Research Paper

Effect of Bank Facilities on Employment: An Approach Based on STR Model

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ABSTRACT

This study aimed to evaluate the role of the banking system, particularly monetary policies and the provision of bank facilities, in recession and boom periods, on employment in the labour market. The study considered several key variables, including employment, the bank and financial development index, the volume of facilities provided to the private sector, the bank facilities rate, the wage rate, the workforce, capital stock, liquidity, the degree of economic openness, the inflation rate, direct foreign investment, government expenditures, and oil revenues. The research utilized the smooth transfer regression (STR) model to assess the relationship between these variables from 1989 to 2016. The findings revealed a non-linear correlation between banking variables and employment. Within the nonlinear model, it was observed that a 2.87% increase in the inflation rate had a significant and distinct impact on employment in relation to banking indexes such as money market development, the volume of facilities granted, and liquidity. The study identified a weak effect of monetary policy indicators and bank facilities on employment in the country, highlighting an inadequate association between monetary policies and workforce supply and demand in the national labour market.

1 Introduction

The top priority for policymakers and authorities in every country is to promote economic growth and development. The success of decision-making by these authorities depends on the positive and negative effects of these decisions on economic growth and development. Therefore, it is crucial for authorities to identify the variables and factors that influence the economic growth of the country before making any decisions, ensuring that informed and fruitful decisions are made [4]. Among the most significant factors influencing the economic growth of developing countries are employment and labor share. However, unemployment and underemployment remain major socioeconomic issues in many countries. In recent years, various sectors have not grown in line with the workforce supply, leading to an imbalance between labor demand and supply within the economic structure of the country. This imbalance can be attributed to flawed decision-making approaches by the authorities. Consequently, the mismatch between labor supply and demand has become a key factor contributing to fluc-

tuations in the unemployment rate, posing an ongoing challenge for the country's labor market. The labor market is one of the four most crucial markets in the economy, and its complexity is heightened due to its involvement with human beings. Unlike other markets, the labor market exhibits demand and supply curves, and numerous studies have highlighted an increasing gap between labor supply, demand, and the number of unemployed individuals. Notably, there are distinct differences in the behavior of women and men within the labor market, particularly in terms of education levels, resulting in reduced working hours for men compared to women. Some economists argue that one of the primary causes of rising unemployment in recent years is the increased active population in the country [1-6]. According to this perspective, the unemployment rate of 12.4% in 2016 was not solely attributed to a decrease in the employed population but rather to an increase in the active population. Changes in men's education levels constitute a crucial variable for analyzing labor market developments in Iran. Studies indicate that labor supply increased from 7.8 million in 1966 to 9.8 million in 1976, representing an annual growth rate of 2.3%.

Subsequently, labor supply expanded by 2.7% during 1976-1986, reaching 12.8% and exhibiting significant growth compared to previous decades. By 1996, the labor supply had reached 16 million, showcasing a 2.3% growth compared to 1986. Finally, according to the latest available data in 2006, the country's labor supply had reached 23.5 million, with 3.6 million women among them. In 2016, the unemployment rate was reported as 12.4%, and the number of employed individuals was stated to be 22.6 million. Simultaneously, the active population ready for work in 2016 amounted to 25,800,000. As previously mentioned, the labor market is influenced by both supply and demand. However, the demand side of the labor market has not aligned with the supply side, resulting in a gap between supply and demand that forms the basis for involuntary unemployment in the economy. Given significant changes in the labor market structure in recent years, particularly within the educated stratum, monetary policies alone cannot sufficiently alter the employment status in the country. Projections indicate that Iran's job applications will increase by 2.5% annually in the coming years, underscoring the importance of creating occupations and fostering economic activities to attract the workforce, especially young job seekers, more effectively than before. The enduring high unemployment rate in the country is primarily attributed to an imbalance in the labor market, characterized by an excess of labor supply over demand, which stems from long-term population changes over the past decades and the presence of a young population [7-16]. Another contributing factor could be the economic problems and the lack of sustained economic growth required to attract this workforce to the labor market. Additionally, the labor market in Iran faces the persistent challenge of high youth unemployment rates that have not reduced to single-digit figures. Over the years, the composition of unemployment has shifted, with an increasing proportion of unemployed individuals being graduates (from 10% in 2001 to over 41% in 2016).

