

# Fiscal Decentralization and Deficits: International Evidence

Bilin Neyapti\*  
Bilkent University

## Abstract:

The literature on the effects of fiscal decentralization (FD) has been expanding, though macroeconomic effects of FD have not yet been sufficiently explored. This paper empirically investigates the relationship between FD and budget deficits, providing strong panel evidence that both expenditure and revenue decentralization have significant negative relationships with deficits. More interestingly, the evidence in this paper reveals that fiscal disciplining effect of FD increase with the size of population, whereas the value added of FD decreases with governance and local accountability. Also, it appears more prudent to advise revenue, rather than expenditure, decentralization in cases of high ethnolinguistic fractionalization.

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Key Words: Fiscal Decentralization, Budget Deficits.

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\* Associate Professor, Bilkent University, 06800 Bilkent, Ankara, Turkey.  
Tel: (90 312) 290 2030. Fax: (90 312) 266 5140. E-mail: [neyapti@bilkent.edu.tr](mailto:neyapti@bilkent.edu.tr)

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## I. Introduction

Fiscal decentralization can be defined as devolution of policy responsibilities from the central government towards local governments with regards to spending and revenue collection. It has been viewed to be an appealing feature of economic reform programs based on the following arguments: i) decentralization of spending increases allocative efficiency since local governments have better local information and hence can affect non-uniform provisions that better match with the preferences of citizens<sup>1</sup> (see, for example, Samuelson, 1954, Oates, 1972 and 2001). ii) Decentralization of fiscal activity is expected to boost accountability and transparency in public good delivery (see, for example, de Mello, 2000a) that would help ensure its dynamic efficiency. iii) In addition, tax-payers are expected to better cooperate with local governments that are accountable (see, for example, Wasylenko, 2001).<sup>2</sup>

If FD indeed helps to increase economic efficiency, accountability and transparency in local public good provision, then one expects that it is also likely to lower budget deficits. The literature, however, falls short of providing a satisfactory assessment of this proposition<sup>3</sup>, with the exception of De Mello (2000b), that examines fiscal structures of a set of countries

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<sup>1</sup> Public goods whose provision is considered to be more efficient if decentralized are not pure public goods with wide spill-over effects, but local public goods.

<sup>2</sup> Panizza (1999) provides an overview of the theoretical literature on FD. He groups the existing literature as the studies on optimal division of powers (decentralization theorem), the role of organization costs and competition among jurisdictions.

<sup>3</sup> While the empirical literature on issues related to FD has markedly grown in the recent years, evidence on the macroeconomic effects FD has been rather scant. Some recent exceptions, however, are listed as follows. King and Ma (2001) and Neyapti (2004) both find a negative relationship between revenue decentralization and inflation. While Davoodi and Zou (1998) show a negative relationship between FD and growth in less developed countries, Martinez-Vazquez and McNab (2005) argue that the empirical evidence on the relationship between FD and growth is mixed. Moreover, Thiessen (2003) demonstrates that, for high-income OECD countries, there is an intermediate level of FD beyond which the positive growth effect disappears. In addition, Jin and Zou (2002) demonstrate that while expenditure decentralization increases the size of aggregate government, revenue decentralization has a reverse impact.

and reports negative effects on fiscal balances of the coordination failures in intergovernmental fiscal relations in especially developing countries.<sup>4</sup> The current study differs from that of de Mello (2000b) in regards to both its explicit exploration of the role of institutional and structural factors on this relationship, and its separate treatment of expenditure and revenue decentralization.

An investigation of the effects of FD for budget deficits should address both expenditure and revenue aspects of FD. The literature emphasizes that decentralization of fiscal expenditures may increase efficiency of local public good delivery in cases where the country is large, heterogeneous, or ethno-linguistically fractionalized, since it is especially in those cases that local governments are in a position to make better assessment of local preferences than the central government. While decentralizing budgetary spending may be efficiency enhancing granted the above conditions, both expenditure and revenue decentralization may have certain drawbacks as well. Among the main possible reasons for this are that local governments either have limited tax-bases available to them, or they fail to fully exploit the existing ones, and that local debt issuance and management capacity is usually limited.<sup>5</sup> Limited revenue autonomy of local governments implies that their expenditure autonomy is also possibly limited and thus local governments may become mere spending units of the central governments. These disadvantages may be so large as to overweight the increased likelihood of cooperation in revenue collection in case of decentralized fiscal activity.

There are various arguments against expenditure decentralization also. First, local governments may suffer from the lack of economies of scale in the provision of public goods;

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<sup>4</sup> De Mello (2000b) measures coordination failures, which may arise due to common pool and agency problems, by expenditure decentralization and sub-national revenue autonomy and dependency.

information and coordination costs may particularly be higher for local governments due to the lack of institutional and administrative capacity. Secondly, if local vested interests are powerful, decentralization may increase corruption and social fragmentation in the absence of local accountability.<sup>6</sup> Thirdly, decentralization may increase competition and political tension among local governments. Fourthly, coordination problems across different tiers of the government may lead to a deficit bias and thus hinder fiscal reforms and implementation of macroeconomic adjustment.

Hence, the literature offers arguments both in favor and against the effectiveness of fiscal decentralization in improving fiscal performance.<sup>7</sup> Tanzi (2000) argues that the effectiveness of FD in improving allocative efficiency depends on factors such as the size of country, the extent of privatization in the economy<sup>8</sup>; ability of local governments to raise revenue; transparency; and local administrative and institutional capacity.<sup>9</sup> Extending the

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<sup>5</sup> Limitation on sub-national borrowing may be legally imposed.

