THE NEXUS AMONG FISCAL POLICIES, FISCAL DECENTRALIZATION, AND ECONOMIC PERFORMANCE: JOINT EFFECT OF GLOBALIZATION AND INSTITUTIONAL QUALITY

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Abstract

This article aims to reveal not only the individual effects of globalization and institutional quality but also their interaction effects on fiscal decentralization, government spending, tax revenues, and economic performance. The role of institutions is important as the underlying basis for economic activity. Institutional quality should include an analysis of the impact of fiscal decentralization on macroeconomic variables to determine the dynamics of economic structure. There are not enough studies that deal with the interaction effect of globalization and institutional quality within this concept. As an additional contribution, panel VARX method is applied to investigate the direction and size of the interaction for the 24 countries that are members of Organization for Economic Co-operation and Development between 1996 and 2010.

Keywords: Fiscal decentralization, globalization, institutional quality, economic performance, fiscal policy.

MALİYE POLİTİKALARI, MALİ YERELLEŞME VE EKONOMİK PERFORMANS ARASINDAKİ BAĞ: KÜRESELLEŞME VE KURUMSAL KALİTE ETKİLEŞİMİ

Öz

Bu makale, küreselleşmenin ve kurumsal kalitenin sadece bireysel etkilerini değil aynı zamanda birlikte etkileşimlerinin mali yerelleşme, kamu harcamaları, vergi gelirleri ve ekonomik performans üzerindeki etkilerini de ortaya koymayı amaçlamaktadır. Kurumlar, ekonomik faaliyetin temel unsurlarındandır. Mali yerelleşmenin makroekonomik değişkenler üzerindeki etkisi incelenirken ekonomik yapının dinamiklerinin belirlenebilmesi için kurumsal kalitenin de incelenmesi gereklidir. Bu kapsamda, küreselleşmenin ve kurumsal kalitenin birlikte etkisini ele alan çalışmalar literatürde yeteri kadar bulunmamaktadır. Literatüre ek bir katkı olarak, 1996-2010 dönemleri arasında Ekonomik İşbirliği ve Kalkınma Örgütü üyesi olan 24 ülke için etkileşimin yönü ve boyutu panel VARX yöntemiyle araştırılmaktadır.

Anahtar Kelimeler: Mali yerelleşme, küreselleşme, kurumsal kalite, ekonomik performans, maliye politikası.

1. Introduction

Today, international integration of markets, decentralization of authorities, and the quality of institutions are emerging as important issues. The tendency of national economies to integrate with other country's economies creates a global economy based on free markets, investment flows, and information technologies. The global impact is determined by a vibrant

economy that embraces a steady process of growth and development. Autonomous economies are being shifted towards the global market by incorporating production, distribution, and consumption activities. The effect of globalization process varies according to the economic categories of countries. Trade liberalization, one of the basic instruments of globalization, provides industrialized countries with access to the world market while slowing down the industrialization process; hence, the lack of development in certain economies. Developed and developing economies, which are among the actors of globalization, are concerned with market expansion for goods and services while underdeveloped economies end up in a permanent cycle of underdevelopment because they do not utilize internal resources for production purposes. Unused resources in arrested economies are otherwise raw materials for industrial production in other economies. Rapid integration of financial markets hinders macroeconomic stability of developed economies, and has significantly influenced the national policy makers in terms of the execution of monetary and fiscal policies. This situation is an increasing source of shock and disturbance from one financial market to another. In addition, industrialized countries impose restrictions on the free movement of labor while promoting free trade and free movement of capital. The mobility of labor in underdeveloped countries is constrained and controlled, but maintained among developed countries. International capital flows associated with high volatility cause persistent inflation, increased interest rates, less consumer demand, a negative investment climate, and a higher unemployment rate rather than encouraging economic growth and development in deficient economies (Obadan, 1999). Nevertheless, the negative effects of underdeveloped economies influence developed economies, and optimization cannot be achieved for global economics.

The interaction effects of globalization and institutional quality on selected variables differ depending on the definition of globalization employed as economic, political, or social. Sub-components of globalization allow a more precise measurement of the effects on economic structure. Studying several aspects of globalization using a broad Konjunkturforschungsstelle (KOF) index, not only includes measurement of economic globalization but also the social and political dimensions of globalization. The KOF globalization index is constructed using 23 variables covering aspects of economic, political, and social globalization; then, the sub-indices combine into an overall globalization index using principal components analysis. The index reflects the process of developing extensive networks of people, information, capital, ideas, and physical goods across multiple continents (Dreher, 2006).

This paper empirically examines institutional quality as a determinant of fiscal decentralization and selected variables. Kuncic (2014) describes and compares different

institutional classification systems and shows how to experimentally operationalize institutional concepts. More than 30 institutional indicators were clustered into three homogeneous groups as legal, political, and economic to capture the full institutional structure of a country. The quality of the institutions belonging to these three groups between 1990 and 2010 is calculated to show if the relative institutional environment has improved or deteriorated. Moreover, a country average for each institutional group is created as an absolute measure of legal, political, and economic-institutional quality. The measurement reflects internal institutional changes concerned only with in-country dynamics.

The next section mentions the concepts of globalization, fiscal decentralization, and institutional quality relative to economic structure. After the panel VARX method is presented in the third section, the findings are given in the fourth section. Results and comments conclude.