This indicates a changing nature of the labor market, necessitating the development and implementation of occupation creation policies that cater to the needs of these academically educated applicants. This trend has continued during the period of 2016-2017 as well, as evidenced by statistics provided by the Iranian statistics centers, which demonstrate an increase in the number of unemployed university graduates and individuals with academic degrees [17-23]. The main focus of this study is to examine the factors influencing changes in the structure of the labor market within the country's economy and to determine whether the volume of bank facilities significantly impacts the labor market in terms of workforce supply and demand. Given the asymmetrical relationship between bank facilities, bank lending policies, and economic fluctuations, the study utilizes non-linear models, including smooth transfer regression (STR) and Markov Switching (MS), to evaluate the effect of bank facilities on

employment. This article consists of five sections. The subsequent section provides the research background for the topic, followed by an evaluation of the theoretical literature in the field in the third section. The fourth section presents the experimental model employed in the study. Finally, the research concludes with a discussion of the findings and policy recommendations in the last section.

2 Research Background

Koich evaluated the impact of bank facilities on employment using nonlinear models and concluded that different behaviour of employment variable in two regimes during 1990-2014. In the first regime (boom regime), the variables of bank facilities, capital stock, economic value added (EVA) and minimum wage per capita had the highest impact on growth, respectively. In the second regime (recession phase), the variables of minimum wage per capita, capital stock, EVA, and bank facilities had the highest effect on growth, respectively [23-28]. In another research, Morgan assessed the relationship among bank facilities interest rates, value added and employment. According to economists, capital is one of the most important factors for production in societies, in a way that its shortage is always recognized as the major problem in various economic sections. In the aforementioned research, Morgan reported a significant and positive relationship between the bank interest rate and the variables of value added and employment. In addition, a bilateral correlation was obtained between the bank interest rate and the variables of value added and employment with the use of Granger causality test. Applying the generalized method of moments (GMM), Rabiul assessed the effect of the development of banks and stock markets on the economic growth of 80 developing countries during 1973-2002. According to the results, banks and stock markets had both separate and aggregate positive and significant effects on economic growth. Therefore, the existence of banks along with stock markets is important for acceleration of long-term economic growth in developing countries. In addition, it has been determined that the relationship between financing and economic growth is nonlinear, which implies that financial development is more beneficial for underdeveloped countries. As such, developing countries should adopt policies that simultaneously develop their banks and stock markets. In another study, James evaluated the mechanism of association between bank development and economic growth in Malaysia by using six equations [29-31].

The results from the estimation of these equations demonstrated that banking development has led to high economic growth in Malaysia through increased savings and private investment. In addition, his results confirmed the indigeneity of banking development and growth, showing that financial development has led to economic growth through increased efficiency of investment. In 2010, Ridhwan et al. [23] assessed the impact of monetary policies on actual economic activities using a meta-analysis approach. In this study, the scholars aimed at recognizing the various causes of the effect of monetary policy on economic growth. To this end, vector autoregressive (VAR) models were employed, and the results demonstrated that capital accumulation, financial deepening, inflation rate, and size of the economy were important factors for explaining changes in the impact of monetary policies on production over time. Furthermore, differences in the type of models used in primary studies significantly explained the diversity of this effect. In an article on bank lending channel and monetary transmission, Matousek and Sarantis concluded that while there is evidence of bank lending channel in all countries, its intensity differs from country to country. According to these scholars, it seems that the size of the bank and liquidity play the most role in the reaction of banks to monetary policy changes. The macroeconomic implications of bank lending channel were assessed in the mentioned study as well, presenting evidence of a relationship between the total loan supply and actual economic activities in Eastern and Central Europe countries. In 2017, Nazarzadeh [11] evaluated the effect of bank

facilities on the employment level of major economic sectors in the provinces of the country. In this research, the time interval used was 2001-2014, and GMM was exploited for data analysis. According to the results, while the variable of bank facilities had a negative impact on employment in agriculture and service sections for all provinces of the country, it had a positive effect on the industry section. On the other hand, the variable of value added had a negative effect on employment in the agricultural sector, whereas it had a positive impact on the sectors of industry and services. In addition, the results related to the divisions made in provinces based on unemployment show that the variable of bank facilities has negative and equal impact on the employment of both groups with the high and low unemployment rate in the agricultural sector.