<sup>6</sup> See, for example, Blanchard and Shleifer, 2000, and Bradhan and Mookherjee, 1998

<sup>7</sup> Among the empirical cross-sectional studies, de Mello (2000a) shows that higher *social capital*, defined as confidence in government, civic cooperation and associational activity, is positively related with fiscal decentralization. De Mello and Barenstein (2001) also finds evidence that good *governance* is positively related with sub-national spending levels, and the higher the non-tax revenues the stronger is this relationship. In addition, Fisman and Gatti (2002) find a strong negative relationship between expenditure decentralization and *corruption*, while Treisman (2000) observes no significant relationship between the two variables, due possibly to different measures of corruption and inclusion of more control variables in the latter.

Case studies on the effects of FD also appear inconclusive. Those that do not favor FD include the experiences of Argentina and Philippines (Eaton, 2001), Japan (Barrett, 2000), and China (for inflation effects, Feltenstein and Iwata, 2002). In contrast, the experiences of Botswana, reported by Hope (2002); China, reported by Dethier (2000), Lin and Liu (2000) and (for growth effects) Feltenstein and Iwata (2002); and Turkey, reported by Neyapti (2005), are argued to be favorable. Inspecting the cases of Russia, Ukraine and Kazakhstan, Norris et al. (2000) point out that greater autonomy and accountability assigned to local governments and transparency with regards to spending and revenue collection arrangements are all necessary for obtaining the benefits of decentralization. Similarly, in a comparative case study of Bolivia and Colombia, Faguet (2005) also points out that local accountability, small central government, hard-local budget constraints and local revenue raising capacity all matter for FD to improve fiscal performance.

<sup>8</sup> Privatization can be considered as substitute for local government in the provision of local public goods and services.

<sup>9</sup> See, for example, Panizza (1999), Von Braun and Grote (2000), and De Mello (2000a).

framework of Von Hagen and Harden (1995) to the central-local government relations, decentralization of fiscal activity can be viewed to increase fiscal burden in case local governments are subject to fiscal illusion.<sup>10</sup> It can be argued, however, that such spending biases can be limited or eliminated via local accountability and good governance that help internalize the externalities of local activities. In addition, efficiency gains of fiscal decentralization in large and heterogeneous countries may compensate for the increase in potential spending biases.

This paper contributes to the literature by empirically investigating the nature of the relationship between FD and budget deficits in view of structural and institutional factors that theoretical and empirical literature suggests to affect this relationship. More specifically, the factors that are explicitly taken into account in the current empirical analysis are the country size, quality of governance, local accountability and the extent of ethnolinguistic fractionalization. The main hypothesis tested is that FD lowers budget deficits controlling for these factors.

The panel evidence provided in this paper lends strong support to the hypothesis that fiscal decentralization (both expenditure and revenue types) has a significant negative effect on budget deficits. Furthermore, the evidence indicates that the effectiveness of fiscal decentralization in reducing deficits can be enhanced by the size of population, even though deficits appear to increase with the population size on average. The disciplining effect of FD is observed especially in cases of inadequate governance and lack of local accountability, implying that the more improved the governance and local accountability the lower the value added of FD in attaining fiscal discipline. Ethnolinguistic fractionalization appears to

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<sup>10</sup> Fiscal illusion arises when local governments receive the whole benefit from their own spending or from not collecting local taxes, while the resulting burden, which may be an increase in budget deficits, is shared by all.

enhance the effectiveness of revenue decentralization in achieving fiscal discipline, but not that of expenditure decentralization. While output growth, income level, governance and local accountability are all found to have significant negative influences on budget deficits, the impact of the size of the government is significantly positive, as expected. These results survive the sensitivity analyses performed by using alternative measures of FD.

The structure of the rest of the paper is as follows: Section 2 presents the data and methodology of the paper; Section 3 reports the findings of the regression analysis; and Section 4 concludes.

## 2. Data and Methodology

Sub-national levels of government are not uniformly defined across countries. Hence, in order to attain some consistency in definition, this study takes the sum of local and state-and-provincial levels of government, where they are both available, as the indicator of sub-national government activity.<sup>11</sup> Expenditure decentralization is thus measured as the share in total government spending of the spending made by both the state and provincial governments and local governments (*FDexp*). Revenue decentralization (*FDrev*) is measured in the same manner, using revenue data instead of expenditures.<sup>12</sup> The main source of these

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<sup>11</sup> For a check of robustness of these findings, however, I also repeated the regression analysis by using two other alternative definitions of decentralization. Those alternative definitions are: i) the ratio of state and provincial government expenditure (or revenues) to the total of central and state and provincial expenditures (or revenues) and ii) the ratio of local spending (or revenues) to the total of central and local expenditures (or revenues). The results of those regressions are to be discussed later in the paper. (note that while data on local governments is available only for current level spending, data on state and provincial level of governments include both current and capital spending)

<sup>12</sup> This paper does not account for the particularities in reporting across countries regarding the extent of the separation of revenue collection authority from the central authority, it rather simply utilizes the data on revenue collection by the local versus central authorities as reported by the IMF. The data may therefore suffer from measurement problems, such as in case of shared revenues or grants appearing as own revenues of local governments in some countries. The possible direction of bias in case of grants is positive in case of the revenue decentralization measure and negative in case

data, detailed descriptions of which are provided in Appendix 1, is the Government Financial Statistics of the IMF.<sup>13</sup>

