Growth Effects of Fiscal Decentralization: The Role of Macroeconomic Stability and Governance Institutions

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The study analyzes the impact of fiscal decentralization on economic growth. The scope of assessment is broadened by allowing the impact of decentralization on growth to depend on nation's quality of governance institutions and macroeconomic stability. The study uses a panel dataset of 53 countries over the period of 1996-2014. The empirical findings show that the impact of decentralization on per capita GDP growth rate is positive when it is supported by stable macroeconomic conditions in terms of stability in prices, budget deficit and exchange rate. Further, the results show that fiscal decentralization is growth enhancing when it is complemented by sound institutional structure in terms of low corruption in government institutions, rule of law, high bureaucratic quality and democratic accountability. Hence, decentralization can become growth enhancing if macroeconomic stability and quality of governance institutions surpass a critical level.

***Keywords*:** public policy, fiscal decentralization, macroeconomic stability, governance, growth,
Jel Codes: H7, H4, H5

Fiscal decentralization is a vital issue in the academic discipline of public finance for its effects on the efficiency of public sector and economic growth. Theoretically, fiscal independence at sub-national level leads to higher per capita output and higher rates of growth by enhancing economic efficiency (Brueckner, 2006; Oates, 1993). A fiscally decentralized structure, where sub-national governments have more imperative role than the central government in the provision of public service, guides to the speedy growth process. As the public services provision that responds to state and local circumstances are expected to be more efficient in enhancing economic growth than the central government strategies that neglect geographical differences.

Fiscal decentralization promotes economic growth by transmitting spending authority to sub-national governments that are better equipped to effectively satisfy the state and local demand. Fiscal decentralization may lead to allocative efficiency as citizens "*vote with their feet*" (Tiebout, 1956) and prefer to live in a jurisdiction that provides the public services which match their needs and preferences. Further an important benefit of fiscal decentralization, as postulated by the recent empirical evidence, is that it improves governance through better local accountability, higher information transparency and competition among the sub-national governments.

The benefits of fiscal decentralization also have some potential risks that can adversely affect economic growth and development. Theoretically, decentralization may lead to increase in

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corruption opportunities as it might deteriorate monitoring via central agencies and controls. Decentralization may lead to increase in corruption opportunities due to involvement of increased number of officials to manage potential investors and to protect and help political supporters and interest. Further, fiscal decentralization can lead to macroeconomic instability. In a decentralized structure, public resources are not necessarily under the control of central government and excessive public borrowings/budget deficit at sub-national level could result in national repercussion as federal government may not be able to manage these economic shocks by using fiscal or monetary policy.

However, the quality of governance institutions and macroeconomic stability of an economy can mitigate the risks of fiscal decentralization. The quality of governance institutions in terms of rule of law, low corruption in government institutions, high bureaucratic quality and democratic accountability may reduce the risks associated with decentralization of public sector. Better quality of governance institutions decreases the level of corruption/inefficiency in government institutions and results in better accountability of public administrators that favorably affect economic growth.

Further, macroeconomic stability in terms of stability in prices, budget deficit and exchange rate is crucial for realizing the growth enhancing effects of fiscal decentralization. In stable macroeconomic conditions sub-national governments would be able to efficiently allocate the available resources, widen the tax base and enhance their revenue generation capacity that favorably affect economic growth.

Several studies have been conducted in cross-country setting to explore the effects of decentralization on growth but literature that also incorporates the impact of fiscal decentralization on economic growth in the presence of macroeconomic stability and quality of governance institutions is rare. Macroeconomic characteristics, political and institutional aspects of a nation that interact with public policies need special consideration to draw some overall judgment about the desirability of fiscal decentralization. These effects have not been considered in different studies with appropriate control variables.

The previous studies mainly concentrate on the efficiency effects of decentralization on growth and ignore the political and institutional aspects that interact with decentralization and afterwards affect economic growth. The present study focuses on the impact of fiscal decentralization on economic growth and attempts to improve the empirical specification by establishing the link between decentralization and growth in the presence of macroeconomic stability and quality of governance institutions.