However, this issue has a positive impact on both groups in the industrial sector. Nevertheless, the effectiveness is higher in the group with a higher unemployment rate, compared to the group with a lower unemployment rate. In the services sector, the results showed that bank facilities had negative and positive on the employment of the groups with higher and lower unemployment rates, respectively. In 2016, Bashuki [2] assessed the effect of bank facilities granted to employment in Zanjan province's economic sectors. To this end, a panel data model was applied for a sample of provincial banks (including 12 banks that played a role in providing bank facilities) for the maximum available data and the period of 2005-2013. In this research, employment was applied as a dependent variable, whereas value added of economic sectors and obligatory and non-obligatory facilities were used as independent variables. According to the results of the study, while granting obligatory facilities had no significant impact on occupation creation, there was a significant relationship between non-obligatory facilities and employment in the agricultural sector. On the other hand, no significant association was observed between non-obligatory facilities and employment in the services sector, and granting non-obligatory facilities had no effect on occupation creation in this field. Therefore, it could be concluded that granting non-obligatory facilities has the highest impact on employment creation in the industrial sector. In addition, value added of the services and industrial sectors has a positive and negative effect on occupation creation, respectively.

Meanwhile, the non-obligatory facilities in the industrial sector have a higher impact on occupation creation, compared to value added. In research, Amini [24] analysed the labour market and employment policies of the Iranian economy with an emphasis on the fourth economic, social and cultural development plan of Iran. In this study, Amini pointed out that the specific demographic structure of the country and the high supply of labour on one hand, and the lack of access to existing job opportunities, as well as the lack of facilities that fit the characteristics and needs of the workforce on the other hand have led to the recognition of unemployment as the most important socio-economic challenge of Iran, affect, affecting other socio-economic variables as well. Among the five markets of the economy (labour market, capital market, money market, security market, and markets for goods and services), the labour market plays a pivotal and determining role in regulating supply and demand relations of labour and creating balance in macroeconomic variables (e.g., employment). In addition, this market is distinguished from other markets due to the involvement of human agents in the supply and demand of this market. Positive consequences and effects of socio-economic balance in the labour market are such that it has attracted the attention of economists, policymakers, and politicians. This study aimed to provide a comprehensive analytical image of the labour market and economy of Iran and review the performance of occupation creation policies in the form of economic development programs of the country, which can be used to improve population planning and policies, occupation and development during the years of the fifth development plan. Applying exploratory and descriptive methods, we evaluated the process of changes in the workforce and key indicators of the country's

labour market during 1989-2010. In 2012, Saeedi assessed the effect of bank facilities on employment in Golestan Province, Iran. This research was applied in terms of goal and descriptive-survey regarding the method. In addition, data analysis was performed using regression analysis and panel data model. The statistical population included the payment credits of all active banks (a total of 16 specialized and commercial banks) during 1998-2006. Data collection was carried out by assessing the annual financial documents and statements of commercial and specialized banks. According to the results, labour plays the highest role in the economic growth of the province and is positive in line with theoretical expectations.

On the other hand, obligatory facilities had little impact on employment in the province, whereas non-obligatory facilities played a more positive role in this regard. Tayebi et al. [6] evaluated the impact of bank facilities on occupation creation in the economic sectors of Iran. In addition, they assessed the impact of the allocation of bank facilities of the country to agricultural, industrial and services sectors and measuring the employment trend in these areas during 1973-2006. In this regard, the net employment rate of bank facilities in the economic sectors of the country was calculated during this period by introducing and formulating pure employment indices in the form of occupation creation and job destruction. In total, due to the allocation of bank facilities to the industry and mine, agriculture and services sectors, the highest and lowest annual means of occupation creation were observed in the sectors of agriculture and services, respectively. However, the results were indicative of fluctuation in the performance of the banking system of the country regarding occupation creation in sectors, especially services, in a way that this type of facilities led to job destruction in the mentioned period. An overview of previous studies shows the lack of attention to the labour supply and demand sector and labour market structure and the impact of bank credits on the labour market structure in Iran. In fact, the majority of studies have focused on workforce supply and effective factors in this respect. Therefore, we aimed to evaluate the effect of bank credits on labour market structure.

