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The Role of Institutional Structure in the Effect of Monetary Policy on Growth: An Application on Countries at Different Income Levels[1]

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Para Politikasının Büyüme Üzerindeki Etkisinde Kurumsal Yapının Rolü: Farklı Gelir Düzeyindeki Ülkeler Üzerine Bir Uygulama[2]

Abstract

In this study, the impact of monetary policy on growth is discussed within the institutional framework for countries with different income levels. The findings from the GMM estimator showed that the effect of contractionary monetary policy on growth is negative in all countries. On the other hand, it is concluded that the impact of all institutional indicators is positive in high and upper-middle-income countries and that the increase in institutional quality reduces the adverse effects of contractionary monetary policy on growth. In terms of lower-middle-income countries, the effects of some institutional variables are found to be statistically insignificant.

Keywords : Institutional Economics, Monetary Policy, Economic Growth, System GMM.

JEL Classification Codes : B52, C33, E52, O43.

Öz

Bu çalışmada, para politikasının büyüme üzerindeki etkisi, farklı gelir düzeyindeki ülkeler için kurumsal çerçevede araştırılmıştır. GMM tahmincisinden elde edilen bulgular, daraltıcı para politikasının büyüme üzerindeki etkisinin tüm ülkelerde negatif olduğunu göstermiştir. Öte yandan, yüksek ve üst orta gelirli ülkelerde tüm kurumsal göstergelerin etkilerinin olumlu olduğu ve kurumsal kalitedeki artışın daraltıcı para politikasının büyüme üzerindeki olumsuz etkisini azalttığı sonucuna varılmıştır. Alt-orta gelirli ülkeler açısından ise bazı kurumsal değişkenlerin etkilerinin istatistiksel olarak anlamsız olduğu sonucuna ulaşılmıştır.

Anahtar Sözcükler : Kurumsal İktisat, Para Politikası, Ekonomik Büyüme, Sistem GMM.

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[2] *Bu çalışma, 08.08.2019 tarihinde Murat Eren tarafından Atatürk Üniversitesi, Sosyal Bilimler Enstitüsü, İktisat Anabilim Dalında Prof.Dr. Selim Başar danışmanlığında tamamlanan "Kurumsal Yapının ve Ekonomi Politikalarının Büyüme Üzerindeki Etkisi: Farklı Gelir Düzeylerindeki Ülkeler Üzerine Bir Uygulama" başlıklı doktora tezinden türetilmiştir.*

1. Introduction

Monetary transmission channels explain the impact process of monetary policy and examine the impact of monetary policy on output, mainly on the investment axis. When the relationship between monetary policy and investment is considered from the mainstream economic perspective, the cost of investment will decrease due to an expansionary monetary policy, increasing investments and, thus, the output. However, it is also accepted that the behaviour of economic agents depends on the structure of the system's rules and the incentive structure of the economy (North, 1990; Acemoglu & Robinson, 2012; Williamson, 1979). Contrary to mainstream economists, economists considering the relationship between monetary policy and output from an institutional perspective point out that the relationship between investment and monetary policy cannot be directly realised. They argued that the impact of monetary policy on investment will depend on externally effective institutional factors.

According to the institutional approach, institutional factors affect economic growth through the behaviour of economic agents, as they are indicators of rules and incentive structure in a society. This direct effect of rules and incentive structure on economic growth indirectly determines the effectiveness of monetary policy. According to this approach, the effectiveness of the monetary policy transmission channels will decrease unless institutional security is ensured. Therefore, the effectiveness of the policy on the output will decrease. According to institutionalism, the impact of monetary policy decisions on savings and investments varies depending on whether economies are saving-constrained or investment-constrained. The fact that an economy is saving-constrained is related to the consumption patterns of individuals. From this point of view, the main reason for the lack of investment in the economic system is the low national savings. The common characteristics of saving-constrained economies are high real interest rates and any increase in resources transfers from abroad finances mainly investments rather than consumptions. On the other hand, the common characteristics of investment-constrained economies are low real interest rates and any increase in resources transfers from abroad finances mainly consumption rather than investments (Rodrik & Subramanian, 2009: 127-128). In these economies, the returns on investments are not protected by the legal system and transaction costs are very high due to the widespread perception of corruption (Hardt, 2011: 12). Consequently, the institutional environment of the economy determines the functioning of monetary transmission channels and the effect of monetary policies on economic growth.

When the effectiveness of monetary policy is considered in the axis of institutional factors, it is accepted that the institutional structure of the country is closely related to the financial structure of the country and monetary transmission channels (Cecchetti, 1999: 12). When the economic growth literature developing about institutional factors is also examined, it is seen that most of the studies examine the direct effects of democracy and freedoms (Scully, 1988; 2002; Abrams & Lewis, 1995; Tavares & Wacziarg, 2001; Barro, 1996), the rule of law (Hasan et al., 2009; Keefer & Knack, 1997), property rights (Claessens & Laeven, 2003; Redek & Sušjan, 2005), political stability (Devereux & Wen, 1998;

Asteriou & Price, 2001), regulatory quality (Nawaz, 2015; Yapraklı, 2008) and control of corruption (Mauro, 1995; Akçay, 2011; Karagöz & Karagöz, 2010). It is striking that the studies dealing with the issue regarding monetary policy are minimal. When the studies dealing with the interaction between institutional factors and monetary policy are examined, it is seen that most of the studies deal with the relationships between institutional factors and central bank independence (Eijffinger & Stadhouders, 2003; Acemoglu et al., 2008; Gollwitzer & Quintyn, 2010) and they evaluate the effects of monetary policy in the axis of central banks dynamics. It is noteworthy that the studies dealing with the issue in terms of the effectiveness of the monetary policy of the institutional factors include the institutions directly as an independent variable (Aysun et al., 2013), and the relationship is not evaluated in terms of policy performance.

In this paper, unlike the mentioned studies, the effects of monetary policy on economic growth were examined under the contributions of the differences in the institutional structure. When the institutional quality and economic growth literature is analysed, it is seen that the indicators addressed to represent institutional quality effectively determine the economic system's problems. Therefore, the indicators representing institutional quality were examined separately in different models. In addition, to test the hypothesis that the effects of institutions vary according to the development levels of the countries, the countries at the high, upper-middle and lower-middle income levels are examined separately. With this strategy, it is aimed to contribute to the literature in terms of determining the institutional factors that determine the effect of monetary policy on growth and explaining why implemented policies have different results between countries.