This study uses a panel dataset of 53 countries over the period of 1996-2014 to analyze the relationship between fiscal decentralization and economic growth. Our theoretical and empirical framework put forward two empirical hypotheses: (i) decentralization directly influence the rate of economic growth and (ii) decentralization affects rate of economic growth through interaction with other macroeconomic and institutional variables. Hence, the objective of the study is to explore the direct association between decentralization and per capita GDP growth and also to capture the probable influence of macroeconomic stability and quality of governance institutions on the growth effects of fiscal decentralization.

Review of Literature

Several theories have been advanced on the valuable effects of fiscal decentralization (FD) on economic growth. However, varied empirical outcomes by different studies have resulted in a long-standing debate. Theoretically, fiscal decentralization is likely to promote growth by transmitting spending authority to sub-national governments that are better equipped to effectively satisfy the demands at the lower level. Empirically, the function of decentralization to enhance growth and development is a controversial issue because empirical findings are quite ambiguous with mixed results as reported in Table 1.

The cross-country studies presented in Table 1 show different and ambiguous results. The difference in methodology, period of analysis, nature of countries analyzed and difference in definition of decentralization variable, etc. may contribute to the diversity and ambiguity in empirical results. The previous study design only focuses on the direct efficiency effects of fiscal decentralization and tends to overlook the impact of fiscal decentralization on economic growth with macroeconomic stability and quality of governance institutions.

Fiscal decentralization may also affect growth through interaction with the political and institutional structure (Feld & Schnellenbach 2011; Martinez-Vazquez & McNab 2003). Therefore, macroeconomic, political and institutional factors, which are influenced by fiscal decentralization or interact with public policies, need special consideration while exploring the effect of fiscal decentralization on economic growth to improve the performance and design of fiscally decentralized structure.

Table 1

Evidence on the Impact of Decentralization on Economic Growth

Empirical Study	Countries covered	Time Period	Technique	Findings
Davoodji & Zou (1998)	46 Developed and developing Economies	1970-1989	Fixed Effect Model, Time Dummies	Higher spending decentralization reduces economic growth in developing countries.
Wollar & Philipps (1998)	23 developing Economies	1974-1991	Fixed Effect Model, OLS	Revenue and spending decentralization has no significant impact on growth.
Thieben (2003a)	21 Developed Economies	1973-1998	OLS	Expenditure decentralization has positive effect on economic growth and quadratic term has significantly negative effect on economic growth.
Thieben (2003b)	26 Developed Economies	1981-1995	GLS	Spending decentralization increases growth rate of GDP
Limi (2005)	51 Developed and developing Economies	1997-2001	OLS, IV	Higher spending decentralization increases growth rate of GDP.
Martineze Vazquez & McNaab (2006)	66 Developed and developing Economies	1972 - 2003	OLS, PCSC, IV	Decentralization has positive effect on economic growth in developing countries but it negatively affect economic growth in developed countries
Enikolopov and Zhuravskaya (2007)	75 Developing and Transition Economies	1975-2000	OLS, 2SLS	Higher revenue decentralization reduces growth rate of GDP in "young" developing countries but increase rate of growth in "older" developing countries
Rodrigueez & Krojjer (2009)	16 Central and Eastern European countries	1990 -2004	Fixed Effects regressions	Expenditure decentralization has negative effect on economic growth. Initially, revenue decentralization has negative growth effect but it becomes positive over the time
Rodrigueez & Ezcurra (2010)	OECD Countries	1990-2005	OLS	Decentralization has negative impact on economic growth
Bodman (2011)	OECD Countries	1981-1998	OLS	Spending and revenue decentralization has no significant impact on economic growth
Baskarran & Feld (2013)	OECD Countries	1975 - 2008	Fixed Effect Model, OLS	Revenue decentralization has negative impact on economic growth
Gemmel *et.al* (2013)	OECD Countries	1972-2005	PMG and IV regressions	Spending decentralization retard economic growth whereas revenue decentralization enhances growth.

Theoretical Framework

We now outline our methodological approach to analyze the impact of fiscal decentralization on economic growth and the impact of fiscal decentralization on economic growth with other macroeconomic and institutional variables.