3 Theoretical Foundations and Framework

In general, the economy of each society is divided into two actual and financial parts. Gross domestic product (GDP) or the size of the economy is the actual part of the economy. Economic growth and development are interpreted as growth in the actual sector. All major variables of national accounts (e.g., capital consumption and formation) represent the activities performed in the actual sector of the economy. The financial sector is the other side of the economy, which in fact supports and facilitates the activities of the actual sector of the economy. The financial sector should not endanger or substantially compromise the actual sector of the economy.

Basically, the optimal performance of the economic system in any society depends on the existence of two efficient, complementary, powerful and supervised actual and financial sectors. In order to establish an optimal economic system, it is necessary for these two sectors to work together since the unproductive performance of one of these two sectors will negatively affect the functioning of the other sector. Therefore, the stable and long-term balance of any economic system is obtained when the two sectors act with their internal connections in balanced conditions. Accordingly, it could be expressed that the financial sector injects life into the actual sector of the economy. Here, the financial development is interpreted as the development of the monetary sector or system (i.e., markets, institutions, and financial instruments) used to create and exchange claims. This issue provides incentives for transferring the money of savers to applicants. Financial systems include institutions that trade financially in an institutional framework known as the financial market. The efficient and stable operation of both financial and actual sectors in each economic system provides conditions for sustainable eco-

nomic growth. In a model of "allocation of Arrow-Debreu resources", there is no need for financial institutions to move toward Pareto optimality. In addition, the Modigliani-Miller theorem (M&M) is used to support the issue of lack of effectiveness of the monetary and banking structure: while households can select a basket of assets, the financial intermediary cannot add added value to this selection. In the Arrow-Debreu model, with the assumption that firms and households have unlimited access to perfect markets, banks will have zero gains, and the size and composition of the bank's balance sheet will not affect other economic factors.

The extreme views that the money and banking market optimally allocates resources alone is clearly in conflict with real and historical experiences. In the real world, there is a need for these institutions due to deficiencies in markets, such as transaction costs and information asymmetry. By decreasing these costs, financial intermediaries can follow an optimal saving-investment program to efficiently allocate resources. In the majority of economic systems, the bank is the centre of the financial and payment system and plays an important role in the process of saving, identifying investment opportunities and diversifying risk. Therefore, the size, structure, and efficiency of the banking sector are considered as a dimension of financial development. The profitability of banks, repayment credits, and easy access of the private sector to bank credits are discussed in this section. By providing the resources required for actual investment, banks affect economic growth by playing a mediating financial role (McKinnon & Shaw [18]). The presence of an efficient banking system is a necessary and effective tool for the economic development of the country. Banks are the pulse of financial activities, and the situation governing them has an important impact on other sectors of the economy of a society. Banks facilitate trade and business exchanges by organizing and directing receipts and payments, thereby expanding markets and economic growth. Banks are the main provider of financial resources for actual sectors of the economy (industry and mine, agriculture, housing and construction, and commerce and services). Along with their core function, banks' main motivation in optimal resource allocation and provision of different services to customers is earning revenues and profits similar to other economic entities. Given the special role of banks in the economic system of countries, the occurrence of any shock, disturbance, or inefficiency in the economic system directly affects the activities of banks and financial institutions. In addition, the occurrence of phenomena such as high inflation or shocks and severe price fluctuations in other markets (e.g., gold or currency) directly and indirectly affects the volume and composition of resources, operating costs, full cost and the profitability of banks. Similar to any other business, the main objective of banking management is to earn profits. The fundamental requirement of all profit-making activities is profitability. At a macro level, a profitable and strong banking system can resist the negative momentum in the market and stabilize the financial system of an economy.

