



The Effect of Unemployment Rate on Fiscal Policy in the Political Cycle

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ABSTRACT

Unemployment is one of the big problems that the country is facing. On the other hand, governments seek to avoid social unrest caused by problems such as unemployment. Therefore, in this research, the government's policy in the face of social unrest caused by the unemployment rate has been investigated. In this regard, the effect of the unemployment rate as a representative of social unrest on public debt, government expenses, and tax revenues in 31 provinces in 2011-2019 has been studied. The feasible generalized least squares (FGLS) method was used to estimate this study's regression model. The results of this research show that with the increase in the unemployment rate, the government's public debt has significantly increased. The government's tax revenues have decreased, which indicates that the ruling governments in Iran from 2011 to 2020 are facing unrest caused by They have used the unemployment rate from issuing public debt.

1. Introduction

Governments try to avoid and minimize social unrest as much as possible to stay in power and increase their chances of re-election. One of the factors that cause social unrest and increase inequality in society is the unemployment rate. From the point of view of macroeconomics, the effect of shocks caused by the increase of inequalities on total consumption can be analyzed from two aspects. First, with the increase in inequality, the total consumption will probably decrease. On the other hand, even if investment and savings increase in certain circumstances, it will never compensate for the decrease in total consumption. The decrease in total consumption causes a reduction in tax revenue collection, and on the other hand, the demand for compensation in society increases. These conditions will lead to unrest and societal instability (Carrera et al., 2023). Social

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unrest originates from various factors; one of these factors is the increase in the unemployment rate, which endangers the government's re-election in the elections. The phenomenon of unemployment and economic problems also causes political tensions (Sidaii et al., 2011). Therefore, when faced with an increase in the unemployment rate, governments use available financial tools to increase society's satisfaction and the chance of re-election. As a result, with the increase in the unemployment rate in society, the amount of public debt and government expenses will likely increase, and taxes will decrease. Government financial policies have various functions. Improving the employment situation and reducing the unemployment rate are some of the functions of the financial instruments available to the government (Murwirapachena et al., 2013). One of the tools that the government has in the face of social unrest is increasing taxes, which does not seem to be a suitable policy for the government to increase the satisfaction of the society and increase its chances of re-election. Because the big taxpayers, who are also the constituents of the government's electoral base, will resist this policy, and on the other hand, the government's electoral base will be severely destroyed by the implementation of this policy. Therefore, with these conditions, the government will issue public debt and increase its expenditures to deal with social unrest caused by factors such as unemployment (Carrera et al., 2023).

Government spending to increase employment can be direct or indirect. Governments can directly invest government spending in infrastructure, education, healthcare, etc., and create new jobs (Abauelfarag & Outb, 2021). Also, governments indirectly affect unemployment by influencing macro indicators such as increasing or decreasing the inflation rate (Holden & Sparrman, 2018). The present research studied the effect of unemployment rate on public debt, government expenses and tax revenues in 31 provinces of Iran from 2010-2019. This period is considered due to statistical limitations and to keep all provinces in the sample. The feasible generalized least squares (FGLS) method was used to estimate the regression model of this research. In the second part, the theoretical foundations and background of the study are explained; in the third part, the research model and method are described. In the fourth part, the estimation results of the models are reported, and in the fifth part, the conclusions are presented.

2. Literature Review

The undeniable impact of politics on economic performance has caused the relationship between these two categories to attract the attention of researchers. The effectiveness of governments'