The model assumes two tiers of government, federal and provincial. Following Barro (1990), the production function is assumed to consist of two inputs i.e. public spending and private capital stock. Public spending is undertaken via two tiers of government that are federal and provincial [Xie *et al.* (1999); Devarajan & Zou (1996); Dvoodi & Zou (1998)]. The economy's aggregate production function is assumed to be cobb-Douglas:

$$y = \mu\, k^{\alpha} f^{\beta}\ p^{\gamma} \tag{1}$$

where y is output per worker, k is private capital stock per worker and f is per capita federal government spending and p is per capita provincial government spending. α, β and $\gamma \in (0,\ 1)$ and $\alpha + \beta + \gamma = 1$.

Let g be the per capita total government spending so that $g = f + p$. The distribution of aggregate government spending between the two tiers of government is shown by $f = \varphi_f g$ and $p = \varphi_p g$, where $\varphi_f + \varphi_p = 1$, φ_f is federal government's spending share in aggregate government spending and φ_p is the provincial's government spending share. Flat income tax at the rate τ is imposed to finance total government spending:

$$g = \tau y \tag{2}$$

The preferences of representative's household are given by

$$U = \int_0^{\infty} \frac{C^{1-\sigma}}{1-\sigma} e^{-\rho t} \tag{3}$$

where c denotes private consumption, ρ is the rate of time preferences and σ is inverse of the intertemporal elasticity of substitution. The household's dynamic budget constraint is given by

$$\dot{k} = (1-\tau)\, \mu\, k^{\alpha} f^{\beta} p^{\gamma} - c \tag{4}$$

The above equation 4, which is used as dynamic budget constraint of the representative agent in public finance literature, is actually the national income identity[1].The choice of consumption of the representative's household is determined by maximizing (3) subject to (4) with given g, τ and p. For household optimization problem, the Hamiltonian can be written as

$$H = \frac{C^{1-\sigma}}{1-\sigma} e^{-\rho t} + \lambda[(1-\tau)\, \mu\, k^{\alpha} f^{\beta} p^{\gamma} - c] \tag{5}$$

where λ is Lagrange Multiplier. The first order conditions for the optimization problem are given in equation (6) and (7).

$$\frac{\partial H}{\partial C} = 0 \Rightarrow C^{-\sigma} e^{-\rho t} - \lambda = 0 \tag{6}$$

$$\frac{\partial H}{\partial k} + \dot{\lambda} = 0 \Rightarrow \lambda\, \partial\, (1-\tau)\, \mu\, k^{\alpha-1} f^{\beta} p^{\gamma} = -\dot{\lambda} \tag{7}$$

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[1]

$\dot{k} = (1-\tau)y - c$

$\dot{k} = \Delta k = I = (1-\tau)y - c$

$I = y - \tau y - c$ or $y = c + I + g$

where Δk is the change in capital stock and I is the level of net investment.

By using equation (6) and (7) and applying transversality condition, growth rate of consumption can be derived which is similar to the growth rate of output and capital. The solution from these equations for growth rate of the economy is given by[2]

$$\dot{y}/_{y} = \frac{1}{\sigma}\left[\alpha\,(1-\tau)\,\tau^{\frac{1-\alpha}{\alpha}}\,\mu^{\frac{1}{\alpha}}\varphi_f^{\frac{\beta}{\alpha}}\varphi_p^{\frac{\gamma}{\alpha}} - \rho\right] \quad (8)$$

We further denote μ as a combination of exogenous technology (A), macroeconomic variables (M) and institutional (G) variables or

$$\mu = AM^{\theta}G^{\omega} \quad (9)$$

If decentralization affects output through interaction with macroeconomic and institutional variables then it will also affect economic growth through interaction with macroeconomic and institutional variables.