4 Estimation of Empirical Research Model

This study aimed to evaluate the role of the banking system and, in particular, monetary policies and the provision of bank facilities during the era of recessions and booms on employment in the labour market. In order to estimate the relationship between the variables of the research using the time series data model, the dependent variable of this research was employment, whereas its independent variables included economic growth, bank and financial development index, the volume of facilities granted to the private sector, the rate of bank facilities, the wage rate, capital, liquidity, level of economic openness, inflation, foreign direct investment, government expenditures, and oil revenues. In this study, Eviews8 and Ox-Metrics were applied. In addition, data were collected through the library

method (document branch) since the information related to the research variables were extracted from seasonal data during 1989-2016 and the model was designed based on this information. It should be noted that all research variables were seasonally adjusted by the X-12 filter.

4.1 Unit Root Test

Before modelling the research, the durability of the variables was assessed by augmented Dickey–Fuller (ADF) test to prevent false regressions in the study. Using the tests, we determined whether the time series used had durability (zero accumulation rank) or convergence (non-zero accumulation rank). To this end, the unit root test was performed on the research variables. The root test of the unit was carried out in the presence of y-intercept and trend terms. The results of Table 1 showed that the zero-hypothesis based on the presence of unit root for variables was rejected due to the significance level below 0.05. Therefore, the variable's durability was confirmed.

Table 1: Unit Root Test of Variables

Variable	ADF Test	
	Test statistic	Probability
Economic growth	-4.45	0.008
Occupation growth	-3.57	0.005
Bank and financial development index	-4.48	0.012
Facilities granted to the private sector	-3.28	0.002
Bank facilities rate	-4.12	0.006
Wage rate	-3.17	0.019
Capital growth	-4.60	0.002
liquidity growth	-3.49	0.005
Degree of economic openness	-2.98	0.027
Inflation rate	-5.30	0.000
Foreign direct investment	-4.43	0.000
Oil revenues growth	-3.34	0.012
Government expenditure growth	-5.49	0.002

Source: results obtained from research

4.2 Estimation of Empirical Research Model

In this study, we used the smooth transfer regression (STR) model, which is a non-linear model, to assess the asymmetric effects of bank facilities on employment in the labor market in Iran. These models are completely flexible and can display different forms of nonlinear behavior. To specify a non-linear model, the following stages must be performed:

1- Specifying a linear model and testing the hypothesis of zero-linearity versus non-linearity using different transition variables

2- Determining the type of nonlinear model for model estimation after ensuring the nonlinearity of the model and determining the best transition

As a starting point, the linear model was estimated to model the nonlinear behavior of employment Akaike and Schwarz criteria). In the next stage, the null hypothesis of linearity versus non-linearity was assessed based on the modeling process. Following the work of Granger and Terasvirta the line-

arity assumption of the relationship between the variables was tested against two nonlinear parameters of the logistic regression model (LSTR) and nonlinear exponential regression model (ESTR).

$$Y_t = \beta_0' Z_t + \sum_{j=1}^{3} \beta_j' \tilde{Z}_t S_t^j + u_t, t = 1,2,3,\dots,T \tag{1}$$

Where, $u_t \sim iid(0, \sigma^2)$ is the z_t of a vector of the descriptive variables, $z_t = (1, \tilde{z}_t')'$ is the $\tilde{z}_t$ of a vector $(m \times 1)$, s_t is the transition variable and F is the transition function, value of which is limited to the range of 0-1 and can be either in the logistic or exponential form. In constructing STR models, the test is performed as follows:

First, we select a set of potential transition variables that can have elements similar to z_t. It is also possible for theories to limit some variables (deletion of some variables) or to introduce some new variables. After defining s, the test is performed in a way that each of the variables in s is used as a transition variable. If the null hypothesis of linearity is rejected for more than one transition variable, a variable for which the P-value of the test is minimum will be selected. The logic behind this issue is that the null hypothesis rejects linearity stronger than other transition variables. In this research, after estimating the model with different transition variables, the inflation rate was selected as the transition variable since the estimated results were more satisfactory than other variables. After selecting the transition variable, the next step to estimate the nonlinear model is to select the type of model that should be selected and used among the different STR models to specify the model. Selection among various STR models (i.e., LSTR1 and LSTR2 [ESTR]) was carried out according to the non-linear regression literature, as presented below:

$H_{04}: \beta_3 = 0$.

