Efficiency of the Banking Sector Of Bosnia–Herzegovina with Special Reference to Relative Efficiency of the Existing Islamic Bank

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The main aim of this research is to investigate how efficient is the only existing Islamic bank in Bosnia and Herzegovina (B-H) related to average efficiency of other banks from our sample. The analysis has been conducted on the sample of 18 conventional and one Islamic bank from data published by Banking Agency of Federation of B-H for 2009. The banking and economic environment of B-H as European, post-communist and transition country is of conventional type, and it has not been analyzed in this sense ever before. B-H has not made any regulatory or economic adoption in banking sector for developing of Islamic banking, so Islamic bank is treated as a conventional one. This research is conducted by using of nonparametric technique DEA (Data Envelopment Analysis) as a mostly used tool for analysis of efficiency in banking. We have used two output and three input analysis according to input oriented approach. According to majority of indicators, Islamic bank has lower efficiency comparing to their conventional counterparts. Also, we have done comparison and within the classes of banks that Islamic bank belongs to. In the class of foreign banks, and banks with assets up to quarter of billion of EUR, Islamic bank is again less efficient that their conventional counterparts. According to all efficiency indicators, there are a significant potential for efficiency improvements.

Key words: Efficiency, Islamic bank, DEA, Bosnia-Herzegovina

1. Introduction

The banking system efficiency is one of important determinants of economic growth of one country (Kumar and Gulati, 2008; Yildirim and Philippatos 2002). But also, presence of Islamic banks in one banking system can have positive or negative effects on efficiency of that system. A great number of different studies on bank efficiency using the DEA analysis have been conducted in the last twenty-five years. In past few years, there have been conducted and a several studies of Islamic bank efficiency. Most of them are for Middle Eastern and North African (MENA) countries, Gulf Cooperation Council (GCC) countries, for Malaysia, but none of these studies didn't treat Bosnian banking sector in this sense.

For example Rosly and Abu Bakar (2003), in the analysis of Malaysian banks from 1996-1999 found that Islamic banks have higher ROA than conventional banks. Arslan and Ergec, (2010), in their analysis of efficiency of banks in Turkey in 2006 and 2009 found that the Islamic banks performed better than the conventional banks. Omar at al. (2007), analyzed efficiency of banks in Indonesia for 2007 and found that Islamic banks are on average more efficient than conventional ones. Beck (2010), analyzed in period 1995 to 2007 Islamic banks from different countries and found that Islamic banks are in average more cost-effective than conventional banks.

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But, there are some researches in which authors didn't find some differences in bank efficiency of Islamic and conventional bank. For example, Bader et al. (2008) found that in 21 selected countries from 1990-2005 there are no significant differences between conventional and Islamic banks. Also, Mohamad et al. in analysis of 21 Organization of Islamic Conference countries from 1999-2005, found that there are no significant differences between conventional and Islamic banks.

On the other side, Srairi (2010) analyzed efficiency of GCC from 1999–2007, and found that in terms of both cost and profit efficiency, conventional banks are more efficient than Islamic banks. Also, for GCC Johnes et al. (2009) analyzed efficiency of Islamic and conventional banks in GCC from 2004-2007, and found that Islamic banks are less cost but more profit and revenue efficient. Hassan (2006) analyzed efficiency of the Islamic banking industry from different countries in the period of 1995-2001, and found that Islamic banks are less efficient than conventional ones. For Malaysian case, Mokhtar et al. (2006) found that Islamic banks improved their efficiency over the period 1997-2003., but anyway they stayed on lower levels of efficiency than their conventional counterparts.

In the case of B-H, there is only one Islamic bank, Bosna bank International (BBI). Our research question is, does presence of this bank in B-H banking sector has negative or positive impact on overall bank efficiency of banking system, and is this bank more or less efficient than conventional banks.

We used DEA (Data Envelopment Analysis) methodology to estimate bank efficiency, and to make comparison between efficiency of Islamic bank and average efficiency of B-H banking system.