Drawing on the discussions by Oates (1972) and Panizza (1999), the current analysis focuses on the "decentralizable" part of fiscal spending to correctly measure the extent of decentralization; social security and defense spending are considered to account for the main part of non-decentralizable government spending. Considering that social security spending is fairly larger in developed countries than in less developed countries, the exclusion of this component helps to avoid a potential bias in the results.<sup>14</sup>

Data used in this study covers up to 19 years of observation, ranging from 1980 to 2000, for 16 countries, for which all the relevant data is available.<sup>15</sup> The panel is unbalanced and the actual number of available observations ranges between 177 and 209 for the cases of *FDexp* and *FDrev*, respectively.<sup>16</sup> The estimations are separately run for *FDexp* and *FDrev*.<sup>17</sup>

Based on the above descriptions of *FDexp* and *FDrev*, the following models are estimated, where FD is used as a generic notation to refer to either *FDexp* or *FDrev*:

$$(Def/GDP)_{it} = \alpha_0 + \alpha_1 FD_{it} + \alpha_2 (FD_{it} * I_{ij}) + \alpha_3 G_{it} + \alpha_4 GDPgr_{it} + \alpha_5 GNIpc_{it} + \alpha_6 I_{ij} + \varepsilon_{it}$$

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of expenditure decentralization. This is in case grants are counted as part of the revenues, as is the case in Turkey for example.

<sup>13</sup> This data set was retrieved from that source in early 2003. The same data breakdown is no more available, however, as of 2008.

<sup>14</sup> Once the social security and defence component of government spending is taken out, indicators of expenditure decentralization appear much higher in developed countries than in less developed countries.

<sup>15</sup> The country list consists of: Austria, Australia, Bolivia, Brazil, Canada, Colombia, France, Germany, Iran, Malaysia, Mexico, Portugal, South Africa, Spain, Switzerland and the US.

<sup>16</sup> In the regressions estimated with *FDrev*, the number of observations rises to 226 and 212, when using state and provincial level of data and local government level data, respectively. The number of observations in the regressions estimated with *FDexp* does not change across alternative definitions.

<sup>17</sup> While *FDexp* and *FDrev* are both negatively significant in separate regressions (using a basic model that employs the rest of the control variables but not the interactive terms) when both are employed in the regression *FDrev* turns out to be positive and significant due possibly to high collinearity between *FDrev* and *FDexp* (0.91).

where the subscript  $it$  stands for country  $i$  at time  $t$ .  $Def/GDP$  stands for consolidated budget deficits in percentages of GDP;  $G$  is the ratio of consolidated government expenditures in GDP;  $GDPgr$  is the growth in real GDP; and  $GNIpc$  is the per capita gross national income.  $G$  is added to the estimation to account for the possible effects of government size that is often argued to cause inefficiency and thus higher deficits.  $GDPgr$  is added to control for business cycles since they also have potential to affect the size of deficits.<sup>18</sup>  $GNIpc$  is used as a proxy for the level of development.

$I$  stands for the various country-specific and institutional characteristics, denoted by subscript  $j$ , that hardly change over time. Those characteristics ( $j$ 's) that the literature suggests to be related with the outcomes of FD are: country size, measured as population ( $pop$ ); the extent of ethnolinguistic fractionalization ( $ethnoling$ ); governance indicators and; local accountability ( $locelec$ ), which is proxied by a dummy that takes the value of one in case local elections exist and zero otherwise. The average of the six indices of Kaufmann et. al. (2002), namely, control of corruption; rule of law; political instability; governmental efficiency; voice and accountability; and regulatory quality, are used as a measure of governance ( $Gov$ ).<sup>19</sup> Each of these variables ( $I_j$ 's where  $j=1$  to 4) are rescaled to numbers that range between 0 and 1 (see Appendix 1 for explanations and Appendix 2 for summary statistics). The resulting four indices,  $I_{pop}$ ;  $I_{ethnoling}$ ;  $I_{locelec}$  and  $I_{gov}$ , are used to measure a country's structural and institutional characteristics. These indices are used both as control

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<sup>18</sup> The data source for these variables is International Financial Statistics of the IMF.

<sup>19</sup> The estimates for each of all the six governance variables are based on an analysis of wide-ranging data sources -- comprised of both polls and surveys conducted in individual countries (see, Kaufmann 2002).



variables and in interaction with the FD terms as the main hypothesis of the current paper is that they influence the effectiveness of FD in reducing deficits.<sup>20</sup>

Following Brambor et al. (2006), one needs to observe the marginal effect of FD on  $Def/GDP$  by constructing the confidence interval for the term  $(\alpha_1 + \alpha_2 * I_{ij})$  over the possible values of  $I_{ij}$ . If the interval lies above (below) the zero line, then the effect is significantly positive (negative).<sup>21</sup> Hence, one can identify the range of  $I_{ij}$  values for which the effect of FD can be said to be significant. The authors show that even when the coefficient  $\alpha_2$  is insignificant, it is possible to have a significant marginal effect of FD for a substantive range of  $I_{ij}$  values. In the next section, we adopt this method to evaluate the effects of FD on deficits.

Noting the limited country coverage of the panel due to data deficiencies, fixed effects model would not be a preferred method of estimation (see, for example, Kennedy, 1997). Fixed effects model is inappropriate also because some of the right hand side variables, investigation of whose effects is key to the current study, are invariant over time. On the other hand, random effects specification is rejected based on the Hausman test results.<sup>22</sup>

To explore the endogeneity of the FD terms, Hausman test of endogeneity is employed. To this end,  $FDexp$  ( $FDrev$ ) is regressed on all the right hand side variables and

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<sup>20</sup> Brambor et al. (2006) show that, to avoid inconsistencies in the estimation, it is necessary to include all of the constitutive terms in the regression that involves multiplicative interaction terms, as we have for the FD here.