The rest of the paper is organised as follows. Section 2 briefly summarises the literature reviews that deal with the relationship between monetary policy and output on the axis of institutional factors. The methodology and data, including cross-section dependence and unit root tests, are provided in Section 3. Section 4 presents empirical findings, while Section 5 provides concluding remarks and discussion.

2. Literature

Modern studies in monetary policy suggest that, unlike traditional approaches, the effectiveness of monetary policies is determined not by external factors but by internal factors resulting from the policy-making process. The institutional structure that constitutes the policy-making process can directly and indirectly determine the effectiveness of monetary policy.

Cecchetti (1999) analysed the effect of financial structure on the effectiveness of monetary policy and discussed the differences in financial structure due to the legal system. The findings showed that the financial structure, legal structure, and monetary transmission mechanisms of the countries are closely related, and the effects of monetary policy depend on the legal system of the countries. On the other hand, Mishra et al. (2010) used the income level of the countries as an indicator of the institutional structure. In the study, the process

of monetary transmission channels for low-income countries is analysed and compared with developed countries. The authors stated that the effectiveness of traditional monetary channels decreased in low-income countries due to factors such as low institutional quality, weak securities markets, imperfect competition in the banking sector, and high credit costs. Besides the institutional structure of the countries, monetary transmission channels can also determine the effectiveness of the monetary policy. Hardt (2011) examined the impact of institutional factors on monetary transmission channels regarding the elasticity of investments to the changes in interest rates. The author stated that countries with low institutional quality are more investment-constrained than those with high institutional quality. Also, as a result of the study, it was concluded that the elasticity of domestic investment demand to interest rates is higher in countries with high institutional quality than in countries with low institutional quality.

The cyclicality of monetary policy, one of the modern approaches that deal with the effects of monetary policy, is also addressed institutionally. Duncan (2014) examined the relationship between institutional quality and the cyclicality of monetary policy and showed that the cyclicality of monetary policy is significantly related to institutional quality. In addition, in countries where institutional quality is ensured, the relationship between interest rate and output is positive, and in countries where it cannot be provided, it is negative. When the effect of institutional quality on volatilities is analysed, the findings show high volatilities in interest rates and output in countries with weak institutions. In addition, Nawaz et al. (2018) examined institutional quality's effect on macroeconomic policies' cyclicality. The findings showed that institutional quality in SAARC countries impacts the cyclicality of monetary and fiscal policies, and its impact is more vivid in the monetary policy example.

When examined, it is observed that the number of studies dealing with the institutional factors and the effect of monetary policy on output is relatively limited. It is also worth noting that the studies examined the impact of institutional factors on direct policies or direct output, and they do not address how institutional indicators affect the impact of monetary policy on output. In this study, which was developed based on this gap, the effect of monetary policy on output was discussed within the framework of institutional factors.

3. Data and Methodology

In this part of the study, which deals with the effects of monetary policy on output within the framework of institutional factors, interactions previously studied theoretically are dealt with empirically. This section will explain the model, data and methodology used in the research. Then, after the necessary tests, the relationships between the variables are tested with the Blundell and Bond System Generalized Method of Moments (System GMM) method, and the findings obtained will be mentioned.

3.1. Model Specification and Data

To analyse the effect of monetary policy on growth within the framework of institutional indicators, the central bank discount rate is used to represent monetary policy since it represents the direct control power of monetary authority. Central bank independence is vital in monetary policy's impact and institutional factors' effects. However, this study does not directly include central bank independence due to insufficient available data and the controversy over independence measurement. Representing institutional indicators, Political Stability and Absence of Violence/Terrorism, Rule of Law, Government Effectiveness, Regulatory Quality, Control of Corruption and Voice and Accountability are included in the model as independent variables. These indicators, selected to measure institutional quality, reveal countries' governance structure, institutions and traditions. Among these variables, voice and accountability and the political stability and absence of violence/terrorism include the selection, monitoring and replacement of governments. In addition, the government effectiveness and regulatory quality variables illustrate the capacity of governments to formulate and implement effective and sound policies, while the rule of law and control of corruption variables show the respect of citizens and the state for the institutions that manage economic and social interactions among them (Kaufmann et al., 2009: 5-6; 2011: 3).

In addition, capital, labour and trade openness variables are included in the models as control variables, which are important in their effects on economic growth. Apart from economic indicators, external factors also affect economic growth. The 2007-2008 global financial crisis affected most countries economically, and the quantitative easing program applied to overcome the crisis significantly affected the countries' economic growth. Although there are signs of overcoming the crisis in developed countries due to the policy, there has been hot money flow to developing countries, and this situation has deeply affected the policy structure, especially in developing countries. As a result of this process and the preliminary tests, a dummy variable was assigned to 2009, representing the 2007-2008 global financial crisis, taking into account the spreading effect of the crisis.

To determine the effect of monetary policy on growth by including the contribution of institutional factors, firstly, the effect of monetary policy on growth was examined without having institutional factors; then, monetary policy and institutional factors were brought together, and estimations were produced. The models used in the study were created based on the models used by Nawaz et al. (2018), Duncan (2014) and Canh (2018) in their works. The basic models created in this context are as follows:

$$Y_{i,t} = \alpha_1 Y_{i,t-1} + \alpha_2 X_{i,t} + \alpha_3 mp_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$Y_{i,t} = \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \beta_3 mp_{i,t} + \beta_4 mp * ins_{i,t} + \varepsilon_{i,t} \quad (2)$$

In equations, i and t respectively indicate the country and time, and Y represents the GDP that proxies for economic growth. The lag of Y is put into the model to control for the dynamic of the economic growth model. X represents the vector of control variables, which

includes gross fixed capital formation, labour force and trade openness. mp represents the monetary policy, and mp*ins represents the multiplicative term created to capture the interaction between monetary policy and institutional quality.