2. The Banking Sector in Bosnia and Hezegovina

The banking sector in B-H has experienced some significant structural and organizational changes in last 20 years. The banking sector, as well as other sectors of the economy, was destroyed during the war period 1992-1995. Therefore the post-war reconstruction started since 1996, and has been very difficult for the development of banking system of B-H. In 1997 the Central Bank of B-H was established according to the "Currency board" arrangement, whereby the focus was put on stabilization of the currency and restoring confidence into the financial system, and at the same time "stripping" the Central Bank's instruments of monetary policy. What followed after the establishment of the Central Bank was the introduction of a single currency in B-H market in line with the principle of pegging the national currency KM/BAM (Convertible Mark) to DEM (German Mark) at a fixed exchange rate of 1KM=1DM. The main effect of this was withdrawing from payment system as many as four then existing currencies, i.e., Serbian "Dinar", Bosnian "Dinar", Croatian "Kuna" and German "Mark". Today, KM is pegged to EUR at a fixed exchange rate of 1 EUR = 1,95583 KM.

At the end of the last century, the banking system went through the processes of consolidation, regulation and privatization. In accordance with the administrative organization of B-H, the legal framework consists of The Law of Banks of Federation B-H (FB-H) and the Banking Law of Republika Srpska (RS). Implementation and enforcement of those laws are controlled by the two bank supervision agencies in B-H, namely the Banking Agency of FB-H and RS, which issuing and banking licenses too. These agencies and regulators didn't support any changes or adoptions in lows on banks for full implementation of Islamic banking.

The intensive privatization process is now finished, with 98% of private domestic or foreign ownership. In the last ten years, confidence in the banking system has been restored and the banking system itself has been significantly developed and strengthened, measured by growth of deposits and the amount of capital. These processes coincided with the process of the concentration of the banking system due to numerous mergers and acquisitions of banks, which further resulted in reducing of the number of banks in B-H.

3. Data and Methodology

The data for this research were collected from the condensed reports of external auditors in FB-H published by the Federal Banking Agency (BF, 2009). This Report provides condensed and audited financial reports for banks which were active in this market during 2009.

Our sample is constituted of 18 conventional and one Islamic bank. All of them work according to same regulatory framework. For the analysis of their efficiency, we used the DEA method which was firstly introduced by Charnes et al. (1987), based on the work of Farrell's (1957), with respect to all advantages and disadvantages that are indicated by Berger & Humphrey (1997). We deal with pretty small number of banks, so the DEA is the method which can be conducted for small sample of data, and used for comparison between banks in that sample. With DEA we can measure relative efficiency among the units that belongs to same group with same environment and regulatory framework, what is actually the case with B-H banking system where Islamic bank is treated same as all other banks.

There are two approaches of DEA method: production and intermediation approach. Production approach means that bank is an entity that uses various inputs like labor and capital to produce its outputs. In this approach, outputs are usually loans, number of open accounts, number of issued cards, financial products and else. This approach is rarely used because of lack of data. Accordingly, we chose second one, the intermediation approach. In this approach the bank is treated as an intermediary between depositors and borrowers. Here is possible to conduct two types of analyses: input-oriented and output-oriented analysis. In the first one, we examine how much it is possible to reduce the amount of input used without reduction in level of output. In the second one we examine the possibility of increasing of the level of output using the given level of inputs. In our research, we decide to use the input-oriented analysis.

The DEA is linear programming technique where each bank is compared with similar efficient banks/bank. So, the model identifies the efficient referent bank/banks for each individual bank and then it estimates the level of efficiency of each bank by comparing of their performance with the bank that is best-practice one or best benchmark for that bank. According to this, the reference banks create the efficiency frontier. So, one bank is inefficient if it is above/below the efficiency frontier. In this research we treated all banks in model as one group with Islamic bank included, because all banks in B-H are treated as conventional banks, and for supervisory and regulatory bodies in B-H there is any differences.

The presented results for the efficiency in this research are: technical efficiency, scale efficiency, cost efficiency and allocative efficiency (according to Coelli, 1996).

