



Study the Relation between Banking System Concentration and Unemployment Rate in Iran

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ABSTRACT

In this study, we investigated the relation between banking system concentration and unemployment-rate in Iran. Research aims included identifying effect of internal factors of banks on employment and also recognition of effect of bank internal factors on unemployment rate (UIR). In this study, dependent variable is UIR and independent variables are: Bank concentration, total size of bank, credit risk, liquidity risk, and inflation control variable. Statistical population includes all banks of Iran. In order to study co-integration of variables, auto regression distributed lag method was used. And then research variables were investigated with taking hydro statistic and structural break into account. And they are tested by hydro statistic test. Some of them were in static level. And some of them became static by differentiation. In investigation of research hypothesis, short term, and long term relations for research models were met. Results indicated that banking concentration and unemployment have negative relation. In other word, by increase of banking concentration, and by increase of bank size, UIR is decreased. Internal factors of banks have negative relation with UIR while with increase of size sector bank, UIR is decreased. Credit rate has positive relation so with increase of credit rate, UIR is increased. Liquidity rate have negative relation with unemployment so with increase of credit rate, UIR is increased. Liquidity rate has negative relation with unemployment so by increase of Liquidity rate, UIR is increased so relation of inflation variable with UIR is positive.

Keywords: Unemployment Rate, Banking Concentration, Credit Rate, Liquidity Rate, Inflation

JEL Classifications: E5, E31, J64

1. INTRODUCTION

Banks status can have significant effect on other economic sectors of the society. Banks provide different facilities in different economic sectors so they cause development of investment and employment. On the other hand, banks are affected by monetary policies of the government so they can have a role as enforcement of these policies. Thus, status of banking system and its concentration can have effect on supplying facilities and investment which following has effect on employment. In their research Noori and Broujerdi, illustrated that assets concentration in private banks which are biggest banks of Iran is 0.1742 (De Jonghe, 2008). According to assessment standard of market concentration, index value less than 0.18 is representation of average concentration or semi-competitive market while index value less than 0.1 is indicator of competitive market and when it is more than 0.18 it is indicator of monopolized market. Hence

according to this research, importance of banking concentration in Iran is clear (Noori et al., 2011).

On one hand, from opponent views, banking concentration causes system efficacy in collecting fund and subsequently credit allocation are reduced. Consequently, by more concentration on professional banks, granting loan is decrease so people with specific condition can receive loan. Hence, granted loans are given only in special sector and giving loan is not balanced in different sectors (Fahim, 2003). At result, investment is being decreased so employment is also reduced. On the other hand, based on compatible theories, concentration have positive effect on banking economy and efficacy. Hence according to high unemployment rate (UIR) in Iran and considering other researches' results which assess high concentration among Iran banks, investigating relation between these two variables has high importance (Taji et al., 2013).

Tayebi et al. (2010) provided a research titled as “effect of banking facility on entrepreneurship of Iran economic sector” during 1973-2006. They concluded that comparing allocation of banking facilities into industry, and mine, agriculture and services indicated that agriculture sector has highest annual mean in job creation and service sector has lowest annual mean in job creation. However, results are indicator of oscillation in performance of state banking system in entrepreneurship in economic sectors specially service sector. So that these facilities led to destruction of job creation in mentioned years. Taji et al. (2013) performed a study titled as “effect of banking facilities on variables of macro sector of agriculture.” They concluded that floating credit and capital credit on added value, investment and employment of agriculture sector was positive and significant.

In addition, Morin et al. (2012) had a research about investigating effect of accessing to banking credit on economic performance of main economic sectors in Kenia through panel data and generalized torque during 2000-2010. Results indicated that credits have positive and considerable effect on gross domestic product of economic sectors specially agriculture sector. Moreover, Feldmann (2015) had study about “concentration of banking system and unemployment in developing countries” during 1987-2007. Their results indicated that in mentioned countries, there is significant relation between facilities and employment. In this research, main aim is study the relation between banking concentration and unemployment in Iran along with identification of effect of bank internal factors on employment and UIR in Iran.

2. RESEARCH HYPOTHESIS AND RESEARCH METHODOLOGY

Banking concentration in Iran has positive and significant relation with unemployment.

Internal factors of banks individually have significant effect on UIR.

This study is going to be practical. Applied method is correlative method. In this research, main purpose is determining relation between variables. Hence, appropriate indices have been adopted in respect of measurement scales. Research data were collected through time series data of central bank and financial ills and also annual statistics of banks. Considered time duration was 2001-2014 (World Bank, 2010). Analyzing data was performed by auto regression distributed lag (ARDL) software due to using advantages and properties of this mode in variables' durability. Statistical population includes all bank of Iran which their data is accessible. Under studies banks include 23 banks.

