Analyzing the Accounting Ratios of Islamic and Conventional Banks through Linear and Non-linear Classification Techniques: The Case of Pakistan

AWAIS UR REHMAN
SYED NISAR AHMED
MUHAMMAD AMJAD
Department of Business Administration
Faculty of Management Sciences
International Islamic University, Islamabad
Pakistan

Abstract:

Islamic banks, being Sharia compliant, differ from conventional banks from many points of view. But since they work parallel to conventional banks in the same industry, some sort of similarity is not out of question. Hence, many researches have designed their studies to draw out these similarities and differences. One way to distinguish them is to check the accounting ratios, while the decision upon these ratios is inferred by employing linear classification techniques. This study, after calculating the accounting ratios, opts for linear and nonlinear classification techniques. Results state that accounting ratios of Islamic and conventional banks can be significantly and sharply contrasted. Study suggests the Islamic banks to trigger up their marketing strategies to new customer, since they lag behind to competing conventional counterparts, in the matter of their small consumer base, and some implications for future research.

Key words: Islamic finance, Conventional banking, Accounting ratios, Non-Linear Techniques

Introduction

Islamic Banking, relatively a new phenomenon, has witnessed a rapid growth from the last three decades around

the globe. Islamic banking emerged in response to the market need in the Muslim countries, to fill the gap prevalent in the banking system, as the conventional banking (Interest based) is counter to their religious philosophy and widen its wings to non-Muslim countries as well. It seems an increasingly visible alternative of conventional banking from east to west due to its viability, feasibility, efficiency and as a productive way of financial intermediation (Iqbal & Molyneux 2005). This banking has made its spread to 70 countries over the globe (Khan 2010). *The Economist* told its level at US $700 billion by the year 2008 (*Economist* 2008). Its growth is impressively at 15% p.a. (Khan 2010). IIBI's (Institute of Islamic Banking & Insurance) estimates tell that nearly 277 Islamic Financial Institutes are working globally (IIBI 2005). Interestingly this growth has not centred in the East only, instead it paved its way in the European and American markets as well. A lot of big players of global financial market seems impressed by this new experience and have gone to take opportunities in this new business, e.g., HSBC, BNP Paribus, Standard Charted, and Citicorp. The above facts are not less than a stimulus that makes the researchers to search for what differences have Islamic banks brought as compared to conventional banks in the market. This quest has led this study to compare Islamic and conventional banks on the basis of accounting ratios in the context of Pakistan.

Pakistan is an Islamic country. It has preserved its Islamic identity at many paces. Similarly in financial industry, it introduced a series of reforms to Islamize its economic and financial scenario. These at length reforms cooked a banking system in Pakistan, where Islamic banking runs at parallel to its conventional counterparts, since 2002 (CII 2008). Local growth of Islamic banking is quoted as "swift progress" by the State Bank of Pakistan (SBP 2008). Growth rate of Islamic banks in Pakistan is recorded at 60%. Share of Islamic Banking industry is 4.2% in total deposits and 4.3% in the total assets of

overall banking assets & deposits of Pakistani banks. This ratio is impressive as compared to other countries like Bahrain, Malaysia and Indonesia. (SBP 2008). These and some other reasons have led this study to conduct the research in the context of Pakistan.

Islamic Banking has many distinguished characters, as compared to its conventional counterpart. It erects its posture on the Islamic Law, which prohibits charging *Riba* (interest) and *Gharar* (an ambiguity in contract, which may lead to conflict). Since these banks work parallel to the conventional banks, hence some resemblance is not out of question. Many studies have been done on Islamic banking to distinguish its unique characteristics from the conventional banks (Ayub 2007; Hassan 2001; Khan 2010; Tahir 2007; Usmani 2000; Zaman 2008). But the use of accounting ratios to spearhead this distinction has been studied only in the study of (Olson & Zoubi 2008). This paper concludes that non-linear classification techniques can be used more efficiently, to determine the differences in both types of banks in GCC region. The current study will strive to conduct research in the context of Pakistan to see wheatear both types of banks are distinguishable on the basis of accounting ratios or not?

