SUPPLY-SIDE DETERMINANTS OF INFLATION IN IRAN: THRESHOLD REGRESSION APPROACH

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Abstract
Inflation is one of the challenging and vital issues of economics, which has an undeniable effect on economic stability in countries all over the world. For this reason, many researchers and policymakers have always sought to identify the factors affecting inflation. In this regard, oil price, as one of the global and strategic variables, can have a significant effect on inflation, especially in countries dependent on oil revenues, such as Iran. Accordingly, given the importance of inflation and the need to identify its causes and determinants on the one hand, and the prominent role of supply-side factors on the other hand, the aim of the present study is to examine the effect of oil price fluctuations on the inflation rate, taking into account the threshold effect of economic growth, and also to identify other supply-side determinants of the inflation rate, including technology and labor market dynamics, over the period 1996–2022 (1375–1401), using the time-series threshold regression econometric approach. According to the results, when economic growth is lower than 4.303%, the oil price has a positive and significant effect on the inflation rate. This effect is also positive and significant when economic growth is above the said threshold, but its magnitude is smaller. In addition, the unemployment and technology indices have negative and significant effects on the inflation rate, which respectively confirm the Phillips theory and the Solow (1956) growth theory. In contrast, the population size variable has a positive and significant effect on the inflation rate.

1. Introduction

Inflation, as one of the most fundamental economic challenges, has an unavoidable effect on the economic growth of countries. For this reason, this issue has always been one of the main concerns of economists and researchers. Inflation means the continuous increase in the general level of prices, or, in other words, the decline in the purchasing power of a country's currency. Changes in the inflation rate spread into various areas of the economy, causing changes in household saving, investment, and consumption patterns, and affecting the economic health of the country (Ahmad et al., 2024).

The inflation rate is a quantity that results from the actions and reactions of both the supply and demand sides of the overall economy. In other words, what causes the general price level to rise is the excess of aggregate demand over supply (Akbarifard et al., 2017). In this regard, supply-side factors, or the economy's supply chain which is generally associated with problems related to production and distribution and with structural weaknesses have become a key indicator affecting inflation. Accordingly, identifying the supply-side factors that determine the inflation rate, from a broad perspective that includes the production and availability of goods and services as well as any structural issues related to supply, is of great importance.

One of the key supply-side variables affecting inflation is the price of energy. Since crude oil plays an important role in the expansion of industry as well as in the domestic consumption of societies particularly oil-exporting countries such as Iran. It is regarded as one of the most important dimensions of energy (Sarmah & Prasad Bal, 2021). Given that the oil price is determined at the international level, it serves as a fundamental benchmark for many industries. Experts and policymakers therefore seek to identify the inflationary effects of the oil price. Information and

communication technology is another supply-side variable recognized as an important factor affecting inflation. In recent decades, the expansion of technology has brought about enormous changes in the social and economic structure of societies. These developments have led to considerable changes in macroeconomic variables, including economic growth and development and the inflation rate. Hence, in recent years technology has been regarded by policymakers and economists as one of the factors affecting inflation. Labor market dynamics is another fundamental factor determining the inflation rate. In recent decades, labor market issues including rising unemployment and low participation rates, have been among the most important labor market challenges, which can lead to changes in other parts of the economy, including inflation (Keshavarz, 2019).

Based on the foregoing, and given the importance of inflation on the one hand and the prominent role of supply-side factors in inflation on the other hand, the main objective of the present study is to examine the effect of key supply-side factors — including the oil price, technology, and labor market dynamics — on the inflation rate, taking into account the threshold effect of economic growth, over the period 1996–2022 (1375–1401), by applying the time-series threshold regression method.

1.1. Theoretical Background

Inflation is one of the important topics in macroeconomics, on which extensive theoretical research has been conducted. Inflation refers to the continuous increase in the general level of prices. In other words, the percentage increase in the price level in one period relative to the previous period indicates the inflation rate for that period. Despite the existence of a clear definition of the inflation rate, there are different views regarding its causes and determinants. In general, inflation can be divided into demand-side and supply-side components. Based on this classification, some researchers have argued that demand-side factors create economic pressures which, in turn, lead to inflation (Monfort & Pena, 2009; Hussain & Obaid, 2013). Many other researchers believe that supply chain disruptions and supply-side factors play an important role in raising inflation (Di Giovanni et al., 2022; Carrière-Swallow et al., 2023; Dao et al., 2023).

