

## **CROSS-COUNTRY EVIDENCE ON THE RELATIONSHIP BETWEEN FISCAL DECENTRALIZATION, INFLATION, AND GROWTH**

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November 2001

### **Abstract**

In this paper, we examine how fiscal decentralization may influence economic growth. Previous research on this question has primarily focused on the direct relationship between decentralization and growth, ignoring other channels by which decentralization may also influence growth. We thus examine the influence of decentralization on macroeconomic stability, in particular on its impact on the inflation rate. We also investigate the direct influence of fiscal decentralization on economic growth. Using panel data, we find that decentralization appears to reduce the rate of inflation in the sample countries and does not appear to directly influence economic growth.

JEL Classification Numbers: E62, H77, O20, O40

Keywords: Fiscal Decentralization, Economic Growth, and Macroeconomic Stability

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## 1 Introduction

Given the current drive among developing and transitional countries to decentralize expenditures and revenues to subnational governments, it is important to ask not only whether fiscal decentralization does influence economic growth, but also **how** may fiscal decentralization influence economic growth.<sup>1</sup> As decentralization moves to the forefront of policy options being considered by developing and transitional countries and figures prominently among the prescriptions offered by international donor organizations, an examination of the relationship between decentralization, inflation, and economic growth is quite timely. First, the renewed focus on fiscal decentralization appears to be fueled by the widespread belief that fiscal decentralization is an effective tool for increasing the efficiency of public expenditures. Second, the rush to decentralize can also be seen as a reaction to the failures over the past two decades of centralized bureaucracies under very different political regimes in developing and transitional countries. Decentralization has also been seen as a way to break the central government's grip on the economy by shifting fiscal authority to subnational governments.<sup>2</sup>

If fiscal decentralization negatively influences economic growth directly or indirectly through its impact on macroeconomic stability, then policymakers need to be aware of these relationships when formulating and implementing decentralization policy. On the other hand, if decentralization enhances, or at a minimum does not present obstacles to achieving macroeconomic stability, or directly enhances economic growth, then the case for fiscal decentralization is strengthened and policymakers need to focus their attention on the other potential influences of fiscal decentralization.<sup>3</sup> In this paper we report some of the findings from a larger investigation of this issue where we use

panel data for a number of countries to estimate the impact of fiscal decentralization on macroeconomic stability and economic growth (Martinez-Vazquez and McNab, 2001b).

## **2 An Empirical Estimation On The Impact of Fiscal Decentralization**

### **2.1 *The Measurement of Fiscal Decentralization***

The most serious difficulty we face in the cross-country study of fiscal decentralization is how to properly measure the extent of decentralization. Ideally, we would be able to construct a panel data set of measures of fiscal decentralization that effectively quantified the activities of subnational governments resulting from autonomous or independent decisions of subnational governments. This would require classifying those revenues and expenditures that are under the effective control of the central government as central government activities, regardless at which level of government these revenues or expenditures occurred.<sup>4</sup> Likewise, activities that were under the control of subnational governments, even if they were funded by the central government, would be classified as subnational government activities. Constructing such a panel data set would require information on: (i) types of grants and transfers received by subnational governments; (ii) the structure of the tax system to determine whether and how revenues were shared; (iii) the discretion of subnational governments to levy and collect taxes; and (iv) the discretion granted to subnational governments to spend resources to meet the needs of their constituents. Ideally, we would also include information on the political autonomy of subnational governments in the data set.

Unfortunately, we cannot readily address these issues with the available data. As with many other empirical studies of fiscal decentralization, we employ the International Monetary Fund's Government Finance Statistics Annual Yearbook (GFS) as the primary

data source for revenues and expenditures of national and subnational governments.<sup>5</sup> We are, as Oates (1972) concluded, left with the standard, albeit imperfect, measures of fiscal decentralization based on revenue and expenditure data.<sup>6</sup> We, as many of the other studies that have preceded us, thus define fiscal decentralization in one dimension, that is, as the share of subnational government revenues to general government revenues or the share of subnational government expenditures to general government expenditures.<sup>7</sup>

We draw data from the GFS on consolidated central governments, regional and state governments, and local governments. For those countries that do not report consolidated central government data, we substitute data on the budgetary central government.<sup>8</sup> Of the 180 plus potential countries in the GFS data set, we select those countries in the GFS that reported revenues and expenditures for at least the central government and at least one level of subnational government.<sup>9</sup> We then calculate two measures of fiscal decentralization: (1) the ratio of total subnational government revenues to general government revenues; and (2) the ratio of total subnational government expenditures to general government expenditures. These two measures are the standard measures of fiscal decentralization that have been widely used in the previous studies of determinants and outcomes of fiscal decentralization.<sup>10</sup> We then construct a panel data set that is drawn from five sources: the electronic version of the International Monetary Fund's Government Finance Statistics Annual Yearbook (1999), the World Bank's World Development Indicators 2000 (2000), the United States Census Bureau's International Data Base (2000), and Freedom House's Survey of Freedom (2000).<sup>11</sup> The resulting unbalanced panel data set contains 610 observations.