Equation (1) shows the effect of contractionary monetary policy on growth without including institutional factors, and the effect is represented by the α_3 coefficient. Equation (2) shows the effect of policies on growth in the axis of institutional factors. According to Equation (2), the effect of contractionary monetary policy on growth emerges as a direct effect (β_3) and indirect effect (β_4) that changes depending on the institutional quality level of the country. This approach, the interaction effect, expresses the common effects of the independent variables that affect the dependent variable. According to this approach, the effect of an independent variable on the dependent variable can be determined by another variable. With this approach, the impact of policies on growth can be determined at different institutional quality levels. The following equation determines the marginal effects of contractionary monetary policy (Berry et al., 2012: 3).

$$\frac{\partial \mathrm{Y_{i,t}}}{\partial \mathrm{ep_{i,t}}} = \beta_3 + \beta_4 ins_{i,t} \tag{3}$$

In equation (3), $\mathrm{ins_{i,t}}$ represents the average of the institutional variable included in the model. Accordingly, if $\beta_3 > 0$ ($\beta_3 < 0$), the effect of contractionary monetary policy on growth is positive (negative). And if $\beta_4 > 0$ ($\beta_4 < 0$), institutional factors positively (negatively) affect the impact of contractionary monetary policy on growth.

Summary explanations and the sources about the variables are presented in Table 1.

Table: 1
Variables, Definitions and Sources

Variables	Definitions	Sources
LGdp	GDP (constant 2010 US$)	World Bank
Gfcf	Gross Fixed Capital Formation (% of GDP)	World Bank
LLabf	Labour Force	World Bank
Trade	Trade (% of GDP)	World Bank
Discr	Discount Rate	IMF & Central Banks of Countries
Polst	Political Stability and Absence of Violence/Terrorism	World Bank
Rule	Rule of Law	World Bank
Govef	Government Effectiveness	World Bank
Regq	Regulatory Quality	World Bank
Corr	Control of Corruption	World Bank
Voiac	Voice and Accountability	World Bank

Empirical analysis was conducted for three country groups with annual data for 2002-2017, based on the World Bank's 2019 classification. In the study conducted with 37 high-income, 19 upper-middle income and 19 lower-middle-income economies[3], whose data are available, the countries in the lower-income group were not included in the analysis since

[3] *The list of countries is given in Table A1 in the Appendix.*

they did not have sufficient institutional formation and effective results were not obtained in the preliminary examinations.

The study used the logarithm of the real GDP variable (LGdp), representing economic growth as the dependent variable. As independent variables, along with monetary policy (Discr), the share of gross fixed capital formation in GDP (Gfcf), the logarithm of the total labour force (Llabf) and the sum of exports and imports as a share of GDP (Trade) variables were used as control variables. Data on dependent and explanatory variables were obtained from the International Monetary Fund (IMF) and World Development Indicators database published by the World Bank. In addition, institutional factors are included in the model to investigate the effects of institutional quality on economic growth. The political stability and absence of violence/terrorism (Polst), rule of law (Rule), government effectiveness (Govef), regulatory quality (Regq), control of corruption (Corr) and voice and accountability (Voiac) indicators used to represent institutional factors were obtained from the Worldwide Governance Indicators database published by the World Bank. Institutional variables are used in estimates with the percentile rank term from 0 to 100, with higher values corresponding to better outcomes[4].

The primary purpose of this study, which emerged due to the importance of institutions on social and economic life, is to determine the effects of institutions on the relationship between monetary policy and economic growth and to examine whether this effect varies depending on the institutional variable and income level. In the ongoing part of the study conducted for this purpose, various explanations will be made about the study's methodology.

3.2. Methodology

This study used the System GMM estimator, one of the dynamic panel data models. In the system GMM model, it is generally assumed that the residuals are independently distributed across individuals, and the series is stationary due to the low time dimension (Sarafidis, 2008: 1; Jung & Kwon, 2007: 2). However, instrumental variables may be invalid when the series are non-stationary. Therefore, in this study, in terms of the effectiveness of the estimates, firstly, the existence of cross-section dependence was investigated, and the predictions were produced by examining the stationarity of the series based on the results of cross-section dependence tests.

Cross-section dependence tests

The cross-sectional dependence, which expresses the correlation between error terms, is important in selecting the appropriate stationary test, especially in panel data analysis performed with macro data. The first-generation unit root tests are based on the assumption of no dependence between sections. Therefore, first-generation unit root tests should be used

[4] *The summary statistics of variables are given in Table A2 in the Appendix.*

without cross-sectional dependence. However, second-generation unit root tests postulate interdependence between sections (Tatoğlu, 2017: 21).

In order to investigate the presence of cross-sectional dependence, cross-sectional dependency tests such as Breusch & Pagan (1980), Lagrange Multiplier (LM), Pesaran (2004) Cross-Section Dependence (CD), Pesaran et al. (2008) Bias-Adjusted Lagrange Multiplier (LM_{adj}) are mostly used in the literature. This study used the Pesaran et al. (2008) LM_{adj} test. LM_{adj} test is adjusted by adding the variance and the average to test statistics of Breusch & Pagan's (1980) LM test, which is biased when the average group is zero, but the average individual is different from zero. Also, the LM_{adj} test is more consistent than Pesaran's CD test. The adjusted form of LM test regression is as follows:

$$LM_{adj} = \left(\frac{2}{N(N-1)}\right)^{1/2} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \left[\hat{\rho}_{ij}^2 \left(\frac{(T-K-1)\hat{\rho}_{ij} - \mu_{Tij}}{\upsilon_{Tij}}\right)\right] \rightarrow d\ N(0,1) \quad (4)$$

In equation (4), μ_{Tij} represents the average and υ_{Tij} represents the variance. The test statistics to be obtained from the equation show an asymptotically normal distribution, and the null hypothesis of the LM_{adj} test is no cross-section dependence. The findings of the LM_{adj} cross-section dependency test are presented in Table 2.