For a function that consist of four X variables involving $\tau, \mu,\ \varphi_f$ and φ_p, the Taylor series to first order about the point ($\tau_o, \mu_o,\ \varphi_{f_o},\ \varphi_{p_o}$) is given by:

$$f(X,\beta) = F(X_o,\beta) + \left[\frac{\partial f(X,\beta)}{\partial X}|X = X_o\right]'(X - X_o) + R \quad (10)$$

Accordingly, by applying Taylor series approximation on equation (8), the growth rate of the economy can be rewritten as:

$$g = \dot{y}/_{y} = a_o + a_1\tau + a_2\varphi_f + a_3\varphi_p + a_4\mu + U \quad (11)$$

Now we allow a_3 to vary with macroeconomic stability, M, and governance, G. Therefore, the effect of fiscal decentralization on economic growth itself depends on macroeconomic stability and governance. Thus,

$$a_3 = \gamma_o + \gamma_1 M + \gamma_2 G \quad (12)$$

Substituting this relationship in equation (11) yields

$$g = \dot{y}/_{y} = a_o + a_1\tau + a_2\varphi_f + \gamma_o\varphi_p + \gamma_1\varphi_p M + \gamma_2\varphi_p G + a_4\mu + U \quad (13)$$

The above equation shows that rate of growth depends on spending shares of federal and provincial government, income tax rate and other macroeconomic and institutional variables.

Several studies in cross-country setting are based on models with linear approximation. The current study is also based on the model with linear approximation to make it comparable with previous studies. Nevertheless the results of this study may be considered suggestive rather than categorical as change of functional form may indeed affect the quantitative nature of results.

Empirical Model, Data and Estimation Procedure

The theoretical framework put forward two empirical hypotheses: (i) decentralization directly influence the rate of economic growth and (ii) decentralization affects rate of economic growth through interaction with other macroeconomic and institutional variables. So this section investigates whether or not these hypotheses are accepted by the empirical support.

Equation 14 is our growth regression that is based on the theoretical framework discussed in previous section.

[2]Applying other functional forms such as the CES production function does not influence the overall analysis [See Xie, *et al*. (1999) for details].

$$g_{it} = \alpha_0 + \alpha_1 \tau_{it} + \gamma_o \varphi_{p_{it}} + \gamma_1 M_{it} \varphi_{p_{it}} + \gamma_2 G_{it} \varphi_{p_{it}} + a_2 \mu_{it} + \alpha_3 Z_{it} + \varepsilon_{it} \qquad (14)$$

where i (=1…..m) refers to a country at time t (=1…….n), m refers to the number of countries, α_1,γ_o, γ_1, γ_2, and α_2 are scalar parameters and α_3 is a vector, g_{it} is rate of growth,τ_{it} the tax rate, $\varphi_{p_{it}}$ is the level of decentralization measured by spending and revenue shares of provincial government, $M_{it}\varphi_{p_{it}}$is interactive term for macroeconomic stability and fiscal decentralization, $G_{it}\varphi_{p_{it}}$is interactive term for quality of governance and fiscal decentralization, Z_{it} is a vector of control variables and ε_{it} is the random error.

The econometric equation (14) suggests that decentralization directly influence the evolution of output as proposed and examined in previous empirical studies, and it also affect rate of growth through interaction with macroeconomic stability and quality of political and governance institutions.

To explore the effect of decentralization on growth, we use panel dataset for 53 countries from the year 1996 to 2014. All the countries included in the study are reported in the International Monetary Fund (IMF) *Government Financial Statistics (GFS).* The data on federal and provincial government fiscal performance are taken from IMF-GFS. The data on macroeconomic variables like GDP growth rate, inflation, budget deficit, exchange rate, capital stock, labor force and other control variables like urbanization and openness are mainly taken from *World Development Indicators*.

The detail of variables in Equation (14) is given as follows. Per capita gross domestic product, measured in constant US dollars adjusted for purchasing power parity, is used to measures per capita output. The measure of average tax rate "τ" is the ratio of the total receipts of government to GDP, both measured in nominal terms in local currency. Following the literature in public finance, fiscal decentralization is measured as spending share of provincial plus local legislative tiers in total government spending. This spending share corresponds to φ_p in our theoretical framework. An increase in sub-national governments' share shows higher level of decentralization. Further, revenue decentralization, the ratio of sub-national governments' revenue to aggregate government revenue, is also used as a measure of fiscal decentralization.

