been found that greater ratios of total costs to assets tend to be negatively related to profitability (Pilloff, 1996).

H2a   There will be a positive relationship between the equity capital to assets ratio and return on assets.

H2b   There will be a positive relationship between the liquidity assets to liabilities ratio and return on assets.

H2c   There will be a positive relationship between the net interest income to assets ratio and return on assets.

H2d   There will be a positive relationship between the net income to stockholder equity ratio and return on assets.

H2e   There will be a negative relationship between cost to asset ratios and return on assets.

Interest-free banks have no interest income, therefore there will be no relationship between interest income and profits in these banks. They may compensate for this in several ways. First of all, we suggest that they will have greater amount of income from other sources built into the unique arrangement with borrowers. Furthermore, they should have lower costs, since they do not need to process interest charges and may spend less time and resources investigating the credit-worthiness of potential borrowers. It is possible that other income and costs will have strong relationships with profitability for interest-free banks as well, thus further bolstering their profitability. It is not clear how the relationship between the other factors and profitability will differ. We thus propose the following general hypothesis:

H3   The structure of determinants of return on assets will differ between interest-free and interest-based banks.

IV. METHODS

a. Sample

To test these hypotheses we selected forty banks in Turkey, thirty-two of which are traditional interest-charging institutions while eight do not charge interest, in accordance with Islamic law. We obtained data on all forty of these banks over seven years, from 2002 to 2008, from [put in specific data base/source]. There was no missing data for any of the variables measured. The unit of analysis for this study is a bank's operations for a single year. Thus the total sample size for this analysis is 280 (40 banks times seven years).

Measures

We use measures that are common in the banking literature. Variable names, definitions and descriptive statistics are displayed in Table 1. It was initially evident that two of the variables had highly skewed distributions. Net income to stockholder equity (*Income*) had a skewness measure of -11.86, while total costs to assets had a skewness measure of 7.71. Since a high degree of skewness can affect statistical analysis, it is common to deal with this by transforming variables, often using the natural logarithm function. However before resorting to this method we examined distributions and discovered that both of these variables had extreme outliers. In the case of interest income to assets, all but four of the cases fell in the range of -100% to plus 248%. In four cases (one bank in two different years, and two other banks in one year) this measure ranged down to -2535%. We felt it would be preferable merely to truncate these cases to a -100%, which was still below the next highest case which was -95%. Doing so reduced skewness from -11.86 to .067. For total costs to assets (*Costs*), all but one case ranged from 2.02 to 55. The single outlier had a cost measure of 213. We truncated this case to 60, which was still higher than the next lowest case which had a measure of 55. Doing this reduced the skewness measure from 7.71 to .839.

b. Method of Analysis

We use analysis of variance to test hypothesis one – whether there is a difference in profitability between interest-free and interest-based banks. Multiple regression analysis is employed to test hypotheses two and three. Structural equation analysis is used to test the entire model and to help presents results in a coherent and unified way.

V. FINDINGS

a. Direct Effects of Interest-free Status

Table 2 presents zero-order correlations among the variables. Initial findings show that return on assets is negatively related to interest-free status, thus suggesting that hypothesis one may not be confirmed. However, significant zero-order correlations between return on assets and the five predictor variables all suggest support for them. Of course, these hypotheses need to be tested in a regression model that includes all of the variables simultaneously as well as control variables.

Our first hypothesis predicted that the overall profitability of interest-based and interest-free banks would be the same. To test this we used analysis of variance and the results are indicated in Table 3. These data indicate that return on assets (ROA) for interest-based banks is 4.96 while for interest-free banks it is only 2.76, a difference that is statistically significant at the .011 level. One reason for the lower profitability of interest-free banks may be that they have less of those factors that predict profitability and/or more of the factor that reduces it (i.e. costs). Table 3 indicates interest-free and interest-charging banks differ significantly on four of the five proposed determinants of return on assets, and that thus their overall difference in ROA may be due to differences in these determinants. To test for this, we created a dummy variable for interest-free status (interest-free status = 1; interest-charging status = 0) and entered it as a predictor in a regression model along with the other variables as controls (Table 4). These results indicate that interest-free status continues to have a significant negative effect on return on assets even when controlling for other variables. Therefore, hypothesis one must be rejected.