$H_{03}: \beta_2 = 0 \mid \beta_3 = 0$.

$H_{02}: \beta_1 = 0 \mid \beta_2 = \beta_3 = 0$.

The LSTR model was selected for the transition variable of s_t in case of rejection of H_{04} or H_{02}. On the other hand, the ESTR model was selected if the H_{03} was rejected. If all three hypotheses are rejected, the LSTR (ESTR) model is selected when the H_{04} or H_{02} is rejected more strongly, compared to H_{03}. However, it is possible to estimate the model with both LSTR and ESTR models and then select the optimal model in the model evaluation stage if the P-values obtained from null hypotheses are almost equal. The model will be LSTR2 if $\beta_{4j} = 0, j = 1, \dots, p$ and $\beta_{3j} \neq 0$ is established for at least one j. if the model is LSTR1, $\beta_{2j} = 0$ is at least for one j. For example, the model will be LSTR1 if the H_{04} is rejected. However, LSTR2 or ESTR will be selected if H_{04} is accepted and H_{03} is rejected. As mentioned before, a possible answer is the nonlinearity of the relationship between bank facilities and employment. Therefore, in order to achieve the main goal of this research, the nonlinear association must be approved or rejected by a test. To carry out the linearity test of the model, the auxiliary regression obtained from the third-degree Taylor of the transfer function was applied. We must first determine the transfer function to estimate the equation. The changes of the transfer function and its distance from the threshold can affect the effectiveness of the variable or explanatory variables on the dependent variable. This variable can be an interruption of the endogenous variable, exogenous variables or a third variable outside of this framework, such as the time trend variable. Therefore, the most suitable transition variable was selected from various variables. In general, the suitable transition variable is one that has the minimum test statistic related to the linearity test. In other words, it has the lowest amount of test statistic among other variables.

In case of confirmation of the non-linearity of the model that has a suitable transition variable, an appropriate functional form must be evaluated for the transition function. As mentioned before, the tran-

sition function has two forms of LSTR1 and LSTR2. Therefore, based on the tests previously mentioned, the suitable functional form was determined for the transition function. The results of these tests are summarized in Table 2. It should be noted that the values presented in Table 2 show the uncertainty level of the F statistic (Prob F). Accordingly, the first column indicates the level of uncertainty in the rejection of the linearity hypothesis, whereas the following columns are related to the certainty level of rejection of H_{02}, H_{03}, and H_{03}, respectively.

Table 2: Results of linearity tests, determining the transition variable and proper functional form

Transition variable	Level of significance				Proposed functional form
	H_0 hypothesis	H_2 hypothesis	H_3 hypothesis	H_4 hypothesis	
Government expenditure growth	0.5172	0.92065	0.31186	0.033709	Linear
Facilities growth	0.0060422	0.23215	0.0065356	0.072183	LSTR2
Inflation	0.011966	0.039101	0.071977	0.15510	LSTR1
Oil revenues growth	0.01162	0.055193	0.088653	0.076315	LSTR2
Wage rate	0.02153	0.22405	0.51846	0.0018515	LSTR2

According to the results of the first column, the H_0 hypothesis relating to the linearity of the model was rejected with regard to government expenditures as a transfer variable at a 99% confidence level. In addition, the P-value in this test was lower for the inflation variable, compared to other variables. Therefore, the inflation variable was selected as the appropriate transmission variable. The results of the other three columns were indicative of the rejection of H_{02}, H_{03}, and H_{04} by considering inflation as the transition variable. Accordingly, the proper functional form proposed for the transfer function was LSTR1. However, confirming this functional form for the transfer function indicated that there is a threshold. As such, it seems that the effect of bank credit on employment has undergone a regime change based on a level of inflation, which is the threshold point, and this regime change has occurred gradually. The equation below was applied to assess the asymmetric effects of bank facilities on employment in the labor market in Iran. The standard form of the model (Terasvirta,[23]) is defined, as follows:

$$y_t = \varphi' z_t + \theta' z_t F(\gamma, s_t, c) + u_t = \{\varphi + \theta F(\gamma, s_t, c)\}' z_t + u_t \qquad t = 1, \dots, T \qquad (2)$$

