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Identifying and Measuring the Factors Effective on Liquidity Risk in Mellat Banks of Iran

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Abstract: From the bank point of view, the useless and stagnant fund means to block sources as liquidity asset, which has no payoff and income for the bank. Besides, if banks encounter cash deficit and according to this fact that in any of the cases the liquidity risk of the banks will increase, in this article, it has been tried to give effective suggestions to decrease liquidity risks of the banks. In this article by conducting case study for Mellat Banks after enough investigation and by using the opinions of Ball Committee, it has been found with %99 of certainty that there is a positive and meaningful correlation between the discrepancy of cash assets and cash liabilities and the discrepancy between cash revenues and cash expenses of Mellat Bank and according to the opinions of Ball committee, predicting and hypothesizing for these currencies of cash assets of future, can help immensely to the reduction of this discrepancy and this can lead into the decrease of liquidity risk.

Key words: Liquidity risk cash assets · Cash liabilities · Cash revenues · Cash expenses · Managing the cash · Ball Committee and unity research

INTRODUCTION

The experts of devising the "Bank" have related the entrance of this word into the literature of economy and trade to different era and societies. Despite different opinions in this field, by the passing of time and along with the development of inventions, explorations and mechanisms which is beholden and completed. This time again human being has developed the invention by experience which could be very useful in one side and boom economy of different societies by giving facilities and on the other side if it is not controlled and managed properly, it's so probable to create grate problems in the country's' pecuniary and financial system and even sometimes it can cause trouble on international level [1]. Today banking is one of the most important parts of economy. By organizing and directing the amount received and the paid, the banks facilitate economic trades, make the markets develop and make the economy grow. It has to be mentioned that fulfilling such a role in economy is possible only through the correct management of the banks. In this case, the management of liquidity (as apart of the management system) in banks as the most important monetary and financial institutions of country is of high importance. Cash is an asset without payoff that keeps it more than necessary and not using it in high–paying investments, decreases its efficiency for banks. And on the other hand the shortage of liquidity makes the bank encounter immense systematic consequences which may lead banks to bankruptcy and their dissolution, so the importance of liquidity for a bank is higher than any other issues. The management of liquidity or the control of liquidity risk means keeping optimal (not much or less) amount of cash in the proper time and having such a control needed to recognize the effective factors on liquidity risk in banks.

Nowadays, the economists deem the constant development of economy impossible without the growth and development of financial parts and the historical experience of developed country shows that there has always been a converge between economic growth and the development of financial parts. In other words, they help each other [2]. Since the financial parts collect the resources of different depositors and give them to different economic sectors as large loans. The financial system determines the framework for the operations of all economic units [3]. In general, the orders applied to create and trade the requests, specifically provide the condition

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in which the savors money is transferred to money demandants, This is called the financial system. The financial system consists of institutes within the institutional frame called financial markets, trading financial requests with each other [4]. The financial system can be described as a subset of economic system, consisting of money market, capital, depreciation, securities, currency and insurance, in which there is a flow of fund and capital from the savors and money owners to the demandants with definite goals and rules [5]. Through gathering people s deposits and cooperating with them, banks can collect a great deal of capital and use it to solve the country s economic problems [6]. Nowadays the banking system, composed of the central bank and commercial banks, has a huge role in controlling the economy and spinning the wheel of economic and social development, so that in economic literature the central bank is deemed the heart of economy which injects blood(money) to the real parts in proportion to their requirements [7].

Liquidity risk originates from the difference between cash resources and cash spending of banks. It means that when the cash resources exceed cash expenditure, it creates cash funds (without payoff) and when the cash expenditure exceeds the cash resources, it creates liquidity deficit. This can make a bank unable to reduce the debts or to collect funds to increase the assets [8]. In their operations, banks are encountered by the threat of the paucity of enough liquidity to repay the deposit accounts, give loans, or satiate other cash requests. This threat is called liquidity risk [9].