2. The Links Among Fiscal Decentralization, Globalization, And Economic Structure

The transfer of fiscal management or financial power from the national government to local governments is part of a reform package boosting competition in local economies, reducing budget deficiency, and promoting economic growth to improve public sector efficiency and offer public services (Bird and Wallich, 1993).

To statistically investigate the potential contribution of fiscal decentralization to macroeconomic variables, a quantitative measure of fiscal decentralization must be developed. To measure the level of decentralization, the extent of deviation (or amount of authority of the lower-level government) must be known. Fiscal decentralization, tax revenues, and public spending reflect the distribution of responsibilities per government level. The measurement of decentralization is surprisingly difficult. The standard approach measuring authority distribution uses accounting measures such as income or expense. The econometric analyzes are divided into two groups: studies focusing on decentralization differences among the sub-central units of countries, and those focusing on differentiation among countries. Usually, the studies are based on Government Finance Statistics (GFS) by the International Monetary Fund (IMF), and define the degree of decentralization as a sub-centric share of total government spending or income. Although GFS provides consistent definitions between countries, the data set fails to address the intergovernmental fiscal structure of countries properly, ignoring the central government's control over local tax rates and tax bases. The first part of traditional fiscal decentralization theory is based on the power

of representation (Breton, 1996). Optimal division of power between central and local governments constitutes the second part of traditional theories (Oates, 1972). The third part focuses on organizational costs (Breton and Scott, 1978). Second-generation theories focus on government incentives and state-market relations by examining the effects of decentralization on efficiency and growth, equity and redistribution, and macroeconomics.

A large economically integrated country with high heterogeneity is associated with a higher demand for decentralization to prevent the separation of minority groups and wealthy regions. Bolton and Roland (1997) examined the relationship between globalization and decentralization. It is argued that economic integration in the form of separation of small regions and centralization changes the incentives for autonomy of regional governments. Economic integration does not reduce the costs of diversification, whereas it reduces the benefits of economies of scale. The integration of international markets prevents the central authority from breaking down by reducing the economic costs of downsizing associated with possibilities of accruing to economies of scale. This stands for a positive correlation between decentralization and globalization.

Garrett and Rodden (2003) examined the impact of trade and capital span on the local share of public revenues/expenditures for developed and developing countries and found a positive relationship between economic integration and fiscal centralization. Stegarescu (2009) shows that political integration encourages a positive effect of economic integration on decentralization. Additionally, fiscal decentralization is increased by economic integration, as political integration encourages the elimination of trade and factor movements. According to Stegarescu (2004b), the effect of political integration on fiscal centralization is different depending on the type of fiscal centralization examined. In terms of income decentralization, political unity leads to the centralization of tax and income decisions and the decentralization of the decision-making process in terms of expenditures. Dreher (2006) found a negative relationship between political integration and fiscal decentralization, since political integration limits the effects of tax competition created by economic integration. Ermini and Santolini (2010) showed a positive relationship between globalization and fiscal decentralization.

Inflation rate is a monetary phenomenon arising from disproportionate increases in the money supply when authorities are under pressure to finance public spending beyond a budget's capacity; either when the resistance authorities have to political pressures is low, or when the pressures themselves are stronger. Monetary authorities exert more pressure on governing bodies when high costs are incurred to pay for new government policies or the marginal cost of inflation is low. The transfer of expenditure or monetary policies to lower

levels of government limits the central government's failure to comply with the rules. In this case, decentralization is expected to reduce inflation. Inflation reduces macroeconomic stability because asymmetric information causes delays in the plan that many actors have agreed upon for macroeconomic stability (Alesina and Drazen, 1991). Stable prices are important for public welfare, but cannot be achieved when the number of potential beneficiaries is large. The division of authority among different government levels increases coordination costs and makes decreasing inflation difficult. The more the government involves itself with the distribution of stabilization costs, the higher and longer does the inflation persist. In developed countries, federal agencies and influential sub-national (local) authorities oversee the central economic policy makers and maintain the independence of the central bank (Lohmann, 1998). Political decentralization in developing countries manifests through an increase in pressure on high public expenditures, encouraging excessive public debt and the weakening of price stability. High public spending is the government's use of a dominant strategy, pressing for inadequately high monetary expansion regardless of inflation costs. The institutional solution protecting monetary authorities from state pressure and maintaining price stability is associated with the independence of the central bank. In addition, regarding the central bank's level of independence, the increased pressure the central bank must withstand is diverse. If political power is divided among a few actors, the demand for inflationary monetary policy increases. If inflation is due to inadequate independence of the central bank, increasing autonomy through decentralization strengthens the bank's ability to resist political repression increasing the effectiveness of its monetary policy (Moser, 1997). Nevertheless, if the inflation is due to difficulties coordinating savings plans, it may be argued that decentralization worsens the condition. When local governments prioritize their self-interests (inflationary preferences) without imposing restrictions, the cost of their inflationary expenditures spreads to all regions. The central government is the only actor comprehensively interested in price stability. In countries more dependent on imports, the deficiency caused by inflation leads to costly depreciation. Countries that purposely increase decentralization tend to have both larger and lower levels of import penetration. If decentralization is linked to economic development and more effective taxation, it is expected to overlap with low inflation. In addition, decentralization associated with fewer imports and political instability is expected to overlap with high inflation.