Where z_t is the vector of explanatory variables. In addition, $\varphi = (\varphi_0, \varphi_1, \dots, \varphi_m)'$ and $\theta = (\theta_0, \theta_1, \dots, \theta_m)'$ are the vector of parameters and $u_t \sim iid(0, \sigma^2)$. Moreover, the transfer function of $F(\gamma, s_t, c)$ is a bounded function based on the transition variable of s_t, γ is the slope parameter and $c = (c_1, c_2, \dots, c_k)'$ is a vector of local parameters, in a way that $c_1 \leq c_2 \leq \cdots \leq c_k$. The last expression in the above equation shows that the model can be interpreted as a linear model with coefficients that change randomly over time.

$$\begin{aligned} Y_t = \beta_0 + \beta_1 LLO_t + \beta_2 LM2_t + \beta_3 LR_t + \beta_4 INF_t + \beta_5 FD_t + \beta_6 W_t + \beta_7 LK_t + \beta_8 GRO_t \\ + \beta_9 OP_t + \beta_{10} FDI_t + \beta_{11} LGOV_t + \beta_{12} LOIL_t + (\alpha_0 + \alpha_1 LLO_t \\ + \alpha_2 LM2_t + \alpha_3 LR_t + \alpha_4 INF_t + \alpha_5 FD_t + \alpha_6 W_t + \alpha_7 LK_t + \alpha_8 GRO_t \\ + \alpha_9 OP_t + \alpha_{10} FDI_t + \alpha_{11} LGOV_t + \alpha_{12} LOIL_t) (1 + \exp\{C * (S_t - \gamma)\})^{-1} \end{aligned} \qquad (3)$$

In the equation above, the vector Y is the amount of employment. In addition, the parameter C expresses the local parameter, whereas γ and LLO_t denote the slope parameter and the logarithm of the

volume of facilities and loans granted to the private sector, respectively. Moreover, $LM2_t$ is liquidity logarithm, LR_t is the rate of facilities, INF_t is the inflation rate, FD_t is the financial market development index in the money market, W_t is wage rate, LK_t is the logarithm of capital stock, GRO_t is economic growth, OP_t is the degree of economic openness, FDI_t is the direct foreign investment, $LOIL_t$ is the logarithm of oil revenues, and $LGOV_t$ is the logarithm of government expenditures.

Table 3: Estimation of the non-linear patterns of model

Variable	Coefficient (level of significance)
Linear model	
Y-intercept	(0.00) 0.154
Economic growth	(0.01) 0.028
Bank and financial development index	(0.02) 0.015
Volume of facilities granted to the private sector	(0.00) 0.029
Bank facilities rate	(0.59) 0.013
Wage rate	(0.01)-0.029
Growth of capital stock	(0.04) 0.121
Liquidity growth	(0.03) 0.048
Degree of economic openness	(0.38) 0.045
Inflation rate	(0.02) 0.075
Growth of direct foreign investment	(0.01) 0.068
Growth of oil revenues	(0.02) 0.082
Growth of government expenditures	(0.02) 0.088
Non-linear model	
Y-intercept	(0.01) 0.069
Economic growth	(0.00) 0.045
Bank and financial development index	(0.02) 0.017
Facilities granted to the private sector	(0.00) 0.012
Bank facilities rate	(0.58) 0.017
Wage rate	(0.03)-0.054
Growth of capital stock	(0.02) 0.004
Liquidity growth	(0.03) 0.099
Degree of economic openness	(0.28) 0.033
Inflation rate	(0.01) 0.032
Growth of direct foreign investment	(0.00) 0.038
Growth of oil revenues	(0.03) 0.028
Growth of government expenditures	(0.01)).039
Gamma coefficient	2.87
C coefficient	0.68
Statistics of good fit of the model	
The coefficient of determination: 0.74, F statistic: 24.54, Durbin–Watson statistic: 1.97	

The results of nonlinear model estimation using the 1LSTR pattern are presented in Table 3. In this estimation, the variable of inflation rate in LSTR model is determined as the optimal transition variable. Considering the significant difference of all research variables (except for the rate of bank facilities and the degree of economic openness), the result indicated that the bank indexes, such as bank facilities, liquidity, and financial development, had a significant and positive effect on employment. The results obtained from the diagnostic tests of the model demonstrated the lack of autocorrelation

and the problem of variance of heterogeneity in residuals of the model. As mentioned in the previous sections, the nonlinear model was limited to two LG (corresponding to low inflation rate) and HG (corresponding to the high inflation rate) regimes.