Accordingly, the liquidity risk is zero only when the cash resources and cash expenditures of banks are absolutely equal and there is no budget surplus of deficit. In this article, absolute value of positive deviation (liquidity surplus) and negative deviation (liquidity deficit) is deemed as liquidity risk and because there isn't a discrepancy in the total result, there's no need to charge it into the necessary percent.

There is a question here that why the absolutes were used to answer this question, it has to be mentioned that according to the opinion of Basel committee the liquidity risk of bank increases both in the case of cash surplus and cash deficit. But for sure, being exposed to cash deficit and bankruptcy and dissolution is not equal to the case of cash surplus and having revenues and efficiencies and giving equal weight to these two in the increase of liquidity risk will lead the study incorrectly. In this study, according to investigation of the amount of cash at the end of the specific period, it was proved that Mellat Bank had encountered no liquidity deficit. Controlling the liquidity risk with the requisite of recognizing effective factors on the cash funds show the preservation of the proper amount of cash (not much or less) in the proper time. In this case one of the active and important referent in banking is the "Basel" committee which has been established by the chairmen of central bank of countries in "G 10" in 1975, specialists from different and advanced countries in banking gathered in this committee to give useful advice for the health and efficiency of monetary systems around the world, using their expertise.

Now, this committee has become the most important referent in bank supervisions and has focused in its studies about controlling the liquidity risk on finding a way in which banks manage their liquidity in a unified and general way. In this matter the Basel committee has paid attention to effective factors on the liquidity risk and considers the detection of effective factors on the fluctuation of cash funds and the prediction and the theorizing about future cash processes as factors of success in managing liquidity risk. It mentions that the discrepancy between the cash funds in banks and the needed amount, which is the main case of liquidity risk in banks, is affected by different factors that cannot always be predicted precisely and it's necessary to revise the hypotheses and the predictions especially because of fact changes in banking markets to diagnose their validity. Nevertheless according to Basel committee the effective factors on liquidity risk of banks are limited and can be divided into four main groups.

- Assets
- Debts
- Cases out of balance sheet.
- Other factors (like incomes and costs)

Detecting and recognizing the factors constituting these groups and measuring the effect of their changes on the liquidity risk in Mellat Bank is the main issue in this article.

Hypotheses: Because this article tends to corroborate and reject its hypotheses, it has a demonstrative base and is investigated and experimented through these hypotheses.

- The liquidity risk of Mellat bank is meaningfully a function of the amount of cash assets, cash liabilities and cash revenues and cash expenses.
- There is a direct and meaningful correlation between the discrepancy of cash assets and cash liabilities and liquidity risk in Mellat Bank.
- There is a direct and meaningful correlation between the discrepancy of cash revenues and cash expenses and liquidity risk in Mellat Bank.

Domain of the Study: The subjective domain of the article is about the effective factors on the liquidity risk of the banks and the locale domain of research has been the 2000 branches of Mellat Bank, working all over Iran in1384 and the time domain has been 24 periods of 15 days from 2005/1/1 to 2005/12/30.

Background of the Study: No survey has yet been conducted to investigate only the liquidity risk in Iranian Banks and if there was any survey about liquidity, it discussed the management of cash funds or managing the current capital of banks and companies, like these.

Muhammad Talebi [10] has reached these results in a research named "Assessing the current situation in management of current capital in Iranian companies".

- According to the industry, in which the companies work, the management of cash funds can affect the situation of liquidity companies.
- According to the industry in which the companies work, the management of demands affects the situation of liquidity in companies.
- According to the industry in which the companies work, the methods of financing affect the liquidity.
- According to the industry in which the companies work, the nature of their activities affects the pervasive index.
- In the periods in which the costs for financing were low, there had been no management in current capital.
- In the periods in which the expected rate of inflation has decreased the indices of goods optimization have improved.

Another research conducted at the department of research and planning in Mellat Bank, was done by Rezaee, Bidaar and Mahmmad Ebrahimpour [11] as "Assessing the management of cash funds in Mellat Bank in 2001". The results are:

- In Mellat Bank, the average amount of cash funds kept in Tehran is more than needed amount to respond to customers' demands and other daily expenses.
- In Mellat Bank the cost of exchange is 2 times more than the cost of opportunity.