<sup>21</sup> Brambor et al. (2006) show that it is incorrect to decide on the inclusion of the interactive term simply by looking at the significance of the coefficient of the interactive variable.

<sup>22</sup> Hausman (1978) proposes a test for the correlation between individual effects and explanatory variables. The null hypothesis is that, assuming that both OLS and GLS are consistent, OLS is inefficient, the alternative being OLS is consistent but GLS is not. Rejection of the null hypothesis thus leads to the rejection of random effects model, in favor of fixed effects (see Hsiao, 1986, Greene, 1993, or Baltagi, 1995).

The null hypothesis of random effects specification being consistent is rejected at 1% level of significance; for the baseline model, reported in column 1 of both Tables 1 and 2, the Chi-Square Test is 288.9 for  $FDexp$  and 20.9 for  $FDrev$ , both significant at 1% level.

lagged deficits. This exercise not only reveals that the lagged deficit term is insignificant in explaining the FD terms, but the inclusion of the residuals from this first stage regression reveals no significant effect. As a result, it can be concluded that FD can be used as an exogenous variable.<sup>23</sup> Hence, in what follows, the estimations are conducted using OLS method with heteroscedasticity correction in the error terms<sup>24</sup>. Section 3 reports the main empirical findings.

### 3. Estimation Results

In this section, the main hypothesis of the paper, that fiscal decentralization has a significant relationship with budget deficits especially under certain structural and institutional conditions, is tested using both expenditure (*FDexp*) and revenue measures decentralization (*FDrev*).

Tables 1 and 2 below report the estimation results of the above model for both *FDexp* and *FDrev* as the dependent variables, respectively. Columns I and II in both Tables report a version of the above model excluding the  $I_j$  terms so as to mark the improvements in the explanatory power of the model brought about by the addition of these terms which are reported in the subsequent columns. Column II reports the results of this basic model after including an additional term, *FDexp-Extreme* (and *FDrev-Extreme*), that stands for the “extreme values” of FD.<sup>25</sup> This modification is made to explore the potentially different

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<sup>23</sup> These results are available from the author upon request.

<sup>24</sup> In addition to correcting for heteroscedasticity, estimations that also allow for autocorrelation correction has been performed, leading to slightly weaker but virtually the same results as those currently reported in the paper.

<sup>25</sup> Extreme values of FD are selected by adding and subtracting one standard deviation to the median values of the respective FD measure observed in the current sample. Hence, the extreme values are those above 0.60 and below 0.20 for *FDexp*, and above 0.35 and below 0.05 for *FDrev*.

Alternatively, the square of the FD term is used in order to explore the non-linearity in the effect of FD, as was originally done in Thiessen (2003). This alternative yields very similar results to

effects of high and low values of FD on deficits. In view of the significance of this term, it is kept for the rest of the regressions.

Due to the high level of collinearity among the interaction terms  $I_j$  (see Appendix 3), the regressions in columns III to VI are reported with one interaction term at a time.<sup>26</sup> Based on Brambor et al.(2006), Appendix 4 provides the plot of the 95% confidence interval for the marginal effects of  $FDexp$  and  $FDrev$  on deficits in case of the four  $I_{ij}$  terms, each of which is measured within the interval of [0, 1] as described in the previous section.

The results reported in Columns I and II of both Tables 1 and 2 primarily indicate that both  $FDexp$  and  $FDrev$  have negative significant effects on deficits. As in Thiessen (2003), the extreme values of both  $FDexp$  and  $FDrev$ , however, are observed to have positive effects on deficits, where significant, though these effects appear weaker than those of  $FDexp$  and  $FDrev$ .<sup>27</sup> In all the regressions reported in Tables 1 and 2, the size of the government ( $G$ ), economic growth ( $GDPgr$ ) and the level of economic development ( $GNIpc$ ) all have significant effects in the expected directions: the first being positive and the latter two being negative. In addition, direct effects on deficit of both the population size and the local elections dummy are observed to be significant, where the sign of the first one is positive and of the latter one is negative.<sup>28</sup>

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those with the extreme values. Since the squared term is highly correlated with the actual series (97%), however, I prefer to report the results with the extreme values in order to single out the effects of relatively high or relatively low values of FD.

<sup>26</sup> Appendix 3 shows that most of the interactive terms, indicated by shaded cells, exhibit correlations both with each other and with the FD terms by more than 80%.

<sup>27</sup> This finding seems to mainly stem from the differences in the level of decentralization between developed and less developed countries: when estimated separately, the coefficient of the extreme values of  $FDexp$  term is negative in the less developed country (LDC) sub-sample only. On the other hand, the coefficient of the extreme values of  $FDrev$  term is positive, where significant, in the developed country (DC) sub-sample only, and not significant in LDCs (see Appendix Tables 4 and 5).