From technical efficiency we are getting information about management and their ability to organize activities in their bank and also to find the best way to transform inputs into outputs. Full technically efficient bank makes the maximum amount of outputs from given level of

resources. If the technical efficiency analysis is made assuming the constant return to scale (CRS), this kind of efficiency is considered as "pure technical efficiency" (PTE). In the case of CRS we are starting with assumption of optimal level of its capacities. On the other side, if the bank is below or above the optimum level, then we are starting with assumption of variable return to scale (VRS) (Banker et al., 1984). According to this, in DEA analysis pure technical efficiency will be decomposed into Overall Technical Efficiency (OTE) and the Scale Efficiency (SE = OTE / PTE). By the OTE we are getting information about efficiency of configuration of inputs/outputs, but also about quality of setting of capacities of the operations that bank realizes. The SE provides information about managerial ability in deciding about optimal amount of resources used, or activities that will result with efficient banking operations. If we conduct analysis with VRS assumption, there are two possible results: decreasing returns to scale (DRS) or increasing return to scale (IRS). If the bank is in the "IRS", it means that the bank has some unused capacities and that management can increase bank efficiency by increasing the activity level and vice versa for the "DRS". If we have information about input prices by DEA we can estimate and Cost efficiency (CE). Therefore, we have cost efficient bank if it has minimum costs of inputs for a given level of output. Finally, by the Allocative efficiency (AE) we measure how bank allocates its resources to realize the level and mix of outputs that maximize revenue (Leibenstein, 1966).

As we mentioned earlier, in this research we have used the input-oriented approach with different returns to scale which Coelli (1996) presented as a mathematical problem, computing the ratio of all outputs and all inputs such as $u´y_i/v´x_i$ (1).

In the relation (1) y_i and x_i are output and inputs respectively, while the symbol „u" is the Mx1 vector of output weights, and „v" is Mx1 vector of input weights. According to (Coelli, 1996), mathematical formulation of the model for the constant return to scale is:

$$\max_{u,v} (u´y_i/v´x_i),$$
$$u´y_j/v´x_j \leq 1, \quad j = 1, 2, \ldots, N$$
$$u, v \geq 0.$$

In this formulation there is a problem of possibility for unlimited number of solutions, so it is necessary to impose a constraint $v´x_i = 1$, and then the model gets the following form (Coelli, T.A., 1996):

$$\max_{\mu,v} (\mu´y_i),$$
$$v´x_i = 1,$$
$$\mu´y_j - v´x_j \leq 0, \quad j= 1,2,3, \ldots, N$$
$$\mu, v \geq 0.$$

By this form it is possible to give the final formulation of the model (Coelli, T.A., 1996):

$$\min_{\theta,\lambda} \theta,$$
$$-y_i + Y\lambda \geq 0$$
$$\theta x_i - X\lambda \geq 0$$
$$\lambda \geq 0$$

Where „θ" is scalar of the efficiency scores that satisfies the condition $\theta \leq 1$. If it is equal to 1, it indicates full technical efficiency. The "λ" is a Nx1 vector of constants. But, for the variable return to scale it is necessary to introduce the convexity constraint $N1'\lambda = 1$ as follows (Coelli, T.A., 1996):

$$\min_{\theta,\lambda} \theta,$$
$$-y_i + Y\lambda \geq 0$$
$$\theta x_i - X\lambda \geq 0$$
$$N1'\lambda = 1$$
$$\lambda \geq 0,$$

N1 being a vector of Nx1 of ones. For the scores of allocative and cost efficiency, it is necessary to conduct the cost DEA (Coelli, T.A., 1996):

$$\min_{\lambda, xi^*} w_i' x_i^*,$$
$$-y_i + Y\lambda \geq 0$$
$$x_i^* - X\lambda \geq 0$$
$$N1'\lambda = 1$$
$$\lambda \geq 0$$

Where „wi " is a vector of input prices for the i-th DMU, and „xi*" is a cost-minimizing vector of input quantities. Accordingly, cost efficiency is represented with relation: CE = wi´xi*/ wi´xi. Finaly, Allocative efficiency is AE=CE/TE.

The most important issue in the process of analyzing of efficiency by DEA is selection of variables. First of all, it depends on the approach used. According to the fact that we have used intermediation approach, we decided to select the variables and input prices as it is given in Table 1.