performance before the elections has caused the ruling politicians to manipulate financial policies with political motives to obtain appropriate election results. (Nordhaus, 1975). One of the most essential macro variables in any country is employment. The government can influence this critical variable through its financial tools in the form of financial policies. (Rasouli et al, 2020) The unemployment rate is one of the indicators of social unrest and political instability. This index also shows political and electoral motives. The trade-off between inflation and unemployment plays a significant role in the political budget cycle (Nordhaus, 1975). In the relevant literature, various instruments are mentioned as representatives of financial policy. Among these tools, government spending, taxes, and government debt can be mentioned. Financial instruments are decisive in dealing with unemployment and the economy's stability (Cyrek, 2019). There are different opinions among different economic schools about the effectiveness of financial policy on actual variables such as employment. The Keynesian school claims that government intervention through Applying financial policies can affect actual variables such as employment. In contrast to this school, financial policies are ineffective due to the unpredictability of economic factors and ineffectiveness (Rasouli et al., 2020). In the period close to the elections, the ruling government faces unemployment, and to increase its chances of re-election, it applies expansionary policies (Shakeri, 2011). Government debt will increase. One of the government's tools in facing the instabilities caused by the increase in unemployment is to increase its expenditures near the elections, which, if it is accompanied by the financial illusion or naive expectations of the voters (Nordhaus, 1975) and in wise conditions with the asymmetry of the information of the voters. It will supply the political government. On the other hand, from the perspective of theoretical foundations, with the increase in government spending, the income and purchasing power of the society increases. As a result, it will increase the demand for goods and services. Continuing this cycle will create employment and reduce unemployment (Akbari et al., 2011).

Another financial policy in the face of instabilities is issuing public debt. Theoretically and empirically, the effect of inequality caused by unemployment on the government's public debt is ambiguous. In other words, this effect of paying attention to the conditions can be manifested both positively and negatively. Therefore, this issue can be examined from two perspectives. In the first view, with the increase of inequalities, the risk of income also increases; as a result, the government's motivation to borrow increases. Government debt results from government policies in the face of inequality (Azzimonti et al., 2014). In the second view, the rise in inequality causes

the accumulation of capital and, as a result, the increase in production, and finally, tax revenues increase and public debt increases. The government decreases. (Sadeghi Amroabadi & Hoshmandi 2021).

One of the permanent and predictable sources of attention for politicians is taxes. Taxes affect the economy differently depending on the role of income generation and policymaking. The effect of inequalities on taxes can be investigated through two channels. On the one hand, with the increase in inequality caused by factors such as unemployment, total consumption decreases, and even if it increases under certain investment conditions, it will not compensate for the decrease in total consumption, which leads to a reduction in tax revenue collection. As inequality increases, tax revenues decrease. On the other hand, with the rise in economic inequality, the government increases taxes to avoid the unrest caused by it, which will face the resistance of large taxpayers; as a result, with the increase in economic inequality, the government's tax revenues will probably decrease (Carrera et al. et al., 2023).

Carrera et al. (2023), in an article titled (Income inequality and financial policy in the political cycle), investigated the effect of inequality on government economic policy in a sample of 79 countries from 1990 to 2015. The results of their study show that the marginal effect of income inequality on public debt increases with the completion of the implementation period. All the countries studied in this research reacted to the increase in inequality by issuing public debt.

Carrera and Delauga (2021), in an article titled (Effect of income inequality on public debt) in a sample of 158 countries over 20 years, concluded that public debt not only depends on the traditional determinants related to tax smoothing but also on Political and financial pressures from changes in inequality and unemployment are also relevant. Imran and Bilan (2020), in an article entitled (Effect of Fiscal Policy on Unemployment Rate in Egypt), have investigated how the unemployment rate reacts to fiscal policy shocks. In this study, annual time series data from 1976 to 2018 have been used using the structural vector autoregression (SVAR) approach with the shock response function (IRF) tool. The results of this study show that government spending harms the unemployment rate, and a positive shock to tax revenue has a positive effect on the unemployment rate. IWUOHA (2020), using time series data from 1981 to 2019 using the distributed lag model, investigated whether borrowing to Reduce unemployment in Nigeria is helping. The results of this study show that unemployment granger causes government debt and debt servicing. Mozafari (1402), in an article entitled "Investigation and comparison of the effects of corporate income tax