Since inflation adversely affects economic growth by creating uncertainty, macroeconomic policies should be based on the maintenance of non-inflationary economic growth. Rogoff (1985) shows that open economies tend to have lower inflation. Romer (1993)

uses the Barro-Gorden model and argues that inflation is lower in open economies even when there is no independent central bank committed to price stability. Openness also affects inflation through its impact on the output. Inflation drops because of the following reasons: open economies, increased productivity, changes in domestic and foreign inputs, better allocation of resources, improved capacity utilization, increased foreign investment on production, and lower costs caused by increasing foreign investments that alleviate pricing pressure (Jin, 2000). Okun (1981) found that after the economy opened, shocks resulting from local price volatility are eased due to fluctuations in domestic output. Cukierman et al. (1992) emphasized lower price skewing in outward-looking countries. Lane and Gian (2006) demonstrate the existence of imperfect competition and solid nominal prices, which lead to a negative relationship between openness and inflation in non-tradable sectors. Hanif and Batool (2006) found that openness variables have a significantly negative effect on local price increases. Wynne and Kersting (2007) showed a strong negative correlation between countries' trade openness and the long-term inflation rate in the United States. Mukhtar (2010) also concluded a long-term significant disadvantage between inflation and trade openness. Samimi et al. (2011) argued that openness has a significantly negative effect on short-term inflation, but insignificant effects on long-term inflation. Evans (2007) advocates the positive effect of openness on inflation. Zakaria (2010) showed that there is a positive relationship between trade deficit and inflation.

Efficiency and income mobility are among the positive outputs of decentralization. The close relationship between local spending and income production provides better accountability of management (Bahl, 1999). Decentralization reduces corruption, increases the need to pay for public services, increases the supply of real estate and other land-based taxes, and reduces organizational costs (Wasylenko, 2001). In addition, taxes are perceived as financing local services. While central governments cannot access all businesses and taxpayers through value-added and income taxes, local authorities do have access to unused financial capacity from the income tax of small businesses and independent workers. However, decentralization is not always effective in developing countries or transitioning economies, as wealthy urban governments are likely to benefit from greater local taxation. A lack of proper policy for administrative responsibilities increases regional disparities making it difficult to provide services with fair distribution. Centralization is more effective in determining regional differences for executing public services and taxation. However, the potential for productivity is weakened because of local institutional inefficiency (Robalino et al., 2001).

The direction and extent of economic expansion rates were investigated by means of decentralization. Efficiency of public services and expectations of a high growth increase with decentralization. Prud'homme (1995) and Tanzi (1995) questioned the role of decentralization supporting growth. Differing opinions indicate that productivity gains from decentralization are not realized, especially in developing countries, because the central government restricts revenue collection and spending decisions by local governments. In addition, they argue that local governments may not be sensitive to citizens' preferences and needs regarding corruption, poverty, and education. Lin and Liu (2000) found that fiscal decentralization contributed significantly to economic growth. Bahl and Linn (1992) argue that decentralization occurs when a higher economic development is achieved, and the threshold of economic development to which fiscal decentralization becomes attractive is high. Wasylenko (2001) states that decentralization is a consequence of economic development. Davoodi and Zou (1998) found a negative relationship between decentralization and economic growth in developing countries, but no relationship in developed countries. Xie et al. (1999) indicated fiscal decentralization may be detrimental to growth. Davoodi and Zou (1998) used cross-country data in which institutional differences are important, yet did not make data adjustments to consider those differences. The argument is that local governments increase economic efficiency because they are positioned to provide public services to meet local preferences and needs better than central government, and over time the productivity gains lead to faster decentralization and national economic growth. Although there are fundamental concerns, few empirical studies have been conducted on developing countries and the relationship between economic growth decentralization.

Increasing integration in the world economy attracts national spending and taxation decisions. There are two differing hypotheses suggesting globalization affects public expenditure. According to the compensation hypothesis, economic insecurity leads to expansion of the public sector and social spending while the efficiency hypothesis suggests lower tax requirements encourage small public sector growth and especially productive government spending. While the efficiency hypothesis emphasizes globalization's effects on supply, the compensation hypothesis emphasizes globalization's effects on demand. There is no conclusive evidence as to which hypothesis predominates due to the choice of empirical methodology, inconsistencies between country samples, choice of financial variables, and choice of globalization indicators (Schulze and Ursprung, 1999). The efficiency hypothesis argues that globalization is the reason for increased competition among countries to attract mobile factors in production, specifically capital, leading to an erosion in tax revenues and a

fall in public spending (Dreher et al., 2008a). In addition, the increased competition shifts from public goods to public entrances by changing the composition of expenditures (Keen and Marchand, 1997).

Although globalization is a primary instrument for the development of economic activities of free markets and private enterprises, it also refers to the increasing integration of national economies, and the rapid spread of social, cultural, and political norms worldwide. Chang and Lee (2010) found that, in general, the social and political aspects of globalization have a long-term one-way influence on economic growth. Granato, Inglehart, and Leblang (1996) indicated that cultural values can be an important influence on economic development, hence it is necessary to consider globalization as a multi-layered structure when examining its effects.