Table: 2
LM_{adj} Cross-Sectional Dependency Test Results

Variables	High-Income Countries		Upper-middle Income Countries		Lower-middle Income Countries	
	Test Statistic	Prob. Value	Test Statistic	Prob. Value	Test Statistic	Prob. Value
LGdp	178,98	0,000	116,15	0,000	118,72	0,000
Gfcf	53,74	0,000	16,73	0,000	22,51	0,000
Llabf	154,62	0,000	119,14	0,000	128,51	0,000
Trade	120,99	0,000	22,60	0,000	25,92	0,000
Discr	70,56	0,000	17,52	0,000	19,90	0,000
DiscrxPolst	150,86	0,000	18,11	0,000	16,49	0,000
DiscrxRule	157,01	0,000	24,51	0,000	17,96	0,000
DiscrxGovef	156,50	0,000	22,13	0,000	16,59	0,000
DiscrxRegq	154,49	0,000	32,27	0,000	16,84	0,000
DiscrxCorr	157,19	0,000	24,64	0,000	15,62	0,000
DiscrxVoiac	154,44	0,000	24,56	0,000	19,45	0,000

According to the results of the LM_{adj} test statistics presented in Table 2, since the probability values of the series are less than 0.05, H_0 hypotheses are strongly rejected, and it is concluded that there is cross-sectional dependence between countries. These findings show that significant exogenous shocks in one country also affect others. Therefore, policymakers must consider other countries' policies and external factors in decision-making. In addition, the fact that there is a cross-sectional dependency between countries means that second-generation unit root tests need to be used in the unit root analysis, which postulates interdependence between countries.

Panel unit root tests

In panel data analysis, spurious regression problems may arise in estimations made with non-stationary series. To eliminate the spurious regression problem, it is necessary to

investigate the stationary and to see whether the series has a unit root before making the predictions. Based on the cross-sectional dependence evidence in the series, the stationarity of the series was analysed with the Cross-sectionally Augmented Dickey-Fuller (CADF) panel unit root test developed by Pesaran (2007), which is robust in the presence of cross-sectional dependency. CADF test, based on augmenting the Augmented Dickey-Fuller regression with the lagged cross-sectional mean and first difference to capture the cross-sectional dependence that arises through a single factor model. The CADF regression is as follows:

$$\Delta Y_i = a_i + b_i Y_{i,t-1} + c_i \bar{Y}_{t-1} + d_i \Delta \bar{Y}_t + e_{it} \quad (5)$$

The CADF test shows that the series for each cross-section contains a unit root; that is, it tests the null hypothesis. In equation (5), $\bar{Y}_t$ is the average at time t of all N observations, and the findings show the stationarity of the cross-section, not the stationarity of the panel. The stationary of panel units is analysed with a Cross-Sectionally Augmented IPS (CIPS) test. In the whole panel dataset, the regression for the CIPS statistics given by the average of the individual CADF statistics is as follows:

$$CIPS = N^{-1} \sum_{i=1}^{N} CADF \quad (6)$$

The CIPS panel unit root statistics based on CADF equations for high-income, upper-middle income and lower-middle-income countries are presented in Table 3.

Table: 3
Pesaran (2007) Unit Root Test Results

Variables	High-Income Countries		Upper-middle Income Countries		Lower-middle Income Countries	
	Level	First Difference	Level	First Difference	Level	First Difference
LGdp	-1,37 (0,984)	-2,72 (0,000)***	-1,49 (0,846)	-3,08 (0,000)***	-1,22 (0,985)	-2,61 (0,000)***
Gfcf	-1,90 (0,156)	-3,18 (0,000)***	-2,47 (0,001)***		-1,51 (0,824)	-3,21 (0,000)***
Llabf	-1,87 (0,196)	-3,16 (0,000)***	-2,20 (0,022)**		-0,79 (1,000)	-2,41 (0,003)***
Trade	-1,06 (1,000)	-2,51 (0,000)***	-1,24 (0,982)	-3,42 (0,000)***	-1,66 (0,621)	-3,26 (0,000)***
Discr	-4,79 (0,000)***		-1,71 (0,539)	-2,62 (0,000)***	-1,60 (0,709)	-3,16 (0,000)***
DiscrxPolst	-4,90 (0,000)***		-2,13 (0,045)**		-2,50 (0,001)***	
DiscrxRule	-5,06 (0,000)***		-2,39 (0,002)***		-2,05 (0,083)	-3,81 (0,000)***
DiscrxGovef	-4,96 (0,000)***		-2,40 (0,002)***		-2,41 (0,002)***	
DiscrxRegq	-4,97 (0,000)***		-2,44 (0,001)***		-2,087 (0,064)	-3,67 (0,000)***
DiscrxCorr	-4,93 (0,000)***		-2,15 (0,036)**		-1,69 (0,574)	-3,77 (0,000)***
DiscrxVoiac	-4,89 (0,000)***		-2,40 (0,002)***		-1,92 (0,205)	-3,71 (0,000)***

*Note: *, **, *** indicate statistical significance at 10%, 5%, 1%, respectively, and the values in parentheses indicate probability values.*

Table 3 shows the CIPS statistical values obtained from CADF unit root tests. For the countries included in the models, the dummy variable is assumed to be stationary; according to the CADF unit root test results of 11 variables, the series that are not stationary

at the level became stationary in their first differences, and all series are included in the estimations as stationary.

System generalised method of moments estimator

This study examined the effect of monetary policy on growth by considering institutional factors. Since the growth variable is affected by the explanatory variables and its lag, it was decided to conduct the study with dynamic panel data models.

The main emergence point of dynamic models is that the dependent variable does not react immediately to independent variables, and this reaction is lagged. However, in dynamic models, the relation between the lag of the dependent variable and the error term causes endogeneity problems, and the least squares estimation method gives biased and inconsistent results. This discrepancy, called Nickel Bias, disappears only when T tends to infinity (Nickell, 1981). However, since the study sample is limited, it is possible to have deviated and inconsistent results due to the endogeneity problem. To eliminate these biased and inconsistent results, the GMM method is recommended in the literature (Baltagi, 2005: 136; Roodman, 2009).