Various theories including demand-pull inflation, cost-push inflation, structural inflation, and expectational inflation, have been proposed by economists to explain the occurrence of inflation. Among these, supply-side shocks, which refer to events or changes related to the production and supply of goods and services, are of considerable importance. One of the most important theories of inflation related to the supply side of the economy is the cost-push inflation theory. According to this theory, the main cause of inflation is the increase in the cost of producing goods and services (Asayesh et al., 2023). Accordingly, cost-push inflation occurs when the general price level rises because of increases in production costs, such as labor costs or the price of raw materials (Sihotang & Nopeline, 2020).

Therefore, when the price of crude oil and consequently the cost of using oil as one of the main factors of production rises, the cost of producing goods and services also increases, ultimately leading to inflation (Babaei et al., 2018). Many studies, such as Javed et al. (2010) and Takami (2015), have pointed to changes in input prices and increased production costs as sources of inflationary pressure. Another theory relating to the factors affecting inflation is the structural inflation theory. This theory attributes the occurrence of inflation to conditions related to the economic, political, governmental, cultural, and social structure, and to the persistence of these conditions in society. In this regard, one of the causes of structural inflation is the dependence of economic sectors on oil revenue. Accordingly, a change in the price of this strategic commodity can lead to a change in the general price level (Mahdavi Adeli et al., 2012).

Inflation expectations is another theory put forward by a group of economists. According to this theory, expectations play an important role in determining inflation. That is, people, based on their past experience or on market observations, anticipate that prices will rise in the near future. Consequently, on the one hand consumers increase their spending and purchases, and on the other hand producers and sellers withhold goods from supply and sale in the hope of price increases. Price expectations also enter into wage negotiations and bargaining and into price-setting in contracts. This leads to an increase in the inflation rate. Given the inflation expectations theory, it can be stated that, because of the sensitivity of the economy to oil as a strategic commodity, a

change in the oil price acts as a signal to producers and affects price expectations and supply behavior, thereby influencing the inflation rate (Monjazeb & Alimardani, 2021).

In this regard, many studies have also pointed to the nonlinear and asymmetric effects of the oil price. The existence of asymmetric effects of oil price shocks on economic variables was examined by Tatom (1988). Based on earlier studies, it can be expected that changes in the oil price especially in countries dependent on oil revenue would have different effects on inflation under different economic conditions. According to the study of Samsami and Helali (2014), one of the reasons for this difference is the composition of the government budget. Under conditions of low economic growth and income, oil revenues account for a large share of the government budget; therefore, given the government's important share in the economy, oil shocks can have a greater effect on macroeconomic variables under these conditions. However, when economic growth is higher, this effect is expected to be weaker.

Another factor leading to nonlinear effects of the oil price on inflation is that, when an oil shock occurs under conditions of low economic growth, there are many idle economic capacities that get filled through the absorption of oil revenues, which accelerates the effect of oil price changes on macroeconomic variables (Hosseini-Nasab & Mirkazemi Moud, 12010). However, when economic growth is higher, the necessary investment capacity is lower, and oil revenues are generally channeled into longer-payback investment projects, whose effect on economic variables such as inflation is associated with long lags. Therefore, in general, it can be expected that the effect of oil price fluctuations on the inflation rate would be greater under conditions of low economic growth and greater economic dependence on oil, compared with conditions of higher economic growth.

Another supply-side variable that can have a considerable effect on inflation is technological progress. The relationship between inflation and technological progress has attracted the attention of many researchers, such as Shone (1981), Mincer and Danninger (2000), and McAdam and Willman (2013). In general, technological progress by affecting producer behavior at the level of economic enterprises, and consequently bringing about effective changes in the quantity and quality of the production of goods and services leads to growth in the productivity of factors of production. This reduces production costs and leads to a decline in the inflation rate in society (Sepehrdoust & Zamani Shabkhaneh, 2015).

In this connection, Wadhwani (2000) argues that technological progress, by reducing research and development costs and by shortening and removing barriers in the supply chain, increases productivity and consequently reduces production costs. This helps widen profit margins and reduce the inflation rate. Furthermore, based on the Solow growth model (1956), technological progress can be regarded as a catalyst for long-run economic growth. This theory states that technological upgrading leads to increased productivity and increased output without increased cost, and thereby reduces the inflation rate. Accordingly, technological change is expected to have a negative effect on the inflation rate.