The results of this study can be utilized by various stake holders such as policy makers, general public, researchers and students. Due to the abstract nature of Sharia compliance, it is very difficult to convert it into numerical terms. This study would help the policy makers and even a lay man to gain an insight into the concepts of distinction in the results of accounting ratios, if any, due to the Sharia complaint nature of Islamic banks. For researchers and students this study is expected to open new avenues of further study where they can get new impulses to differentiate Islamic and conventional banks on the basis of accounting ratios. The most important result of our study is to testify the conclusion of Olson & Zoubi's

paper (2008) in a different geographical and econo-financial context.

Survey of literature

Banks are the cornerstones in modern robust economies as the financial system revolves around banking. Banks, as financial intermediaries, channel funds from savers to borrowers in such a way that eradicate the inherent mismatch between surplus and deficit of funds in an economy. By lubricating a frictionless flow of funds, banks also improve economic activities by maintaining equilibrium. The need for financial intermediary to reduce the friction in fund transfer has even more surged in the scenario of globalization (Dincer, Gencer, Orhan, & Sahinbas 2011).

Banking sector in Pakistan is, although, comparatively small yet owns its own worth. Here the banking came with British Raj as the Reserve Bank of India in 1934. On its independence Pakistan strived to have the nation's own central bank, the State Bank of Pakistan in 1948. History of banking in Pakistan is startling where there had been experiences of Nationalization and Liberalization to show that the Liberalization impacts the banks' performance favorably instead of Nationalization (Akhtar 2002; Awais & Rehman 2010). This industry of Pakistan is least connected with globe, hence the shocks of global crisis here are not effective as such (Gul 2011). According to the latest statistics of Ministry of Finance Pakistan Financial deepening Ratio, which elaborates the liquidity of financial market, is at 35% in the first half of 2011 against 36.5% in 2010, showing a rich unallocated area of funds available in the market. Only 7% of the total population uses the banking services, showing a great unexplored area of customer base (Gul 2011).

Out of 35 banks at total, there are 5 Islamic banks in Pakistan. The banking industry here is a mix of public, private

and international banks, which creates a contesting competition among the conventional and Islamic players of this industry. Competition promotes a cut in the cost leading to enhanced profits, since the competition imperatives upon the banks to efficiently supply the best-demanded products (Abdullah, Alhabshi, & Mokhtar 2008), at least as per the theory (Nickell, 1996). In short, competition decreases the cost which leads to efficiency. Efficiency studies on banking are at their boom since the last decade of previous century (Berger & Mester 1997). Abdullah et al. (2008) numerates the benefits of studying and measuring the bank efficiency. They are of the view that the efficiency can be a proxy for the (i) Measure of an individual bank's success, (ii) Assessment of macro industry's performance, and (iii) Degree of regulations' impetus upon the performance of banking industry. These reasons at large escorted us to study the distinction of Islamic and conventional banks in Pakistan on the basis of relevant results of accounting ratios.

Distinguished features of Islamic Banking

Along with financial intermediation, many other functions performed by bank in the modern economies have similar importance for the development and operations of Muslim economies (Ayub 2007; Iqbal & Molyneux 2005). But, the traditional banking system is counter to the religious thought of Muslims; therefore, the idea of Islamic banking was endorsed in response to the market by the Muslim scholars to fill the gap in banking system.

Islamic banking seeks guidance from a specific branch of Shariah (Islamic Law) called Fiqhul-Muamalat (Islamic rules on transactions). This is based on several prohibitions like Riba, and permissions like trade. Such prohibitions are to promote social harmony in the transactions for mutual benefits of the society (Khan & Bhatti 2008) and to avoid unjust with a weaker