From the research conducted abroad mentioning the liquidity risk is the one, conducted at Asahi Bank of Japan with the title of revising the system of managing the risk in banks. After detecting different risks in banking, the mentioned research shows that the key factor to the effective management of risks is not essentially the minimization of all risks.

The Basel committee that works compiling and administering the standards, in a declaration named "the effective procedures in liquidity management in bank" and published in February 2000 has detected the effective factors in liquidity risk of banks. It has issued some principals of the correct management of liquidity risk on which this study is based.

The Data and the Research Methodology: To compile the 15-day liquidity, the Mellat Bank report in 2005 was used [12], Because the effect of independent factors or dependent ones were studied, the method of research is from correction and linear regression type and to analyze the data, first the descriptive statistics were used to describe the data the data was analyzed by the multivariable model and by SPSS (13) and (Evies4) softwares.

Independent and Dependent Variables: In this article the independent variables are the amount of cash assets, cash liabilities, The discrepancy between cash revenues and cash expenses. The dependent variable is liquidity risk in Mellat Bank. Therefore, the impressionability of dependent variable from each of the independent ones was investigated.

Testing the Hypotheses

The First Hypothesis: The liquidity risk of Mellat Bank is significantly a function of the amount of cash assets, cash liabilities, cash expenses and cash revenues. The regression of the following model was estimated by the least square model:

Dependent Variable: Y
Method: Least Squares
Sample: 124
Included observations: 24

Variable	Coefficient	Std.error	T-statistic	Prob.
X1	0.128703	0.063970	2.011934	0.0586
X3	0.249697	0.213476	1.169671	0.2566
X2	-0.119203	0.063556	-1.875563	0.0762
X4	-0.326524	0.221710	-1.472750	0.1572
C	-273.6055	512.2293	-0.534146	0.5994
R-squared	0.655186	Mean dependent var		1983.458
Adjusted R-squared	0.582593	S.D. dependent var		795.6618
S.E. of regression	514.0534	Akaike info criterion		15.50558
Sum squared reside	5020767	Schwarz criterion		15.75101
Log likelihood	-181.0670	F-statistic		9.025533
Durbin-Watson stat	2.663066	Prob(F-statistic)		0.000292

Y=C(1)*X1+C(2)*X3+C(3)*X2+C(4)*X4+C(5)
Substituted Coefficients:
Y=0.1287030482*X1+0.2496970731*X3-0.1192029565*x2-0.326523643*X4-273.6054516

None of the coefficients of independent variables are meaningful; it means the amount (p) for coefficients is more than 0.50. On the other side there is self correlation, it means the amount of (D.W) or Watson binocular has a deviation more than 2, that shows the relation of co linearity. Therefore the regression model doesn't justify the effects of independent variables on dependent variables, so the first hypothesis is not acceptable.

The Second Hypothesis: There is a direct and meaningful correlation between the discrepancy in cash assets and cash liabilities and liquidity risk.

HO: r = o
H1: r > o

R (n = 24) = 0/899 p= 0/000 p < 0/01

The level of meaningfulness of Pearson correlation between the discrepancy of cash assets and cash liabilities and liquidity risk in Mellat Bank is less than 0/01. So the hypothesis of zero by 99% of certainty is rejected. Therefore between the discrepancy of cash assets and cash liabilities and liquidity risk of Mellat Bank, there is a positive and meaningful correlation.

Because the variable of liquidity risk is dependent and the discrepancy between the cash assets and cash liabilities is an independent variable, the two-variable regression test is done too and the results show that 0/81 of fluctuation in liquidity risk is justified through the variable of discrepancy between cash assets and cash variables.

$$J = \alpha + \beta (x)$$

Liquidity risk = 246/605 + 0/489 * (discrepancy between cash assets and cash liabilities)

t = 9/604 p= 0/000 p < 0/01

On the strength of the correlation of the two variables and because of observing the needed assumptions for the test, the result of the test is dependable and far from fake regression.