## 2.2 *Fiscal Decentralization and Inflation*

We build upon Fischer (1993) and Fornasari, Webb, and Zou (1999) by hypothesizing that the inflation rate is determined by the rate of economic growth, the growth of the money supply, and, among other things, fiscal decentralization. We specify the base log-linear two-way fixed effects error components estimator for inflation as<sup>12</sup>

$$P_{it} = \beta_1 D_{it} + \beta_2 M_{it} + \beta_3 y_{it} + \delta' Z_{it} + u_{it} \quad [1]$$

where  $P$  is the annual change in the consumer price index,  $D$  is the measure of fiscal decentralization discussed above,  $M$  is the measure of M2 as a percentage of GDP,  $y$  is GDP per capita, and the  $Z$  matrix includes several additional control regressors, including openness to international trade, tax revenues as a percentage of GDP, Gross Domestic Investment as percentage of GDP, and population.<sup>13</sup> We note the presence of serial correlation in the error terms when the base estimation equation is estimated in levels and thus respecify the equation in first differences.<sup>14</sup> Testing for the presence of endogeneity<sup>15</sup>, we fail to reject the null hypothesis of exogeneity for fiscal decentralization with respect to the inflation rate.<sup>16</sup> We must, however, instrument for the first difference of M2 as a percentage of GDP with the two-period lagged level of M2 as a percentage of GDP and for the first difference of per capita GDP with the two-period lagged level of per capita GDP.<sup>17</sup> Noting that the fixed effects are jointly significant, we specify the estimable form of Equation (1) as a two-way fixed effects model.

As reported in Martinez-Vazquez and McNab (2001b), the most important result of the full sample estimations is the negative and statistically significant relationship between revenue decentralization and the rate of inflation. The estimated coefficient for

revenue decentralization is statistically significant at the 1% level. A 1% increase in revenue decentralization appears to induce, for the countries in the sample, an approximate 0.3% decrease in the growth of the consumer price index. The estimated coefficient for revenue decentralization also appears to be robust to the inclusion of other regressors, to include total population, defense expenditures, and urbanization. Note, however, that the estimated coefficient for expenditure decentralization is not statistically significant. Thus it appears that while the decentralization of expenditures does not matter to inflation, countries with a more decentralized system of revenue assignments tend to experience more stable macroeconomic environments. Perhaps the ability of subnational governments to mobilize their own revenues puts less strain on central government budgets and ultimately on inflation.

Similar results hold for the sub-sample estimations. Revenue decentralization appears to negatively influence the rate of inflation for the sub-samples of developed and developing and transitional countries.<sup>18</sup> For the sub-sample of developed countries, the estimated coefficient for revenue decentralization is statistically significant at the 10% level and suggests that a 1% increase in the level of revenue decentralization induces a 0.4% decrease in the inflation rate for the developed countries in the sample. For the sub-sample of developing and transitional countries, the estimated coefficient for revenue decentralization is also statistically significant at the 10% level and appears to suggest that a 1% increase in the level of decentralization induces a 0.13% decrease in the rate of inflation. The estimated coefficient for expenditure decentralization in the inflation equation is not statistically significant and the performance of the model is poor relative to the full sample of countries.

The results reported in Martinez-Vazquez and McNab (2001b), even in light of these cautionary notes, are quite striking. Revenue decentralization appears to promote, and not hinder as has been often previously suggested by some in the literature, price stability among the sample countries. That is result is consistent, although at the lower order of magnitude for the sub-sample of developing countries, suggests that this relationship is not entirely dependent upon the level of development.

Our empirical results appear to support the arguments of McLure (1995), Sewell (1996), and Spahn (1997) that fiscal decentralization may enhance price stability. We do not find evidence to support the arguments of Prud'home (1995), Tanzi (1996), and others who have cautioned that decentralization, at a minimum, presents an obstacle to achieving macroeconomic stability. Our findings also appear to contradict those of Treisman (2000) who suggested that decentralization “locks in” the current rate of inflation in that we have found evidence to suggest that revenue decentralization may, in fact, serve to lower the rate of inflation.