party, whereas permissions are to encourage real economic activity. This implies that Islamic banking must be an asset backed (involving certain goods or papers representing constructive ownership) and promotes real economic activities (Ahmad & Luo 2010). Further, Islamic banks must also go after moral and social standards. The distinguishing guideline that Islamic banks follow is, no Riba (Interest), no Gharar (uncertainty about the future outcome), (IIIE 1999), in addition, gambling and investment in haram products are also forbidden (Khan, 2010). Functions of Islamic banking akin to the conventional counterpart, that is financial intermediation, but it works alternatively using trading and participatory modes. Broadly, Islamic banks have two types of modes, Profit Loss Sharing (PLS) and Non Profit Loss Sharing (Non-PLS). PLS are the modes that have most unique feature of Islamic banking where both investor and entrepreneur share profit like mudarbah and Musharkah. These modes formulate the basis of Islamic finance as they are the sole mean of Islamic banking, (Toumi, Viviani, & Belkacem 2011), (Khan 2010), (Usmani 2009), (Chong & Liu 2008), (Dar & Presley 2000), (Errico & Farahbaksh 1998), in the context of reward sharing is related to risk sharing butbank use these modes mainly on the liability side of its balance sheet to generate resources and tend to avoid to use it on the asset side. Non-PLS, charging fixed profit is used nearly by all Islamic banks mostly to the asset side to avoid risk sharing and offer trading and financing on the basis of markup, leasing, commissioned on manufacturing etc like Murabaha, Ijara, salam etc (chong & Liu 2008), (Iqbal & Molyneux 2005), (Usmani 2002), (Dar & Presley 2000), (Errico & Farahbaksh 1998). Though Non-PLS is not at the heart of the theory of Islamic banking but have its own importance (Khan, 2010). The model of Islamic banking works in such a better way that it seems visible alternative to the conventional counterpart in both Muslim and non-Muslim countries.

Previous works to study the distinction between conventional and Islamic banks

Ariss (2010) examined the competitiveness of both Islamic and conventional banks and found that asset utilization to generate business is more aggressive in Islamic banks than their conventional counterparts. Hence in parallel, the Islamic banks shoulder a bigger default risk as well. He used traditional measures of concentration i.e., concentration ratios and Herfindahl-Hirschman index (HHI) for the purpose of comparing the competitive conditions in both the Islamic and conventional banks. Moreover he also analyzes the profitability of both the types of banks using multivariate regression equation.

A struggle to distinguish Islamic and conventional banks on the basis of their capital budgeting techniques was carried out by Ajmi, Al-Saleh and Hussain (2011). They conducted their study on the comparison of capital budgeting techniques of Islamic and conventional banks. For this purpose they employed a survey questionnaire which in first part included questions regarding general information of the institution such as size of the institution, listing status, size of government ownership etc, and in second part it contained questions regarding capital budgeting practices including quantitative investment evaluation techniques, risk analysis, discount rate and cost of capital.

Hayat and Kraeussl (2011) analyzed the risk and return characteristics of Islamic equity funds (IEF) against both the Islamic and conventional indices. To examine the IEFs' risk and return, they used CAPM performance analysis. At first they conclude that IEF's are different in their structure because of their basic requirement of being in harmony with Islamic law. Researchers then found that the IEF's performed badly when invested globally while it performed a little better in local investments. In order to check the marketing timing ability of

IEF, a multivariate regression model was incorporated in the study. They also differentiated the risk characteristics of these two types of equity funds and found that IEF's cluster more risk and their analysis must be done in respective of their risk profile. A previous study (Abdullah, Mohamed, & Hassan, 2007), it is worth mentioning here, resulted in another dimension to Hayat and Kraeussl (2011) to conclude that Islamic mutual funds performance is respectively better than such mutual conventional funds when the market trend is towards low-performance. But when the economic condition of market is better, conventional funds take the lead.

Saad, Majid, Kassim, Hamid, & Yusof (2010) in their study compare the efficiency of Conventional and Islamic unit trust companies using a sample of 27 unit companies of Malaysia. Using Data Envelopment Approach, an efficiency measurement technique, they take two inputs Expense Ratio and Portfolio Turnover Ratio, and one output, Return. Their findings reveal that the efficiency of Islamic unit trusts goes in parallel to their Conventional counterparts adding that some of the Islamic unit trust companies performed better than average in Total Factor Productivity.

Mokhtar, Ahmad, Abdullah, & Alhabshi (2008) conducted study to examine the efficiency of full-fledged Islamic banks and the Islamic windows in Malaysia. Using non parametric approach i.e., data envelope approach they concluded that the efficiency of full-fledged Islamic banks was better than Islamic windows in Malaysia. When compared with conventional banks, the authors found that the efficiency of conventional banks in Malaysia is still better than Islamic banks.

In the paper "Using accounting ratios to distinguish between Islamic and conventional banks in the GCC region" Olson & Zoubi, (2008) have taken a novel approach to highlight the distinctive feature of Islamic banks from conventional banks via the comparative results of accounting ratios.