The processes of globalization tend to cause certain socio-economic effects on efficiency, growth, and distribution. Globalization's short-term impact on growth is contractionary. Increasing competition at national and international levels pushes increase in productivity by lowering costs, employment, and wages, increasing uncertainty about job opportunities which decreases consumer demand, and results in budget deficits and reduction of public expenditures to control inflation. Increased integration in factor and product markets prevents the adoption of expansionist policies that demand promotion and job creation. Further, any attempt to lower interest rates, increase public spending, or increase bank lending leads to “overreaction” as markets by nature have their own contractionary pressure. Long-term effects are uncertain, but increased productivity, increased competition, and the promotion of a favorable business environment encourages progress in investment, business, and technology, leading to faster growth in a sustainable structure.

The pace of globalization increases with change in policies regarding free markets and private enterprises. The spread of globalization strengthens market liberalization and tendency to privatize. Along with changes in economic policies, globalization significantly changes the effectiveness of existing institutions. Dominance of companies with various international links increases considerably with rising national and international competition, greater capital mobility, and an increasing dependence of governments on global capital markets. These changes also reflect the level of institutions. Capital flow plays an important role in economic growth, not only in the accumulation of capital but also in productivity through technology transfer. Taking institutional quality into consideration, Alfaro, Kalemli-Özcan, and Volosovych (2008) argue a negative relationship between capital flow and gross domestic product, indicating that the Lucas Paradox does not exist. Snyder (2012) noted that different measures of institutional quality have differing effects on capital flows, the effect of

institutional quality on capital flow varies in poor and rich countries, and the effect of institutional capital on capital flow varies according to the level of economic development. Okada (2013) found that institutional quality associated with capital has a significant effect on financial openness and a partial effect in capital flow increases, offering higher levels of institutional capacity.

Kuncic (2012) proposes a method to separate institutions into legal, economic, and political categories. Legal institutions, including property rights, legal systems, civil liberties, and law enforcement, are often the most formal institutions developed by state or private contracts. Political institutions include election rules, citizen participation through voting and party membership, corruption, and accountability. Economic institutions provide appropriate market functions such as the enforcement of property rights, financial freedom, regulation in labor, and credit markets.

3. Econometrics Literature

In Vector Autoregressive Models (VAR) all variables are treated as endogenous and interdependent in both a dynamic and static sense. The VAR model is formally defined as

$$Y_t = A_0 + A(L)Y_{t-1} + e_t \quad (1)$$

where Y_t is a G x 1 vector of endogenous variables and A(L) is a polynomial in the lag operator, A_0 is a G x 1 vector and e_t is a G x 1 vector of i.i.d. shocks. Y_t is the stacked version of y_{it}, the vector of G variables for the cross-sectional dimension across countries i = 1,…,N and t=1,…,T. The major difference between VAR and Panel Vector Autoregression (PVAR) is that the covariance σ_{ij} of the residuals is zero by definition for country i differ from country j in a VAR model. The PVAR is defined as follows:

$$y_{it} = A_{0i} + A_i(L)Y_{t-1} + e_{it} \quad (2)$$

A_{0i} are Gx1 vectors and A_i are GxGN matrices. Country-specific heterogeneity is allowed by including a country-specific intercept. Further, lags of all endogenous variables for each entity enter the equation of country i. This feature is called dynamic interdependencies. The residual e_{it} is a G x 1 vector and $e_t = (e_{1t}, e_{2t}, \dots, e_{Nt})$. Generally referred to as static interdependencies, e_{it} correlates with the cross-sectional dimension i (Canova and Ciccarelli, 2013). Thus, the variance-covariance matrix for a PVAR has the following property $E(e_{it}e'_{jt}) = \sigma_{ij} \neq 0$ for $i \neq j$. On the other hand, dynamic interdependencies occur when one country's lagged variables affect another country's variables. Hence, PVAR is more flexible compared to VAR ($\sigma_{ij} = 0$ for $i \neq j$).

Canova and Ciccarelli (2009) proposed an unrestricted PVAR allowing for the selection of restrictions involving dynamic interdependencies, static interdependencies, and cross-section heterogeneities. Koop and Korobilis (2016) found that the proposed methodology by Canova and Ciccarelli (2009) offers better properties compared to others (Urban, 2017).

The PVARX model is an extension of Canova and Ciccarelli (2013) with a predetermined purely exogenous variable X_t as a M x 1 vector common to all entities i, and is shown as

$$y_{it} = A_{0i} + A_i(L)Y_{t-1} + F_i(L)X_t + e_{it} \quad (3)$$

The following asterisk denotes some transformation of the original variable when considering a k-variate panel VAR(p) model in a compact form.

$$Y_{it}^* = \overline{Y_{it}^*}A + e_{it}^*$$
$$Y_{it}^* = [y_{it}^{1*}\ y_{it}^{1*} \dots y_{it}^{k-1*}\ y_{it}^{k*}]$$
$$\overline{Y_{it}^*} = [Y_{it-1}^*\ Y_{it-2}^* \dots Y_{it-p+1}^*\ Y_{it-p}^*\ X_{it}^*]$$
$$e_{it}^* = [e_{it}^{1*}\ e_{it}^{2*} \dots e_{it}^{k-1*}\ e_{it}^{k*}]$$
$$A' = [A_1'\ A_2'\ \dots\ A_{p-1}'\ A_p'\ B']$$