The Third Hypothesis: There is a meaningful correlation between the discrepancy of cash revenues and cash expenses and liquidity risk in Mellat Bank.

HO: r = o
H1: r ? o

r (n = 24) = 0/713 p= 0/004 p < 0/01

The level of meaningfulness between the discrepancy of cash revenues and cash expenses and liquidity risk of Mellat Bank is less than 0/01.

So the hypothesis of zero by 99%certainty is rejected. Therefore there is a meaningful correlation between the discrepancy of cash revenue and cash expanses and liquidity risk in Mellat Bank. Because the variable of the bank liquidity risk is dependent and the variable of discrepancy between cash revenue and cash expenses is independent, the regression test is done and the result showed 0/51 of fluctuation in liquidity risk is justified by the variable of discrepancy between cash revenues and cash liabilities.

$$J = \alpha + \beta (x)$$

Liquidity risk = 1470/ 858+ 0/289 × (the discrepancy between cash revenues and cash liabilities)

t= 6/911 p = 0/008 p < 0/01

On the logical strength of the correlation of the two variables and because of observing the needed assumptions for the test, the result of the test is dependable and far from fake regression.

Collateral Findings: There is a direct and meaningful relation between cash revenues and cash expenses of Mellat Bank.

HO: r = o
H1: r > o
r (n = 24) = 0/985 p= 0/000 p < 0/01

The meaningfulness level of Pearson correlation between cash revenues and cash expenses of Mellat Bank is fewer than 0/01. So the hypothesis rejected with 99% certainty. So there is a direct and meaningfulness correlation between cash revenues and cash expenses of Mellat Bank. There is a direct correlation between cash assets and cash liabilities of Mellat Bank.

HO: r = o
H1: r > o
R (n = 24) = 0/999 p= 0/000 p < 0/01

The meaningfulness level of Pearson correlation between cash assets and cash liabilities of Mellat Bank is fewer than 0/01. So the hypothesis of zero is rejected by

Table 1: The result of correlation test between the dependent variable of liquidity risk and independent variable

Liquidity risk	Pearson correlation	One-sided significant level	number
cash liabilities	0.677	0.000	24
cash assets	0.666	0.000	24
cash revenues	-0.269	0.102	24
cash expenses	-0.273	0.098	24

Table 2: the distribution results of variable under study in 2 halves of 2005

group	variable	Number	mean	Standard deviation	Z statistics	Significant level
The first half of 2005	Liquidity risk	12	2466.41694357	543.78914	0.923	0.361
	Cash liabilities	12	292665.5833	33946.61087	0.571	0.900
	Cash assets	12	290510.5000	34207.90272	0.576	0.894
	Cash revenues	12	2281.9167	1768.72345	0.973	0.301
	Cash expenses	12	2748.6667	1708.82955	0.688	0.731
	Cash assets and Cash liabilities	12	3055.0833	1281.14654	0.480	0.975
	Cash revenues and Cash expenses	12	639.2500	415.58220	0.469	0.980
The second half of 2005	Liquidity risk	12	1500.5000	720.48235	0.615	0.844
	Cash liabilities	12	252930.9167	83998.04273	1.360	0.050
	Cash assets	12	252314.4167	85191.73580	1.348	0.053
	Cash revenues	12	8608.8333	2434.20903	1.139	0.150
	Cash expenses	12	8640.5833	2142.34394	0.541	0.932
	Cash assets and Cash liabilities	12	1592.3333	1287.19387	0.963	0.312
	Cash revenues and Cash expenses	12	512.7500	532.21034	0.700	0.711

Table 3: Table for the test results of comparing the variance and the mean two by two in variables in Mellat Bank between 2 halves of 2005

	Variance comparison test		mean comparison test			
	F	Level significance	t	Degree of freedom	Level significance	Mean difference
Liquidity risk	0.575	0.456	3.707	22	0.001	965.91667
Cash liabilities	6.222	0.021	1.519	22	0.143	39734.66667
Cash assets	6.228	0.021	1.441	22	0.164	38196.08333
Cash revenues	0.000	0.986	-7.284	22	0.000	-6326.91667
Cash expenses	0.088	0.770	-7.448	22	0.000	-5891.91667
Cash assets and Cash liabilities	0.438	0.515	2.790	22	0.011	1462.75000
Cash revenues and Cash expenses	0.718	0.406	0.649	22	0.523	126.50000

99% of certainty. The relation between the dependent variable of liquidity risk and independent variables of cash liabilities, cash revenues and cash expenses of Mellat bank is investigated by correlation test of Pearson and the result are shown in Table 1.