Table 1: Selected variables for the DEA analysis of efficiency of the conventional and Islamic banks in B-H

Character of variable	Variables	Input costs
Input	Total deposits	Total interest Costs
	Fixed assets	Costs of business premises, other fixed assets and utilities
	Employees	Costs of salaries and benefits
Output	Net loans	-
	Other earning assets	

Source: construction of author

Our model is made of three inputs and two outputs variables. Input variables are total deposits, fixed assets and employees. Total bank deposits in B-H include categories of interest and non-interest current, savings and term deposits. Fixed assets includes premises and other fixed assets that the bank has and category of employees are input with which bank made all its intermediation activities and is presented as a number of full-time employees in each bank. In the model, outputs are net loans and other earning assets. The net loans means loans and other investments of the bank reduced for reserves for potential credit losses. Another output "other earning assets", for B-H banks we chose the investments in unconsolidated associated companies, interest-bearing deposit accounts and other assets.

For the cost efficiency analysis, we need and inputs prices. Respecting the form of B-H income statements, we have chosen following input costs: for employees - the costs of salaries and benefits; for deposits - total interest costs, and for fixed assets - cost of business premises, other fixed assets and utilities.

5. Efficiency – Empirical Results

The results of DEA efficiency analysis for all analyzed banks individually are given in the Appendix 1. We found in our sample that efficiency of banks is strongly asymmetrical, and the lowest technical efficient bank is on the level of 0,553. In the following table we have presented average results obtained by the DEA analysis for conventional and Islamic bank in B-H.

Table 2: Average scores of efficiency on the basis of all indicators for Islamic and conventional banks in B-H

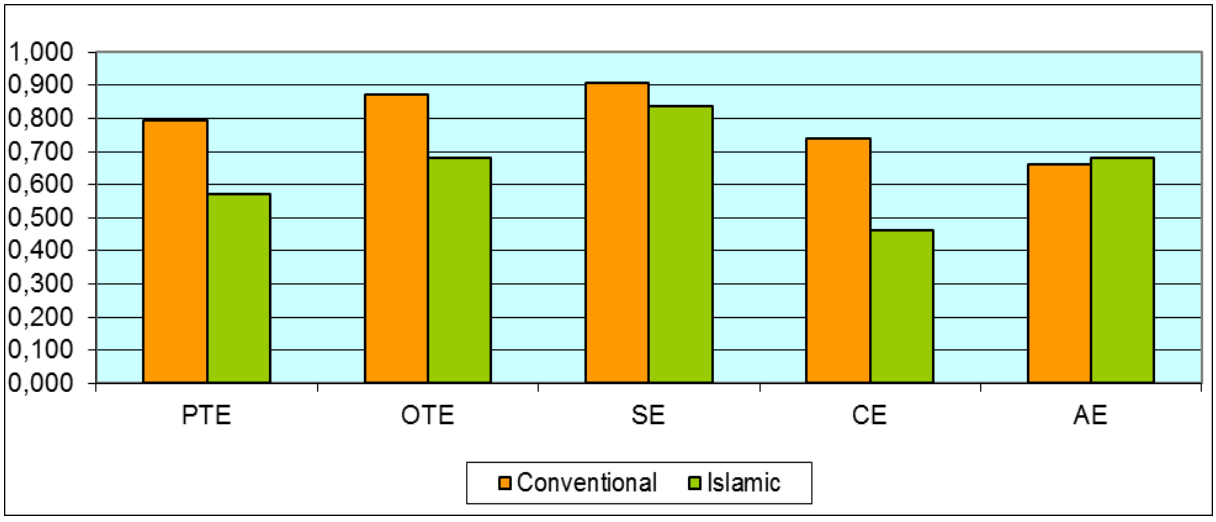
Type of Bank	PTE	OTE	SE	CE	AE
Conventional	0,793	0,874	0,910	0,741	0,662
Islamic	0,571	0,683	0,837	0,464	0,680
All together	0,782	0,864	0,906	0,738	0,652

Source: Calculation of author

From the Table above we can see that Islamic bank have pretty low efficiency according to all indicators. The lowest efficiency is cost one (CE = 0,46), what means that Islamic bank has higher costs related the best practice bank in sector, and there is potential for 54% of savings. Also, it is technically very inefficient, with PTE 0,57 and OTE 0,68 what means that they could increase their efficiency for more than 30% with different managerial and technological solutions. If we look at all banks average efficiency, it is lower than sample made without Islamic bank, what means that Islamic bank has negative effect on efficiency of banking sector in B-H.