Suppose the common instrument, L ≥ kp + l, is given by the row vector Z_{it}, where X_{it}, $\in Z_{it}$, and equations are indexed by a superscript number. If the original variable is denoted as m_{it}, then the first transformation implies that $m_{it}^* = m_{it} - m_{it-1}$ while the forward orthogonal deviation $m_{it} = (m_{it} - \overline{m_{it}})\sqrt{T_{it}/(T_{it}+1)}$, where T_{it} is the number of available future observations for panel i at time t, and $\overline{m_{it}}$ is its average. The Generalized Method of Moments (GMM) estimator is given by

$$A = (\overline{Y^*}'Z\widehat{W}Z'\overline{Y^*})^{-1}(\overline{Y^*}'Z\widehat{W}Z'\overline{Y^*}) \quad (4)$$

where $\widehat{W}$ is a (LxL) weighting matrix assumed to be non-singular, symmetric, and positive semidefinite. Assuming that E[$Z'e$] = 0 and rank $E[\overline{Y^*}'Z] = kp + l$, the GMM estimator is consistent. The weighting matrix $\widehat{W}$ is selected to maximize efficiency (Hansen, 1982).

Joint estimation of the equation system makes cross-equation hypothesis testing straightforward. Wald tests concerning the parameters may be implemented based on the GMM estimate of A and its covariance matrix. Granger causality tests, with the hypothesis that all coefficients on the lag of variable m are zero in the equation for variable n, may likewise be carried out using this test (Abrigo ve Love, 2015).

4. The Effects of Globalization and Institutional Quality On Macroeconomic Variables

The relationships between fiscal decentralization, economic performance, inflation and fiscal policy variables are examined for 24 OECD countries between 1996 and 2010 annually periods, considering the individual and interaction effects of globalization and institutional quality. Government expenditure (%GDP), tax revenues (%GDP), real gross domestic product(RGDP), consumer price indices(CPI), and expenditure-base/revenue-base fiscal decentralization indices are obtained from GFS, UNCTAD, and the OECD database. While several indicators of fiscal decentralization are considered, the shares of sub-national revenue and expenditure on total government revenue and expenditure are used to show fiscal decentralization.

In the scope of this study, panel vector autoregression (PVAR) model structuring is used to involve the interaction of corresponding dynamic relations. Since the PVAR model has a simultaneous equation structure, the endogeneity problem appearing in the simultaneous system is seen in each model because the lag values of the dependent variable are represented as independent variables. For this reason, an estimation method solving endogeneity is preferred. The PVARX model, a dynamic model based on its PVAR structure, is estimated using GMM, a suitable method in the presence of heteroscedasticity having consistent estimators and ensuring the orthogonality condition.

Two PVARX models, based on expenditure-based and on revenue-based, is established within this paper. The models consisting of inflation (I), output growth (OG), government expenditure (GE), tax revenue (TR), expenditure-based fiscal decentralization (EFD), revenue-based fiscal decentralization (RFD), globalization (G) and institutional quality (IQ) are defined as

$$I_{it} = \alpha_1 \sum_{j=1}^{m} GE_{it-j} + \alpha_2 \sum_{j=1}^{m} OG_{it-j} + \alpha_3 \sum_{j=1}^{m} EFD_{it-j} + \alpha_4 \sum_{j=1}^{m} I_{it-j} + \alpha_5 G_{it} + \alpha_6 IQ_{it} + \alpha_7 G_{it} * IQ_{it} + e_{1t}$$

$$OG_{it} = \gamma_1 \sum_{j=1}^{m} GE_{it-j} + \gamma_2 \sum_{j=1}^{m} OG_{it-j} + \gamma_3 \sum_{j=1}^{m} EFD_{it-j} + \gamma_4 \sum_{j=1}^{m} I_{it-j} + \gamma_5 G_{it} + \gamma_6 IQ_{it} + \gamma_7 G_{it} * IQ_{it} + e_{2t}$$

$$GE_{it} = \beta_1 \sum_{j=1}^{m} GE_{it-j} + \beta_2 \sum_{j=1}^{m} OG_{it-j} + \beta_3 \sum_{j=1}^{m} EFD_{it-j} + \beta_4 \sum_{j=1}^{m} I_{it-j} + \beta_5 G_{it} + \beta_6 IQ_{it} + \beta_7 G_{it} * IQ_{it} + e_{3t}$$

$$EFD_{it} = \delta_1 \sum_{j=1}^{m} GE_{it-j} + \delta_2 \sum_{j=1}^{m} OG_{it-j} + \delta_3 \sum_{j=1}^{m} EFD_{it-j} + \delta_4 \sum_{j=1}^{m} I_{it-j} + \delta_5 G_{it} + \delta_6 IQ_{it} + \delta_7 G_{it} * IQ_{it} + e_{4t} \quad (5)$$

expenditure-based model (5) because government expenditure and expenditure-based fiscal decentralization variables are in the model structure and

$$I_{it} = \alpha_1 \sum_{j=1}^{m} TR_{it-j} + \alpha_2 \sum_{j=1}^{m} OG_{it-j} + \alpha_3 \sum_{j=1}^{m} RFD_{it-j} + \alpha_4 \sum_{j=1}^{m} I_{it-j} + \alpha_5 G_{it} + \alpha_6 IQ_{it} + \alpha_7 G_{it} * IQ_{it} + e_{1t}$$

