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The Performance of the Use of Modern Methods of Financing and its Impact on Banks' Capital Adequacy Ratio

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A B S T R A C T

Due to the variable nature of the banking system space in recent years, many researchers have studied the performance of these systems as well as the impact of new financial performances on them. Increasingly competitive market of financial institutions and banks, prompted investors and managers of these units to pay special attention to improving the performance of their systems especially the cases related to financing methods of the institution. In this regard, some banks use modern methods of financing. The purpose of this study was to investigate the performance of the use of modern methods of financing and its impact on the banks' capital adequacy ratio. The statistical population of the study is all branches of Eghtesad Novin Bank in Iran, which are over 270 branches throughout Iran. Due to data envelopment analysis selection in this study as a research method, the sample was consistent with the population. Due to the integrated banking system of EghtesadNovin Bank, all banking operations are concentrated in the central core of the bank and the branches have no independent financial statements. Therefore, the required data for the present study have been computed and extracted from the headquarters of EghtesadNovin Bank. The results of this study showed that technical efficiency in the state of BCC (VRS) situations of issuing in the modes of I and E and in the state of CCR (CRS) situations of issuing in the modes of E, D, and J is below average, so it is ineffective.

Keywords: Financing Modern Methods, Capital Adequacy Ratio, The Bank Of Eghtesad Novin.

INTRODUCTION

Capital is considered the inseparable part of financial formation, development and health of active institutions in the business and financial sector (Armstrong, Guay, Mehran, & Weber, 2015; Jizi, Salama, Dixon, & Stratling, 2014; Laudon & Laudon, 2016). But its function is different between financial and nonfinancial institutions. Active companies in the manufacturing and services industries often need capital to invest in fixed assets, purchase and construction of the facilities and equipment, to facilitate the process of production and providing services, while in the

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financial and credit institutions finances, investment main focus is on other things(Jizi et al., 2014; Samad, 2004).

In other words, the main function of capital in the banks and financial institutions is to cover unexpected losses due to credit, operational and market risks. Appropriate and sufficient financing is one of the basic and essential conditions for maintaining the health of the banking system and each of the banks and credit institutions to ensure the stability and sustainability of their operations should always keep an appropriate proportion between capital and risk in their assets(Salas & Saurina, 2002; Saunders & Allen, 2010). The main functionality of this proportion is protecting banks against all financial and non- financial banking risks, unexpected losses and protecting depositors and creditors (Hassan Al-Tamimi & Mohammed Al-Mazrooei, 2007; Njanike, 2009; Raeisi, Haghighat, & Shirazi, 2016).

In fact, banks' capital adequacy management is designing strategy management appropriate for investment in different assets due to financial institution liabilities and output streams associated with it through funds available to financial institutions. Iran's banking system (due to legal requirements) based on the deposit -taking and lending facilities is based on Islamic contracts. As a glimpse of Iranian banks' balance sheets, it is quite evident and over 80 % of the volume of bank assets and liabilities are comprised of these items(Khodamoradi, Safari, & Rahimi, 2014).

With the development of private banking in recent years, and privatization of some state banks, a new situation has arisen which makes it mandatory for banks to have practical guidelines to learn about the performance of their new projects and processes(Bazbauers, 2017; Mohieldin & Nasr, 2007).

In this study, the researcher intends to analyze the data and evaluate the efficiency changes of EghtesadNovin Bank before and after implementation of the new financing process based on the both methods of minimization of the factors of fixed and variable production and return in scale. In this study, using data envelopment analysis, which is one of the most practical methods to measure productivity and efficiency, the impact performance of applying innovative financing tools in EghtesadNovin Bank was evaluated, based on which through exact measuring of fluctuations and possible changes in key indicators of credit institutions performance measurement (e.g. capital adequacy) an appropriate ground is provided to create decision making space for the bank's senior executives.