and government expenditures on the unemployment rate in the provinces of Iran," investigated and compared the effects of corporate income tax and government expenditures on the unemployment rate of Iranian provinces during The years 1387 to 1400 have been analyzed using the econometric method of the moments obtained by Naim. The results of Mozaffari's study show that corporate income tax, unemployment rate in the past period, and urbanization have a positive and significant effect, and the variables of government spending and economic growth have a negative and significant effect on unemployment. Ebrahimi et al. (1400), in an article titled (Effect of fiscal policy on the unemployment rate and inflation rate in Iran's provinces: GVAR approach), investigated the effect of fiscal policy on the unemployment rate and inflation in the country's provinces using the autoregression approach. Global vector has been studied from 1384-1395 to 1395-4. This study's results show the Nestlé provinces' response to the positive shock of fiscal policy. The unemployment rate is significant in some provinces and meaningless in others. Amini Milani et al.(1400), in an article entitled (Evaluation of employment policies in Iran), evaluated the employment policies in Iran from 1355 to 1395 with the ARDL estimation method. The results of their study show that gross domestic product, business climate index, government spending, non-governmental sector credit balance, labor productivity, capital reserve, and foreign direct investment have a significant relationship with employment. Rasouli et al.(2019), in an article entitled "Prediction of the Effect of Monetary and Financial Policies on the Unemployment Rate in Iran's Economy," using Bayesian-based dynamic models TVP-FAVAR, TVP-DMA to determine the effect of policies Money and Finance have studied the unemployment rate in Iran in the period from 1370-1370 to 1397-4. The results of their study based on the TVP-DMA approach indicate that financial policies have a more significant effect on interest rates than monetary policy. Also, the results obtained from the TVP-FAVAR approach show that all the variables affecting unemployment in the long term lead to an increase in unemployment. have become. A review of the studies conducted on this research shows that most foreign studies have examined the effect of economic inequality on the government's financial instruments at the international level. In domestic studies, the effect of inequality has been investigated only on one instrument, or the effect of policies on economic inequality has been measured. The leading research, compared to the conducted studies, worked on a provincial basis. The effect of economic inequality with the unemployment rate index on three government financial instruments, including public debt,

expenditure, and government tax revenues, and also by considering the political variable was evaluated.

3. Research Methodology

In this research, within the framework of the research literature, especially the experimental study (Kerra et al., 2023) to measure the effect of the unemployment rate as a representative of communal unrest on the government debt, tax revenues, and government expenditure in the provinces of Iran in the period from 1390 to 1399. The following regression model was used.

$$y_{i,t} = \beta_0 + \beta_1 y_{i,t-1} + \beta_2 INEQ_{i,t-1} + \beta_3 INEQ_{i,t-1} shrterm_{i,t} + X_{i,t} \gamma + \mu_i + \varepsilon_{i,t} \quad (1)$$

In model (1), indices t and i represent time (year) and sections (province), respectively, β values of the model parameters, unobservable effects between sections, and disturbances. The fiscal policy variable in province i and period t includes (the share of Public debt in government expenditure and tax revenues from GDP. In this research, due to the lack of access to each province's share of public debt, according to Falahati and Heydarian's study (2017), the proxy of the provincial budget deficit is the difference between the performance of payments (the sum of expenditure and capital credits) and receipts (The place of provincial income and national income) has been used. So that the debt share of each province from the gross production of that province in the studied period is obtained as follows:

$$Public\ debt\ share\ of\ GDP_{i,t} = \frac{deficit\ budget_{i,t}}{GDP_{i,t}} * 100 \quad (2)$$

Government expenses in each province are the sum of each province's current and capital expenses and transfer payments. The share of government expenses from the GDP of each province is obtained as follows:

$$share\ of\ government\ spending\ in\ GDP_{i,t} = \frac{government\ spending_{i,t}}{GDP_{i,t}} * 100 \quad (3)$$

Tax revenues are the total income from taxes on incomes, companies, wealth, and goods and services, and the share of tax revenues of each province in the province's gross domestic product is as follows:

$$Tax\ income\ share\ of\ GDP_{i,t} = \frac{Tax\ income_{i,t}}{GDP_{i,t}} * 100 \quad (4)$$

As a critical explanatory variable as an indicator of social unrest in this research, which is measured by the unemployment rate, this indicator has a lag period because social and political reactions related to inequality changes may take time. In this research, the unemployment rate of the statistical yearbooks of each province has been used.