### ***2.3 Decentralization, Inflation, and Economic Growth***

Let us now turn to the question of what is the effect of fiscal decentralization on economic growth. If Oates (1993) is correct, then the static proposition that fiscal decentralization is efficiency enhancing has a corresponding proposition in the dynamic setting of economic growth. This subsection empirically examines the proposition that fiscal decentralization directly affects economic growth.

Drawing on the neoclassical economic growth literature<sup>19</sup>, Martinez-Vazquez and McNab (2001) specify the log-linear base estimation equation for growth in per capita GDP as

$$y_{it} = \beta_1 D_{it} + \beta_2 K_{it} + \beta_3 H_{it} + \beta_4 G_{it} + \beta_5 P_{it} + \delta' Z_{it} + u_{it} \quad [2]$$

where  $D$  and  $P$  are as previously discussed;  $K$  is private capital as proxied by gross domestic private fixed investment;  $H$  is human capital as proxied by infant mortality<sup>20</sup>; and  $G$  is public capital as proxied by gross domestic public investment. The  $Z$  matrix contains a number of control regressors, including openness to international trade, population, democratic governance, and tax revenues as a percentage of GDP, and defense expenditures as a percentage of GDP. Because of the presence of serial correlation in the error terms when the equation is estimated in levels, Equation (2) is respecified in first differences.<sup>21</sup>

In order to proceed with the estimation of Equation (2), we first test for the endogeneity of the regressors. We fail to reject the null hypothesis of exogeneity for fiscal decentralization with respect to growth in per capita GDP, a result that supports the previous findings of Davoodi and Zou (1998) and Woller and Phillips (1998). We do, however, reject the null hypothesis of exogeneity for the inflation rate and gross domestic fixed private and public investment per capita. We instrument for these endogenous regressors with the two-period lagged level of the regressor in question.

As reported in Martinez-Vazquez and McNab (2001b), the most striking empirical finding of this paper is the failure to detect, for the full sample of countries, a statistically significant relationship between fiscal decentralization and growth in per capita GDP. While the estimated coefficient for expenditure decentralization is positive, it does not approach any meaningful level of significance. The estimated coefficient for revenue decentralization is negative but insignificant. The inclusion of the control regressors, to include total population, defense expenditures as a percentage of GDP,

openness to international trade, and democratic governance, does not improve the significance of either of the estimated coefficients for fiscal decentralization. Our findings appear to support those of Woller and Phillips (1998) who also failed to detect a statistically significant direct relationship between decentralization and economic growth in developing countries.

For the sub-sample of developed countries, we fail to reject the null hypothesis that the country-specific effects are jointly equal to zero and thus use the one-way IV Within estimator. Examining the results of the sub-sample estimations, we note that there appears to be a negative and statistically significant relationship between fiscal decentralization and growth in per capita GDP. The estimated coefficients for expenditure and revenue decentralization are statistically significant at the 1% level. While the estimated coefficient for revenue decentralization appear to be robust to the inclusion of the control regressors (total population, defense expenditures, M2 as a percentage of GDP), the estimated coefficients for expenditure decentralization appear to be fragile. We are left with the conclusion that, for the developed countries in the sub-sample, increases in revenue decentralization may actually have a negative influence on economic growth.

With respect to the sub-sample of developing and transitional countries, we are able to reject the null hypothesis that the country and time-specific effects are singularly and jointly equal to zero and therefore use the two-way IV Within estimator. As with the full sample estimations, we fail to detect a statistically significant direct relationship between fiscal decentralization and growth in per capita GDP. The estimated coefficients for expenditure and revenue decentralization are positive and negative, respectively, but

insignificant. Based on this empirical evidence, we conclude, for the countries in the sub-sample, that fiscal decentralization does not appear to directly influence economic growth.

### **3 Summary and Conclusions**

This paper reports on some of the main findings of Martinez-Vazquez and McNab (2001b). We have examined the linkages between fiscal decentralization, inflation, and economic growth and have found support for the hypothesis that decentralization, at a minimum, does not appear to present a threat to price stability in the sample developed and developing countries. Our findings suggest that fiscal decentralization per se does not create conditions that undermine efforts to achieve price stability. While it is quite clear that poorly designed or implemented fiscal decentralization policy may create incentives for subnational governments to overborrow relative to their debt-servicing capacity and that this practice may potentially lead to macroeconomic instability, it appears that, in reality, revenue decentralization leads to more stable prices. This may be due to the fact that decentralization allows governments at different levels to mobilize revenues which ultimately leads to less pressure on the consolidated budget and more stable prices. The mechanism which these processes take place are at this time not established and should be investigated in the future.

