



WP/12/146

IMF Working Paper

Local Governments' Fiscal Balance, Privatization, and Banking Sector Reform in Transition Countries

Ernesto Crivelli

IMF Working Paper

Middle East and Central Asia Department

Local Governments' Fiscal Balance, Privatization, and Banking Sector Reform in Transition Countries

Prepared by Ernesto Crivelli¹

Authorized for distribution by Joël Toujas-Bernaté

June 2012

This Working Paper should not be reported as representing the views of the IMF.

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

Abstract

Several transition economies have undertaken fiscal decentralization reforms over the past two decades along with liberalization, privatization, and stabilization reforms. Theory predicts that decentralization may aggravate fiscal imbalances, unless the right incentives are in place to promote fiscal discipline. This paper uses a panel of 20 transition countries over 19 years to address a central question of fact: Did privatization help to promote local governments' fiscal discipline? The answer is clearly 'no' for privatization considered in isolation. However, privatization and subnational fiscal autonomy along with reforms to the banking system—restraining access to soft financing—may prove effective at improving fiscal balances among local governments.

JEL Classification Numbers: L33; H74; H77

Keywords: Fiscal decentralization; Privatization; Soft budget constraints; Transition

Author's E-Mail Address: Ecrivelli@imf.org

¹ I would like to thank Anna Bordon, Mariana Colacelli, Luc Eyraud, Davide Furceri, Christoph Klingen, Esther Perez Ruiz, and Bahrom Shukurov for helpful comments. I am grateful to Kia Penso and Kadia Kebet for excellent editorial work. The usual disclaimer applies.

| Contents | Page |
|---|------|
| I. Introduction | 3 |
| II. Decentralization, Fiscal Balances, and Privatization: Background..... | 5 |
| III. Empirical Specification and Data | 7 |
| A. Empirical Specification..... | 7 |
| B. Estimation..... | 7 |
| C. Data | 9 |
| IV. Results..... | 12 |
| V. Further Analysis..... | 15 |
| VI. Discussion and Conclusions | 17 |
| Tables | |
| 1. Main Results | 14 |
| 2. Robustness Results | 16 |
| A.1. Descriptive Statistics..... | 19 |
| B.1. Robustness to instrument choice: Main results..... | 21 |
| B.2. Robustness to Instrument Choice: Further Results | 22 |
| Appendices | |
| A. Data | 18 |
| B. Robustness to Instrument Choice..... | 20 |
| References..... | 23 |

I. INTRODUCTION

Along with the fundamental liberalization, privatization, and stabilization reforms, most of the transition economies in Eastern Europe and the Former Soviet Union have undertaken significant reforms to their intergovernmental fiscal systems during the past two decades (Bird et al., 2005; Dabla-Norris, 2006), in the firm belief that fiscal decentralization can potentially improve allocative efficiency (Oates, 1999). Subnational governments account for a growing share of public sector activity in most of the transition countries, where local government expenditures represented about 20 percent of general government expenditures in 2009. A significant concern for many countries as they contemplate further decentralization is, however, the potential impact on fiscal outcomes, and thereby on overall macroeconomic stability.

Indeed, a commonly held view in the literature is that fiscal decentralization may aggravate fiscal imbalances in cases where local governments are too dependent on central government financing through grants, coupled with high borrowing autonomy that allows them to leverage spending programs. Together, they can create coordination problems among levels of government that could be manifested in soft budget constraints (Kornai, 1979). This picture is not unfamiliar to many transition countries, where central government grants still represent a significant share of local government total revenues—on average, about 40 percent—and where countries have granted virtually unlimited borrowing powers to subnational governments.

Privatization of state-owned enterprises has also played an important role in local government finance, as many transition countries transferred ownership of some state enterprises to the subnational level (Bird et al., 2005). A key question, then, is whether privatization has helped local governments harden their budget constraints, thus inducing fiscal responsibility. The standard prescription for doing so has been that privatization of state-owned enterprises would imply less transfers to these enterprises and thus less expenditure responsibilities. It has been argued, however, that privatization itself can do little to induce fiscal discipline in cases where soft financing cannot be contained (Kornai, 2001). A key aspect directly linked to the degree of borrowing autonomy of local governments in transition countries has been the financing of local budgets through the banking sector. If not accompanied by a comprehensive reform of the banking sector, privatization of only state-owned enterprises won't prevent local governments having access to soft credit to finance spending programs will result in fiscal indiscipline.