For the system GMM method to give consistent and effective results, there should be no correlation in disturbances, and additional instruments should be valid. The absence of correlation in disturbances is tested by AR(1) and AR(2) tests developed by Arellano and Bond (1991). The AR(1) tests the hypothesis of "there is no first-order serial correlation for the disturbances", while the AR(2) tests the hypothesis "there is no second-order serial correlation for the disturbances". For the GMM estimator to be consistent, the AR(1) null hypothesis, there is no first-order serial correlation for the disturbances, can be rejected, and the AR(2) test null hypothesis, there is no second-order serial correlation for the disturbances, which cannot be rejected. The validity of overidentifying restrictions is investigated for the validity of additional instruments. In this context, Arellano & Bond (1991) suggested the Sargan (1958) test. However, in the one-stage estimator, the Sargan (1958) test seems to yield inconsistent results, and using the Hansen (1982) test provides theoretically more consistent results (Roodman, 2009: 97-98). Both tests used for the validity of additional instruments test the null hypothesis of "overidentifying restrictions are valid". Failure to reject this null hypothesis means that the instruments are valid.

4. Results

This study analysed the effect of institutional structure and monetary policy on growth with the available yearly data for the 2002-2017 period for 37 high-income, 19 upper-middle income and 19 lower-middle-income countries. The System GMM method and lags of both the dependent variable and regressors were used as instrumental variables to control for potential endogeneity.

While examining the effects of institutional factors and monetary policy on growth, estimations were made in two stages to distinguish the effects of institutional factors. In the

first stage, the effect of monetary policy on growth was examined without institutional factors. In the second stage, estimates were made by bringing together institutional factors and monetary policy. In addition, dummy variables were assigned to 2009, representing the 2008 global crisis for the high and upper-middle-income groups. Considering the spreading effect of the global crisis and the dummy variable was not statistically significant in the preliminary examinations for the lower-middle income group, the dummy variable was not included in the estimations for the lower-middle income group. The results of the estimates for high-income countries are presented in the ongoing part of the study.

Tables 4, 5 and 6 show the effect of contractionary monetary policy on growth for high-income, upper-middle income and lower-middle-income countries, respectively. When the significance of the models is examined, it is seen that the Wald Chi2 tests, which show the significance of the variables used as a whole, are significant in all models. The lagged values of the dependent variable, which is the indicator of the validity of the dynamic model, are significant and positive in all models. The probability values of the AR(2) test greater than 0.05 in all models indicate that there is no second-order serial correlation for the disturbances in the models. The probability values of Hansen's tests are greater than 0.05, and the number of instruments is lower than the number of groups, indicating that the additional instruments used in predictions are valid. It is concluded that the models created to examine the effect of monetary policy on growth are valid for high-income, upper-middle income and lower-middle-income groups.

Table 4 shows the effect of contractionary monetary policy on growth for high-income countries. When analysed in terms of control variables, it is seen that the effects of the Labf and Trade variables on growth are positive, and the effect of the Gfcf variable is negative except for Model 2. Additionally, it was concluded that the dummy variable added for 2009, representing the 2008 global crisis, was statistically significant in all models and had a negative effect on growth.

Model 1 examines the effect of contractionary monetary policy on economic growth without including institutional factors. The findings obtained from Model 1 show that the increase in interest rates negatively affects economic growth in the expected direction. In Model 2, the Polst variable is estimated by combining it with the contractionary monetary policy. The results show that the monetary policy variable (Discr) and the interaction coefficient (DiscrxPolst) are statistically significant. The monetary policy coefficient, which indicates the marginal effect, is $[\boldsymbol{\partial} \mathrm{Y}_{\mathrm{i,t}} / \boldsymbol{\partial} \mathrm{Disc}_{\mathrm{i,t}} = -0.0080009 + (0.0000933 \times 72.81861) = -0.00121)]$ -0.00121. These findings mean that the improvement in political stability reduces the contraction effect of monetary policy (-0.00298 <-0.00121), and a 1% increase in interest rates decreases growth by 0.00121% when political stability is considered. Similar to the Polst institutional variable, it is observed that other variables also reduce the contraction effect of monetary policy and the effects of policies applied in models estimated by Govef and Regq variables on growth transformed from negative to positive. When the effect of institutional structure and monetary policy on growth is analysed, it is

seen that the positive effect ranking of institutional factors is Regq> Govef> Rule> Voiac> Polst> Corr.

The rest of the study includes the estimation results for upper-middle-income countries.

Table: 4
System GMM Estimation Results for the Impact of Monetary Policy on Economic Growth - High-Income Countries

Model	1	2	3	4	5	6	7
Dependent Variable: DGdp	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
DGdp(-1)	0,2408 (0,000)***	0,1291 (0,000)***	0,2113 (0,000)***	0,1911 (0,000)***	0,1574 (0,000)***	0,2447 (0,000)***	0,2868 (0,000)***
DGfcf	-0,0026 (0,000)***	0,0094 (0,000)***	-0,0024 (0,000)***	-0,0026 (0,000)***	-0,0025 (0,038)***	-0,0025 (0,000)***	-0,0025 (0,000)***
DLlabf	1,8628 (0,000)***	2,1515 (0,000)***	1,3370 (0,000)***	1,2048 (0,000)***	1,3760 (0,049)**	1,4761 (0,000)***	1,0531 (0,000)***
DTrade	0,0015 (0,000)***	0,0009 (0,001)***	0,0009 (0,000)***	0,0009 (0,000)***	0,0009 (0,000)***	0,0011 (0,000)***	0,0011 (0,000)***
Discr	-0,0029 (0,021)**	-0,0081 (0,004)***	-0,0099 (0,027)***	-0,0132 (0,003)***	-0,0117 (0,000)***	-0,0116 (0,035)**	0,0297 (0,002)***
DiscrxPolst		0,00009 (0,003)***					
DiscrxRule			0,0001 (0,028)**				
DiscrxGovef				0,0002 (0,002)***			
DiscrxRegq					0,0001 (0,000)***		
DiscrxCorr						0,0001 (0,041)**	
DiscrxVoiac							-0,0003 (0,002)***
Dummy	-0,1046 (0,000)***	-0,0172 (0,001)***	-0,1294 (0,000)***	-0,1378 (0,000)***	-0,1276 (0,000)***	-0,1182 (0,000)***	-0,1120 (0,000)***
Constant	0,0081 (0,000)***	0,0032 (0,385)	0,0090 (0,000)***	0,0094 (0,000)***	0,0057 (0,053)*	0,0091 (0,000)***	0,0086 (0,001)***
No. Inst/Group	20/37	21/37	21/37	21/37	21/37	21/37	21/37
Obs.	518	518	518	518	518	518	518
Wald Chi2 (prob.)	217,04 (0,000)***	908,97 (0,000)***	326,84 (0,000)***	404,99 (0,000)***	259,31 (0,000)***	340,43 (0,000)***	275,18 (0,000)***
AR(1) test	-4,12 (0,000)***	-3,12 (0,002)***	-4,39 (0,000)***	-4,60 (0,000)***	-4,47 (0,000)***	-4,17 (0,000)***	-3,75 (0,000)***
AR(2) test	-0,06 (0,949)	-1,25 (0,213)	0,01 (0,991)	0,41 (0,679)	0,17 (0,866)	-0,26 (0,796)	-0,96 (0,339)
Hansen test	17,38 (0,182)	18,47 (0,140)	19,13 (0,119)	19,592 (0,106)	17,92 (0,161)	19,65 (0,105)	19,37 (0,112)
Policy Coefficient	$-29{,}8*10^{-4}$	$-12{,}1*10^{-4}$	$-1{,}3*10^{-4}$	$5{,}0*10^{-4}$	$12{,}1*10^{-4}$	$-15{,}1*10^{-4}$	$-3{,}6*10^{-4}$