Following Sirimaneetham and Temple (2009), Ismihan (2003), Burnside and Dollar (2000, 2004), macroeconomic stability index is constructed as a weighted average of inflation rate, budget deficit as percentage of GDP and exchange rate for the panel of countries included in the study. The weights are generated by the principal component analysis. The index is normalized, in the range of 0 to 1,and scaled up where higher values indicate improved macroeconomic stability and vice versa.

To measure governance an index is constructed on the quality of governance institutions. The index is a combination of four indices, which are taken from *International Country Risk Guide (2014)*, involving the indices on democratic accountability, bureaucratic quality, rule of law and corruption in government institutions. Each subjective index is scaled from 0 to 6 where a high value indicates high quality of bureaucracy, higher accountability, less corruption in government and better law and order conditions. The composite series of governance index, G_{it} , for each country are then normalized in the range of 0 to 1. Higher the value of G_{it} , the greater will be the quality of political and governance institution and vice verse.

The vector Z_{it} consists of a set of control variables that include capital labor ratio, trade openness and urbanization as these variables have been frequently employed in growth literature as an important control variables for cross country growth regressions (Sala-i-Martin, 1997; Barro & Lee, 1996; Mankiw *et al*., 1992; Levine & Renelt, 1992). Urbanization is measured by the percentage of urban population and trade openness is measured by the ratio of total trade, that is export plus imports, to GDP. For capital labor ratio, series of capital stock is constructed for all the countries by the following formula:

$$K_1 = \frac{I_1}{g + \delta}$$

where K_1 is the stock of capital in period 1, I_1 is gross investment at constant prices in period 1, g is compound annual GDP growth rate for the entire period and δ is depreciation rate. The stock of capital for the remaining years t = 2,-----,T is calculated as follows:

$$K_t = K_{t-1}(1 - \delta) + I_{t-1}$$

After collecting the data on the above mentioned variables from different sources, we end up with an unbalanced panel data set of 53 countries for the period 1996-2014.

We first estimate the regression model by considering the panel characteristics of the dataset and estimate fixed and random effects models. The baseline model includes as explanatory variables the decentralization measures, interactive terms of decentralization with macroeconomic stability and quality of governance institution and tax to GDP ratio. The control variables include trade openness, capital labor ratio and urbanization.

In the second stage we control for the potential endogeneity of the spending shares by different levels of government as these spending shares might possibly depends on the pace of economic growth. Due to the complexity of getting appropriate external instruments to be used for decentralization, system-GMM estimator (Arellano & Bover, 1995; Blundell and Bond 1998) is used with lagged values of the level variables as instruments to address the endogenity problem (Filippetti & Sacchi, 2013; Strumpf & Oberholzer-Gee 2002).

Empirical Analysis

We start our analysis by applying diagnostic tests, on equation 14, for model selection in panel data. The Wald test is applied to test whether or not fixed effects are equal to zero. The test statistic rejects the null hypothesis that all the parameters representing fixed effects are equal to zero[3]. Therefore, fixed effect model is preferred to pooled LS model in terms of econometric criteria and for explaining the growth effects of fiscal decentralization.

The Breusch-Pagan LM test determines whether or not random effect model is preferable to pooled LS model. The test statistic rejects the null hypothesis that individual or time specific variance across random effects are equal to zero[4]. Therefore, random effects model is preferable to pooled OLS model. Finally, the Hausman test is used to determine which of the two models, that are fixed

[3]Wald test P-Value is less than 0.01 for the global sample.

[4] LM test P-Value is less than 0.01 for the global sample.

and random effects models, is preferable. The test statistics suggests that random effects model is preferred to the fixed effects model[5].

The Empirical results on the estimates of equation 14 are reported in Tables 2 and 3. The first set of regressions, based on random effect model, is presented in Table 2.The effects of fiscal decentralization on per capita GDP growth are estimated with six different model specifications. Model 1 to 3 in each table measures the effect of expenditure decentralization (ED) on GDP growth rate whereas model 4 to 6 in each table consider the effect of revenue decentralization (RD) on GDP growth rate.