METHODOLOGY

The necessitation for using any new financial instruments is studying and being completely aware of the impact of their application in business and financial activities of financial institutions. One of the most appropriate study patterns in this field is to investigate the impact of these tools on increasing the efficiency and productivity of enterprises. Increasing productivity requires knowledge and this important factor requires measurement. Measurement:

(1) Leads to the provision of identification of influencing factors in improving productivity,
(2) Helps determining priorities and decision makings
(3) Help the management in comprehensive and effective understanding of problematic areas (especially new financial instruments)
(4) Provides valuable information to assess the effect of changes and resources guidance for managers.

Therefore, in this part of the study various aspects of DEA method, which is one of the most practical ways to measure efficiency and productivity of new activities in the organization, are examined and EghtesadNovin Bank has been selected as research sample.

The statistical population of the study is all branches of EghtesadNovin Bank in Iran, which are over 270 branches throughout Iran. Due to the integrated banking system of EghtesadNovin Bank, all banking operations are concentrated in the central core of the bank and the branches have no independent financial statements. Therefore, the required data for the present study have been computed and extracted from the headquarters of EghtesadNovin Bank.

The sample: due to data envelopment analysis selection in this study as a research method, the sample was consistent with the population.

MODEL IMPLEMENTATION PROCESS

1. Solving the model using granted facilities data with house collateral that can be change to Sukuk (Islamic bonds) (which were previously discussed).
2. Then, according to the results of solving the CCR model and BCC model, the measure efficiency is calculate based on which a comparison between the status of bank before financing using the Sukuk tools and after that is done.
3. Solving model of returns to non-additive scale (NIRS), to determine increasing or decreasing returns to scale.
4. Ranking of simulation operation using AP model (Anderson - Peterson Model) the results of which are given in Table 3.

Determining the volume of bank granted facilities that have usability for issuing Sukuk.

To estimate the expected amount and size of the document that EghtesadNovin Bank can sell in the market, according to the action plan of the Central Bank, banks (Appendix 1) are only allowed to transfer that part of their assets that have the following conditions:

1. Assets are the only granted facilities in front of mortgage house collateral;
2. Assets are only resulted from installment sales granted facilities and lease acquisition condition;
3. Having minimum of two years history, and also five years maturity to the contract expiration in the divesting time.
4. Payment may not be deferred.
5. Determining the volume of homogeneous mortgage receivables convertible to securities

The granted facilities of EghtesadNovin Bank

RESULT

Table 1. The comparison of the performance of issuing states in EghtesadNovin Bank with the help of CCR model, with output nature

Row	Situation Code	CCR model with output nature
		Bank Efficiency Amount
1	F	0.896
2	D	0.789
3	E	0.859
4	G	0.986
5	I	1
6	J	0.784
Efficiency Average		0.885

According to the above table results situations of issuing in the modes of D and J has below-average efficiency i.e. less than 0.885, so the efficiency of D and J sates are specified inefficiently.