If we compare Islamic bank with other banks in the sector, we can see that there is a pretty big gap in efficiency of these two kinds of banks. This could be seen from graphical presentation of the analysis given below:

Figure 1: Average scores of efficiency on the basis of all indicators for Islamic and conventional banks in B-H



Source: previous table

Even all banks in the sector are pretty inefficient, Islamic bank is below their average. Especially huge gap is in the pure technical efficiency what means that Islamic bank has some problems in managing of their business and setting of their products.

But according to the study of efficiency of banks in B-H conducted by Efendic and Avdic (2010), there are some differences in banks efficiency in B-H depend of banks size and ownership structure. In this analysis, Efendic and Avdic (2010) classified B-H banks into the three classes according to assets size: above half of billion EUR, up to half of billion EUR and up to quarter of billion EUR. They also classified analyzed banks into three classes according to ownerships structure of banks equity: Foreign owned banks, mixed ownership and domestic owned & state banks. According to these classifications, Efendic and Avdic (2010) found that there are significant differences in efficiency between foreign and domestic banks and between smaller and big banks. Accordingly, foreign banks are more efficient than domestic and banks with mix ownership, and biggest banks are most efficient in B-H.

Following this research, we compared Islamic bank within the classes from Efendic and Avdic (2010) research that it belongs to. According to this, in the Table below there are presented data with average efficiency of banks up to quarter of billion EUR of assets size (without Islamic bank), and Islamic bank which asset size is also less than quarter of billion EUR.

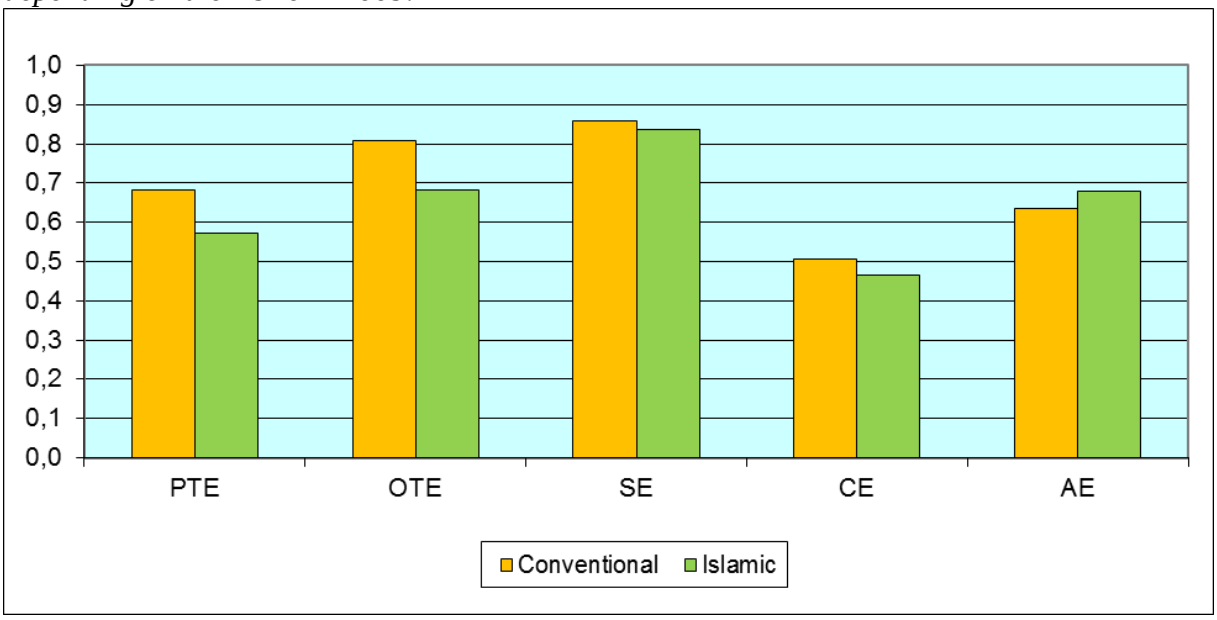
Table 3: The average efficiency levels of Conventional banks up to quarter of billion EUR asset size and Islamic bank

Type of Bank	PTE	OTE	SE	CE	AE
Conventional (up to quarter of billion EUR)	0,682	0,809	0,857	0,507	0,634
Islamic bank (up to quarter of billion EUR)	0,571	0,683	0,837	0,464	0,680
All together (up to quarter of billion EUR)	0,672	0,798	0,855	0,507	0,634