Accounting Ratios describe the relationship between different types of accounting values to elaborate the comparison among them. They have concluded that although the mean values of the results of accounting ratios are similar and do not interpret a difference but once the non-linear classification techniques have been employed on these results, the Islamic banks are correctly distinguishable. His study is focused at the banking community of GGC region. The fact that the contextual studies in social sciences cluster its own value, our work focuses on Pakistani banks.

Hypothesis

Olson & Zoubi (2008) are of the view that Islamic banks are more profitable than conventional banks. Based on this finding, the following hypothesis is stated.

H1: Islamic banks are more profitable than Conventional banks. As mentioned in above literature, Ariss (2010) examined the competitiveness of both Islamic and conventional banks and found that asset utilization is more aggressive in Islamic banks than their conventional counterparts. Moreover, Abdullah, Mohamed, & Hassan, (2007) concluded that Islamic institution are relatively efficient when compared to conventional financial institutes. On the basis of this finding, the following hypothesis is drawn.

H2: Islamic banks are more efficient than conventional banks. Based on the study of Olson & Zoubi (2008), Islamic and conventional banks, more efficiently, can be distinguished by using non linear classification techniques. In this study the same hypothesis is tested in the context of Pakistan.

H3: Non-linear classification techniques can be used to distinguish between Islamic and Conventional banks.

Methodology:

This study used the financial statements of the both the conventional and Islamic banks in order to compare them by applying the accounting ratio to 69 observations collected from the sample of 5 full fledge Islamic and 9 conventional banks of Pakistan in between 2006-2010. This sample size is apparently not very big, but as in Pakistan, the Islamic banking sector is a small and new industry with respect to only 5 Islamic banks, we had not been able to go beyond this limit. The financial statements were downloaded from the websites of the banks selected as the sample. These statements included the Income Statement, Balance Sheet, Statement of change in stockholder's equity, statement of cash flows and the notes to the financial statements. The study used five categories of financial ratios which totalled to be 26 ratios. The categories are profitability, efficiency, asset quality, liquidity and risk ratios. These ratios, under each of the above head are as follows:

1.   Profitability Ratios:

i.   Return on Assets = $ROA = \dfrac{Net\ Income}{Average\ Total\ Assets}$

ii.   Return on Equity = $ROE = \dfrac{Net\ Income}{Average\ Stockholder's\ equity}$

iii.   Profit Margin = $PM = \dfrac{Net\ Income}{Operating\ Income}$

iv.   Return on Deposits = $ROD = \dfrac{Net\ Income}{Average\ Total\ Customer's\ Deposit}$

v.   Return on Shareholder Capital = $ROSC\dfrac{Net\ Income}{Shareholder\ Contributed\ Capital}$

vi.   Net Operating Margin = $NOM = \dfrac{Operating\ Profit\ or\ Income}{Interest\ Income}$

2.   Bank Efficiency Ratios:

i.   Interest Income to Expenses = $IEE = \dfrac{(Interest\ Income - Interest\ Expenses)}{Average\ Total\ Laons\ and\ Advances}$

ii.   Operating Expense to Assets = $OEA = \dfrac{Operating\ Expenses}{Average\ Total\ Assets}$

iii.   Operating Income to Assets = $OIA = \dfrac{Operating\ Income}{Average\ Total\ Assets}$

iv.   Operating Expense to Revenue = $OER = \dfrac{Operating\ Expenses}{Operating\ Income\ (Revenue)}$

v.   Asset Turnover = ATO = $\dfrac{Interest\ Income}{Average\ Total\ Assets}$

vi. Net Interest Margin = NIM = $\dfrac{(Net\ Interest\ Income - Net\ Interest\ Expenses)}{Average\ Total\ Assets}$

vii. Net non-interest Margin = NNIM = $\dfrac{(Net\ Non\text{-}Interest\ Income - Net\ Non\text{-}Interest\ Expenses)}{Average\ Total\ Assets}$