Our next hypothesis proposed five determinants of ROA: equity capital to assets (Equity), liquid assets to liabilities (Liquidity), net interest income to assets (Interest), net income interest to

stockholder (Income), and total costs to assets (Costs). The first four of these were proposed to have positive relationships with ROA while total costs would have a negative relationship.

Results in Table 4 (standardized regression coefficients are shown) indicate that equity capital to assets has a positive relationship with ROA (beta = .383), significant at the .001 level. By holding a higher capital-to-assets ratio, banks send a signal that their business is run in a prudent manner (Zhang, 1996). Park (1994) offers a different interpretation of the positive correlation between capital ratios and firm profitability. He raises the possibility that a poor profitable bank may seek a low capital ratio. With smaller capital, it is more likely that losses will be borne ultimately by debt holders. However, Lloyd-Williams et al. (1994) anticipate the capital-to-assets ratio to be negatively related to ROA, as they believe that lower capital ratio is associated with higher risk taking, since treat profits as risk-premiums. In their study they found the capital ratio has significant positive correlation with profitability.

Liquidity assets to liabilities (Liquidity) is found to have no significant relationship with ROA, thus hypothesis 2b must be rejected. This result is not consistent with some earlier studies' findings. Wall and Gup et al. (1985) report the liquidity ratio to have significant positive relationship with profitability.

Net interest income-to-assets (Interest) has a positive relationship with ROA (beta = .287), significant at the .001 level, thus supporting hypothesis 2c. This result supports earlier findings. Spong et al. (1995) found that the net interest income-to-assets ratio is the most important determinant of ROA. Net income to stockholder equity (Income) has a positive and significant relationship with profitability (beta = .335), thus supporting hypothesis 2d. Total cost to assets (Costs) has a negative and significant coefficient (beta = -.362) with ROA, supporting

hypothesis 2e. This result is consistent with previous research. Thus equity, interest income, net income and costs have been found to be significant predictors of ROA, providing support for hypotheses 2a, 2c, 2d and 2e. No support is found for hypothesis 2b.

Zero-order correlation coefficients among the six predictor variables are generally low, though *Intfree* has a fairly strong negative correlation with *Liquidity* and *Income*, while *Liquidity* has a .471 correlation with *Interest*. To make sure the regression results are not compromised by excessive multicollinearity, we examined the diagnostics provided in the SPSS program. These results showed that the highest tolerance level reported was .672, much below the level of 10 considered to be problematic (Field, 2005). Likewise the smallest VIF statistic was 1.49, while only a measure of .1 or less is considered to indicate a problem. Thus we conclude that these results do not suffer from multicollinearity.

b. Interactive effects of Interest-free Status

Hypothesis three predicts that coefficients in this model will differ between interest-free and interest-based banks. To explore this hypothesis we entered interaction terms consisting of the product of interest-free status (Intfree) and four determinants: equity, liquidity, income and costs. Since interest income is zero for all of the interest free banks, no interaction term could be calculated. Model D in Table 4 displays results when these four interaction terms are added. Two are found to be statistically significant. The negative sign of the interest-free/equity coefficient indicates that equity has a less positive relationship among interest-free banks. The positive sign of the interest-free/costs coefficient indicates that costs has a more positive relationship among interest-free banks. The positive coefficient for the interest-free/liquidity

interaction suggests that the impact of liquidity may be positive among interest-free banks, even though it was not significant overall.

To illustrate these differences we ran the basic model for interest-based and interest-free banks separately. Table 5 shows that indeed the relationship between equity and ROA is less positive among interest-free banks. The beta is -.361 among the interest-free banks while it is .395 among interest-based banks. Thus equity capital is found to detract from profitability among interest-free banks, while it strongly enhances it among interest-based ones. While the costs to assets ratio reduces profitability among interest-based banks, it has no effect among interest-free ones. These results also show that the liquidity to assets ratio is a significant determinant of ROA for interest-free banks while it has no effect among interest-based ones. Thus support is found for hypothesis three, that the model predicting profitability varies systematically between interest-based and interest-free banks.