The purpose of this paper, therefore, is to explore the underlying question of fact: Has privatization of state-owned enterprises helped local governments in transition economies to consolidate their budgets? Using a dataset that includes annual data for 20 transition economies for the period 1991–2009, this paper finds empirical evidence supporting the hypothesis that indeed, in a context of fiscal decentralization, privatization alone may not be an appropriate device for inducing fiscal discipline at the local level. However, reforms to the banking sector, and thereby preventing access to soft financing, may prove effective at hardening the budget

constraints of local governments when coupled with privatization and subnational fiscal autonomy.

Surprisingly, this question has received almost no systematic empirical attention. With the exception of a descriptive paper by Alm and Buckley (1994) on the link between decentralization, privatization, and the solvency of the city of Budapest, and multiple country studies describing the challenges of decentralization in transition countries (as in Bird et al., 2005; Dabla-Norris, 2006), all the empirical attention to the extent to which privatization may affect fiscal outcomes has focused on federal government issues (as documented by Davis et al., 2000), excluding subnational governments and aspects related to intergovernmental relations.¹ It appears, therefore, that no formal econometric assessment has been conducted of the extent to which, conditional on other market-oriented reforms, transition countries have in fact succeeded in inducing fiscal discipline at the level of local governments through increased fiscal autonomy, privatization, and banking sector reforms. Such an assessment is what the present paper intends to provide, by considering the experience in a unique panel of countries.

An important reason for empirical work in this area remaining so limited appears to be the relative paucity of reliable data at the subnational level, the length of the data base (usually too short to produce reliable results in the early stages of transition), as well as the scarcity of good indicators for privatization and banking sector reform. To overcome these deficiencies, this paper uses what it is believed to be a reasonably reliable and broad (unbalanced) panel dataset covering local government finances for 20 transition economies over the period 1991–2009, and a series of indicators reflecting the extent of reform. The essence of the empirical strategy consists in examining how local governments' cyclically-adjusted fiscal outcomes are affected by the interaction between privatization and subnational fiscal autonomy with banking sector reform, conditioning on other variables that are likely to be associated with the fiscal outcomes of local governments.

The plan of the paper is as follows. Section II sets out, against the theoretical background of key issues in fiscal decentralization, the empirical approach adopted in the paper. Section III presents the empirical specification and estimation strategy, and describes the dataset in more detail. The main empirical results are provided in Section IV, with further analysis for the purpose of additional robustness done in Section V. Section VI summarizes the results and evaluates their importance in the context of increasing fiscal decentralization.

¹ At firm level, Bonin and Schaffer (1995); Perotti and Carare (1997); Schaffer (1998); and more recently Bignebat and Gouret (2008) examine the banking sector's role in softening the budget constraint of state-owned enterprises.

II. DECENTRALIZATION, FISCAL BALANCES, AND PRIVATIZATION: BACKGROUND

Decentralization can give rise to coordination problems, and these may eventually be manifested in soft budget constraints (SBC) (Kornai, 1979; Kornai et al., 2003).² The expectation of federal bailouts in the event of a fiscal crisis weakens the budget constraint of subnational governments and induces them to behave strategically, selecting inefficient spending levels and overborrowing.

Fiscal misbehavior is more likely when a high share of local spending is financed from the common pool of federal resources, because the jurisdiction does not fully internalize the cost of local expenditures (Aizenman, 1998; Sanguinetti and Tommasi, 2004), creating the appearance that local public expenditures are funded by nonresidents (Weingast et al., 1988; Rodden, 2002). The gap between subnational governments' own revenue sources and their expenditure responsibilities that is filled by federal grants is usually known as vertical fiscal imbalance (VFI). Even in the case where local governments have engaged in unsustainable spending programs, it may be difficult for the federal government to ask for corrective measures when the local government has limited ability to raise revenues.³ As a result, the federal government may feel compelled to step in and provide additional grants, creating further incentives for fiscal misbehavior at the local level.