We caution that while our findings suggest that decentralization promotes, and does not hinder, price stability, that much work remains to be done before we can emphatically state that decentralization promotes price stability. The unidimensional nature of our fiscal decentralization measure is subject to the criticisms prevalent in the

literature. Refining our measure of price stability to include measures of unemployment and other dimensions of price stability is also a next step in future work.

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## Endnotes

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<sup>1</sup> Out of the 75 developing or transitional economies with populations greater than five million, all but 12 claim to have embarked on some type of decentralization initiative involving the transfer of power to local governments (Dillinger, 1994).

<sup>2</sup> Brennan and Buchanan (1980) is the classical exposition of how decentralization can control the Leviathan. See Ehdaie (1994) for evidence that decentralization may reduce the size of the public sector.

<sup>3</sup> We caution, however, that fiscal decentralization may actually appear to be more popular among developing and transitional countries than it truly is because there is often a confusion of terminology. See Bird (1993), Bird and Vaillancourt (1997), and Martinez-Vazquez and McNab (1998).

<sup>4</sup> This, of course, assumes agreement on what is meant by the term “fiscal decentralization.” For a discussion of the issues regarding the definition of decentralization, see Ebel and Yilmaz (2001).

<sup>5</sup> While the GFS system reports information on grants and transfers between the various levels of government, it does not contain information on whether the grants and transfers are under the control of the central or recipient level of government or if the grants are conditional, block, or lump-sum. The GFS system also does not report information on the nature of transfers.

<sup>6</sup> See Davoodi and Zou (1998) and Woller and Phillips (1998), Treisman (2000), and McNab (2001b) for examples of using panel data to investigate the influence of fiscal decentralization. Martinez-Vazquez and McNab (1998, 2001a,b) and McNab (2001) discuss the advantages and problems associated with the use of panel instead of cross-sectional data.

<sup>7</sup> See Ebel and Yilmaz (2001) and Martinez-Vazquez and McNab (2001a).

<sup>8</sup> This is consistent with previous examinations of fiscal decentralization in the literature. See, for example, Davoodi and Zou (1998).

<sup>9</sup> We did not include those countries that stopped reporting revenue and expenditure information prior to 1990 and those countries whose reported data were mathematically inconsistent but included countries that reported zero or minimal expenditures or revenues for at least one subnational level of government.

<sup>10</sup> While some studies of fiscal decentralization have attempted to construct measures of decentralization net of grants and transfers and net of certain types of expenditures, we do not construct such measures, as we are not able to ascertain, with any degree of certainty, whether these techniques reduce or enhance the bias already present in our measures of fiscal decentralization. See, for example, Woller and Phillips (1998) and Lin and Liu (2000).

<sup>11</sup> See McNab (2001) for an extended discussion of these data sets.

<sup>12</sup> See Hsiao (1986) and Baltagi (1995) for discussions of fixed effects estimators.

<sup>13</sup> We would prefer to examine the potential impact of fiscal decentralization on macroeconomic stability as proxied by the misery index (inflation rate plus unemployment rate). Unfortunately, we lack sufficient data on unemployment across countries and time to construct a misery index variable for inclusion in the panel data set. We must leave the construction of this measure to future research.

<sup>14</sup> We reject the null hypothesis of no serial correlation at the 1% significance level using a Durbin-Watson test for serial correlation. Respecifying the model in first differences, we fail to reject the null hypothesis of no serial correlation.

<sup>15</sup> See Hausman (1978), Hausman and Taylor (1981), Hsiao (1986), and Baltagi (1995).

<sup>16</sup> We also fail to reject the null hypothesis of exogeneity for openness to international trade, tax revenues as a percentage of GDP, population growth, and Gross Domestic Savings as a percentage of GDP.

<sup>17</sup> We instrument for the endogenous regressors using the two-period lagged level of the regressor in question. See Baltagi (1995) for a discussion of these instrumental variables approach with panel data.

<sup>18</sup> We fail to reject the null hypothesis that the time-specific effects are jointly equal to zero but are able to reject the null hypothesis for the country-specific effects and thus present the results for the one-way fixed country effects IV Within estimator in Table 2.

<sup>19</sup> See Barro (1990, 1991, 1999) and Mankiw, Romer, and Weil (1992), among many others.

<sup>20</sup> We would prefer to measure human capital using schooling data, however, panel data on education levels is currently not of sufficient quantity to include in the panel data set.

<sup>21</sup> We reject the null hypothesis of no serial correlation at the 1% significance level using a Durbin-Watson test for serial correlation. Respecifying the model in first differences, we fail to reject the null hypothesis of no serial correlation.