3. Asset Quality Ratios:

i.   Provision to Earning Assets = PEA = $\dfrac{Provision\ for\ Loan\ Losses}{Average\ Total\ Loans\ and\ Advances}$

ii. Adequacy of Provision for Loans = APL = $\dfrac{Allowance\ for\ Loan\ Losses\ at\ the\ end\ of\ the\ year}{Average\ Total\ Loans\ and\ Advances}$

iii. Write-off Ratio = WRL = $\dfrac{Write\text{-}off\ of\ Loans\ during\ the\ year}{Average\ Total\ Loans\ and\ Advances}$

iv. Loan Ratio = LR = $\dfrac{Average\ Total\ Assets}{Average\ Total\ Loans\ and\ Advances}$

v.   Loans to Deposits = LTD = $\dfrac{Average\ Total\ Customer\ Deposits}{}$

4. Liquidity Ratios:

i.   Cash to Assets = CTA = $\dfrac{Cash}{Average\ Total\ Assets}$

ii. Cash to Deposits = CTD = $\dfrac{Cash}{Average\ Total\ Customer\ Deposits}$

5. Risk Ratios:

i.   Deposits to Assets = DTA = $\dfrac{Average\ Total\ Customer\ Deposits}{Average\ Total\ Assets}$

ii. Equity Multiplier = EM = $\dfrac{Average\ Total\ Assets}{Average\ Stockholder's\ Equity}$

iii. Equity to Deposits = ETD = $\dfrac{Average\ Shareholder's\ Equity}{Average\ Customer\ Total\ Deposits}$

iv. Total Liabilities to Equity = TLE = $\dfrac{Average\ Total\ Liabilities}{Average\ Stockholder's\ Equity}$

v.   Total Liabilities to Shareholder's Capital = TLSC = $\dfrac{Average\ Total\ Liabilities}{Shareholder\ Contibuted\ Capital}$

vi. Retained Earnings to Total Assets = RETA = $\dfrac{Retained\ Earnings}{Average\ Total\ Assets}$

Results and Discussion

In order to analyse the above ratios of both types of banks, t-test, logit model and Ward's Dendrogram cluster

analysis were used. Discussion and results are given below under the following headings.

Linear Techniques

Distinction among the results of accounting ratios of Islamic and conventional banks through linear techniques of taking means and checking statistical differences, if any, among them is given in the Table 1.

Means and T test stats are clear to show that Islamic banks are manifesting a similar trend in their ratios of NOM, OEA, OIA, OER, ATO, PEA, APL, WRL, LTD, CTA, CTD, TLE, RETA, TLSC and NIM, while other ratios are significantly different among our sample banks. Moreover, conventional banks are better at the earnings while in the management of operating expenses both banks show no significant differences, which in turn, is boosting conventional banks' ROA and ROE A better ROE in conventional banks is referred as the signal of having more funds from the deposit in the investments of these banks, than the equity funds, which results in a higher return to these equity holders. Our descriptive stats result opposite to that of GCC countries (Zoubi & Olson 2008) where Islamic banks show higher profitability. GCC results are also opposite to this study, since Zoubi & Olson (2008) states that while investing, Islamic banks use deposits as the sources of funds, while in the case of Pakistan this statement is true for conventional banks, instead of Islamic banks. A negative ROD and NNIM and higher IEE cumulatively show that Islamic banks are suffering losses while lower DTA and EM tell that the culprit behind this loss is lower volume of customer base at deposit sides, which in turn make the Islamic banks less fortunate in making assets out of these funds. Overall in the purview of the results of accounting ratios, Islamic banks lag behind the conventional banks in the matter of generating resources of funds, i.e. deposits and in the allocation of funds,

as well. To put it differently Islamic banks lacks in their customer base, both at assets and liabilities sides, which has squeezed their profits.

Our logit regression, in proceeding part of this paper, witnesses that the Islamic banks of Pakistan have lower costumer base in their portfolio, that is to say that their investments have a bigger part from equity funds and show lower ROE. By saying that Islamic banks are more efficient in their operational income and operational expenses, our study goes parallel to the results of Yudistira (2003), and partially accepts H1 that Islamic banks are better in profits in the matter of operating income.