Another supply-side variable that affects inflation is labor market dynamics. One of the fundamental theories describing the relationship between labor market dynamics and the inflation rate is the Phillips curve. This theory was first introduced by Phillips (1958). According to this curve, there is always an inverse relationship between unemployment and wage growth, on the one hand, and the inflation rate, on the other (Fotros et al., 2021). The reason for this inverse relationship is that, as the unemployment rate falls, the number of unemployed workers decreases; workers therefore have greater bargaining power in negotiations, and employers must offer higher wages in order to attract employees (Labonte, 2016). Hence, according to the cost-push inflation theory, a decline in unemployment leads to wage growth and increased production costs, and these increased costs are passed on to buyers in the form of higher prices. In addition, the inverse relationship between unemployment and inflation may also arise because a decline in unemployment causes inflation expectations to rise, and people, on the basis of these expectations, demand higher wages in their negotiations; this wage increase in turn raises the price level (Yuldashev et al., 2023).

1.2. Empirical Background

1.2.1. Foreign Studies

Ahmad et al. (2024), using panel data for selected South Asian countries over the period 1995–2022 and applying the panel ARDL regression method, examined the effects of oil price fluctuations, technological progress, and labor market dynamics on inflation, and found that changes in the oil price have a positive and significant relationship with inflation. On the other hand, the findings of this study indicate that technological progress can reduce inflationary pressures. It was also found that unemployment has a significant negative effect on inflation.

Aliyev et al. (2023), using data and statistics from Azerbaijan over the period 1997–2021 and applying the Autoregressive Distributed Lag Bounds Testing (ARDL BT) approach, Fully Modified Ordinary Least Squares (FMOLS), and Canonical Cointegrating Regression (CCR), examined the relationship between inflation and the oil price. The findings of this study show that the oil price is a long-run determinant of inflation, affecting the general price level both directly and indirectly through the money supply; this effect is also significant in the short run. In addition, according to the results of the study, the oil price moderates the effect of the money supply on inflation in the short run.

Abbai et al. (2022), using PCE data over the period 1997–2021 and applying the Shapiro decomposition and autoregression method, examined the relationship between supply-side factors and inflation, and found that both demand-side and supply-side factors are important in generating recent inflation dynamics. Specifically, the initial global decline in headline inflation at the start of the COVID-19 pandemic in 2020 was mainly attributable to the decline in demand-side inflation that coincided with quarantine measures; however, prior to that, from early 2012 onward, both demand-side and supply-side factors contributed to rising inflation. In addition, according to the results of this study, both demand-based and supply-based inflation declined in late 2022.

Almgren and Holmberg (2022), using data and statistics from the G-7 countries and applying a structural vector autoregression (SVAR) model, examined whether reduced dependence on oil weakens the effect of oil price shocks on inflation. The findings of this study show that in periods when the economies under study had lower dependence on oil, oil price shocks produced a weaker reaction in inflation than in periods when dependence on oil in these countries was greater.

Necati Çoban (2022), through ordinary least squares (OLS) panel-data regression analysis using data from the ASEAN-5 countries (Indonesia, Malaysia, the Philippines, Singapore, and Thailand) over the period 1994–2014, examined the effect of internet use on the inflation rate. The results of this study indicate that as internet use increases in the countries under study, the inflation rate declines.

Sarmah and Prasad Bal (2021), based on a structural autoregression framework and using monthly data from India over the period 1997–2016, examined the effect of the crude oil price on the inflation rate and economic growth, and found that the crude oil price has a positive effect on the inflation rate, while there is an inverse relationship between the crude oil price and economic growth. This study also decomposes the crude oil price into two components, the positive and the negative partial sums and obtains a similar result for the effect of the positive partial sum of the oil price on the inflation rate and economic growth; however, a significant negative relationship was found between the negative partial sum of the crude oil price and economic growth.

Sultan et al. (2020), using data and statistics from India between 1970 and 2017 and applying the Johansen cointegration method, analyzed the effect of a rising crude oil price on the level of inflation. This study states that the oil price affects the level of inflation in India in both the short run and the long run. It also finds that, when a country faces declining demand for consumption as well as investment, an increase in the oil price and the resulting rise in the general price level can further deepen the crisis.