The link between large dependence on grants financing and local government fiscal indiscipline becomes evident, however, in cases where subnational governments enjoy a high degree of borrowing autonomy. The coexistence of both, large VFIs and relatively unrestricted access to borrowing undermines the effectiveness of markets as a disciplining device. At low levels of VFI, local governments are fully responsible for their spending commitments and, therefore, creditors will punish high indebtedness with higher interest rates as they see subnational governments' obligations as "sovereign." With large VFIs, however, subnational governments have an incentive to borrow beyond socially optimal levels, while shifting part of the cost of repayment onto others outside the jurisdiction. For that reason, a wide range of strategies have been adopted to limit subnational borrowing autonomy (Ter-Minassian and Craig, 1997; Sutherland et al., 2005).

Privatization of state-owned enterprises is also linked to subnational finance. Local governments have played a major role in promoting or inhibiting privatization, in countries where ownership was transferred from the center to the subnational level. While the objective of

² Maskin (1999) and Kornai et al. (2003) provide excellent surveys of the growing literature on SBC. Crivelli et al. (2011) provide an updated review of the literature, including the determinants of SBC, and the motivations for federal government intervention.

³ Fiscal autonomy would also imply that local governments enjoy enough discretion to set tax rates and define tax bases.

privatization has not always been fiscal in nature,⁴ it may affect subnational fiscal balances through several channels, potentially limiting the amount of subsidies that governments provide to keep state-owned enterprises operating, but also reducing revenues such as profits and taxes from enterprises transferred to local governments.⁵ Several authors (most prominently perhaps, Bird et al., 1995; and Kornai, 2001) argue that while it is very relevant and important, privatization of state-owned enterprises is only a necessary condition for improving fiscal balances of local governments, but it won't prevent local governments from behaving strategically when choosing spending levels,⁶ unless it is coupled with credible rules to prevent access to soft financing.⁷

Soft financing, understood as soft bank credit, usually from the state-owned banking sector, is perhaps the key instrument through which subnational governments and local state-owned enterprises have expanded borrowing access (Kornai, 2001), fuelling the SBC syndrome, and creating incentives for fiscal indiscipline.⁸ If not accompanied by a comprehensive reform of the banking sector, privatization of state-owned enterprises won't prevent local governments from having access to soft credit to finance spending programs, exacerbating the SBC syndrome. In such a case, local governments may find it optimal to continue providing subsidies to privatized firms, if the social burden associated with the firms' potential failure is substantial (Lin and Li, 2008). Finally, in the event of a fiscal crisis, local governments may still expect the federal government to continue rescuing them if the federal government itself enjoys access to soft financing from the banking sector. Only banking sector reform can sever the connection between borrowing autonomy and high VFI, on the one hand, and between the enterprises and the state on the other, and thereby provide the right incentives to promote subnational fiscal discipline.

⁴ Besides fiscal consolidation, privatization schemes have been adopted, for, among other reasons, achieving gains in economic efficiency, attracting investment, improving corporate efficiency, and liberalizing key sectors such as telecommunications and energy. For excellent surveys on the several effects of privatization, see also Megginson and Netter (2001), Svejnar (2002), and Estrin et al. (2009).

⁵ Special tax treatments for some economic sectors and substantial accumulation of tax arrears may have also worsened fiscal outcomes of local governments from the revenue side in the context of privatization.

⁶ Theory seems inconclusive, suggesting that fiscal decentralization can be either a substitute for privatization (Tanzi, 2000), or that both should come along concurrently to achieve local government fiscal discipline (Akin et al., 2011).

⁷ This strategic behavior by local governments may also reflect the choice of enterprises to be privatized, as local governments may not be willing to privatize profit-making enterprises unless the federal government provides additional grants to cover the lost revenues.