The analysis indicated that in case of a low growth rate of inflation, with regard to selecting the LSTR model, employment shows asymmetric behavioral growth rate relative to different levels of growth rate. The transition speed between two inflation regimes was estimated to be 2.87 based on the estimated transition parameter INF_{it}. The above equations demonstrated the varied impact of bank facilities and the monetary policy on employment when the growth rate of inflation is high and low. In other words, the behavior of this function will change when the inflation rate reaches 2.87%.

Given that the model was estimated based on LSTR with K=1, (LSTR1 model) could model the behavior of the symmetric variables. The transition variable was used to measure the phase or period of changes. The LSTR1 can be a suitable and reliable model for the description of processes that have different dynamic characteristics in each type of regime (processes that have different behaviors in periods of booming and recession) and transition from one regime to another is carried out gradually. On the other hand, the LSTR2 model (K=2) is suitable for a situation in which the modification process is dynamic and the model has similar behavior in the upper and lower values of the transient variable and only shows different behaviors in intermediate values. In the estimated model, all coefficients had a significant difference from zero at the error level of 5%. In addition, the variables of government expenditure, foreign investment, and physical capital showed a positive and significant relationship between government expenditure, foreign investment and physical capital with employment. Furthermore, the bank development index, volume of facilities, and liquidity were positive and significant.

5 Conclusion

The present study aimed to assess the role of the banking system and, in particular, monetary policies and the provision of bank facilities, during the recession and the boom on employment in the labor market during the period of 1989-2016 based on seasonal data and STR method. As financial intermediaries, banks play a pivotal in the economy, in a way that their activities can affect the attraction of savings and investments. The results of the studies in this field indicated a strong relationship between employment and banking development. In fact, financial and monetary markets are financing sources for various economic activities. The financing of production units is one of the most important issues in the management of a system, either from the point of view of working capital or from the perspective of developing new activities and investments.

Due to this importance, a type of management known as financial management is discussed in theoretical and practical discussions as an important factor for preserving and maintaining the activities of the system. In the section of the nonlinear model, it was observed that monetary policy and facilities indicators had different and significant impacts on employment because of a 2.87 increase in the inflation rate. In the linear model for employment, it was observed that the indicators of liquidity, bank facilities, and banking development had a positive and significant effect on employment in the country. According to our findings, it is recommended to use various tools in financing and creating an effective portfolio for our financial system since in the new conditions of banking system, banks act as competitive economic agencies in a set of local, national and transboundary activities to gain more profitability in these areas. Since the structure of the banking system of the country still has an improper function, which, of course, has rooted in factors such as the traditional structure of the banking system over time, our findings showed the effect of all determinants of aspects of monetary policy and

bank facilities on employment. The policy proposal for action to expand the capital market, in particular, will make it possible for all people to access the capital market in order to improve the situation of the financial sector and consequently increase employment in Iran. The most important action is the expansion of technical and vocational education based on the needs of the country's economy, which will lay the foundation for the growth and prosperity of economic activities by arranging and equipping human resources and increasing their production efficiency and creativity.

Therefore, training and improving the quality of the workforce is one of the items that seems to be a constant necessity in the managerial and executive dimensions. Also, considering the impact of government spending on employment, the most important task of the government is economic growth, and to achieve this goal, it must strengthen and expand production. In Iran, the need for large government investments in production and infrastructure should be considered one of the most important goals of the government. The government should complete the semi-finished projects that started in the previous programs and have not yet been completed, and create jobs. Then start looking for new projects and investing in them. Employment will increase if the government spends its tax revenues on investments. So, although there has always been an emphasis on controlling the government budget deficit, if this deficit, ie the surplus of government spending, is spent on construction and infrastructure investments, one day the return on these investments will increase GDP and reduce the budget deficit.

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