*Note: *, **, *** indicate statistical significance at 10%, 5%, 1%, respectively, and the values in parentheses indicate probability values.*

Table 5 shows the contractionary monetary policy's effect on upper-middle-income countries' growth. According to the results, unlike high-income countries, the effect of Gfcf on growth is statistically significant and positive, while Labf and Trade's effects are positively similar to that of the high-income countries. The fact that the dummy variable is statistically significant and negative in all models indicates that the global crisis's impact affects upper-middle-income and high-income countries. When the effect of contractionary monetary policy on economic growth for upper-middle-income countries is analysed, it is concluded that the effect of contractionary monetary policy on growth is negative and institutional factors reduce this adverse effect. Considering the impact of the institutional

structure and contractionary monetary policy on growth, it is noteworthy that the order of impact is as Rule> Govef> Regq> Corr> Polst> Voiac.

The rest of the study includes the estimation results for lower-middle-income countries.

Table: 5
System GMM Estimation Results for the Impact of Monetary Policy on Economic Growth - Upper-Middle Income Countries

Model	1	2	3	4	5	6	7
Dependent Variable: DGdp	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
DGdp(-1)	0,3783 (0,000)***	0,3648 (0,000)***	0,3662 (0,000)***	0,3751 (0,000)***	0,3546 (0,000)***	0,3516 (0,000)***	0,3264 (0,000)***
Gfcf	0,0047 (0,000)***	0,0015 (0,017)**	0,0013 (0,017)**	0,0013 (0,013)**	0,0012 (0,065)*	0,0014 (0,012)**	0,0012 (0,140)
Llabf	0,0392 (0,003)***	0,0015 (0,176)	0,0025 (0,031)**	0,0024 (0,050)**	0,0026 (0,088)*	0,0024 (0,052)*	0,0028 (0,098)*
DTrade	0,0056 (0,000)***	0,0052 (0,000)***	0,0045 (0,000)***	0,0041 (0,000)***	0,0044 (0,000)***	0,0048 (0,000)***	0,0047 (0,000)***
DDiscr	-0,0175 (0,045)**	-0,01425 (0,016)**	-0,0097 (0,030)**	-0,0105 (0,016)**	-0,0128 (0,007)***	-0,0142 (0,001)***	-0,0153 (0,012)**
DiscrxPolst		-0,00005 (0,000)***					
DiscrxRule			-0,00002 (0,006)***				
DiscrxGovef				-0,00002 (0,003)***			
DiscrxRegq					-0,00002 (0,005)***		
DiscrxCorr						-0,00002 (0,000)***	
DiscrxVoiac							-0,00002 (0,003)***
Dummy	-0,0598 (0,001)***	-0,0424 (0,000)***	-0,033 (0,001)***	-0,0351 (0,001)***	-0,0382 (0,002)***	-0,0396 (0,000)***	0,0391 (0,016)**
Constant	-0,6876 (0,000)***	-0,0268 (0,000)***	-0,0414 (0,000)***	-0,0405 (0,000)***	-0,0389 (0,000)***	-0,0421 (0,000)***	-0,0406 (0,000)***
No, Inst/Group	17/19	18/19	18/19	18/19	18/19	18/19	18/19
Obs,	266	266	266	266	266	266	266
Wald Chi2 (prob)	566,95 (0,000)***	577,64 (0,000)***	1487,29 (0,000)***	1320,80 (0,000)***	1149,99 (0,000)***	2562,56 (0,000)***	6633,81 (0,000)***
AR(1) test	-2,55 (0,011)**	-2,59 (0,010)***	-2,56 (0,010)***	-2,67 (0,008)***	-2,84 (0,004)***	-2,72 (0,006)***	-2,95 (0,003)***
AR(2) test	-0,49 (0,623)	-0,57 (0,581)	-0,77 (0,441)	-0,90 (0,371)	-0,83 (0,406)	-0,72 (0,473)	-0,76 (0,449)
Hansen test	13,05 (0,221)	14,08 (0,169)	13,58 (0,193)	13,64 (0,190)	13,55 (0,195)	13,50 (0,197)	12,77 (0,237)
Policy Coefficient	$-175{,}4*10^{-4}$	$-161{,}5*10^{-4}$	$-108{,}3*10^{-4}$	$-116{,}2*10^{-4}$	$-141{,}3*10^{-4}$	$-153{,}4*10^{-4}$	$-166{,}2*10^{-4}$

*Note: *, **, *** indicate statistical significance at 10%, 5%, 1%, respectively, and the values in parentheses indicate probability values.*

Table 6 shows the effect of contractionary monetary policy on growth for lower-middle-income countries. When considered in terms of control variables, Trade has a positive effect on growth as in other income levels, whereas Gfcf affects growth positively, unlike the high-income group, and these effects are statistically significant. On the other hand, Labf negatively affects growth, unlike high and upper-middle-income countries. The dummy variable used in estimates in other income groups and representing the global crisis is not included in the models because it is statistically insignificant in lower-middle income countries. When the effect of contractionary monetary policy on economic growth for the lower-middle income group is evaluated, it is concluded that the effect of contractionary

monetary policy on growth is negative as in other income groups. When considered in terms of institutional variables, it was concluded that the effects of Regq, Corr and Voiac on growth were statistically significant and positive, while the effects of other institutional variables were statistically insignificant. Considering the effect of the institutional structure and contractionary monetary policy on growth, it is seen that the order of impact is as Corr> Regq> Voiac for statistically significant variables.