Table 2

Fiscal Decentralization and Economic Growth: Global Sample, 1996-2014, Fixed and Random Effects Models (Dependant Variable: GDP Per Capita Growth Rate)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
T/GDP	-0.03	-0.05	-0.04	-0.03	-0.03	-0.04
	(0.03)	(0.03)*	(0.026)*	(0.03)	(0.032)	(0.021)*
K/L	-0.01	-0.01	-0.01	-0.004	-0.004	-0.004
	(0.001)***	(0.001)***	(0.001)***	(0.002)**	(0.002)**	(0.002)**
ED	0.002	0.002	0.001			
	(0.016)	(0.23)	(0.024)			
RD				0.005	0.007	0.01
				(0.018)	(0.025)	(0.026)
ED*GI		0.03	0.03			
		(0.01)**	(0.014)**			
RD*GI					0.033	0.03
					(0.015)**	(0.01)***
ED*MSI		0.01	0.015			
		(0.02)	(0.024)			
RD*MSI					0.022	0.021
					(0.025)	(0.025)
URB			-0.15			-0.12
			(0.2)			(0.28)
OPN			0.01			0.01
			(0.01)			(0.01)
Constant	0.098	0.08	0.09	0.08	0.083	0.08
	(0.02)***	(0.02)***	(0.02)***	(0.02)***	(0.02)***	(0.02)***
Wald test	14.14	13.89	12.02	6.00	14.00	17.8

*"The figures in parentheses are robust standard Errors. The statistical significance at 1, 5, 10 % levels are indicated by ***, **, * respectively".*

In the first specification, we include expenditure decentralization (ED) along with tax to GDP ratio (T/GDP) and capital labor ratio (K/L) to measure the effect of fiscal decentralization on per capita GDP growth rate. In the second specification, we include interactive term of expenditure decentralization (ED) with governance index (GI), that is, ED*GI and interactive term of expenditure decentralization with macroeconomic stability Index (MSI), that is, ED*MSI to allow for the impact of

[5] Hausman test P-Value is greater than 0.05 for the global sample.

fiscal decentralization on growth to itself depend on the quality of governance institutions and macroeconomic stability. In the third specification, we also include urbanization (URB) and trade openness (OPN) as control variables.

In the fourth specification, we include revenue decentralization (RD) with other explanatory variables to measure the effect of fiscal decentralization on per capita GDP growth rate. In the fifth specification, we include interactive term of revenue decentralization (RD) with governance index (GI), that is, RD*GI and interactive term of revenue decentralization with macroeconomic stability index (MSI), that is RD*MSI, with other variables to allow for the impact of fiscal decentralization on growth to itself depend on quality of governance institutions and macroeconomic stability. Finally, in the last specification, we include urbanization (URB) and trade openness (OPN) as control variables.

The empirical results presented in Table 2 indicate that the direct effect of both expenditure and revenue decentralization on economic growth is positive but insignificant for the global sample. Bodman (2011), Woller and Philipps (1998) also find no significant effect of expenditure and revenue decentralization on economic growth. With this empirical evidence, the next issue is to consider the possibility that macroeconomic stability and quality of governance institutions influence the nature of this relationship between decentralization and economic growth. To capture this effect, regression models are rerun by including interactive terms of fiscal decentralization with governance index and macroeconomic stability index.

The results presented in Table 2, show that the interactive terms of expenditure decentralization with governance index and macroeconomic stability index have positive regression coefficients. The positive coefficients of interaction terms indicate that the effect of expenditure decentralization in promoting per capita GDP growth rate become favorable when it is supported by macroeconomic stability in terms of stable prices, budget deficit and exchange rate and sound institutional structure in terms of rule of law, low corruption in government institutions, high bureaucratic quality and democratic accountability.

Further, the table indicates that the interactive terms of revenue decentralization with governance index and macroeconomic stability index also have positive regression coefficients. This implies that the growth effects of fiscal decentralization can turn favorable if supported by better institutional quality and stable macroeconomic conditions. In general, the table shows that in the absence of good governance and macroeconomic stability, decentralization is harmful. However, decentralization can be growth enhancing if quality of governance institutions and macroeconomic stability exceeds a critical level.