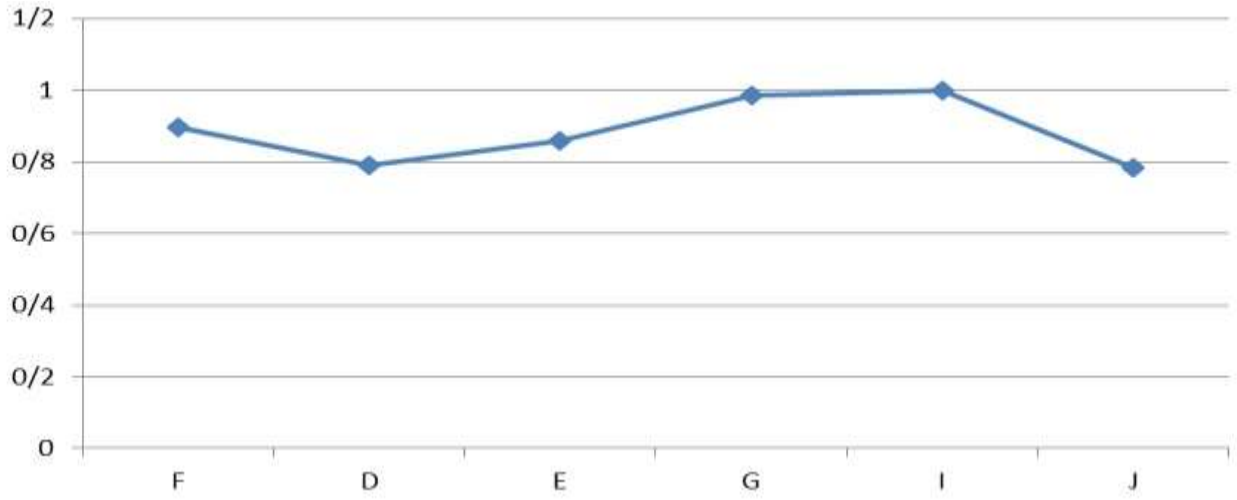
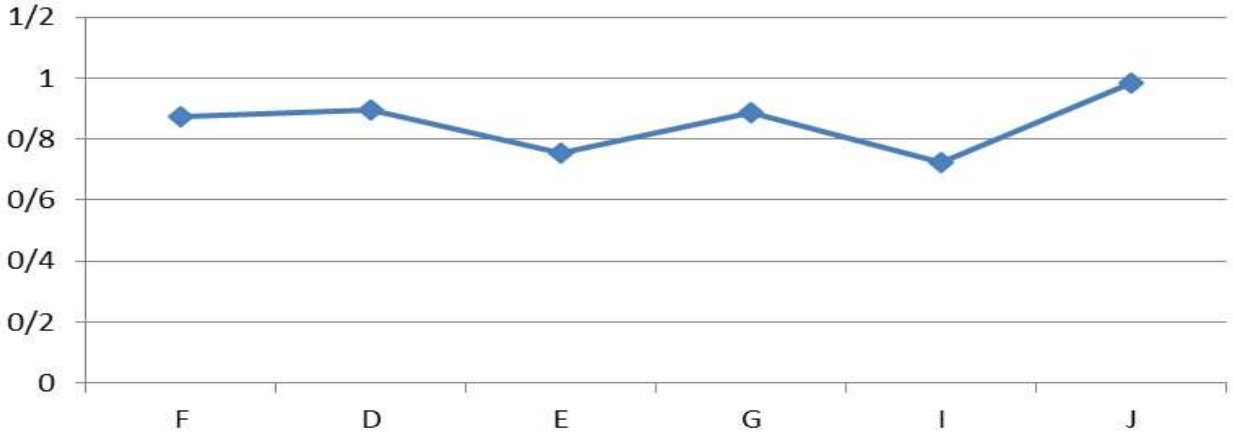


Figure1. The Comparison of the issuing situations efficacy in Eghtesad Novin Bank associated whit CCR model with output nature

Table 2. The comparison of the efficacy of EghtesadNovin Bank of BCC model with output nature

Row	Branch Code	BCC model with output nature
		Bank Efficiency Amount
1	F	0.875
2	D	0.895
3	E	0.754
4	G	0.885
5	I	0.724
6	G	0.986
Efficiency Average		0.853

According to the above table results situations of issuing in the modes of I and E has below-average efficiency i.e. less than 0.853, so the efficiency of I and E sates are specified inefficiently.



Figural 2. The Comparison of the issuing situations efficacy in Eghtesad Novin Bank associated whit AP model with output nature

Table 3. Ranking of EghtesadNovin Bank mortgages issuing state by AP model

Row	Situation Code	Ap model with output nature	
		Branch Efficiency Amount	Ranking
1	F	0.758	3
2	D	0.723	5
3	E	0.653	6
4	G	0.894	2
5	I	0.952	1
6	J	0.741	4

Table 4. Capital adequacy of EghtesadNovin Bank on the balance sheets date

Date Components	03.20.2016	03.20.2016
Base Capital	10.976.266	8.382.501
Risk-weighted assets	91.990.001	83.780.815
Capital adequacy ratio	%11.93	%10.01

The estimation of volume of transferable assets by issuing Sukuk

Given the above data and complementary information received from the credit management of Eghtesad Novin Bank, the volume of granted facilities of leasing acquisition condition as well as bank installment sales which have the ability to be transferred in accordance with the directives of the central bank have described in the following tables:

Table 5. Estimation of transferable assets in EghtesadNovin Bank on the balance sheets date