Since this sample contains seven different time periods, we attempted to determine whether results differed by year. Model C in Table 4 contains dummy variables for all but one of the sample years. None of the year dummy variables was found to be statistically significant. In 2001 there was a spike in profitability (beta = .091), though this coefficient is not significant at the .05 level.

We also examined whether the coefficients in the model are consistent year by year. Table 6 presents the beta coefficients of this model for each of the seven years included in our sample. Given the small size of each yearly sample (N=40) there is considerable variation in coefficients from year to year and fewer of them are statistically significant. We first ran these models with all of the predictors, including the four interaction terms. In these results the

interaction terms were generally consistent with what was found with the full sample, but only two of the coefficients were statistically significant: the terms for interest-free status times costs were significantly positive in 2002 and 2003. Given the small sample sizes and the fact that these interaction terms had not greatly changed the direct effects of the six predictors when added to the model in the overall sample, we ran these models again without the interaction terms. These results are presented in Table 6. The finding that interest-free status is negatively related to profitability is present in six of the seven years (and statistically significant in four of the years). The positive effect of equity capital to assets is quite consistent throughout – the coefficient is positive in all years and statistically significant in six out of seven. While the liquid assets to liabilities ratio was found to be near zero overall, Table 6 indicates that it has a negative and statistically significant effect on ROA in 2002. The effect of net interest income to assets is puzzling. In the full sample it was found to have a modest positive effect on ROA. But yearly results indicate that the effect is significantly positive in only one year (2000), while it is small and statistically insignificant in the other years. Net income to stockholder equity is found to have consistently positive effects on profitability, statistically significant in six of the seven years. Total costs to assets also has consistent effects – they are negative in all seven years and statistically significant in six. Most of the yearly subsamples are thus consistent with what was found for the full sample. But results for the year 2000 do not quite fit the pattern, since net income is by far the largest predictor, and this is the only year in which *interest* is found to have a significant positive relationship.

      c. Structural Equation Model

We have proposed a model in which interest-free status has direct, mediating and interactive effects on profitability. Regression results have shown that interest-free status has a direct effect on profitability. Furthermore, it seems to have mediating effects through four intervening variables: equity capital to assets, interest income to assets, net income to stockholder equity and total costs to assets. Finally, regression analysis revealed interactive effects: namely that the determinants of profitability differ between interest-based and interest-free samples. We use structural equation modeling to test this entire model, specifically AMOS 17.0, the software that is bundled with SPSS. Given that these data include multiple time points on the same set of banks, there exists the possibility of autocorrelation among the variables. We thus used the generalized least squares estimation method, which is considered to be best suited for this kind of data (Bollen, 1989, p. 113). Our model includes only the five predictors and two interaction terms found to be significant in the regression analyses. Modification indices provided by this software were used to improve model fit.

The resulting model is presented in Figure 1. It has excellent fit statistics. The chi-square probability measure is .199, indicating that there is no significant difference between the proposed model and the data. The goodness-of-fit index (GFI) is .992, while anything over .95 is considered acceptable. Other measures indicating good fit are an AGFI of .954, an NFI (Delat 1) of .981, and a CFI of .994. All of the coefficients reported in the model are found to be statistically significant at the .05 level or better, except for the .09 path from *Infree* to *Equity*, which has a probability of .126, and the -.13 path from *Intfree* to *ROA*, which has a probability of .092. This model suggests that interest-free status has three kinds of relationships with profitability, as measured by return on assets. First it has direct negative effect (beta = -.13),