⁸ Theoretical studies showing the links between bank financing and soft budget constraints include Berglof and Roland (1997, 1998), Perotti (1993), Dewatripont and Maskin (1995), and Quian and Xu (1998).

III. EMPIRICAL SPECIFICATION AND DATA

A. Empirical Specification

The estimating strategy consists of combining a measure of local government's fiscal 'autonomy' and privatization with banking sector reform indicators as mechanisms that provide the right incentives for fiscal prudence. Following the argument in the previous section, if local governments are less dependent on central government grants (than on their own revenue sources) to finance expenditures, fiscal prudence appears more likely. Privatization of state-owned enterprises enters the equation to the extent that it may have increase or reduced the fiscal burden of local governments, as the lower costs of subsidies to keep these firms in operation could have been offset by lower revenues from profits and taxes. In any event, neither fiscal autonomy nor privatizations are sufficient conditions for hardening the budget constraints of local governments. A high level of fiscal autonomy may induce fiscal misbehavior in the presence of soft financing. Interest centers on the extent to which a higher degree of fiscal autonomy, together with privatization, along with a comprehensive reform of the banking system, can help to contain the fiscal imbalances of local governments.

To test how these institutional factors may affect local governments' fiscal discipline, the estimating equation (1) considers local government's cyclically-adjusted budget balance $BBCA$ ⁹ as a function of local government fiscal autonomy FA , privatization PR , banking sector reform BAR , and a set of control variables in X , including also a lagged dependent variable to allow for plausible dynamics in policy adjustment (the empirics showing significant serial correlation in its absence), and allowing for interactions between FA , PR , and BAR .

$$\begin{aligned}
 BBCA_{it} = & \alpha_i + \beta_0 BBCA_{it-1} + \beta_1 FA_{it} + \beta_2 PR_{it} + \beta_3 FA_{it} \times PR_{it} + \\
 & + \beta_4 BAR_{it} + \beta_5 BAR_{it} \times PR_{it} + \beta_6 BAR_{it} \times FA_{it} + \beta_7 X_{it} + \mu_t + \varepsilon_{it}
 \end{aligned} \tag{1}$$

where $BBCA$ is cyclically-adjusted local government budget balance to GDP, while $i = 1, \dots, N$ and $t = 1, \dots, L$ are respectively country and time indicators (so that α_i and μ_t are country- and time-specific effects).

B. Estimation

The dependent variable in Eq. (1) is a measure of local government's cyclically-adjusted budget balance, whose change captures discretionary fiscal measures and, therefore, should be a better proxy for fiscal discipline. Following Fatas and Mihov (2003, 2006), local government's cyclically-adjusted budget balances are obtained by estimating Eq. (2) for each country:

⁹ Excluding privatization proceeds. The results in Section IV and Section V do not change qualitatively, however, if local government budget balances are used instead.

$$BB_{it} = \alpha_i + \beta_0 BB_{it-1} + \beta_1 \Delta Y_{it} + \epsilon_{it} \quad (2)$$

where BB is local government's budget balance, expressed relative to GDP , and ΔY is the first difference of GDP . The residuals of (2) for each country represent the discretionary component of fiscal policy¹⁰ and enter estimating equation (1) as the dependent variable $BBCA$.

While estimating Eq.(1), the presence of the lagged dependent variable creates difficulties for the fixed-effects estimator, such as correlation between $BBCA_{t-1}$ and the fixed effect, which translates into dynamic panel bias, and bias from any serial correlation in the ϵ_{it} . A further concern is the potential endogeneity of the privatization variable PR , as growing local government fiscal imbalances may have driven or accelerated the privatization process. Potential endogeneity of the banking sector reform variable BAR is likely too, as reform (and privatization) of the banking sector may have been seen as a fundamental step toward limiting the borrowing autonomy of subnational governments thereby imposing a ban on spending plans. Finally, endogeneity of FA should be considered possible. While most grant formulas include indicators of expenditure needs and tax capacity, it may be possible that some intergovernmental arrangements incorporate a fiscal gap component, meaning that a share of the grants allocated among local governments may be of a gap-filling nature.