Date Asset	03.20.2016 Million Rials	03.20.2015 Million Rials
Total Assets	136.310.829	111.745.299
granted facilities	105.184.114	83.953.949
granted facilities of leasing acquisition condition and installment sales	6.942.040	5.294.529

Table 6. Details of granted facilities of leasing acquisition condition and installment sales

granted facilities of leasing acquisition condition and installment sales	03.20.2016 Million Rials	03.20.2015 Million Rials
Sum	6,942,040	5,294,529
Having collateral property	4,352,125	3,994,658
Facilities that at least two years past from its due date and have 5 years to the deadline	3,859,635	3,004,236
No deferred payment facilities	2,995,638	2,223,639
Transferrable Volume	2,995,638	2,223,639

As can be seen EghtesadNovin Bank has around 3 trillion Rials transferable assets for use in financial modern tools.

Simulation of assumptive Sukuk issuance impact on bank capital adequacy

According to the above statistics the estimated capital adequacy ratio of bank, regard to the volume of issuing, can be simulated and calculated in the form of below table:

Table 7. Capital adequacy of EghtesadNovin Bank with estimation of mortgage issuing

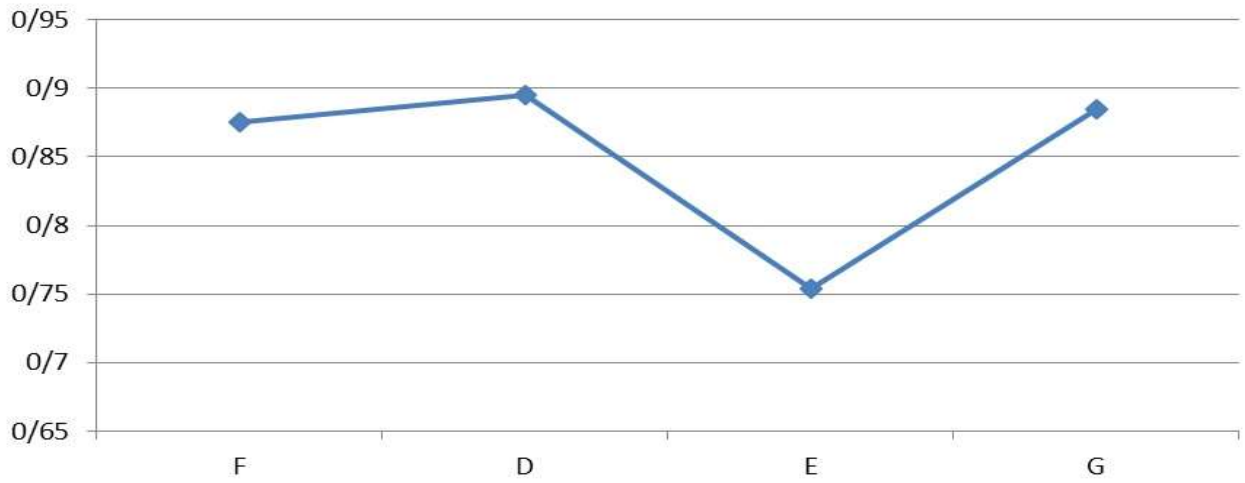
Symbol in Efficiency Tables	Issuing Amount	Risk-weighted assets		Capital adequacy ratio	
		03.20.2016 Million Rials	03.20.2015 Million Rials	03.20.2016 (Percentage)	03.20.2015 (Percentage)
J	500,000	89,956,268	83,256,635	11.98	10.05
B	1,000,000	88,658,563	82,256,896	12.02	10.06
L	1,500,000	87,458,635	81,526,987	12.12	11.01
M	2,000,000	86,365,365	80,365,345	12.14	11.12
C	2,500,000	85,635,325	79,658,635	12.35	11.35
X	3,000,000	84,875,635	78,598,635	12.04	11.20

According to the results obtained from the following tables, it has been indicated that using Sukuk for financing and converting installment sale facilities to securities and selling them lead to the improvement of capital adequacy ratio of EghtesadNovin Bank. This is specified in the marked modes in efficiency related to scale and surpluses and deficits tables in the BCC and CCR models.