Table 1: Estimation results with Expenditure Decentralization (FDexp):

Dependent Variable: Budget Deficits/GDP						
Method: OLS with robust standard errors						
Explanatory Variables:	I	II	III	IV	V	VI
constant	0.13*** (5.53)	0.14*** (5.67)	0.16*** (5.87)	0.36*** (7.51)	0.26*** (7.51)	0.19*** (5.72)
Exp. Decentr.(FDexp)	-0.08*** (-5.23)	-0.09*** (-4.96)	-0.07*** (-2.93)	-0.47*** (-5.46)	-0.45*** (-8.00)	-0.17*** (-4.47)
FDexp - extreme		0.02** (2.09)	0.02** (2.42)	0.01 (1.02)	0.03** (2.91)	0.02** (1.96)
G	0.21*** (7.71)	0.22*** (7.96)	0.25*** (8.19)	0.28*** (9.48)	0.24*** (8.27)	0.25*** (8.23)
GDPgr	-0.002*** (-2.45)	-0.002*** (-4.38)	-0.001* (-1.69)	-0.001* (-1.69)	-0.001*** (-2.59)	-0.001** (-2.44)
GNlpc	-0.02*** (-4.36)	-0.02*** (-4.38)	-0.03*** (-6.27)	-0.04*** (-6.79)	-0.03*** (-6.65)	-0.02*** (-3.96)
FDexp * population			-1.20*** (-4.01)			
FDexp * governance				0.51*** (4.58)		
FDexp * local elec.dummy					0.35*** (5.20)	
FDexp * ethnoling.frac.						0.10** (2.14)
Population			0.87*** (4.83)	0.23*** (9.35)	0.18*** (7.70)	0.18*** (7.34)
Governance			0.09*** (3.20)	-0.09** (-2.52)	0.07*** (3.09)	-0.02 (0.94)
Local elections			-0.02** (-2.45)	0.005 (0.46)	-0.05*** (-3.66)	-0.02* (-1.67)
Ethnoling.Frac.			0.003 (0.35)	-0.04*** (-3.88)	-0.01* (-1.65)	-0.05** (-2.35)
Adjusted R-square	0.38	0.39	0.56	0.57	0.54	0.52
Wald test for the FD terms			18.12***	2.04	12.84***	3.59*
Number of countries:	16	16	16	16	16	16
Number of observations:	177	177	177	177	177	177

Notes: Figures in parantheses are the t-ratios

\*\*\*, \*\* and \* indicate significance at 1 per cent; 5 % and 10 per cent levels, respectively.

<sup>28</sup> The variability for the local election dummy comes from the less developed sample; where the negative sign may imply moral hazard.

Table 2: Estimation results with Revenue Decentralization (FDrev)

Dependent Variable: Deficits/GDP						
Method: OLS with robust standard errors						
Explanatory Variables:	I	II	III	IV	V	VI
constant	0.16*** (6.70)	0.17*** (8.13)	0.18*** (6.41)	0.26*** (6.48)	0.27*** (8.46)	0.20*** (6.12)
Rev. Decentr.(FDrev)	-0.02 (-1.25)	-0.07** (-2.48)	-0.02 (-0.54)	-0.26** (-2.46)	-0.61*** (-7.66)	-0.02 (-0.38)
FDrev - extreme		0.04*** (2.87)	0.03 (1.33)	0.001 (0.04)	-0.01 (-0.36)	0.04 (1.67)*
G/GDP	0.19*** (7.69)	0.21 (8.49)	0.2*** (7.94)	0.25*** (8.72)	0.21*** (7.95)	0.24*** (8.20)
GDPgr	-0.001* (-1.73)	-0.001* (-1.69)	-0.001 (-1.62)	-0.001* (-1.84)	-0.001*** (-2.63)	-0.001* (-1.78)
GNlpc	-0.02*** (-6.17)	-0.02*** (-6.89)	-0.03*** (-5.76)	-0.03*** (-6.02)	-0.03*** (-6.97)	-0.03*** (-4.73)
FDrev * population			-1.15*** (-3.26)			
FDrev * governance				0.30** (2.35)		
FDrev * local elec.dummy					0.63*** (6.57)	
FDrev * ethnoling.frac.						-0.06 (0.89)
Population			0.59*** (4.08)	0.18*** (6.65)	0.16*** (6.85)	0.14*** (6.49)
Governance			0.03 (1.14)	-0.04 (-1.30)	0.03 (1.48)	0.003 (0.13)
Local elections			-0.02** (-2.59)	-0.02* (-1.67)	-0.07*** (-5.90)	-0.02* (-1.84)
Ethnoling.Frac.			-0.001 (-0.10)	-0.01 (-1.43)	-0.0004 (-0.06)	0.003 (0.22)
Adjusted R-square	0.30	0.31	0.44	0.42	0.45	0.41
Wald test for the FD terms			11.02***	1.91	0.13	2.48
Number of countries:	15	15	15	15	15	15
Number of observations	209	209	209	209	209	209

Notes: Figures in parantheses are the t-ratios

\*\*\*, \*\* and \* indicate significance at 1 per cent; 5 % and 10 per cent levels, respectively.

The interpretation of the interactive terms reveals the most interesting contribution of the current study. The graphs in Appendix 4a, constructed on the basis of the reported

coefficient estimates and their variance/covariance matrices, lead to the following observations. The higher the size of the population, the higher is the deficit reducing effect of FDexp.<sup>29</sup> While for all possible ranges of ethnolinguistic fractionalization FDexp has a deficit reducing effect, this effect declines with the extent of ethnic fractionalization, possibly overridden with the disadvantages of increased competition among the heterogeneous groups.<sup>30</sup> For the most part of the possible range of governance measures, FDexp has a deficit reducing effect. However, this effect declines as one reaches the higher end of the governance measure. This seeming anomaly can be explained as follows: good governance already has a negative effect on deficits and FDexp has less and less marginal contribution to this effect as governance improves. Similar to the case of governance, it appears that the presence of local elections already accounts for low deficits and FDexp does not contribute to this effect, at least in the sample investigated in this paper.