Raheem et al. (2020) used a multiple-threshold nonlinear autoregressive distributed lag model with dynamic common correlated effects in a heterogeneous panel framework and, using

data from 20 oil economies including both oil-exporting and oil-importing countries, examined the asymmetric relationship between the oil price and inflation. According to the results of this study, asymmetry is of great importance in the model, and the inflation rate reacts more strongly to positive shocks than to negative shocks. It was also observed, by examining the two groups of countries separately, that the asymmetric effect of oil price changes disappears for oil-importing countries but persists for oil-exporting countries.

Lv et al. (2019), using the dynamic panel-data generalized method of moments (GMM) and quarterly data for the United States from the first quarter of 1999 to the fourth quarter of 2016, examined the New Keynesian Phillips curve and explained the contribution of technology and globalization variables to U.S. inflation, finding that technological progress and globalization significantly explain inflation dynamics.

Choi et al. (2017), using annual data from 72 advanced and developing countries over the period 1970–2015 and applying the vector autoregression (VAR) method, examined the relationship between the oil price and the dynamics of the inflation rate. The results of this study show that a 10 percent increase in the global oil-price inflation rate raises domestic inflation by about 0.4 percent on average. The study also showed that this effect is asymmetric, with positive oil price shocks having a larger effect than negative shocks.

1.2.2. Domestic Studies

Izadkhasti et al. (2022), using the generalized method of moments (GMM) and data from oil-exporting countries over the period 2011–2021, examined the factors affecting inflation and found that information and communication technology did not have a significant effect on inflation. According to the results of this study, inflation inertia, liquidity growth, the gap between GDP growth and liquidity growth, economic openness, and government consumption expenditure had a positive effect, while real GDP growth, the institutional regime and economic incentives, human capital, research, and market complexity had a negative effect on the inflation rate.

Komijani and Haji Heydari (2021), employing a nonlinear autoregressive distributed lag (NARDL) model and Iranian data over the period 1358–1398 (1979–2019), examined the asymmetric effects of oil price shocks, oil price uncertainty, and economic sanctions on economic growth and the inflation rate, and found that a positive oil price shock has a negative effect, while a negative oil price shock has a positive effect, on inflation. In addition, economic sanctions, trade liberalization, and government expenditure had a positive and significant effect, while oil price uncertainty and GDP had a negative and significant effect on inflation. The study also concluded that the effect of oil price shocks on inflation is asymmetric both in the short run and in the long run.

Ghalehvandi and Zandi (2021), using annual data from Iran over the period 1363–1398 (1984–2019) and applying the vector autoregression (VAR) method, examined the effect of the global oil price on economic growth, inflation, unemployment, and the budget deficit. The results indicate that oil price shocks have a direct effect on economic growth and unemployment but have no effect on inflation or the budget deficit.

Salatin and Rezaei (2020), using data and statistics for a group of selected middle-income countries over the period 2005–2016 and applying the dynamic generalized method of moments for panel data, examined the extent of the impact of information and communication technology on the inflation rate. The results show that information and communication technology has a negative and significant effect on inflation, and that increased use of information and communication technology improves the production process, deepens capital, promotes economic growth, and reduces inflation in the countries under study.

Takrousta et al. (2019), using a panel vector autoregression model and quarterly data between 2008 and 2016 for selected OPEC countries, analyzed the effect of oil price shocks on important economic variables and found that oil price shocks arising from national-security shocks have no significant relationship with inflation. According to the results, the reaction of inflation to positive price shocks caused by a decline in supply is also not significant, but other oil price shocks lead to increased inflation.

Babaei et al. (2018), using quarterly data between 1370 and 1394 (1991–2015) and applying the TVP-DMA model, forecast how the factors affecting inflation in Iran operate. The results, based on the TVP, DMS, and DMA regression models, show that the economic growth rate, the growth rate of oil revenues, and inflation uncertainty have a significant effect on the inflation rate.

Kazerouni et al. (2017), employing the quantile regression econometric method and quarterly data from Iran over the period 1369–1393 (1990–2014), examined the factors affecting the inflation rate within the framework of the New Keynesian hybrid Phillips curve, and found that in the lower quantiles the output gap and exchange-rate changes have a positive and significant effect on inflation; in the middle quantiles, expectations are formed and have positive and symmetric effects on inflation; and in the upper quantiles these effects intensify further.

Esna-Ashari et al. (2016), employing the structural break-point identification and regime-based estimation method of Qu and Perron (2007) within a vector autoregression framework, and using quarterly data from Iran from Farvardin 1340 to Esfand 1390 (March 1961 to March 2012), examined the effect of oil price shocks on inflation, growth, and money, and concluded that structural oil shocks are inflationary for the Iranian economy.