According to the calculated level of meaningfulness for dependent variable of liquidity risk and independent variables of cash liabilities and cash assets of Mellat Bank which is less than 0/01 and according to amounts of correlation which has positive coefficients, the existence of direct relation is meaningful and is attested by 99% certainty.

The relation between the variable of liquidity risk and variables of cash revenues and cash expenses is not meaningful, but there is a negative relation between these variables, though from the statistic test standpoint, it's not as powerful to be considered meaningful.

The Comparison of Research Data in the Variables under Study and Between the Two Halves of 2005: The test of comparing two independent samples were used to utilize this test, first the distribution of research variables in Table 2. They indicated that research data in all variables under study have normal distribution. The result of the test for comparing the variance and mean for each of the variables under study in the two halves of the year are shown in Table 3.

For the level of meaningfulness to exceed the amount of 0/05 in all the variables shows the normality of distribution in variables under study.

The results of the test show that there is a meaningful difference between the variance of the two halves of the year in the variable of assets. The variance of other research data between the two halves of the year has no meaningful

difference. The results of the test comparing the mean of the variables in the two halves of the year, shows that:

- The liquidity risk in the first half is meaningfully more than the second one.
- The cash liabilities of the two halves of the year don't have a meaningful difference.
- The cash assets of the halves of they year don't have a meaningful difference.
- The cash revenue of Mellat Bank is meaningfully higher in the second half.
- The cash expenses of Mellat Bank are meaningfully higher in the second half.
- The difference between the cash assets and cash liabilities is meaningfully higher in the second half.
- The difference between the cash revenues and cash expenses is meaningfully higher in the second half.

RESULTS AND DISCUSSIONS

After collecting the needle data from the 15- day liquidity report of Mellat Bank in 2005 and conducting the tests related to the claims and primary guests, it has been tried in section to after a suitable answer to these questions.

According to the first hypothesis, the liquidity risk of Mellat Bank is meaningfully a function of cash assets, cash liabilities, cash revenues and the cash expenses of the bank. After the needed requisites to produce a multivariable regression model, which can predict the dependent variable (liquidity risk) according to the independent variables (cash assets, cash liabilities, cash revenues and cash expenses), it was seen that the coefficient of none of the independent variables which were inserted to the model spontaneously was meaningful. Therefore it can be concluded that the level of liquidities, cash revenues and cash expenses and, as it was mentioned before, some of these variables increase the cash funds and some decrease the cash funds in banks. So, when inserted in the model spontaneously, these models change in a way that counteracts each other's effects on liquidity risk. Then the cash assets, cash liabilities, cash revenues and cash expenses can't have the changes in liquidities risk and this issue is attested in the collateral findings of researches, so the statistic test shows this fact that there is a direct and meaningful relation between the cash assets and cash liabilities of Mellat Bank and between the cash revenues and cash expenses of this bank.

According to the second hypothesis there is a direct and meaningful relation between the discrepancy of cash assets and cash liabilities and the liquidity risk in Mellat Bank. The statistic tests show that there is a direct and meaningful relation between the discrepancy of cash assets and cash liabilities and the liquidity risk in Mellat Bank. It means that with the increase in the discrepancy of cash assets and cash liabilities, the liquidity risk increases too and with the decrease in the discrepancy of cash assets and cash liabilities, the liquidity risk decreases too. Therefore, it is recommended that to decrease their liquidity risk, banks reduce the difference between their cash assets and cash debt, so the liquidity risk decreases. According to Basel committee opinion, the banks' ability to predict the flow of cash can help them keep the cash assets and cash liabilities in the same level and as it was mentioned; this makes the liquidity risk decrease. Some of the Basel committee advices are:

- To define the level of loan application (for example consumption loans) the banks can use the statistic analysis and use seasonal accounts and other effective factors in determining the loan application.
- The banks can make commercial predications, based on arbitration
- Banks can evaluate their main customers and make historical relations for other customers.
- If they consider it useful, banks can refuse to accept new loan applications, approved in usual conditions, or bank can refuse to fulfill. That parts of their loan giving commitment which are not binding and disregard some of their professional terms.
- To determine the level of cash liabilities, banks can use techniques like the historical pattern of the deposits' behavior.
- Banks can ask their main customers to predict their paying and receiving time, so the banks can plan their whole needs of liquidity.

According to the high correlation of the discrepancy between the cash assets and cash liabilities and liquidity risk in Mellat Bank, the decrease in the discrepancy of cash assets and cash liabilities has an important role in reducing liquidity risk. According to the third theory, there is a direct and meaningful relation between the cash revenues and cash expenses and liquidity risk in Mellat Bank. The statistic tests show that there is a direct and meaningful relation between cash revenues and cash expenses and liquidity risk. It means that by the increase in the discrepancy between the cash revenues and cash

expenses, the liquidity risk increases and vice versa. Although the effect of the discrepancy between cash revenues and cash expenses in Mellat bank is less than the effect of discrepancy between the cash assets and cash liabilities, but it is generally recommended to the bank to try to decrease the discrepancy between their cash revenues and cash expenses, so they can decrease the liquidity risk. To do this, banks can use different techniques, for example of the cash expenses are move than cash revenues, they have to can unnecessary expenses or increase their subsidiary revenues.

It is understand from the collateral findings of the research that although we analyze the independent variables of cash assets, cash liabilities, cash revenues and cash expenses with the dependent variable of liquidity risk simultaneously in the multivariable regression model, there isn't a meaningful relation between them. But when we analyze the relation of each of these independent variables with dependent variable, separately, it is found that there is a plosive and meaningful relation between the level of cash assets and cash liabilities and level of liquidity risk. This indicates the need to thoughtful decisions about the relation between the level of cash assets and cash liabilities with level of liquidity risk in banks. Other points from the collateral findings of the research are: the higher level of the liquidity risk of Mellat bank in the first half of the year than the second half of the year and finding its reasons requires other special research, which is not related to our discussion.

REFERENCES

1. Majedi, A. and H. Golriz, 1998. Money and currency from theory to policy making, Iran, Tehran, The banking institute of Iran, pp:165.
2. Mirmotahari, S.A, 1999. The non-banking credit institutes, the beginning of a path of vicissitude, Iran, Tehran, J. Tadbir, No: 46:199.
3. Shabahang, R., 1996. Financia Management, 1st edition, Iran, Tehran, Audit Organization Publication, pp: 13.
4. Khataei, M., 1999. Expansion of financial markets and economic growth, Iran, Tehran, The institute of pecuniary and financial research, pp: 28.
5. Shiva, R., 1999. The role of non-banking financial and credit institutes in the efficiency of the countrys financial system, Iran, Tehran, The role of non-banking financial and credit institutes in the efficiency of the country s financial system, The tenth seminar of Islamic banking, pp: 86.
6. Mirshokraei, N. and others, 2002. Reviewing the role of banking system in economic development, Iran, Tehran, Seasonal booklet of Bank, No. 20: 11.
7. Moosavian, S.A., 1999. Islamik banking, Iran, Tehran, institute of pecuniary and financialresearches, 1st edition, pp: 41.
8. Basel committee on Banking Supervision, 2000.
9. Hiim, Levy and Michael and J. Anderson, 1998. principles of corporate finance, South-western college publishing, pp: 745.
10. Talebi, M., 2003. M.S. dissertation, Iran, Tehran, Tarbiyat Modarres University.
11. Rezaei and others, 2001. Assessing the cash management in Mellat Bank.
12. Mellat Bank, 2005. Annual Report.