Table1:	Mean Differences among IB & CB *		
Accounting Ratio	Mean IB	Mean CB	Significance
ROA	-0.002932582	0.014628547	0.000
ROE	0.018098899	0.211583962	0.000
PM	0.017163685	0.474701101	0.032
ROD	-0.004620426	0.020365403	0.000
ROSC	0.128397231	0.793935109	0.000
NOM	0.429178286	0.419019265	0.912
IEE	0.124684933	0.073296431	0.000
OEA	0.007344241	0.010317930	0.092
OIA	0.032686248	0.031412132	0.774
OER	0.141875270	0.634239317	0.125
ATO	0.078957755	0.090891315	0.069
NIM	0.041531565	0.041734177	0.966
NNIM	-0.037692199	-0.011004152	0.000
PEA	2.245980594	0.026051243	0.136
APL	2.245980594	0.026051243	0.136
WRL	0.001028719	0.009530633	0.135
LR	0.385940459	0.564658658	0.000
LTD	0.642744181	0.857743473	0.221
CTA	5.537798173	0.190182506	0.154
CTD	8.820142638	0.256313022	0.148
DTA	0.632340270	0.809967757	0.002
EM	6.042803262	15.791419041	0.000
ETD	0.586639959	0.50784781	0.000
TLE	16.530539499	156.476754594	0.160
TLSC	18.817282462	504.576368881	0.155
RETA	1.093302988	0.020815904	0.440

On the other hand, Islamic banks' ability in asset utilization is at lower side, than conventional banks, as witnessed by the ratio analysis of ATO, which rejects H2. However, the difference here is not so large. The study of Oslon & Zoubi (2008) has also concluded the same fact.

Performance of Islamic bank with respect to PEA, APL and WRL is at better edge with lower write offs and with higher PEA and APL. This concludes that Islamic banks are aggressive in their risk management with their higher reserves. On the other side, liquidity ratios are quite clear to say that Islamic banks are holding liquidity. Hence, this excess of liquidity has taken these banks to create bigger deposits, in opposite to the results of Oslon & Zoubi (2008). RETA shows Islamic banks tend to distribute more profits instead of retaining then in their reserves. While TLE and TLSC are conclusive in saying that Islamic banks' in Pakistan have lesser customer base with lesser depositors.

Overall discussion under the descriptive stats boils down to partially accept H1 in the matter of operating profits, rejects H2 by saying that Islamic banks are not efficient in asset utilization.

Logit Model

The relationship between two types of banks, Islamic and Conventional, is found by using logit regression model. This is used to represent the probability of occurrence of two mutually exclusive events by taking the dependent variable in the form of one or zero. Because the variable bank type, either Islamic or conventional, occurs in the dichotomous form, the equation for this variable can be mined out through logit regression. Therefore, this study applied logistic regression model on the 26 accounting ratios for the data set of 69 observations. The dependent variable was taken in the form of dummy, which takes zero for conventional and 1 for Islamic

banks. By using SPSS, all 26 financial ratios of 14 banks were thoroughly checked through enter, forward and backward options in the search of best variables to distinguish between Islamic and Conventional banks. After an exhaustive search forward method of logit identified the two variables and eventually led to the following equation, with the T stats in the parenthesis.

$$\text{Bank} = -7.819 \text{ LTD} + 30.831 \text{ ETD} + e$$
$$(0.221) \qquad\qquad (0.000)$$

Table 2.				Variables in the Logit Equation				
		β	S.E.	Wald	df	Sig.	Exp(B)	
Step 4^c	LTD	-7.819	1.997	15.335	1	.000	.005	
	ETD	30.831	10.094	9.329	1	.002	2.452	

The equation includes two important variables of Loans to deposits (LTD) and Equity to deposits (ETD) for Islamic banks. The model is significant for both variables on 100 and 98 percent confidence level, respectively. Hosmer lamshow value of the model is .335, which also reflects that the equation is fit.

Beta-exponential stats show that if LTD is increased by a single unit there will be 0.5% expected decrease in the odds of dependent variable. While a unit increase in ETD is expected to cause an increase of 145% in the odds of dependent variable. That shows that although the LTD ratio is distinguishable among Islamic and conventional banks, but ETD is creating this distinction to a much higher degree, as witnessed by its beta-exponential value. The negative sign of LTD coefficient in our logit equation indicates that Islamic banks have lower loans as compared to conventional counterparts, which is obvious, as per the present status of Islamic banks in Pakistan. This shows that Islamic banks have lower customer base as they are in the early stages of their life. The expected positive sign and high ratio of ETD reflects that Islamic banks have large reserves of equity than conventional banks. This may have the same

reason, as mentioned above that Islamic banks are far behind than Conventional in terms of generating assets and deposits whereas conventional banks have lofty assets and deposits due to vast customer base, this is consistent with the results of (Olson & Zoubi 2008).