Investigation of the corresponding graphs for FDrev, as read from Appendix 4b, reveals the following observations. As in the case of FDexp, FDrev has a significant deficit reducing effect for all possible ranges of values of population, and this effect increases the greater the size of population. Similarly, deficit reducing effect of FDrev is observed to increase with ethnolinguistic fractionalization, but only for substantively higher levels of this measure. Hence, it seems that increasing ethnolinguistic fractionalization contributes to the deficit reducing effect of revenue decentralization, but not to that of expenditure decentralization. This is the only asymmetric impact of the interaction terms that we observe over the two types of FD. The impact of both governance and the existence local elections

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<sup>29</sup> To control for the size of the country, I alternatively used the *area* of the country (also normalized between 0 and 1, like the other  $I_j$  terms). The results are virtually the same as in case of population and are therefore not reported.

<sup>30</sup> The negative direct effect of  $I_{ethnoling}$  is due to the LDC sample only; a reverse effect is observed in the DC sub-sample. These results are available from the author upon request.

on the deficit reducing effect of *FDrev* are similar to the case of *FDexp*.<sup>31</sup> However, the range of governance measures is even lower for *FDrev* to have a significant marginal effect, for which the argument made above is still relevant.

## Alternative Measures of FD

As a separate experiment, a combined measure of *FDexp* and *FDrev* is formed by simple averaging of the two measures. Estimations using this measure yield virtually the same findings as above for the cases where population, governance and local elections are used in the interaction terms.<sup>32</sup> The finding reported above for the effect of ethnolinguistic fractionalization coupled with *FDrev* remains for this newly composed variable (call it *FD*) as well, except that the effectiveness of *FD* is now observed for higher values of *ethnoling* than for *FDrev*.

Instead of both high and low extreme values of *FD*, the effect of its extremely high values is separately investigated. This experiment also leaves the formerly reported results virtually unchanged.

Against the potential of measurement errors, the regressions reported above are also repeated using “state-and-provincial” and “local” data, separately.<sup>33</sup> The results of these regressions, especially in the case of state and provincial level data, are mostly similar to the results reported above, and therefore are not reported.<sup>34</sup> A few differences are observed are

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<sup>31</sup> Note that the variation for the local elections dummy comes from the less developed countries only; it takes the value of 1 for all developed countries in the sample.

<sup>32</sup> These results are available from the author upon request.

<sup>33</sup> The number of observations in regressions where *FDrev* is used rises to 226 and 212, respectively, when state and provincial level data and local-level of government data are used. The number of observations in the regressions using the alternative definitions of *FDexp* does not change.

<sup>34</sup> One exception is that the formerly observed anomalous positive coefficient of *FDrev* in interaction with  $I_{gov}$  is no more significant in regressions using both state-provincial and local level data.

as follows. Using both state and provincial level and local level data separately, the significant effect of not only revenue decentralization, but also expenditure decentralization is now observed to increase in the level of *ethnoling*. Also as different from the earlier results, it is observed that neither governance nor local elections matter for the effectiveness of FD when local level data is used. These exercises especially reveal the robustness of the result that the effectiveness of FD in reducing deficits increases with the size of population.

## 4. Conclusions

There is a remarkable volume of recent research focusing on the relationship between socio-economic variables and fiscal decentralization (FD) that has nevertheless been rather inconclusive about the benefits of FD. The current paper is the first to investigate the benefits of FD from the viewpoint of its potential association with a key fiscal indicator: budget deficits, by explicitly accounting for the structural and institutional factors that the literature suggests to affect this relationship.

The evidence in this paper reveals a significant negative effect of fiscal decentralization on deficits, besides the significant effects on deficits of the usual suspects: the positive effect of the government size and the negative effects of both growth and the level of development. The findings, however, caution about an unconditional policy recommendation towards fiscal decentralization as this evidence in the paper also reveals that country characteristics and institutional features significantly influence the effectiveness of fiscal decentralization in reducing deficits. More specifically, the current study indicates that the effectiveness of fiscal decentralization in reducing deficits can be enhanced by the size of population, even though deficits appear to increase with the population size. The disciplining effect of FD is observed especially in cases of inadequate governance and lack of local



accountability, implying that the more improved the governance and local accountability the lower the value added of FD in attaining fiscal discipline. While revenue decentralization appears be a more effective device for achieving fiscal discipline in cases of high ethnolinguistic fractionalization, expenditure decentralization appears more effective for lower values of ethnoling.

Hence, the current study provides evidence for a policy advice that would favor decentralization of fiscal activity in highly populated societies. In addition, the evidence in the paper suggest that the value added of FD increases in societies with poor governance. Furthermore, based on the evidence presented here, revenue, rather than expenditure, decentralization seems to induce more fiscal discipline the higher the ethnolinguistic fractionalization.