Overall, the results explained above are robust to various specifications of the baseline model. In general, both measures of decentralization have positive but insignificant direct effect on growth. However, both expenditure and revenue decentralization have positive and significant effect on growth in the presence of better quality of governance institutions whereas in the presence of macroeconomic stability both the measures of decentralization have positive but insignificant effect on growth. Buser (2011) gets the outcome in the similar context where decentralization enhances GDP per capita when it operates in an institutional environment that is consistent with economic freedom.

The economic controls in our regression analysis behave plausibly well. The effect of capital stock per worker on GDP growth rate is negative as the countries that have accumulated higher

volumes of capital per worker tend to experience slow down of growth, while the countries with lower capital output ratio are relatively at initial stages of growth and tend to grow faster as postulated by catching-up hypothesis. The effect of revenue to GDP ratio on growth rate is negative as it may have negative impact on the rate of growth if tax revenues are not used for growth enhancing and development purposes.

For robustness checks, we re-estimate the regression model by including urbanization and openness variables. In general, decentralization measures, interactive terms of governance index and macroeconomic stability index and the control variable already included in earlier specifications display similar results in sign and approximately in magnitude as well. Urbanization demonstrates negative coefficient implying that more urbanized countries are expected to have already experienced fast growth when they went through urbanization process and their current growth rate are modest. On the other hand, the countries with lower urban population are expected to be going through the process of rural to urban migration along with better growth figures. For the global sample, the positive sign of the coefficient of openness show that economies that are more open to the global world tend to grow faster.

Generally, the empirical findings presented in table 2 needs a reassessment as the results may be biased if there is potential endogenity of decentralization variables with respect to growth rate. In the second stage regression we control for the potential endogeneity of the revenue and spending shares by different levels of government as these shares can possibly be affected by the rate of growth (see, for example Vazques & McNab, 2003; Bahl & Linn, 1992).

Following Blundell and Bond (1998), Arellano and Bover (1995), in order to avoid the complexity of finding out suitable external instruments to be used for decentralization, system-GMM estimator is used where lagged values of the level variables are used as instruments to address the endogenity problem (also see Filippetti & Sacchi, 2013; Strumpf & Oberholzer-Gee, 2002). The results of system GMM estimation are summarized in Table 3.

The empirical results presented in Table 3 indicate that, the direct effects of both expenditure and revenue decentralization on economic growth is significantly negative for the global sample. This implies that if role of governance institutions and macroeconomic stability are ignored, fiscal decentralization would deteriorate per capita GDP growth rate. However, we get an empirical backing for the positive linkage between fiscal decentralization and economic growth in the presence of macroeconomic stability and quality of governance institution. Again to consider the roles of quality of governance institutions and macroeconomic stability in determining the effect of fiscal decentralization on economic growth, the regression models are re-estimated by including interactive terms of fiscal decentralization with governance index and macroeconomic stability index.

The empirical findings in Table 3 show that the interactive terms of both decentralization measures with governance index and macroeconomic stability are positive and significant, which imply that expenditure/revenue decentralization can become growth enhancing if macroeconomic stability conditions and quality of governance institutions surpass a critical level. Hence, growth effects of fiscal decentralization can turn favorable by the positive impact of fiscal decentralization on

per capita GDP growth rate in the presence of macroeconomic stability and quality of governance institutions.