2. Method

2.1. Model Specification

The present study uses time-series data for Iran over the period 1375–1401 (1996–2022). The variables used in the model of this study are: the inflation rate, the unemployment rate, population growth, the unemployment rate, the number of patents, and the oil price. Data for this study were collected from the country's Statistical Yearbook in the database of the Statistical Center of Iran.

The present study examines the supply-side determinants of inflation, as well as the threshold effect of the global oil price during periods of economic recession and boom, on the inflation rate, using the time-series threshold regression method. The model used in this study is an improved and adjusted version of the model of Ahmad et al. (2024), modified to take into account conditions of economic recession and boom. In this model, in addition to the economic-growth threshold variable and the oil-price variable, human-resource indicators (the population variable and the unemployment rate) and technological innovation (the patent-registration variable) are also included in the model as control variables. Accordingly, the threshold time-series model can be stated as follows:

Equation (1)

$$\mathbf{Inf_t = \alpha_1 + \beta_1^{(1)} op_t\, I(eg_t \le \gamma_1) + \beta_j^{(2)} op_t\, I(eg_t > \gamma_1) + un_t + lpop_t + lpat_t + \varepsilon_t}$$

Here, Inf_t represents the inflation rate variable (dependent variable), eg_t represents economic growth (the threshold variable), op_t represents the oil price, un_t represents the unemployment rate, $lpop_t$ represents the natural logarithm of population size, and $lpat_t$ represents the natural logarithm of the number of patents at time t.

2.2. Time-Series Threshold Regression Method

In many studies, regression functions do not pass uniformly through all observations but instead break into distinct groups. In fact, traditional regression-analysis methods, in specifying nonlinear and asymmetric relationships among variables, rely on the researcher's personal judgment and preferences, and the choice of the number of regimes and their location is arbitrary and left to the researcher. For this reason, such methods lack sufficient efficiency and validity (Emamverdi & Bolandghamat, 2018). In order to resolve this problem and increase the reliability of the estimation, Hansen (2000) introduced a two-regime regression method. In this method, the sample is split into two groups below and above the threshold values and the coefficients are estimated separately within the model, without the intervention of the researcher's subjective perceptions and personal preferences; this therefore provides more efficient and accurate results. In general, the structural form of this model is defined as follows:

Equation (2)

$$y_{it} = \beta_j^{(1)} x_{it}\, I(q_{it} \le \gamma_1) + \beta_j^{(2)} x_{it}\, I(q_{it} > \gamma_1) + e_{it}$$

In this model, y_{it} is the dependent variable, x_{it} are the independent variables, and q_{it} is the threshold variable.

To ensure the validity of the results obtained, it is necessary to examine the unit root of the variables. After confirming the absence of a unit root, and differencing any variables found to contain a unit root, the nonlinearity test of the model is carried out. It is evident that the threshold regression method is one of the nonlinear regression-analysis methods, and therefore, to ensure the accuracy of the estimation, a nonlinearity test of the model must also be performed. This test takes the form of a test of the equality of the coefficient of the variable of interest under conditions below and above the specified value of the threshold variable. It should be noted that the null hypothesis of this test is the equality of the two coefficients and, consequently, the linearity of the model.

3. Results and Discussion

Before estimating the model, the first step is to examine the stationarity of the dependent variable and the independent variables used in the model. In the present study, the Augmented Dickey-Fuller unit root test is used to examine the unit root of the variables. The results of this test are reported in Table 1. It is observed that, at the 0.05 significance level, the existence of a unit root is rejected for all variables, and therefore all variables are stationary at level and are of order I(0).

Table 1. Results of the Augmented Dickey-Fuller Unit Root Test

Variable	Statistic	P-Value
Inflation rate (Inf)	-1.802	0.0426
Economic growth (eg)	-3.661	0.0047
Oil price (op)	-2.066	0.0249
Unemployment rate (un)	-3.914	0.0116
Log of population size (lpop)	-2.642	0.0074
Log of number of patents (lpat)	-2.973	0.0375

In addition to the above, the null hypothesis of the threshold-effect validity test is the absence of such an effect. As shown in Table 2, the null hypothesis is rejected, and therefore it can be stated that a threshold effect exists in the estimated model.