$$OG_{it} = \gamma_1 \sum_{j=1}^{m} TR_{it-j} + \gamma_2 \sum_{j=1}^{m} OG_{it-j} + \gamma_3 \sum_{j=1}^{m} RFD_{it-j} + \gamma_4 \sum_{j=1}^{m} I_{it-j} + \gamma_5 G_{it} + \gamma_6 IQ_{it} + \gamma_7 G_{it} * IQ_{it} + e_{2t}$$

$$TR_{it} = \beta_1 \sum_{j=1}^{m} TR_{it-j} + \beta_2 \sum_{j=1}^{m} OG_{it-j} + \beta_3 \sum_{j=1}^{m} RFD_{it-j} + \beta_4 \sum_{j=1}^{m} I_{it-j} + \beta_5 G_{it} + \beta_6 IQ_{it} + \beta_7 G_{it} * IQ_{it} + e_{3t}$$

$$RFD_{it} = \delta_1 \sum_{j=1}^{m} TR_{it-j} + \delta_2 \sum_{j=1}^{m} OG_{it-j} + \delta_3 \sum_{j=1}^{m} RFD_{it-j} + \delta_4 \sum_{j=1}^{m} I_{it-j} + \delta_5 G_{it} + \delta_6 IQ_{it} + \delta_7 G_{it} * IQ_{it} + e_{4t} \quad (6)$$

revenue-based model (6) because tax revenue and revenue-based fiscal decentralization variables are in the model structure. Openness, foreign direct investment (FDI) flows and stocks of FDI and other various metrics that are suitable proxy for integration are not included in the scope in this paper. These indicators remain limited because economic integration, social, and political integration have an impact on globalization and cannot fully reveal the effects of globalization on decentralization and other economic variables. Panel unit root tests are performed, and all individuals in the panel are found non-stationary in level under the null-hypothesis. Non-stationary processes are removed by taking the first-differences transformation of variables. After the panel unit root tests are performed on the first-differenced variables, all individuals in the panel are stationary as seen in Table 1. While institutional quality indicator consist of three homogeneous groups as legal, political, and economic to capture the full institutional structure of a country, globalization has three sub-dimensions as economic, political, and social. In the scope of this study, the unit root test statistics are given for economic globalization since the economic globalization is found significant within all sub-dimensions of globalization. In this context, only the economic globalization is considered, the results were evaluated on the quality of economic institution.

Table 1. Panel Unit Root Test Results

	GE		RGDP		EFD		CPI	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
Breitung	-0.74	-4.29*	-0.16*	6.48*	0.89	-6.84*	-3.05	-0.09**
IPS	-6.57	-12.69*	-4.69	-10.03*	-1.24	-9.24*	5.36	-15.15*
FisherP-Perron								
Inverseχ^2	255.20	537.75*	127.05	253.12*	71.64	339.34**	147.59	571.76*
Inverse normal	-8.46	-18.46**	-6.18	-10.74*	-1.05	-13.64*	-6.32	-19.98*
Inverselogit	-12.34	-29.05*	-6.21	-13.47*	-1.16	-18.19*	-7.03	-30.98*
Modifiedinv.χ^2	19.92	47.03*	7.35	19.72*	1.86	28.17*	9.37	50.96*
Fisher D-Fuller								
Inverseχ^2	96.42	176.42*	95.31	167.20*	51.60	143.54*	8.48	239.01*

Inverse normal	-2.47	-7.41*	-3.85	-7.50*	0.55	-5.40**	-1.53	-9.16**
Inverselogit	-2.60	-8.55**	-3.61	-8.60	0.55	-6.10	-2.12	-12.32
Modifiedinvχ^2	4.35	12.20*	4.24	11.29*	-0.03	8.97	3.57	18.33
Pesaran's CADF								
T	-1.78	-3.02*	-2.10	-2.75	-1.94	-1.880**	-1.91	-3.57**
Z_t	2.14	-3.49*	0.72	-2.25*	1.43	1.72**	1.58	-5.96***

	TX		RFD		IQ		G		EG	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
Breitung	-4.21	-1.98**	0.21	-3.90*	-0.33	-6.73*	3.17	-8.91*	1.96	-7.12*
IPS	-6.95	-12.28*	-1.58	-10.38*	-1.13	-6.26*	0.08	-7.36*	-2.20	-8.73*
FisherP-Perron										
Inverseχ^2	174.35	442.93*	110.23	350.17**	50.91	189.23*	59.18	247.36*	104.94	275.11*
Inverse normal	-7.26	-15.49**	-1.81	-13.45	0.35	-7.92*	-0.22	-11.29*	-3.54	-12.22*
Inverselogit	-8.70	-23.74*	-3.25	-18.85*	0.23	-9.62*	-0.04	-13.19*	-3.75	-14.79*
Modifiedinv. χ^2	11.99	38.33*	5.71	29.23*	-0.10	13.43**	0.70	19.15*	5.19	21.87*
Fisher D-Fuller										
Inverseχ^2	95.69	174.89*	60.20	205.81*	65.56	113.79*	50.20	131.51*	79.54	146.20*
Inverse normal	-3.62	-7.84*	0.49	-7.79*	-0.78	-3.74**	-0.04	-5.41	-1.61	-5.28*
Inverselogit	-3.72	-8.95*	0.40	-10.09*	-0.83	-4.51*	0.10	-6.28*	-1.61	-6.28*
Modifiedinv χ^2	4.28	12.05*	0.80	15.08*	1.33	6.06*	-0.17	7.79*	3.70	9.23*
Pesaran's CADF										
T	-2.54	-3.26*	-1.73	-3.03*	-2.50	2.79*	-2.00	-2.11*	-1.89	-2.25*
Z_t	-1.30	-4.56*	2.38	-3.52*	-1.11	-2.43**	1.15	0.68**	1.67	0.01*