even while controlling for other variables. Second it has mediating effects through the four intervening variables. Two of these effects tend to reduce ROA. That is, interest-free status eliminates interest income, and such income is one source of profitability. It also reduces the net income rate, which is a positive determinant of profitability. However, interest-free status reduces costs, and this has the effect of increasing ROA. And it has a small (and insignificant) positive effect on the equity capital to assets ratio, which itself enhances profitability. Thus two of these mediating effects tend to increase profitability while two tend to decrease it. Finally, interest-free status has two interactive effects on profitability. The negative interest-free/equity interaction term indicates that interest-free status changes the coefficient between *Equity* and *ROA*. As our regression analysis by subsamples showed, this reflects the fact that equity to assets ratio has a positive effect on ROA among interest-based banks and a negative effect among interest-free banks. Finally, the positive interest free/costs interaction term indicates that the effect of costs is less negative among interest-free banks. This is consistent with findings from our regression analyses, which have showed that the effect of costs on ROA is -.053 among interest-free banks and -.346 among interest-based ones.

VI. DISCUSSION AND CONCLUSION

In today's global economy, most financial activities are performed according to the commercial customs of advanced Western nations. Islamic banking has emerged as a new reality in the global financial scene and is a significant and permanent phenomenon (Taylor, 2003). A key feature of Islamic banking is that in conformance with Islamic religious principles it does not permit charging or paying traditional interest. However, this system does provide for other sources of income, such as profit-sharing. Good projects turned down by conventional banks for

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lack of collateral might be financed by Islamic banks on a profit-sharing basis (Ariff, 1988). Thus even if it is not common in Western countries, Islamic banking has some innovative ideas and instruments which could add more variety to the existing conventional banks.

The question asked in this paper was whether such alternative sources of income could make up for the interest charges foregone and thus whether Islamic banking could be sufficiently profitable. We were able to investigate this issue by examining the level and determinants of profitability (specifically, return on assets) among interest-charging (traditional capitalist) and interest-free (Islamic) banks in Turkey from 2002 to 2008.

Turkey is a country where Western-style banking has predominated. However, Turkey has a majority Muslim population. Thus there is a large group of potential banking customers who may be attracted to the interest-free banking system because of their commitment to Islamic values.

We had proposed that interest-free banks would be as profitable as interest-charging banks. Our results from this Turkish sample showed that interest-free banks did have positive and reasonably strong rates of profitability, though their level of profitability was somewhat less than that of traditional banks, contrary to our initial prediction. It appears that sources of profits other than interest may not make up for the interest-income foregone. It may be that Islamic banks are willing to accept somewhat lower profits in return for their adherence to religious principles. Another possibility is that the relative newness of Islamic banking in Turkey means that Islamic banks there have not had the time and experience necessary to generate alternative sources of income. It will be important to examine relative levels of profitability in other countries before coming to any firm conclusions about this issue.

Our model also specified how profitability was achieved. The major reason for the lower profitability of interest-free banking was, not surprisingly, the interest income foregone. However, interest-free banks seemed to have two advantages: their costs were lower and their level of equity somewhat higher. It also seems likely that value commitment among Islamic customers may be a factor in customers doing business with such banks and depositing their assets in them.

Thus this research gives further support that interest-free banks, based on Islamic principles, are a viable option to tradition capitalist banks that derive a large portion of their profits from interest charges. This system is still in its infancy and has to face many challenges. The system is not standardized across Islamic countries nor across the world. However, there are signs that it has established a significant presence over the last forty years and that it will continue to grow and expand. It has been claimed that the 2008 world financial crisis was due in part to unrestrained pursuit of higher profits with insufficient regard to the well-being of customers and society as a whole. The strongly value-based Islamic system may provide important advantages for national economies in future years.

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Table 1 **Turkish Banking Study** **Variables and Descriptive Statistics**				
Name	Definition	Range	Mean	Skewness
Bank	Name of bank			
Year	Year coded (2002 to 2008)			
Intfree	1 = Interest-free bank (N = 56); 0 = Interest-based bank (N = 224)	0 - 1	.2	----
ROA	Return on Assets	-30.5 - 35.8	4.52	-.266
Equity	Equity capital to assets ratio (EQCA)	-10.3 - 64.6	9.72	3.197
Liquidity	Liquid assets to liabilities ratio (LIQUID)	6.1 - 94.5	37.40	.409
Interest	Net interest income to assets ratio (NIREV)	-23.1 - 44.9	9.45	.792
(Income)	Net income to stockholder equity (NINW)	-2534 - 249	44.62	-11.86
Income	Net income to stockholder equity (truncated)	-100 - 249	58.41	.067
(Costs)	Total costs to assets (TCTA)	2.02 - 213	19.94	7.711
Costs	Total costs to assets (truncated)	2.02 - 60	19.39	.839
Note: Sample size = 280. There was no missing data for any of the variables.				