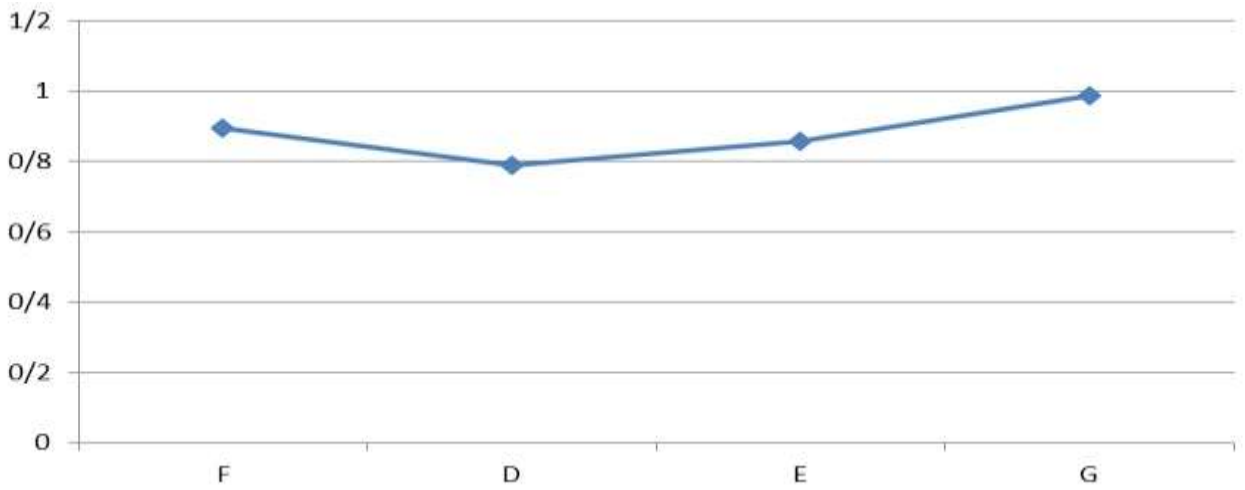
Table 8. Scale efficiency estimation and its Kind

Row	Situation Code	Technical efficiency amount in state	Scale Efficiency	Kind	Row
	F	0.896	0.875	0.758	Fixed
1	D	0.789	0.895	0.723	Fixed
2	E	0.859	0.754	0.653	Fixed
3	G	0.986	0.885	0.894	Fixed
4	I	1	0.724	0.952	Fixed
5	J	0.784	0.986	0.741	Increased
Average	0.885	0.853	0.786	-	Average

The technical efficiency in BCC (VRS) state of issuing situations to E and I modes, and in CCR (CRS) state of issuing situations to E and D, and J modes is below average, so they are ineffective. In the investigations of the kind of efficiencies related to scale in all issuing situations, the situation was fixed, and just in J mode it was increased.



Figural 3. Technical efficiency amount in BCC (VRS) state



Figural 4. Technical efficiency amount in CCR (CRS) state

Inputs:
SO1: Risk-weighted assets
SO2: Base Capital
SO3: Principal Capital
SO4: Complementary Capital
Outputs:
Si1: Capital adequacy ratio
Si2: Ratio of cash assets to cash debt
Si3: Ratio of granted facilities to deposits

Table 9. Surplus and deficiency variables (CCR envelopment model with output nature)

S_{o4}	S_{o3}	S_{o2}	S_{o1}	S_{i3}	S_{i2}	S_{i1}	Eff.	DMU
0.277	0	0.0301	0	0.0545	0	0.1	0.1599	F
0.2917	0	0.0269	0	0.9686	0	0	0.1549	D
0.1048	0.0339	0	0.1467	0	0.0768	0.1351	0.5103	E
0.0288	0	0	0.0484	0	0.0101	0.1736	0.6037	G
0.1063	0.0526	0	0.1659	0	0.088	0.1096	0.5616	I
0.3914	0	0.0353	0	0	0	0.1366	0.4516	J