*0.001,**0.05,***0.10 indicates significance level

The percentage changes of variables are obtained by taking the logarithmic of first-order differences to use in the two model structure. The choice of optimal lag-order is important both in the panel VAR specification and in the condition before starting the panel VARX analysis. Andrews and Lu (2001) proposed consistent moment and model selection criteria (MMSC) for GMM models based on Hansen's (1982) J statistic of over-identifying restrictions. MMSCs are analogous to various commonly used maximum likelihood-based model selection criteria, namely the Akaike Information Criteria, the Bayesian Information Criteria, and the Hannan-Quinn Information Criteria. Based on the three model selection criteria and the overall coefficient of determination, first-order panel VAR is preferred for both models since it has the smallest MBIC, MAIC, and MQIC (as seen on Table 2 and Table 3). Based on the selection criteria, a first-order panel VAR model with the same specification of instruments is fitted using GMM estimation. It is also found that stability condition is satisfied due to all the eigenvalues lying inside the unit circle.

Table 2. VAR Lag-Order: Expenditure-based model

Lag	CD	J	J p value	MBIC	MAIC	MQIC
1	0.999	68.778	0.0261	-198.134	-27.221	-95.931
2	0.999	37.514	0.230	-140.426	-26.485	-72.291
3	0.998	10.543	0.836	-78.427	-21.456	-44.349

Table 3. VAR Lag-Order: Revenue-based model

Lag	CD	J	J p value	MBIC	MAIC	MQIC
1	0.999	63.264	0.068	-203.648	-32.735	-101.444
2	0.999	33.160	0.410	-144.781	-30.839	-76.645
3	0.999	15.136	0.514	-78.834	-16.853	-39.766

Table 4. Expenditure-based Model Estimations

	GE	OG	EFD	I	GE	OG	EFD	I
GE	0.368**	-0.013	0.001*	0.065***	0.270*	-0.002	0.002**	0.039*
OG	-0.08**	0.384**	0.001**	0.057	-0.115*	0.320**	0.004***	-0.001
EFD	-1.840	1.483*	0.528**	-1.026*	-1.771	0.300**	0.346**	-1.109*
I	0.363	-0.429*	0.001*	0.175**	0.252	-0.384**	0.000**	0.014*
IQ	1.030	1.987*	-0.009	0.622	1.709*	1.464*	-0.145	1.193**
G	0.878**	0.035*	-0.006**	-0.050**	0.792**	0.463**	-0.001**	-0.149**
IQxG					0.154	-0.438*	0.001	0.201

*0.001,**0.05,***0.10 indicates significance level

Table 4.1. Expenditure-based Model Estimations (with sub-globalization index)

	GE	OG	EFD	I	GE	OG	EFD	I	GE	OG	EFD	I
GE	0.247*	-0.004	0.001**	0.047**	0.269*	0.002	0.001*	0.038*	-0.248**	-0.009	0.001***	0.046*
OG	-0.15*	0.305*	0.002**	-0.022	-0.164*	0.366*	0.001	-0.034	-0.118**	0.255**	0.001	-0.033
EFD	-1.413	1.56*	0.304**	-1.919*	-1.468	-1.371**	0.342**	-0 .16*	-1.992	1.956**	0.358**	-1.31***
I	0.379**	-0.199*	0.001*	0.014**	0.355	-0.461**	0.000**	.038*	0.197	-0.386**	0.000*	0.010***
IQ	2.739	1.604*	-0.188	0.741*	1.610	1.674***	-0.089	-1.41*	1.521	1.598***	-0.164	0.766***
EG	0.508*	0.390**	-0.002*	-0.087*								
IQxEG	-0.313	-0.366*	0.001	0.064								
SG					0.052	0.136*	-0.001	-0.049				
IQxSG					0.168	-0.253	0.001	0.178				
PG									0.433	0.379*	-0.001	-0.184
IQxPG									-0.094	-0.650	0.002	0.366

*0.001,**0.05,***0.10 indicates significance level

The relations between government expenditure (GE), output growth (OG), expenditure-based fiscal decentralization (EFD), and inflation (I) under the individual and interaction effects of globalization(G) and economic institutional quality (IQ) are seen in Table 4. A significant negative effect of globalization on expenditure-based fiscal decentralization and inflation is found, while it has a significant positive effect on government expenditure and output growth. Economic institutional quality has significant effect on output growth. When the interaction effect is taken account, it is determined that economic institutional quality has also positive effect on government expenditure and inflation,

significantly. Expenditure-based fiscal decentralization affects itself and output growth significantly positive while it has negative effect on inflation. It is found that output growth has significant and positive effect on expenditure-based fiscal decentralization. After the effects of G, the representation of the KOF index, and IQ index are found significant, the interaction effects are examined in terms of the IQ and the three sub-dimensions of globalization (economic, social, political) index due to the fact that different forms of globalization might have different relationships with the interested variables. The relations between government expenditure (GE), output growth (OG), expenditure-based fiscal decentralization (EFD), and inflation (I) under the individual and interaction effects of economic globalization (EG) and economic institutional quality (IQ) are seen in Table 4.1. It is determined that all of the sub-indexes of globalization have positive significant effect on output growth. However, only economic globalization has significant effects on government expenditure, expenditure-based fiscal decentralization and inflation. It is found that economic institutional quality has a significant positive effect on output growth and inflation. When the interaction effect is examined, it can be said that the interaction term has negative effect on output growth, significantly.