<table>
<tr><td colspan="9" align="center">**Table 2**
Correlation Matrix</td></tr>
<tr><td></td><td></td><td>ROA</td><td>Intfree</td><td>Equity</td><td>Liquidity</td><td>Interest</td><td>Income</td><td>Costs</td></tr>
<tr><td>ROA</td><td>Pearson Correlation</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>Sig. (2-tailed)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Intfree</td><td>Pearson Correlation</td><td>-.151</td><td>1</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>Sig. (2-tailed)</td><td>.011</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Equity</td><td>Pearson Correlation</td><td>.352</td><td>.091</td><td>1</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>Sig. (2-tailed)</td><td>.000</td><td>.128</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Liquidity</td><td>Pearson Correlation</td><td>.247</td><td>-.591</td><td>.212</td><td>1</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Sig. (2-tailed)</td><td>.000</td><td>.000</td><td>.000</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Interest</td><td>Pearson Correlation</td><td>.586</td><td>-.517</td><td>.284</td><td>.471</td><td>1</td><td></td><td></td></tr>
<tr><td></td><td>Sig. (2-tailed)</td><td>.000</td><td>.000</td><td>.000</td><td>.000</td><td></td><td></td><td></td></tr>
<tr><td>Income</td><td>Pearson Correlation</td><td>.552</td><td>-.205</td><td>-.146</td><td>.212</td><td>.414</td><td>1</td><td></td></tr>
<tr><td></td><td>Sig. (2-tailed)</td><td>.000</td><td>.001</td><td>.015</td><td>.000</td><td>.000</td><td></td><td></td></tr>
<tr><td>Costs</td><td>Pearson Correlation</td><td>-.407</td><td>-.377</td><td>.116</td><td>.202</td><td>-.013</td><td>-.379</td><td>1</td></tr>
<tr><td></td><td>Sig. (2-tailed)</td><td>.000</td><td>.000</td><td>.052</td><td>.001</td><td>.827</td><td>.000</td><td></td></tr>
<tr><td colspan="9">* Correlation is significant at the 0.05 level (2-tailed) .** Correlation is significant at the 0.01 level (2-tailed).</td></tr>
</table>

Intfree		ROA*	Equity	Liquidity	Interest	Income	Costs
Table 3 ROA and Determinants by Interest-free Status							
Interest-based	Mean	4.956	9.331	42.347	11.814	63.260	21.261
	N**	224	224	224	224	224	224
	Std. Deviation	6.399	8.431	13.743	8.761	50.314	9.324
Interest-free	Mean	2.758	11.269	17.630	.000	39.018	11.901
	N	56	56	56	56	56	56
	Std. Deviation	1.403	8.728	12.646	.000	24.887	8.904
Total	Mean	4.517	9.7196	37.403	9.451	58.411	19.389
	N	280	280	280	280	280	280
	Std. Deviation	5.822	8.511	16.751	9.152	47.327	9.959

* All of the differences between interest-based and interest-free banks were found to be statistically significant at the .01 level except for that of "Equity," which had a significance level of .128.
** The N consists of seven different years of operation for 40 different banks, 32 of which are interest-charging and eight interest-free.