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## APPENDIX 1: Variable Descriptions and Sources

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<b>Deficit/GDP</b>		IMF-International Financial Statistics
<b>Exp. Decentr.(FDexp)</b>	Expenditure decentralization: = (Total expenditures of state, provincial and local governments) / (Total government spending - social security, welfare and defence spending)	IMF-Government Financial Statistics
<b>Rev. Decentr.(FDrev)</b>	Revenue decentralization: = (Total revenues of state, provincial and local governments) / (Total government revenues)	IMF-Government Financial Statistics
<b>G</b>	=Total government spending/GDP	IMF-International Financial Statistics
<b>GDPgr</b>	GDP growth rate (constant LCU)	IMF-International Financial Statistics
<b>GNI per capita (GNIpc)</b>	Gross National Income Per Capita	IMF-International Financial Statistics
<b>Population (I<sub>pop</sub>)</b>	Index of population = (Population/1 Billion, such that all values in the sample range between 0 and 1)	World Bank, WDI
<b>Governance (I<sub>gov</sub>)</b>	Average of the "normalized" indices of 6 governance indicators. The individual indices are "normalized" between 0 and 1, where 1 corresponds to to the largest value for each of the 6 indicators among the original set of 102 countries.	Kaufmann et.al. (2002)
<b>Local elections (I<sub>locelec</sub>)</b>	Dummy variable =(1 if local/sate governments locally elected; =0, otherwise).	Beck et.al.(2001); also see Database of Political Institutions, The W
<b>Ethnoling.Frac. (I<sub>ethnoling</sub>)</b>	Index of ethnolinguistic fractionalization The numbers are "normalized" between 0 and 1, where 1 corresponds to 93, the largest value (Tanzania) among the 102 countries in the original data set.	Easterly and Levine (1997)

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Note: Calculations are available upon request from the author.

## APPENDIX 2: Data Coverage and Summary Statistics

Country	Period	for regressions with Expenditure Decentralization:								
		Period Average								
		Exp. Decentralization	Deficit/GDP	G	GDPgr	Population	Governance	Local elections	Ethnoling.Frac.	GNI per capita (in logs)
Australia	1980-97	0.53	0.01	0.42	3.19	0.02	0.89	1	0.34	9.64
Austria	1980-94	0.42	0.05	0.54	2.21	0.01	0.87	1	0.14	9.57
Bolivia	1986-98	0.24	0.03	0.23	3.49	0.01	0.40	1	0.73	6.67
Brazil	1980-97	0.42	0.07	0.40	2.63	0.15	0.49	1	0.08	7.82
Canada	1980-97	0.70	0.04	0.56	2.34	0.03	0.89	1	0.81	9.69
Colombia	1982-86	0.35	0.02	0.17	2.96	0.03	0.30	1	0.06	7.09
France	1982-84	0.38	0.03	0.58	1.52	0.06	0.76	1	0.28	9.25
Germany	1995-96	0.57	0.02	0.56	1.25	0.08	0.85	1	0.03	10.26
Iran, Islamic Rep.	1980-89	0.03	0.07	0.26	0.54	0.05	0.33	0	0.82	8.01
Malaysia	1985-95	0.21	0.03	0.34	6.96	0.02	0.52	1	0.77	7.84
Mexico	1980-97	0.23	0.05	0.24	2.66	0.08	0.47	1	0.32	7.96
Portugal	1987-88	0.07	0.08	0.38	6.94	0.01	0.78	0	0.01	8.38
South Africa	1984-85	0.23	0.04	0.36	1.38	0.03	0.54	1	0.95	7.74
Spain	1980-97	0.36	0.05	0.44	2.45	0.04	0.81	1	0.47	9.07
Switzerland	1980-84	0.73	0.00	0.39	1.66	0.01	0.95	1	0.54	9.78
United States	1980-98	0.60	0.03	0.41	2.65	0.25	0.85	1	0.54	9.96
DC average:		0.53	0.03	0.48	2.29	0.06	0.86	1.00	0.45	9.57
LDC average:		0.22	0.05	0.30	3.44	0.05	0.48	0.73	0.47	7.69

Country	Period	for regressions with Revenue Decentralization:								
		Period Average								
		Rev. Decentralization	Deficit/GDP	G	GDPgr	Population	Governance	Local elections	Ethnoling.Frac.	GNI per capita (in logs)
Australia	1980-97	0.28	0.01	0.42	3.19	0.02	0.89	1	0.34	9.64
Austria	1980-94	0.27	0.05	0.54	2.21	0.01	0.87	1	0.14	9.57
Bolivia	1986-98	0.20	0.03	0.23	3.49	0.01	0.40	1	0.73	6.67
Brazil	1980-97	0.25	0.07	0.40	2.63	0.15	0.49	1	0.08	7.82
Canada	1980-97	0.53	0.04	0.56	2.34	0.03	0.89	1	0.81	9.69
Colombia	1980-86	0.19	0.01	0.17	3.03	0.03	0.30	1	0.06	7.09
Germany	1992-98	0.33	0.02	0.55	1.51	0.08	0.85	1	0.03	10.19
Iran, Islamic Rep.	1980-89	0.05	0.07	0.26	0.54	0.05	0.33	0	0.82	8.01
Mexico	1980-98	0.21	0.04	0.24	2.78	0.08	0.47	1	0.32	7.98
Peru	1990-98	0.06	0.01	0.19	4.05	0.02	0.43	1	0.63	7.36
Portugal	1987-98	0.06	0.05	0.44	3.58	0.01	0.78	0	0.01	8.97
South Africa	1980-98	0.13	0.04	0.38	1.82	0.04	0.54	1	0.95	7.97
Spain	1980-97	0.15	0.05	0.44	2.45	0.04	0.81	1	0.47	9.07
Switzerland	1980-98	0.45	0.00	0.46	1.51	0.01	0.95	1	0.54	10.22
United States	1980-98	0.41	0.03	0.41	2.65	0.25	0.85	1	0.54	9.96
DC average:		0.34	0.03	0.48	2.27	0.06	0.87	1.00	0.41	9.76
LDC average:		0.14	0.04	0.29	2.74	0.05	0.47	0.73	0.45	7.73