3. RESULTS

In order to analysis of research hypothesis we used ARDL method. In addition, static tests and structural break down were used. And finally model of the research was estimated.

In order to investigate effect of banking concentration and internal factors of banks on UIR in Iran and also analysis of model's hypothesis in short term and long term we estimated following model:

$$UIR_t = \beta_0 + \beta_1 BC_t + \beta_2 BS_t + \beta_3 CR_t + \beta_4 Liq_t + \beta_5 Inf_t + \varepsilon_t$$

Where,

Dependent variable:

UIR_t : Unemployment rate in Iran in t time.

Independent variables:

BC_t : Banking concentration in Iran in t time.

BS_t : Total banking size of the state in t year.

CR_t : Sum of banks credit rate of the state in t year.

Liq_t : Total liquidity rate of banking sector in the state in t year.

Control variable:

Inf_t : Iran inflation in t year is measured with price index of consumer.

ε_t : regression residual in t year.

Money supply variable is applied with stable price in 2004 and in logarithm form.

3.1. Static Test of Variables

In order to test variables statistic, we used generalized unit root test of Dickey-Fuller with width of an origin and trend and without width of an origin and trend. Results of width of a origin and trend test is indicated in Table 1.

Null hypothesis of Dickey-Fuller test is proving presence of unit root for banking concentration variable and banking sector size. In other word it is non-static variable while it is observed that other variables are in static level. Secondly, for being sure, we used Dickey-Fuller test with width from origin and trend which results are indicated in Table 2.

Results of Table 3 are indicating that interring time trend, width of a origin, repetition of generalized unit root Dickey-Fuller test does not change endogeneity of non-latent variables. So null hypothesis of Dickey-Fuller is not rejected; in this step, by differentiating non latent variables we performed unit root test. Results are in Table 3.

It is illustrated from Table 3 that two non-latent variables of the model which are banking concentration and banking sector size became latent with one-time differentiation.

3.2. Estimation of Model and Testing Hypothesis

Since under studied variables in this research are $I(1)$ and $I(0)$, and methods such as granger causality and Johanson-Juselius have

Table 1: Results of Dickey-Fuller test without width of an origin and trend

Variable	t-static	Possibility value	Result
UIR	-4.621	0.002	Static
BC	-0.923	0.611	Non-static
BS	-0.548	0.824	Non-static
CR	-5.084	0.000	Static
Liq	-1.157	0.0482	Static
Inf	-0.758	0.027	Static

Reference: Research results

some flaws, here we used self-explanation with ARDL method for testing variables co-integration.

3.3. Estimation of Short Term Relation

In order to estimate of short term relation or dynamic relation between variables, firstly there is need to use one of the methods including balanced determination coefficient, Akaike, Schwartz Bayesian criterion and Hanan Queen so optimum lags model can be specified. In this research for finding optimum lag we used Schwartz Bayesian criterion because this suggest less optimum lag hence less degree of freedom is lost. Firstly, some ARDL models were estimated with different lags then each Schwartz information criterion was used (Kim, 2012).

$$UIR(-1) = \beta_0 + \beta_1 BC_t + \beta_2 BS_t + \beta_3 CR_t + \beta_4 Liq_t + \beta_5 Inf_t + \varepsilon_t$$

Optimum lag for variables in autoregressive model with distributed lags was selected by Microfit software, ARDL (1,0,0,0,1,1) which its results is in Table 4.

First lag of UIR in 95% level has positive and significant effect on UIR for next year. In other word if UIR has increase in last year, in current year UIR is significantly increased.

Banking concentration has positive and significant effect on UIR in 95% level. In other word if banking concentration has increase in last year, in current year UIR is significantly increased.