Table 2. Result of the Threshold-Effect Test

Statistic	P-Value
2532.04	0.0000

Table 3. shows the results of the threshold regression model estimation based on the threshold effect of the economic growth variable.

Table 3. Results of the Dynamic Model Estimation with the Threshold Effect of Economic Growth

Variable	Coefficient	Standard Error	Z-Statistic	P-Value
Oil price (op) — below the economic growth threshold point	0.139	0.030	4.56	0.000
Oil price (op) — above the economic growth threshold point	0.080	0.037	2.17	0.030
Unemployment rate (un)	-4.297	0.848	-5.07	0.000
Population size (pop)	83.581	24.727	3.38	0.001
Patent registrations (pat)	-0.002	0.000	-4.41	0.000
Intercept	-1431.180	444.149	-3.22	0.001
Economic growth threshold point	4.303	—	—	—

Before interpreting the results obtained, the nonlinearity test of the model is examined. For this purpose, the equality of the coefficient of the oil price variable under the two conditions of economic growth above and below 4.303 is tested. The result of the model's nonlinearity test is reported in Table 4. It is observed that the null hypothesis of linearity is rejected. It can therefore be said that this test confirms the nonlinearity of the model.

Table 4. Model Linearity Test

Statistic	P-Value
5.50	0.0190

Based on the results of the dynamic model estimation, it is observed that, under conditions in which economic growth is below the threshold value, the oil price has a positive and significant effect on the inflation rate. This means that, under conditions of low economic growth, a one-unit increase in the oil price leads to a 0.14-unit increase in the inflation rate. On the other hand, it is observed that an increase in the oil price under conditions in which economic growth is above the threshold value also has a positive and significant effect on the inflation rate, but the magnitude of this effect is smaller: a one-unit increase in the oil price under conditions of high economic growth raises the inflation rate by 0.08. The positive relationship between the oil price and the inflation rate is consistent with studies such as Ahmad et al. (2024).

In addition, the unemployment rate and patent-registration variables have a negative and significant effect on the inflation rate. The negative relationship between the unemployment rate and the inflation rate confirms the Phillips theory and is also consistent with many previous studies that have found a trade-off between unemployment and inflation. The negative relationship between patent registrations and the inflation rate is likewise consistent with the Solow growth theory (1956) and with many empirical studies such as Ahmad et al. (2024), while the population-size variable has a positive and significant effect on the inflation rate. This result is also consistent with studies such as Ahmad et al. (2024).

4. Conclusion

Given the importance of inflation as one of the fundamental factors of economic stability in various countries, on the one hand, and the unavoidable role of supply-side factors in inflation, on the other hand, the main objective of the present study was to examine the effect of the oil price, the unemployment rate, and the population growth rate on the inflation rate in Iran over the period 1375–1401 (1996–2022). It should be noted that, in this regard, the oil price can be expected to have different effects on inflation under different economic growth conditions. Accordingly, the model was estimated using the threshold regression method, taking into account the threshold effects of economic growth on the relationship between the oil price and the inflation rate. The results of the present study indicate that the oil price, with a coefficient of 0.14 under conditions of economic growth below the threshold value and a coefficient of 0.08 under conditions of economic growth above the threshold value, has a positive and significant effect on the inflation rate. In addition, the control variables unemployment rate and patent registrations had a negative and significant effect, while the population growth rate variable had a positive and significant effect on the inflation rate. The negative relationship between unemployment and the inflation rate indicates a trade-off between these two variables, while the negative relationship between patent

registrations and the inflation rate indicates that technological development can contribute to reducing inflation. The positive relationship between the population growth rate and the inflation rate indicates that population growth can contribute to higher inflation. Based on the results of this research, the following policy recommendations are presented: The government should preferably control the oil price in order to reduce the inflation rate, particularly under conditions of low economic growth. Given the trade-off between the inflation rate and unemployment, the government should, in order to achieve its macroeconomic objectives, adopt an optimal combination of inflation and unemployment. In fact, it can be stated that excessively reducing unemployment can lead to inflation higher than optimal. Therefore, rather than focusing on the continuous reduction of unemployment, the government should regard an optimal point of unemployment and inflation as its macroeconomic objective. Furthermore, policymakers can control the country's inflation by increasing investment in research and development and by upgrading technology. Finally, given the significant role of the population growth rate in inflation, population-control policies and the avoidance of encouraging society toward excessive childbearing could have a positive effect on controlling inflation.

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