The variable is a political variable that measures the proportion of the completed executive period. This variable was calculated based on the information obtained from the Political Affairs Quarterly from the Iranian Statistics Center and based on the study (Kerra et al., 2023):

$$shrterm_{i,t} = 1 - \frac{years\ left\ in\ current\ term_{i,t}}{term\ length_{i,t}} \quad (5)$$

It represents the control variables in this study; the inflation rate is the control variable that entered the model according to the following pattern:

$$Inflation_{i,t} = \frac{1 + Inflation_{i,t}}{100} \quad (6)$$

The econometric analysis of equation (1) faces several potential biases that can lead to biased and contradictory estimates (Nickle 1981; Kivit 1995; Rodman 2009). Simultaneous solutions to the problems imposed by the intense stagnation that characterizes public debt include average changes over time in the dependent variable and the key explanatory variable—namely, the unemployment rate—and potentially endogenous regressions. In this regard, various estimation methods are considered to deal with such problems and the results that exist as guaranteed results. However, according to Rodman (2009), it is difficult to know which estimator leads to less bias in the presence of several potential bias sources. This study uses the feasible generalized least squares method (FGLS) and software Stata to estimate research models. Since the problem of variance heterogeneity has an essential effect on statistical estimations and inferences, it is necessary to check the presence or absence of variance heterogeneity. To test the hypothesis of heterogeneity of variance of panel data, we can use the test of variance of heterogeneity of exponential ratio, which is confirmed if the theory of the existence of variance of heterogeneity is rejected. Also, the problem of autocorrelation should be investigated, and Wooldridge's autocorrelation test can be used. The rejection of the null hypothesis is based on the existence of autocorrelation. If these two problems are confirmed, the ordinary least squares method is invalid. Therefore, it is possible to use the generalized least squares method, in which the problem of heterogeneity of variance and autocorrelation is solved for estimation.

4. Model estimation and empirical analysis

Before presenting the estimation results, the descriptive statistics of the research variables are analyzed, the results of which are reported in Table 1. In this study, the range of variable changes of the share of the budget deficit from GDP as a proxy of the government's public debt can vary between infinitely negative and infinitely positive. All other variables have positive values. The urban Gini coefficient in the provinces of Iran is higher than the rural Gini coefficient. The average unemployment rate in Iran's provinces is 11.43.

Table 1: Descriptive statistics of research variables

Variable	Mean	Minimum	Maximum	Standard deviation	Observations
Public debt(% of GDP)	-1.052133	-22.63724	10.87030	2.261272	310
Government expense(% of GDP)	2.154413	0.164047	12.49258	1.767410	310
Tax revenues(% of GDP)	2.644401	0.215266	32.11651	2.261272	310
Executive term completed(%)	0.675000	0.250000	1.000000	0.275445	310
Inflation rate	23.25302	4.072851	46.13535	11.48151	310
Unemployment rate	11.43492	5.770000	22.00000	2.909103	310

Before estimating the model, it is necessary to ensure the significance of the model variables to avoid spurious regression. For this purpose, the Levin, Lin, and Chu (LLC) unit root test was used, showing the significance of all variables at each level. The results are reported in Table 2. In using composite data, the first question is whether the model is essentially panel or aggregated. In this study, by performing Liemer's F test and rejecting the hypothesis, the panel nature of the models is confirmed in all the estimation models. According to the assurance of panel data, the Hashem test (1978) was used to investigate the method of estimating the models, which should be done using the panel method with fixed effects (FE) or the panel method with random effects (RE). It has been paid. By rejecting the null hypothesis in all models, the panel method with fixed effects was confirmed in all models. The results are reported in Table 3.

Table 2: Levin, Lin, and Chu's unit root test results

Variables	The Value Of The Test Statistic	Possibility	Result
Public debt (% of GDP)	-12.3373	0.0000	I(0)
Government expense (% of GDP)	-5.36313	0.0000	I(0)
Tax revenues (% of GDP)	-3.35308	0.0004	I(0)
Executive term completed (%)	-20.4938	0.0000	I(0)
Inflation rate	-2.20251	0.0138	I(0)
Unemployment rate	-8.01114	0.0000	I(0)

Table 3: Leimer and Hausman's F test

Dependent Variable	Model	Leimer F Test			Hausman Test		
		Value Of The Statistic	Possibility	Result	Value Of The Statistic	Possibility	Result
Public debt(% of GDP)	1	8.089780	0.0000	panel	225.5558	0.0000	Fixed effects
Government expense(% of GDP)	2	3.753143	0.0000	panel	110.8495	0.0000	Fixed effects
Tax revenues(% of GDP)	3	3.651466	0.0000	panel	109.0980	0.0000	Fixed effects

The nature of panel data requires such data to have the problem of heterogeneity of variance. Since the problem of variance heterogeneity has an essential effect on statistical estimates and inferences, it is necessary to check the presence or absence of variance heterogeneity before any estimation. The results of the heterogeneity variance test show the rejection of the hypothesis in all models and the confirmation of the existence of the heterogeneity variance. Also, the problem of autocorrelation was investigated, and the existence of autocorrelation in all models was confirmed by rejecting the null hypothesis. According to the results, the ordinary least squares method is invalid.