Source: Calculation of author

The analysis of bank efficiency in B-H has shown that the larger banks are more efficient than the smaller ones, namely the larger the bank, the greater the efficiency. The analysis conducted by Efendic and Avdic (2010) has also showed that the category of large banks with assets over half of a billion EUR (the large banks – 72% market share measured by assets) operate on optimal level and they have constant return to scale, so they fully use the benefits of economies of scales. The positive relation between growth and size of banks, mergers and acquisitions and efficiency were found also by Weiguo X., Ming L., (2008) in their analysis of influence of M&A on efficiency of banks in China and the USA. The results of the efficiency analysis for the second group of banks up to quarter of billion EUR show much lower efficiency compared to the first category for all the indicators obtained. But, as we can see from previous table, Islamic bank is even below this group average. In this group, the gap in efficiency is much smaller what can be seen from graphic representation shown on the Figure 2.

Figure 2: Graphical presentation of average levels of efficiency by the groups of banks depending on their size in 2009.



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hus, as can be seen on the Figure 2, the efficiency of Islamic banks is smaller than their conventional counterparts with pretty same level of asset size. Accordingly, the banks up to the quarter of a billion EUR (small banks - 13% market share in assets), have lowest levels of efficiency in B-H, but Islamic bank is even above their average. They have especially low allocative efficiency on 0.507, which means that the costs in this group of banks can be halved, with no changing in the level of output. Technical efficiency score is 0.68, whereas their scale efficiency is 0.83. Again, if we look at all banks together for this class, their average efficiency is lower than sample made without Islamic bank, what means that Islamic bank has negative effect on efficiency of banking sector in B-H.

One of the very important determinants of bank efficiency is the ownership structure of bank. As in many other studies, our sample of banks is grouped according to this criterion, so we have analyzed the efficiency of foreign-owned banks (foreign banks - 92.2% market share in total assets), the mixed, domestic and foreign (mixed banks - 4,2% market share in assets) and domestic private or domestic-state owned (the domestic banks - 3.6% market share in assets). Islamic banks is foreign owned, so we compare it within this group to. The average efficiency levels for this group of banks are given in Table 5:

Table 4: Average efficiency levels by the groups of banks depending on the structure of ownership in 2009.

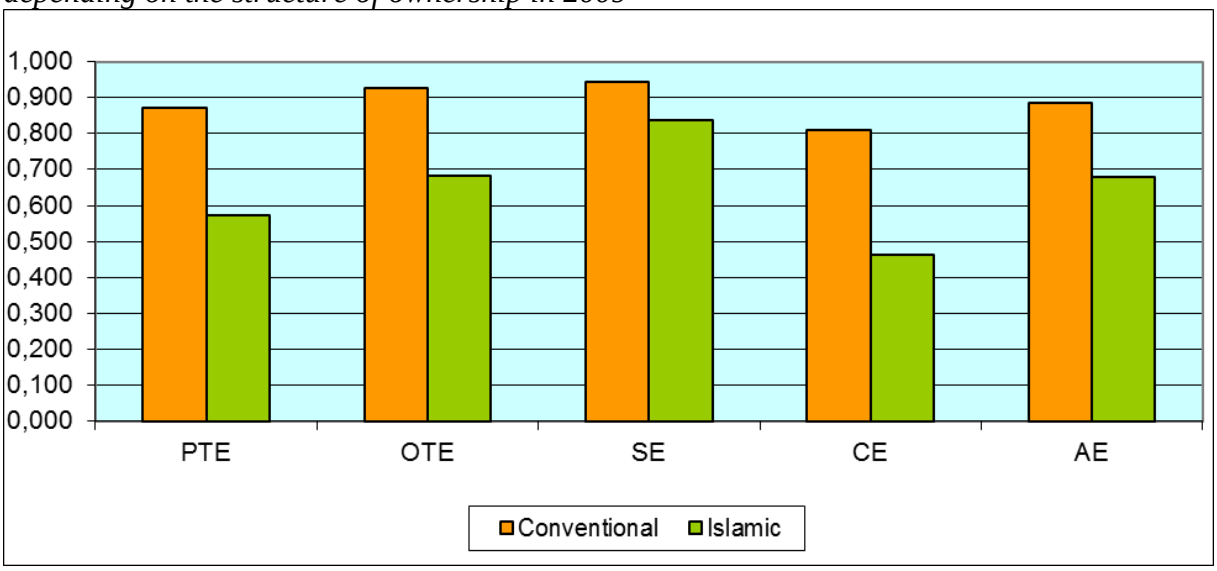
Type of Bank	PTE	OTE	SE	CE	AE
Conventional (foreign owned)	0,871	0,926	0,943	0,810	0,883
Islamic bank (foreign owned)	0,571	0,683	0,837	0,464	0,680
All together (foreign owned)	0,843	0,903	0,933	0,810	0,883