Table 3

Fiscal Decentralization and Economic Growth: Global Sample, 1996-2014, GMM Model (Dependant variable: GDP Per Capita Growth Rate)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
T/GDP	-0.05	-0.06	-0.06	-0.04	-0.04	-0.05
	(0.016)***	(0.015)***	(0.014)***	(0.01)***	(0.01)***	(0.01)***
K/L	-0.01	-0.004	-0.01	-0.02	-0.03	-0.04
	(0.001)***	(0.001)***	(0.001)***	(0.006)***	(0.01)***	(0.01)***
ED	-0.02	-0.12	-0.04			
	(0.01)**	(0.04)***	(0.01)***			
RD				-0.10	-0.02	-0.03
				(0.015)**	(0.01)**	(0.01)***
ED*GI		0.03	0.03			
		(0.01)***	(0.01)**			
RD*GI					0.04	0.04
					(0.01)**	(0.01)***
ED*MSI		0.02	0.02			
		(0.01)*	(0.01)*			
RD*MSI					0.01	0.02
					(0.02)	(0.011)**
URB			-0.23			-0.21
			(0.11)**			(0.13)*
OPN			0.004			0.003
			(0.003)			(0.003)
Constant	0.01	0.09	0.05	0.12	0.08	0.09
	(0.01)***	(0.01)***	(0.02)***	(0.05)**	(0.01)***	(0.01)***
Prob (J-Statistics)	0.26	0.49	0.47	0.24	0.12	0.16
Wald test	81.22	54.23	53.82	65.26	25.34	22.98

*"The figures in parentheses are robust standard Errors. The statistical significance at 1, 5, 10 % levels are indicated by ***, **, * respectively".*

In general, the results show that the direct impact of fiscal decentralization on per capita GDP growth rate is negative and significant for the global sample. However, decentralization can have positive effect on growth if it is supported by macroeconomic stability and better quality of governance institutions. The result shows that interactive terms of both expenditure and revenue decentralization with macroeconomic stability index and governance index are positive and significant which imply negative growth effects of fiscal decentralization are offset by the positive effect of fiscal decentralization on growth in the presence of macroeconomic stability and improved institutional quality.

The regression results in Table 3 also show that the inclusion of the economic controls like urbanization and openness does not alter the sign and significance of estimated coefficients of fiscal decentralization and the interactive terms for fiscal decentralization with macroeconomic stability and quality of governance institutions. In general, the results presented above are robust to the alternative specifications of the baseline model.

The results of system GMM estimator are almost similar to the random effect model with the exception that significance of coefficients in regression models, that trace the effect of fiscal decentralization on economic growth, is improved after controlling for the endogenity problem. Overall, the GMM results explained above are robust to the various specifications of the baseline model.

Conclusion

This study examines the linkages between public sector decentralization and growth rate of per capita GDP. The important empirical result of the study is that public sector decentralization negatively affect growth rate of per capita GDP. However, this negative effect is offset by the positive influence of decentralization on growth in the presence of macroeconomic stability and quality of governance institutions.

The negative effect of expenditure/revenue decentralization on economic growth is due to low institutional quality in terms of disorders in rule of law, high corruption in government institutions, low bureaucratic quality and democratic accountability. Poor quality of governance institutions increases the level of corruption/inefficiency in government institutions and results in poor accountability of public administrators that adversely affect economic growth. The empirical results for the global sample show that expenditure/revenue decentralization becomes growth enhancing if quality of governance institutions exceeds certain critical level and public official are made accountable for their tasks through better quality of governance institutions. This finding reduces the risks associated with decentralization of public sector.

Further, macroeconomic instability in terms of instability in prices, budget deficit and exchange rate also depresses the growth effects of fiscal decentralization. Macroeconomic instability reduces the predictability of macroeconomic environment that results in volatile behavior of key economic variables. Unpredictable macroeconomic environment hampers the efficient allocation of resources, thereby adversely affect investment and economic growth. Macroeconomic stability is important for investor's confidence, effective capital inflows, capital accumulation, growth of private business, efficient allocation of resources, etc.

In stable macroeconomic conditions sub-national governments would be able to efficiently allocate the available resources, widen the tax base and enhance their revenue generation capacity. Hence, macroeconomic stability is indispensable for realizing the growth enhancing effects of fiscal decentralization. The empirical results show that expenditure/revenue decentralization becomes growth enhancing if macroeconomic stability exceed certain critical level.

We find an overall empirical support, from the global sample, for the hypothesis that decentralization enhances growth when it is supported by macroeconomic stability and better quality of governance institutions. The policy guidelines that comes out of this study is that a nation with stable macroeconomic conditions and better quality of governance institutions can expect positive growth effects from public sector decentralization than those nations that lack sound macroeconomic conditions and quality of governance institutions.

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