Table: 6
System GMM Estimation Results for The Impact of Monetary Policy on Economic Growth - Lower-Middle Income Countries

Model	1	2	3	4	5	6	7
Dependent Variable: DGdp	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
DGdp(-1)	0,4134 (0,000)***	0,4166 (0,000)***	0,3952 (0,000)***	0,3929 (0,000)***	0,3669 (0,000)***	0,3972 (0,000)***	0,390 (0,000)***
DGfcf	0,0019 (0,001)***	0,0013 (0,038)**	0,0018 (0,002)***	0,0009 (0,086)*	0,0018 (0,001)***	0,0023 (0,001)***	0,0019 (0,001)***
DLlabf	-1,1136 (0,006)***	-1,1978 (0,009)***	-1,1603 (0,003)***	-0,7822 (0,016)**	-1,3059 (0,007)***	-1,2481 (0,005)***	-1,3018 (0,002)***
DTrade	0,0009 (0,000)***	0,0012 (0,000)***	0,0010 (0,000)***	0,0011 (0,000)***	0,0009 (0,001)***	0,0009 (0,001)***	0,0009 (0,003)***
DDiscr	-0,0024 (0,000)***	-0,0026 (0,000)***	-0,0027 (0,000)***	-0,0029 (0,000)***	-0,0037 (0,000)***	-0,0028 (0,000)***	-0,0036 (0,000)***
DiscrxPolst		0,00001 (0,324)					
DDiscrxRule			0,00002 (0,281)				
DiscrxGovef				0,00002 (0,134)			
DDiscrxRegq					0,00007 (0,000)***		
DDiscrxCorr						0,00004 (0,020)**	
DDiscrxVoiac							0,00005 (0,055)*
Constant	0,0486 (0,000)***	0,0469 (0,000)***	0,0506 (0,000)***	0,0367 (0,000)***	0,0552 (0,000)***	0,0523 (0,000)***	0,0541 (0,000)***
No, Inst/Group	17/19	18/19	18/19	18/19	18/19	18/19	18/19
Obs,	266	266	266	266	266	266	266
Wald Chi2 (prob)	535,14 (0,000)***	614,32 (0,000)***	533,29 (0,000)***	486,83 (0,000)***	563,33 (0,000)***	779,63 (0,000)***	1084,98 (0,000)***
AR(1) test	-2,61 (0,011)**	-2,59 (0,010)***	-2,59 (0,010)***	-2,48 (0,013)**	-2,36 (0,018)**	-2,57 (0,010)***	-2,43 (0,015)**
AR(2) test	0,39 (0,698)	0,42 (0,677)	0,46 (0,646)	0,54 (0,591)	0,44 (0,662)	0,50 (0,620)	0,36 (0,720)
Hansen test	14,56 (0,203)	15,83 (0,147)	14,14 (0,225)	13,37 (0,270)	13,38 (0,270)	14,21 (0,222)	13,38 (0,269)
Policy Coefficient	$-24{,}9*10^{-4}$	$-23{,}7*10^{-4}$	$-20{,}7*10^{-4}$	$-22{,}8*10^{-4}$	$-15{,}9*10^{-4}$	$-14{,}8*10^{-4}$	$-17{,}7*10^{-4}$

*Note: *, **, *** indicate statistical significance at 10%, 5%, 1%, respectively, and the values in parentheses indicate probability values.*

5. Conclusions and Recommendations

Monetary policy deals with the interventions of governments, central banks or monetary authorities in economic indicators and the consequences of these interventions. Although the interventions made through monetary policy transmission channels have intermediate purposes, the ultimate goal of these policies has been to accelerate economic growth at all times.

According to the institutional approach, the effectiveness of the policies varies according to the policy perceptions of consumers, producers and countries with which they have commercial relations, as well as the policy implementation abilities of monetary authorities. In economies where political stability is discussed, property rights are not protected, there is a widespread perception of corruption, and the legal system needs to function more effectively, policies will not produce the expected results. In these countries, the effect of contractionary policies on growth will be higher, and the effect of expansionary policies on growth will be lower. According to the institutional approach, it is necessary to create an appropriate institutional environment and ensure that the managers and the management are committed to the institutions and rules for the policies to produce the expected results.

In this study, which emerged from the importance of institutions on social and economic life, the effect of institutional factors on the relationship between monetary policy and economic growth was examined and whether this effect changes depending on the institutional variable and income level. To examine the relationship between monetary policy and growth from an institutional perspective, Political Stability and Absence of Violence/Terrorism, Rule of Law, Government Effectiveness, Regulatory Quality, Control of Corruption and Voice and Accountability were used as institutional variables, and the central bank discount rate was used to represent monetary policy. The data on the variables used in the empirical analysis cover the 2002-2017 period and three country groups: 37 high-income, 19 upper-middle income and 19 lower-middle income. In addition, capital, labour and trade openness variables, generally accepted in the growth literature, are included in the models as control variables. First, the cross-sectional dependency and stationarity of the series were investigated to examine the relationship between variables. Estimations were conducted using the System GMM method, one of the dynamic panel data methods. While examining the effects of institutional factors and monetary policy on growth, the effect of contractionary monetary policy on growth is examined in the first stage. The next step was conducted by combining monetary policy and institutional factors. With this method, it is aimed to decompose the effects of institutional factors.