Table 2: Results of Dickey-Fuller test with width of a origin and trend

Variable	t-static	Possibility value	Result
UIR	-3.367	0.017	Static
BC	-0.623	0.696	Non-static
BS	-0.415	0.785	Non-static
CR	-6.110	0.000	Static
Liq	-1.075	0.014	Static
Inf	-1.187	0.028	Static

Reference: Research results

Table 3: Unit root test with one time differentiating

Variable	t-statistic	Possibility value	Result
BC	-5.679	0.00	Static
BS	-7.188	0.00	Static

Reference: Research results

Table 4: Optimum lag for variables in autoregressive model with distributed lags

Variable	Coefficient	Standard deviation	t-statistic	Possibility value
UIR(-1)	0.493	0.111	6.198	0.000
BC	0.347	0.154	2.161	0.046
BS	-0.257	0.207	-2.291	0.001
CR	0.381	0.084	2.173	0.037
Liq(-1)	-0.519	0.076	-2.149	0.038
Liq	-0.718	0.279	-4.269	0.000
Inf(-1)	0.175	0.098	1.075	0.376
Inf	0.608	0.0344	5.917	0.000
دنبور	0.557	0.019	1.665	0.117

Reference: Research results

Banking sector size in 95% level has positive and significant effect on UIR for next year. In other word if banking sector size has increase in last year, in current year UIR is significantly increased.

Credit risk (CR) size in 95% level has positive and significant effect on UIR for next year. In other word if CR has increase in last year, in current year UIR is significantly increased.

Liquidity risk (LR) in 95% level has positive and significant effect on UIR for next year. In other word if LR has increase in last year, in current year UIR is significantly increased.

First lag of inflation has no significant effect on UIR for next year while inflation in current year in 95% level has positive and significant effect on UIR. In other word if inflation rate has increase in current year, we must expect increase of UIR. Trend variable is not significant in 95% level.

Determination coefficient of estimated model is 97%. So the model has ability of explaining 97% of changes in UIR. Statistic of F-test based on all model coefficient equals to null is 103.824. While by possibility value of 0.000 in 99% level of all model coefficient equals to null so not significance of model is rejected.

3.4. Estimation of Long Term Relation

In order to identification of long term convergent statistic value can be compared with critical quantities provided by Banerjee, Dolado and Master.

For identifying long term convergent in model, null hypothesis and opposite hypothesis are defined as follow:

$$H_0 : \sum_{i=1}^p \alpha_i - 1 \geq 0$$

$$H_1 : \sum_{i=1}^p \alpha_i - 1 \leq 0$$

Null hypothesis states that there is no in long term convergent between variables while opposite hypothesis stated that there is long term convergent between variables.

Quantity of t-statistic for testing hypothesis of long term convergent is calculated as follow:

$$t = \frac{\sum_{i=1}^p \hat{\alpha}_i - 1}{\sum_{i=1}^p s_{\hat{\alpha}_i}}$$

Where:

α_i is coefficient of dependent variable lags in first side of equation and s_{α} is standard deviation of dependent variable lags in right side of equation.

If calculated t-statistic in above relation is more that critical quantitative provided by Banerjee, Dolado and master, null hypothesis based on lack of long term divergence is rejected.

For above model, t-statistic of Banerjee, *Dolado* is calculated as follow:

$$t = \frac{0.493 - 1}{0.111} = -4.567$$

Quantity of the table is -3.28 thus as calculative coefficient is high, null hypothesis which is based on lack of convergent relation between variables in long term in 95% level is rejected. In other word there is convergent relation between variables in long term. After the test and assuring of long term relation, we estimated long term relation. Result of estimation of long term relation is as follow in Table 5.

Results indicated that banking concentration in 95% level has positive and significant effect on UIR in long term.

Banking sector size in 95% level has negative and significant effect on UIR in long term. In other word it is expected that in 95% possibility increase of banking sector size in long term has significant effect on UIR and reduce it.

CR size in 95% level has positive and significant effect on UIR for next year. In other word if CR has increase in long term, in current year UIR is significantly increased.

LR in 95% level has negative and significant effect on UIR in other word if LR of banking sector has increase in long term, UIR is reduced.

Inflation in long term has no significant effect on UIR. Although long term relation and having long term relation between variables implied that there is significant relation between variables, it is not able to state speed of short term inclination to long term inclination. So there is need to estimate error correction coefficient which will be estimated as follow:

3.5. Estimation of Error Correction Coefficient

Error correction model (ECM) indicates information about both short term and long term characteristic of the model with lack of balance in long term adjustment process (Naderan and Elyas, 2012). When there is no accumulation, by any shock causing providing imbalance, on dynamic balance process eliminates this imbalance for achieving long term balance slowly. ECM relates short term oscillation of the model to long term values (Naghavi, 2003). In addition, this test relates changes of dependent variable to balance error of previous period. ECM coefficient indicates that in each period, what percentage of short term imbalance is adjusted for

accessing to long term. ECM related to long term balancing relation has been estimated by self-regression method (Tregenna, 2009). Adjustment coefficient or error correction coefficient in fitted models equals to $-0/306$ indicates that in every year, 30 percent of current lack of balance in one period in mentioned relation in next period is adjusted. Error correction relation is provided as follow:

$$ECM = UIR - 0.11457 * BC - 0.084879 * BS - 0.19949 * CR - 0.16828 * LIQ - 1.7910 * INF + 0.7833 * TREND$$

4. DISCUSSION AND CONCLUSION BASED ON HYPOTHESIS

4.1. Banking Concentration in Iran has Positive and Significant Relation with UIR

First hypothesis was tested in short term period and long term one. Basis of either rejecting to approving a hypothesis is t-test which was performed during estimation of ARDL model in short term and long term. Null hypothesis of t-test is indicated that banking concentration has no effect on UIR and it states opposite hypothesis which is about effect of banking concentration on UIR. Thus if null hypothesis is rejected we can approve above hypothesis.

Results of model estimation in short term indicated that null hypothesis of t-test in 95% level is rejected thus effect of banking concentration on UIR can be approved. Results illustrated that relation of banking concentration and UIR is negative. In other word by increase of banking concentration UIR is also increased. In long term, short term results were obtained so banking concentration has significant effect on UIR.

4.2. Internal Factors of Banks have Significant Effect on UIR Individually

As first hypothesis, this is tested by t-statistic. Null hypothesis of t-test indicates that internal factors of bank have no effect on UIR and opposite hypothesis states effect of internal factors of banks on UIR. Thus, if null hypothesis is rejected so above hypothesis is approved. Internal factors of banks which studied in this research include: Banking sector size, credit rate of state banks and liquidity rate of whole banking sector.

In short term, null hypothesis of t-test based on no effect on banking sector size on UIR in 95% level is rejected. Hence, in short term banking sector size in short term has significant effect on UIR. Results indicated that relation between banking sector size and UIR is negative; in other word by increase of banking sector size, UIR is reduced. This result is true in case of short term for long term. It means that banking sector size has significant effect on UIR. This effect is negative. It means that with increase of banking sector size, UIR is reduced:

- As other issues, effect of credit rate on UIR was tested by t-test. Result indicated that in short term, credit rate has significant effect in 95% level on UIR. This effect is positive. It means that by increase of credit rate, UIR is also increased. In long term credit rate has significant effect in 95% level on UIR which is also positive. It means that by increase of credit rate, UIR is also increased.

Table 5: Results of estimating long term relation

Variable	Coefficient	Standard deviation	t-statistic	Possibility value
BC	0.860	0.241	2.720	0.012
BS	-1.24	0.177	-2.330	0.034
CR	1.357	0.060	3.575	0.004
Liq	-0.715	0.036	-4.628	0.000
Inf	0.512	0.443	0.627	0.674
Trend	1.819	0.0121	2.842	0.012

Reference: Research results

2. Through calculation of liquidity rate we can conclude that the more delinquents are the more UIR is.

4.2.1. As other issue

And also results indicated that in short term, liquidity rate in banks and also early delinquents has significant effect on UIR. In addition, this effect is negative. In other word, with increase of liquidity rate in current year or last year UIR significantly is reduced. In long term by increase of liquidity rate has also significant and negative effect on UIR. According to method of calculation of liquidity rate for banks we can state that increase of granted banks facilities has short term and long term effect on reduction of UIR.

Control variable of inflation in short term has significant effect on UIR. In other word by increase of inflation in current year cause increase of unemployment. But early delinquent has no significant effect on UIR. While in long term, inflation cannot have significant effect on UIR.

5. CONCLUSION

Results of this research approve opposite theory of banking concentration. In this theory of concentration effect on negative economic is assessed because the more is concentration the more is monopoly power hence banks determine high interest rates so their efficacy become decreased for different economic sectors. On the other hand, increase of concentration in professional banks has effect on resource allocation among different economic sectors so consequently UIR in different sectors is different. Therefore, in Iran based on the result of the research, pretty high banking concentration rate and also UIR proves that concentration effect is assessed as negative. Other results in this research are at the following:

- Relation of banking concentration and UIR is negative so with increase of banking concentration, UIR is high.
- Relation of banking sector size and UIR is negative so with increase of banking sector size, UIR is decreased.

- In short term credit rate has significant effect, in 95% level, on UIR and this effect is positive. It means that by increase of credit rate, UIR is also increased.
- According to method of liquidity rate calculation for banks we can state that increases of bank facilities can have effect of UIR reduction in long term and short term.

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