These results are in consistence with hypothesis 3 that Non-linear classification techniques can be used to distinguish between Islamic and Conventional banks. The study clearly states that Islamic and conventional banks can de distinguished on the basis of accounting ratios by applying non-linear classification techniques and are in accordance with the previous study of (Olson & Zoubi 2008).

Cluster analysis

In order to further differentiate the two types of banks, Ward's clustering was used. In the first instance, the said technique was applied on the combined calculated ratios of both the Islamic and conventional banks.

Applying Ward's clustering on the ratios of both the banks together, the software formed clusters of different banks based on their ratios. To report the results of the analysis, the following figure is illustrated below:
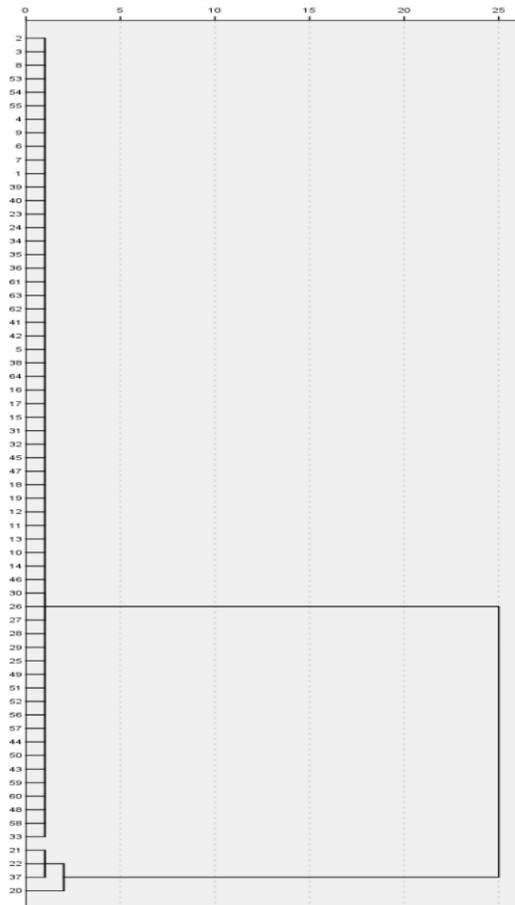
Fig 1: Dendrogram of sample banks

In this figure the vertical axis shows the number of observations i.e., banks in the sample from 2006 to 2010. The lines linking these numbers are the clusters formed by the software. K-means neighbours forms three clusters while analysing the combined ratios of both types of banks. Firstly observation 20 and 22 i.e., Askari bank and Bank Alfalah form one cluster i.e., the accounting ratios of Askari bank and Bank Alfalah follow a similar trend which is logical because both the

banks are making good profits from their operations in a dual manner, i.e. these banks have successfully won the customers in Islamic and conventional business lines. A third cluster found is observation 26, 20, and 22 i.e., the ratios of HBL, Askari and Bank Alfalah when combined together form a very dissimilar trend in comparison to all other banks.

In the second place, Ward's clustering technique was used separately for both the types of banks in order to witness differences among different ratios in banks of same nature.

1. Conventional banks

On applying Ward's clustering to the observations of conventional banks, the following results were revealed.


Dendrogram using Ward Linkage
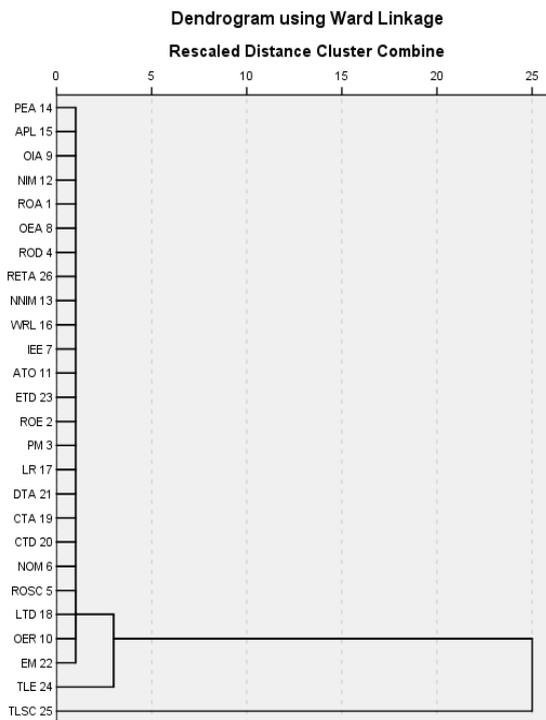
As shown in the dendrogram, for conventional banks, ward test divides the ratios into 3 clusters. The first cluster is comprised of ratios starting from PEA to EM which means that ratios in the above diagram from PEA to EM are highly