Further, by confirming that all research variables are I(0) and that the data is a panel with fixed effects, model (1) based on the study (Kerra et al., 2023) It has been estimated in 3 different specifications by the feasible generalized least squares (FGLS) method. The results are reported

in Table 4. In 3 specifications different from the model of this study, the effect of the unemployment rate as a representative of social unrest on the share of public debt, government expenses, and tax revenues from the gross domestic product at the level of provinces is examined. The effect of the unemployment rate on government debt It is positive and meaningful. The increase in unemployment in society causes social unrest; on the other hand, the government tries to avoid social unrest. Therefore, in the face of these unrests and to increase his chances for re-election, he adopts the policy of increasing the budget deficit. The increase in the unemployment rate in interaction with the political variable of the executive period significantly reduces the government's debt and expenses and increases tax revenues. Inflation rate as a control variable has a negative and significant effect on all the financial instruments studied in this research; with the increase in inflation, the government's debt and tax revenues have decreased significantly. Post-estimation tests about the diagnostic tests reported in Table 4, it should be mentioned that for the estimates obtained from the feasible generalized least squares method, the models were estimated using the ordinary least squares method with fixed effects. Then, the variance of heterogeneity and autocorrelation in these models were checked using Stata software, and the heterogeneity of variance and autocorrelation in the models was confirmed. Then, the models were estimated using the feasible generalized least squares method, in which the two problems of variance heterogeneity and autocorrelation were solved.

Table 4: Estimation results

Model	1	2	3
	Fgls	Fgls	Fgls
Variables	Public debt (% of GDP)	Government expense(% of GDP)	Tax revenues (% of GDP)
Dependent variable(-1)	0.4187923 (0.000)	0.2755716 (0.000)	0.2211769 (0.000)
Unemployment rate(-1)	0.1123192 (0.000)	0.0160878 (0.227)	-0.0360364 (0.006)
Unemployment rate(-1)*			
Executive term completed(%)	-0.21182 (0.056)	-0.0291128 (0.000)	0.0070662 (0.305)
Inflation rate	-0.7712483 (0.068)	-1.084096 (0.001)	-1.139465 (0.000)
Observations	309	309	309
Number of provinces	31	31	31

Model	1	2	3
	Fgls	Fgls	Fgls
Statistics-wald	229.16	56.25	59.37
Wald-p-value	0.0000	0.0000	0.0000

5. Conclusion

In this research, the policy adopted by the government in response to social unrest has been studied, considering increasing its chances for re-election in the elections. To measure this reaction, the effect of the unemployment rate as representative of social unrest on government debt, tax revenues and government expenditures has been investigated in this direction. The statistical sample in this research is 31 provinces of Iran in the period from 2010 to 2019. The regression model of this research was estimated using three different specifications using the least possible square method and Stata software. To evaluate the government's policy in the face of social unrest, the unemployment rate index has been used to represent economic inequality.

The estimation results in this research show that the increase in the unemployment rate in the provinces of Iran causes a significant increase in government debt and significantly reduces the collection of tax revenues. The increase in the unemployment rate in interaction with the political variable of the executive period substantially minimizes the government's debt and expenses and increases tax revenues. The inflation rate as a control variable in the regression models of this research significantly hurts the budget deficit, government expenditure, and tax revenues. In the following, policy recommendations for future research are presented:

1. It is possible to use control variables such as trade regulations and the number of financial laws to measure their effect on government policymaking.
- 2- In future studies, researchers can separate the reactions to inequalities from the opportunistic motives of elections by removing the political variable.
- 3- In future research, by examining the interaction of inequality, the political cycle, and the openness of the national account, it is possible to measure and study the level of governments' access and use of international capital markets in response to inequalities.

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