Table 10. Surplus and deficiency variables (BCC envelopment model with output nature)

S_{o4}	S_{o3}	S_{o2}	S_{o1}	S_{i3}	S_{i2}	S_{i1}	Eff.	DMU
0	0	0	0	0	0	0	1	F
0.4449	0	0.0205	0	0.0107	0	0.1518	0.4583	D
0	0	0	0	0	0	0	1	E
0.1987	0.1017	0	0.1464	0	0	0.0064	0.3567	G
0	0	0	0	0	0	0	1	I
0.0253	0.047	0	0	0.0175	0	0.2455	0.4284	J

Table 11. The weight of the input and output variables (CCR multiple model with output nature)

DMU	**Eff.**	V_{i1}	V_{i2}	V_{i3}	U_{o1}	U_{o2}	U_{o3}	U_{o4}
F	1	ε	0.068	1.30E +01	0.222	ε	0.8984	ε
D	1	ε	1.3889	ε	ε	1.0727	ε	ε
E	1	3.0704	ε	ε	ε	ε	1.9404	ε
G	1	ε	ε	1.70E +01	0.0286	ε	ε	0.9925
I	1	ε	1.1364	ε	1	ε	ε	ε
J	0.4284	ε	1.70E +01	ε	1.2778	1.30E +01	ε	1.8256

Table 12. The weight of the input and output variables (multiple BCC model with output nature)

DMU	**Eff.**	V_{i1}	V_{i2}	V_{i3}	U_{o1}	U_{o2}	U_{o3}	U_{o4}	U_O
F	1	ε	ε	ε	ε	ε	0.3767	0.9049	1
D	1	ε	0.4579	ε	ε	0.7574	0.4573	ε	0.6703
E	1	2.8486	0.1083	ε	ε	ε	1.9404	ε	0.006
G	1	0.8255	0.2278	ε	ε	ε	0.5837	0.8526	0.3913
I	1	0.8653	0.2387	ε	ε	ε	0.6118	0.8937	0.4101
J	0.4284	ε	3.70E +01	ε	1.60 E+01	6.3018	ε	ε	1.00E +01

CONCLUSION

Due to the variable nature of the banking system space in recent years, many researchers have studied the performance of these systems as well as the impact of new financial performances on them (Njanike, 2009; Paradi & Zhu, 2013; Platonova, Asutay, Dixon, & Mohammad, 2016; Samad, 2004). Increasingly competitive market of financial institutions and banks, prompted investors and managers of these units to pay special attention to improving the performance of

their systems especially the cases related to financing methods of the institution. Certainly, the first step in this direction is designing efficiency measurement system of these units based on the new processes. Capital is considered the inseparable part of financial formation, development and health of active institutions in the business and financial sector. But its function is different between financial and nonfinancial institutions. Active companies in the manufacturing and services industries often need capital to invest in fixed assets, purchase and construction of the facilities and equipment, to facilitate the process of production and providing services, while in the financial and credit institutions finances, investment main focus is on other things.

In this research, in which the sample is EghtesadNovin Bank, the researcher has studied the issue the impact of the use of financing new methods instead of customary traditional methods (based on making deposits and creating facilities) in banking system, such as issuing Sukuk bonds on capital adequacy of the banks. In this regard the capital adequacy ratio after issuing Sukuk is calculated and after analyzing the data and evaluating efficiency and productivity using CCR and BCC models of DEA, it is determined that the use of issuing Sukuk effects on the improvement of the bank capital ratio situation and holds the bank more readily in covering the related losses.

Securitization is the process in which first the assets of the asset owner institute or the founder is separated from the balance sheet of the institute, then the provision of the funds are accomplished by investors who have bought tradable financial instrument. This traded instrument represents the aforesaid debt. In other words, converting into securities is the process in which financial intermediaries such as commercial banks are eliminated and debt securities which can be bought and sold are sold directly to investors. The researcher in the present research through estimating the amount of facilities that are convertible into the securities has calculated the capital adequacy of the studied bank first and then computed the bank efficiency using DEA models. Analysis results indicate that assets converting into securities backing of receivable collateral can increase the bank's capital adequacy.

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