Source: Calculation of author

From the Efendic and Avdic (2010) results of the banks efficiency in B-H for the groups of banks by ownership structure, we can see that the foreign-owned banks are more scale and cost-efficient than the domestic and mixed ones. However, in accordance with these results, in

our analysis foreign banks are not fully efficient in controlling of their costs, so there is a 20% potential for cost reduction. Technical efficiency of the foreign banks is at the level of 0.9, while the scale efficiency is at the level of 0.94. Such high level of efficiency of foreign banks affects the efficiency growth of the entire banking system in B-H. Although some studies of efficiency in other countries have shown that the entry of foreign banks has no effect on the efficiency growth, as it was the case with Uzbekistan (Nigmanov, 2010). On the other hand, Bonin et al. (2005) have found that foreign banks are more efficient than domestic ones in transition countries, as concluded by Jemric and Vujcic (2002) in their study conducted for Croatia. Also, Fries and Taci (2005) found in their study for the transition countries, that the banks with major foreign ownership are the most efficient ones, mainly due to better managerial skills, knowledge in risk management, and occasionally less expensive resources. But in this group, Islamic bank is on much lower level of efficiency what means that there were not be "know how" transfers or less expensive resources support by parents banks. Comparison of Islamic bank and conventional foreign banks in B-H is presented on next figure:

Figure 3: Graphical presentation of average levels of efficiency by the groups of banks depending on the structure of ownership in 2009



Source: previous table

As we can see from Figure 2, in this class Islamic bank has much lower efficiency according to all indicators. It has lower level of cost efficiency compared with their conventional foreign owned counterparts.

Based on the results of DEA analysis, we can conclude that in the foreign owned sample of banks in B-H there is pretty high level of efficiency. However, Islamic bank has a pretty high competition in this group, but also we can conclude that Islamic bank has negative effect on average efficiency of this group of banks in B-H.

6. Conclusion

Based on the previous analysis of bank efficiency in B-H using the DEA methodology on a sample of 19 banks in Federation B-H in 2009, it is possible to conclude that the analyzed banks are inefficient as suggested by all obtained efficiency indicators. This analysis also

shows a huge asymmetry in results for the individual banks, so the most inefficient banks, according to some indicators of efficiency, are on the very low levels of efficiency.

According to results from DEA, Islamic bank has pretty low efficiency according to all indicators. Also, efficiency of Islamic bank is lower than their conventional counterparts with pretty same level of asset size. Also, in comparison with conventional foreign owned counterparts, Islamic bank has lower level of cost efficiency compared with the possibility of saving as much as 50%. So, if we look at all banks together, their average efficiency is lower than sample made without Islamic bank, what means that Islamic bank has negative effect on average efficiency of banking sector in B-H.

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Annex 1.

Table 5: Banks covered by the analysis

Bank	Dominated ownership	Assets size in EUR	Market share in assets %
BBI bank	Foreign	Up to quarter of billion	1,6
BOR bank	Domestic - state	Up to quarter of billion	0,8
FIMA bank	Mixed	Up to quarter of billion	0,8
Hipo-Alpe-Adria bank	Foreign	Above half billion	14,6
Intesa San Paolo bank	Foreign	Above half billion	7,6
IK bank Zenica	Mixed	Up to quarter of billion	1,1
KIB bank VK	Domestic	Up to quarter of billion	0,4
NLB -Tuzlanska bank	Foreign	Up to half billion	5,5
Postbank BH	Foreign	Up to quarter of billion	0,4
Privredna banka dd Sarajevo	Mixed	Up to quarter of billion	1,0
ProCredit bank	Foreign	Up to quarter of billion	2,2
Raiffeisen bank dd	Foreign	Above half billion	27,4
Razvojna banka FB&H	Domestic - state	Up to quarter of billion	1,5
Sparkasse	Foreign	Up to half billion	4,3
Turkish Ziraat Bank Bosnia	Foreign	Up to quarter of billion	1,0
UniCredit Bank	Foreign	Above half billion	22,5
Union bank dd Sarajevo	Domestic - state	Up to quarter of billion	1,0
Vakufska banka dd Sarajevo	Mixed	Up to quarter of billion	1,3
Volksbank BH	Foreign	Up to half billion	5,2

Annex 2.