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Models	A		B		C		D	
Table 4 **Regression Models: Predictors of ROA - Full sample (N = 280)**								
Independent variables	Beta	Sig	Beta	Sig	Beta	Sig	Beta	Sig
Interest-free	-.150	.011	-.132	.024	-.124	.036	-.132	.257
Equity			.383	.000	.381	.000	.438	.000
Liquidity			-.045	.352	-.041	.395	-.030	.556
Interest			.287	.000	.298	.000	.244	.000
Income			.335	.000	.325	.000	.339	.000
Costs			-.362	.000	-.358	.000	-.406	.000
Year00					.060	.220		
Year01					.091	.063		
Year02					-.005	.910		
Year03					.028	.565		
Year04					.070	.146		
Year05					.073	.128		
Int. free X Equity							-.366	.003
Int. free X Liquidity							.112	.357
Int. free X Income							-.040	.547
Int. free X Costs							.244	.001
Variance explained	.023		.644		.654		.666	
Adj. var. explained	.019		.636		.638		.653	
Note: Standardized regression coefficients are shown.								

<table>
<thead>
<tr><th colspan="5">Table 5
Regression Models: Predictors of ROA by Subsample</th></tr>
</thead>
<tbody>
<tr><td>Subsamples:</td><td colspan="2">Interest-based
(N = 224)</td><td colspan="2">Interest-free
(N = 56)</td></tr>
<tr><td>Independent Variables</td><td>Beta</td><td>Sig</td><td>Beta</td><td>Sig</td></tr>
<tr><td>Equity capital to assets</td><td>.395</td><td>.000</td><td>-.361</td><td>.139</td></tr>
<tr><td>Liquidity assets to liabilities</td><td>-.022</td><td>.592</td><td>.560</td><td>.018</td></tr>
<tr><td>Interest income to assets</td><td>.212</td><td>.000</td><td>----</td><td></td></tr>
<tr><td>Income to equity</td><td>.328</td><td>.000</td><td>.525</td><td>.000</td></tr>
<tr><td>Costs to assets</td><td>-.346</td><td>.000</td><td>-.053</td><td>.700</td></tr>
<tr><td>Variance explained</td><td>.661</td><td></td><td>.392</td><td></td></tr>
<tr><td>Adjusted variance explained</td><td>.653</td><td></td><td>.345</td><td></td></tr>
<tr><td colspan="5">Standardized regression coefficients are shown.</td></tr>
</tbody>
</table>

<table>
<thead>
<tr><th colspan="8">Table 6
Predictors of ROA by Year</th></tr>
<tr><td rowspan="2">Variable</td><td colspan="7">Year (beta coefficients)</td></tr>
<tr><td>2002</td><td>2003</td><td>2004</td><td>2005</td><td>2006</td><td>2007</td><td>2008</td></tr>
</thead>
<tbody>
<tr><td>Interest-free</td><td>-.349*</td><td>.086</td><td>-.192*</td><td>-.493**</td><td>-.627**</td><td>-.299</td><td>-.627**</td></tr>
<tr><td>Equity capital</td><td>.480**</td><td>.134</td><td>.591**</td><td>.698**</td><td>.743**</td><td>.701**</td><td>.743**</td></tr>
<tr><td>Liquid assets</td><td>-.156</td><td>.195</td><td>-.062</td><td>-.272**</td><td>-.103</td><td>.063</td><td>-.103</td></tr>
<tr><td>Interest income</td><td>.039</td><td>.557**</td><td>.107</td><td>-.093</td><td>-.217</td><td>-.009</td><td>-.217</td></tr>
<tr><td>Net income</td><td>.527**</td><td>.168</td><td>.625**</td><td>.241**</td><td>.443**</td><td>.540**</td><td>.443**</td></tr>
<tr><td>Total costs</td><td>-.362*</td><td>-.241*</td><td>-.202*</td><td>-.604**</td><td>-.618**</td><td>-.212</td><td>-.618**</td></tr>
<tr><td>R^2:</td><td>.647</td><td>.747</td><td>.893</td><td>.841</td><td>.855</td><td>.720</td><td>.855</td></tr>
<tr><td colspan="8">* Significant at .05 level; ** Significant at .01 level or greater. Standardized regression coefficients are shown.</td></tr>
</tbody>
</table>

Figure 1
Turkish Banks
Interest-free Status & Profitibility