Table 5. Revenue -based Model Estimations

	TR	OG	RFD	I	TR	OG	RFD	I
TR	-0.308	0.072	0.000	-0.045*	-0.270	0.0714	-0.001	-0.044
OG	0.721**	0.470*	-0.004**	0.153*	0.593*	2.399*	-0.002	0.115
RFD	4.031	-1.432**	0.087*	-3.332	3.349	-3.375	0.088*	-8.015*
I	-0.75***	-0.648*	0.001	0.0255	-2.07*	-0.622*	0.001	-0.049
IQ	-5.588	1.678	-0.016	1.006	-4.262	-1.293	-0.142	1.904
G	0.140*	0.123*	-0.002**	-0.052**	-0.527	0.053	-0.001	-0.344*
IQxG					0.723	0.154	0.001	-0.397

*0.001,**0.05,***0.10 indicates significance level

Table 5.1. Revenue-based Model estimations (with sub-globalization index)

	TR	OG	RFD	I	TR	OG	RFD	I	TR	OG	RFD	I
TR	-0.254	0.087	-0.000	-0.060	-0.340	0.053	-0.00	-.044	-0.253	.050	.000	-.033
OG	0.67*	-0.460	-0.003	-0.15*	0.83*	-0.342	-0.04	0.156	.857*	-.317	-.005*	.171
RFD	5.467	-5.37	-0.066**	-1.856	2.964	-2.098	0.533	-3.43*	6.004	2.32	.086	-7.63*
I	-1.74*	-.579*	0.000	-0.043	-0.89*	-.594*	0.001	-0.027	-1.859	-.550	.0001*	-.0046
IQ	-2.577	1.094	0.044	1.168	-1.92	-1.129	0.114	13.128	46.019	25.85	-.253	-2.633
EG	-0.025	0.142	-0.003	-0.071								
IQxEG	0.217	-0.027	-0.001	-0.168								
SG					-0.221	0.134	-0.01	-0.151				
IQxSG					0.546	0.157	0.001	-0.167				
PG									0.148	0.147	-0.001	-0.021
IQxPG									-0.558	-0.30	0.002	0.034

*0.001,**0.05,***0.10 indicates significance level

The relationship between tax revenue (TR), output growth (OG), revenue-based fiscal decentralization (RFD), and inflation (I) under the individual and interaction effects of globalization (G) and economic institutional quality (IQ) are seen in Table 5 and Table 5.1. Economic institutional quality is found insignificant for all macroeconomic variables. The effect of globalization is found positive on tax revenue and output growth; negative on revenue-based fiscal decentralization and inflation, significantly. The interaction term for globalization and economic institutional quality is also found insignificant. Moreover, the significant effect of globalization on tax revenue, output growth and revenue-based fiscal decentralization has been lost by adding the interaction term .

5. Findings and Remarks

The individual effects of globalization and economic institutional quality on selected variables are tested, and whether the individual effects are found significant, the interaction effects of globalization and economic institutional quality are re-examined in view of three the sub-dimensions of globalization (economic, social, and political). It is determined that among all components of globalization, economic globalization is the strongest determinant of globalization due to the fact that the relation between globalization and decentralization is driven by economic integration, mainly.

It is found that economic integration promotes centralization of expenditures and globalization promotes centralization of revenues similar to Rodrik (1998) and Garrett and Rodden (2003). Macroeconomic stability and maintenance of the government's re-functioning distribution are more efficient at the central government level. Economic integration increases regional economic risk, and unexpected asymmetric economic shocks may occur. This creates an increase in the demand for cross-regional risk sharing and redistribution of income provided by the central government, meaning economic integration increases the demand for social welfare policy against economic insecurity. It is found that economic globalization decreases inflation as indicated in Romer (1993). It can be said that economic institutional quality has a strong relationship with output growth means that sound markets attract of capital inflows. It is found that the interaction effect of economic globalization and economic institutional quality significantly negative on output growth. The effect of economic globalization on output growth is reduced by higher degrees of economic institutional quality, meaning that globalized countries with strong institutions grow slower than globalized countries with weak institutions.

It is determined that fiscal decentralization has a significant effect on macroeconomic variables. A positive correlation is found between output growth and expenditure-based fiscal decentralization in accordance with Panizza (1999). The negative relationship between revenue-base fiscal decentralization and output growth, as in Davoodi and Zou (1998), are attributed to the loss in economies of scale. To remove the scarce financial resources from the control of central government is inefficient because of decentralization. Moreover, growth in gross domestic product may be accompanied to higher demand for income re-distribution programs that involves higher fiscal centralization. This positive relationship cannot be found in the sub-section of the globalization. Upcoming studies can investigate this relationship using taxes on income, profits, and capital gains.

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