Table 6: The results of efficiency of individually banks using DEA model

BANK	PTE	OTE	SE	CE	AE	RETURN
1	1,000	1,000	1,000	1,000	1,000	
2	1,000	1,000	1,000	1,000	1,000	
3	1,000	1,000	1,000	1,000	1,000	
4	0,979	1,000	0,979	0,982	0,982	**drs**
5	0,809	0,831	0,974	0,579	0,697	**drs**
6	1,000	1,000	1,000	1,000	1,000	
7	0,994	1,000	0,994	0,737	0,737	**drs**
8	0,571	0,683	0,837	0,464	0,680	**irs**
9	0,666	0,669	0,996	0,601	0,898	**irs**
10	0,707	0,756	0,936	0,548	0,724	**irs**
11	0,571	0,619	0,922	0,551	0,890	**irs**
12	0,551	1,000	0,551	1,000	1,000	**irs**
13	1,000	1,000	1,000	0,170	0,170	
14	0,422	0,718	0,587	0,405	0,563	**irs**
15	0,844	0,873	0,966	0,680	0,779	**drs**
16	0,486	1,000	0,486	0,390	0,390	**irs**
17	0,704	0,710	0,991	0,245	0,345	**drs**
18	0,548	0,553	0,991	0,165	0,299	**drs**
19	1,000	1,000	1,000	0,870	0,870	

Annex 3.

Table 7: Quantities of inputs that will lead to the minimization of costs for individual banks (EUR)

	Optimal amount of inputs			Actual amount of inputs			Surplus/Shortage		
Bank	**Input 1**	**Input 2**	**Input 3**	**Input 1**	**Input 2**	**Input 3**	**Input 1**	**Input 2**	**Input 3**
1.	1392645,6	73185,8	1.669	1392645,6	73185,8	1.669	0,0	0,0	0
2.	1342714,9	47422,3	1.389	1342714,9	47422,3	1.389	0,0	0,0	0
3.	962169,0	33534,1	600	962169,0	33534,1	600	0,0	0,0	0
4.	489594,2	12095,1	440	395441,3	12314,5	514	94152,9	-219,3	-74
5.	371937,7	6894,3	373	337461,8	11908,0	473	34475,9	-5013,7	-100
6.	334644,1	5337,4	334	334644,1	5337,4	334	0,0	0,0	0
7.	306581,9	4973,8	314	223688,2	6753,1	426	82893,7	-1779,3	-112
8.	109841,9	2426,1	172	122799,5	4532,1	662	-12957,7	-2106,0	-490
9.	132733,4	2722,6	189	96787,6	5225,4	185	35945,9	-2502,8	4
10.	83517,0	2085,0	154	37255,8	2656,2	122	46261,2	-571,1	32
11.	92585,2	2202,6	160	68635,8	4000,3	212	23949,4	-1797,7	-52
12.	24297,1	1318,1	111	60196,4	3796,9	174	-35899,3	-2478,7	-63
13.	48220,4	1628,0	128	57870,6	13027,7	195	-9650,1	-11399,8	-67
14.	44243,6	1576,3	125	42140,7	3808,1	152	2102,9	-2231,8	-27
15.	121855,2	2581,5	181	49347,3	9154,7	175	72507,8	-6573,2	6
16.	30898,4	1403,5	116	47337,4	3897,1	133	-16439,1	-2493,6	-17
17.	95948,5	2246,1	162	14067,2	9599,0	51	81881,3	-7352,9	111
18.	88961,2	2155,6	157	24297,1	1318,1	111	64664,1	837,5	46
19.	100950,0	2311,0	166	15271,3	3603,6	68	85678,7	-1292,5	98