correlated i.e., showing similar trend. The 2nd cluster contains the ratios in the first clusters with inclusion of TLE, showing that when TLE is combined with the first cluster, the ratios still show same trend but not as strongly correlated as the first cluster is. Moreover, the test form another cluster by including TLSC in the second clusters and shows that when TLSC is combined with all other ratios, the correlation becomes weak that is they move towards the dissimilarity region.

2. Islamic Banks

After analysing different similarities and dissimilarities in the ratios of conventional bank, we applied ward test to ratios of Islamic banks so that major difference between both the banks may be sorted out. On applying the test we got the following illustration:

Dendrogram using Ward Linkage

Rescaled Distance Cluster Combine
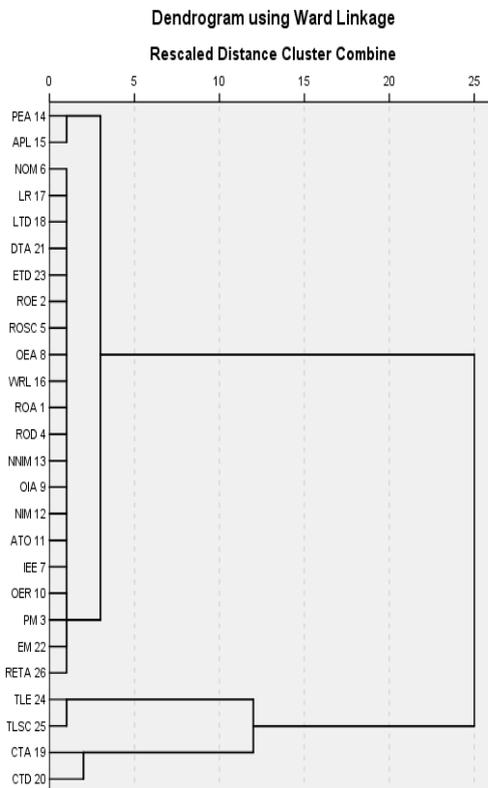
As shown in drendrogram, the first cluster is comprised of ratios PEA and APL, both of these ratios are highly correlated meaning that they show similar trends. The second cluster has ratios from NOM to RETA. All of these ratios are also highly correlated. The test forms a third cluster by combining both the first and second cluster. Because the distance of this cluster from 0 is more than the first and second cluster, this cluster shows that ratios from PEA to RETA show a similar trend which is less similar than the trends shown in first and second cluster. The fourth cluster in the diagram shows that when TLE, TLSC, CTA and CTD are included in the third cluster, the correlation among the ratios becomes weak mean that they fall in to the dissimilarity region.

Conclusion

This study, in the limelight of above discussion and results conclude to say that upon the results of accounting ratios of Islamic and conventional banks, these two types of banks are easily distinguishable. Among 26 ratios, the logit regression highlighted only two. These two ratios have one common inference that the Islamic banks are relatively smaller with reference to their consumer base. These results are in line to the practical facts, that Islamic banks are newer, relative to conventional banks; hence, they have not penetrated the market as such. That is to say that for the further growth of Islamic banks it is imperative upon them to draw more customers, both at liability and asset side products.

Implications for future researches

This study placed its results upon the stats of accounting ratios. A further strive can be done to get the results from other kind of ratios, instead of accounting. Since local context has its esteemed place in the social science researches, the study can

be used in a different scenario to Pakistan. This research takes it data from the banking sector of Pakistan, and since Islamic banking came here in 2005; our sample size was compelled to be for 5 years only. Hence, the research can be replicated in a different country, where the Islamic banks are working parallel to conventional, over a history of more than 5 years.

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