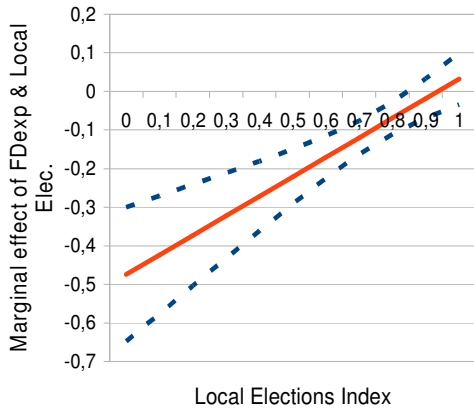
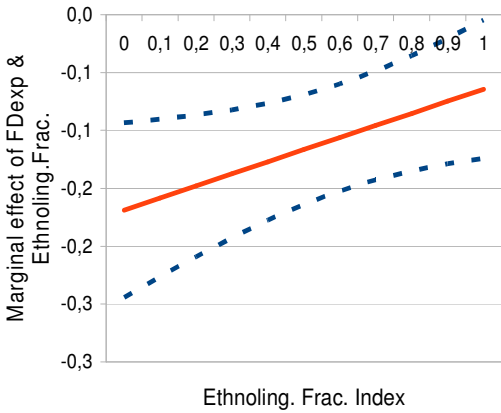
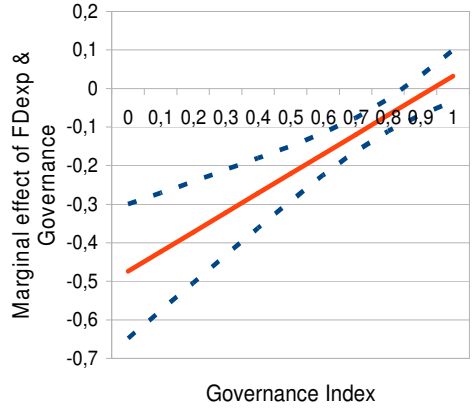
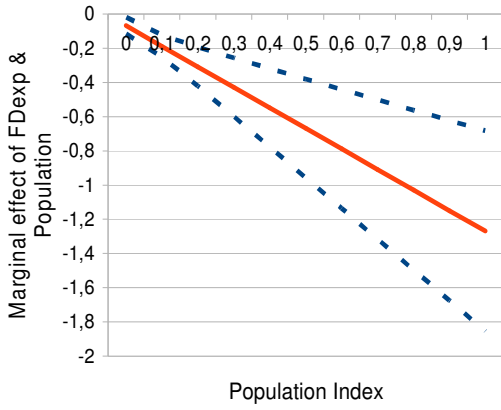
Source: Based on the sources and author's own calculations reported in Appendix 1.

**APPENDIX 3:** Correlations among the major variables used in the empirical analysis.

	FDexp	FDexp - extreme	Fdrev	FDrev - extreme	FDexp * population	FDexp * governance	FDexp * local elec.	FDexp * ethnoling.frac.	FDrev * population	FDrev * governance	FDrev * local elec.	FDrev * ethnoling.frac.	Population	Governance	Local elections	Ethnoling.Frac.
FDexp	1.00															
FDexp - extreme	0.09	1.00														
Fdrev	<b>0.91</b>	-0.17	1.00													
FDrev - extreme	-0.27	0.66	-0.40	1.00												
FDexp * population	0.35	0.13	0.36	-0.33	1.00											
FDexp * governance	<b>0.96</b>	0.00	<b>0.88</b>	-0.35	0.26	1.00										
FDexp * local elec.	<b>0.99</b>	0.10	<b>0.90</b>	-0.24	0.35	<b>0.94</b>	1.00									
FDexp * ethnoling.frac.	0.75	-0.38	<b>0.83</b>	-0.67	0.20	0.78	0.73	1.00								
FDrev * population	0.33	0.08	0.38	-0.35	<b>0.99</b>	0.26	0.33	0.21	1.00							
FDrev * governance	<b>0.92</b>	-0.17	<b>0.96</b>	-0.46	0.28	<b>0.96</b>	<b>0.91</b>	<b>0.85</b>	0.30	1.00						
FDrev * local elec.	<b>0.92</b>	-0.13	<b>0.99</b>	-0.35	0.36	<b>0.88</b>	<b>0.93</b>	<b>0.80</b>	0.38	<b>0.95</b>	1.00					
FDrev * ethnoling.frac.	0.68	-0.47	<b>0.83</b>	-0.68	0.18	0.71	0.66	<b>0.98</b>	0.21	<b>0.82</b>	<b>0.80</b>	1.00				
Population	0.17	0.10	0.20	-0.26	<b>0.97</b>	0.07	0.18	0.03	<b>0.96</b>	0.11	0.21	0.03	1.00			
Governance	0.77	0.13	0.64	-0.20	0.15	<b>0.89</b>	0.77	0.58	0.14	<b>0.80</b>	0.65	0.47	-0.03	1.00		
Local elections	0.06	-0.57	0.22	-0.68	-0.04	0.17	0.04	0.65	-0.01	0.27	0.17	0.68	-0.11	0.03	1.00	
Ethnoling.Frac.	0.57	0.31	0.49	0.26	0.20	0.45	0.63	0.27	0.19	0.40	0.58	0.21	0.12	0.40	-0.29	1.00

Note: Shaded cells indicate correlations that are more than 80%.

**APPENDIX 4a:** Determining the range of significance for the marginal effect of  $FDexp * I_{ij}$





**APPENDIX 4b:** Determining the range of significance for the marginal effect of  $FDrev * I_{ij}$