As a result of empirical analysis, it was observed that the increase in the contractionary monetary policy variable negatively affected the economic growth in all income groups, and this effect was especially high in upper-middle-income countries. The reason why the adverse effect is higher in upper-middle-income countries is thought to be due to the tight integration with other countries in terms of financial markets, real indicators and political factors and the increasingly fragile economic structures of these countries due to the policies pursued in the globalisation process. In addition, the low negative impact in lower-middle income economies is estimated to be due to inefficient financial markets and the small share of these countries in the global economy.

When analysed in terms of institutional indicators, it is concluded that in high and upper-middle-income countries, the effect of all institutional indicators is positive, and the increase in institutional quality reduces the negative effect of monetary policy on growth.

The findings, while confirming the results of Duncan (2014) and Muhammad Nawaz et al. (2018), contradict the results of Aysun et al. (2013). However, Aysun et al. (2013) stated that the negative role of institutional factors in the effectiveness of monetary policy may have arisen from the chosen variables. In terms of the lower-middle income group, it was observed that the effects of Political Stability and Absence of Violence / Terrorism, Rule of Law, and Government Effectiveness variables were statistically insignificant, while the effects of other variables were positive. This difference between high-income and upper-middle-income countries and lower-middle-income countries indicates that the effect of institutional factors depends on income level and that institutional factors will increase as income increases. The findings coincide with the results of Yapraklı (2008), Artan & Hayaloğlu (2013) and Nawaz (2015) and confirm the hypothesis that the effectiveness of institutional factors depends on income level. When considered in terms of institutional variables that are more effective in countries with different income levels, the Regulatory Quality and Government Effectiveness variables in high-income countries, the Rule of Law in upper-middle-income countries, and Regulatory Quality in lower-middle-income countries appear to be more influential. In this case, it shows that in high-income and lower-middle-income countries, the implementations put in place and promised by the government are determinants of the effectiveness of monetary policy. The fact that the Rule of Law variable is more effective in upper-middle-income countries indicates that ensuring the independence of judicial bodies, establishing strong legal foundations and protecting property rights are important determinants of the effect of monetary policy on growth.

The findings obtained from the study examining the effects of institutional structure and contractionary monetary policy on growth have shown that institutional factors are determinants of the effect of contractionary monetary policy on growth. However, when evaluated in terms of contractionary monetary policy, it is accepted that some variables used in the models are closely related to central banks' independence, transparency and accountability (Eijffinger & Stadhouders, 2003). Therefore, future studies that will evaluate the effectiveness of monetary policy on the institutional axis take into account the characteristics of central banks and will be effective in developing the institutional economics literature. In addition, the causality relationship between institutional factors and economic development still remains uncertain (Dawson, 2003). Studies carried out among variables for different periods and income levels will significantly contribute to the literature.

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Appendix

Table: A1
List of Countries

	High-Income Countries		Upper-middle Income Countries	Lower-middle Income Countries
	Austria Barbados Belgium Canada Chile Croatia Cyprus Czech Republic Denmark Estonia Finland France Germany Greece Hong Kong Hungary Iceland Ireland Israel	Italy Japan South Korea Kuwait Latvia Lithuania Luxembourg Malta Netherlands Oman Poland Portugal Slovak Republic Slovenia Spain United Kingdom United States Uruguay	Algeria Botswana Brazil China Colombia Equatorial Guinea Fiji Gabon Jordan Lebanon Macedonia Paraguay Peru Serbia South Africa Saint Lucia Saint Vincent and the Grenadines Thailand Turkey	Angora Bolivia Cabo Verde Cameroon Republic of the Congo Egypt India Kyrgyzstan Lesotho Mauritania Morocco Myanmar Pakistan Philippines Sri Lanka Ukraine Vanuatu Vietnamese Zambia
Total	37		19	19

Table: A2
Summary Statistics of Variables

High-Income Countries					
Variables	Observation	Mean	Standard Deviation	Minimum	Maximum
LGdp	592	26.09667	1.883475	22.12366	30.48202
Gfcf	592	21.93158	4.270593	10.77016	36.73959
Llabf	592	15.16575	1.681492	11.89951	18.9121
Trade	592	112.2122	75.83853	20.68561	442.62
Discr	592	3.921398	13.56987	0.0001	316.01
Polst	592	72.81861	17.774	7.109005	100
Rule	592	83.17695	11.67677	48.51485	100
Govef	592	83.50757	10.89531	46.63462	100
Regq	592	84.05326	10.65577	48.55769	100
Corr	592	81.77002	12.82999	44.71154	100
Voiac	592	80.82969	16.58034	16.11374	100
Upper-middle Income Countries					
Variables	Observation	Mean	Standard Deviation	Minimum	Maximum
LGdp	304	24.67319	2.358525	20.13268	29.94958
Gfcf	304	24.99778	7.395747	11.9837	56.51228
Llabf	304	15.08558	2.415845	10.82679	20.48383
Trade	304	80.6498	32.03806	22.10598	186.7203
Discr	304	8.318406	6.877268	1	55
Polst	304	37.81189	23.5726	1.005025	92.71844
Rule	304	44.63624	18.40664	3.846154	79.32692
Govef	304	49.00334	18.79782	1.435407	79.90196
Regq	304	50.231	18.07921	5.769231	85.78432
Corr	304	46.72364	21.51997	0.0001	85.16747
Voiac	304	43.53518	22.34176	1.477833	90.38461

Lower-middle Income Countries					
Variables	Observation	Mean	Standard Deviation	Minimum	Maximum
LGdp	304	24.13011	1.951901	19.99201	28.59837
Gfcf	304	25.49707	8.207413	9.808427	58.95761
Llabf	304	15.75526	2.006287	11.30224	20.06971
Trade	304	84.21203	39.85155	0.1674176	200.3846
Discr	304	10.29064	14.21047	1.08	150
Polst	304	32.47557	22.34736	0.4739336	99.02913
Rule	304	34.02624	19.3988	0.9569378	74.51923
Govef	304	34.18985	16.64255	2.392344	65.04855
Regq	304	31.9838	14.30344	0.0001	64.28571
Corr	304	32.24979	20.07302	0.4739336	80.28846
Voiac	304	33.88287	19.34657	0.0001	77.3399