To address these issues, results are reported for the fixed effects¹¹ and three further estimators: the two-stage least squares (2SLS) on the levels of Eq.(1), the difference and the system generalized method of moments (GMM), intended to address dynamic panel bias. The 2SLS estimator uses as instruments the first and second lag of PR , BAR , and FA . To the extent that these instruments are valid (as indicated by the Sargan test) this should deal with the potential endogeneity problem. The difference-GMM estimator takes differences in Eq.(1) to remove the fixed effects such that, in the absence of serial correlation in the ϵ , instruments based on second and more lags of PR , BAR , and FA are valid. A potential concern with difference-GMM, however, is proliferation and weakness of the instruments, leading to enhanced finite sample bias (toward OLS) and low power of the Hansen over-identification test. Blundell and Bond (1998) proposed the use of an extra moment conditions that rely on certain stationarity conditions of the initial observation. The system-GMM estimates the differenced and levels

¹⁰ Because there is no consensus in the literature on the appropriate methodology for the construction of a cyclically-adjusted measure of fiscal policy (Alesina and Perotti, 1996; Blanchard, 1993), a second method was employed using Hodrick- Prescott(1997) filters to estimate cyclically-adjusted budget balances, expressed in percent of potential GDP. The results in Section IV and Section V do not change qualitatively when this alternative method is used.

¹¹ Hausman tests favor the fixed effects over the random-effects estimator, so the latter are not reported. Chow (1960), and Roy (1957), Zellner (1962), and Baltagi (2008) tests for poolability support the panel specification with homogeneous (not country-specific) slope coefficients, since the joint significance of the interactions between regressors and country dummies is rejected. For Chow test, $F(104,154) = 0.8$ with P-value = 0.89, whereas for Roy-Zellner-Baltagi test, $X2(107) = 114.8$ with P-value = 0.28.

equations as a system, using lagged changes as instruments in the later. It has been shown that when these conditions are satisfied, the resulting system-GMM estimator has much better finite sample properties in terms of bias and root mean squared error than the difference-GMM estimator.

Finally, since the dependent variable is based on estimates, the regression residuals can be thought of as having two components: a sampling error (difference between the true value of the dependent variable and its estimated value) and the random shock. This leads to an increase in the standard deviation of the estimates, lowering the significance of the estimates (Afonso et al., 2009). This provides additional reassurance for those coefficients that are found statistically significant. Finally, to correct for potential heteroskedasticity in some of the estimations, robust standard errors, clustered by country (and across time), are used.

C. Data

The unbalanced panel dataset includes annual data for 20 post-socialist transition economies for the period 1991–2009. Data on local governments' budget balances, as well as different indicators on decentralization, were collected from the Government Finance Statistics (GFS) produced by the IMF. At first, countries in the sample present a relatively large degree of expenditure decentralization, at about 22 percent on average for the period 2000–09. The level of fiscal autonomy, defined as the difference between total local government revenue and grants (expressed in percent of total local government revenue) is also relatively large, averaging 62 percent. It is noteworthy, however, that while expenditure decentralization has remained stable in the past 20 years, the source of the financing required to meet the assigned expenditure obligations has changed significantly, with fiscal autonomy deteriorating by 10 percentage points, on average, in the last decade.

The budget balance of local governments (measured in percent of local government's expenditures) averages a deficit of about 0.7 percent for the period 2000–09, but presents large variation across countries in the sample. Overall, local governments appear to have consolidated their budgets robustly from a budget deficit of about 5 percent, on average, in the 1990s. This may suggest that the adopted reforms (including privatization and banking sector reform) may have helped to harden the budget constraints of local governments.

To capture the depth of privatization and banking sector reform, the paper takes advantage of a series of indicators developed by the European Bank of Reconstruction and Development (EBRD). Data on general government as well as local government proceeds from privatization and private sector share on GDP were collected from the EBRD and GFS databases, and from the World Bank privatization database (for proceeds and number of events of banking sector privatization). While it occurs at different paces and with distinctive individual characteristics, the privatization process has taken place in all countries. This can be illustrated by the sizable amount of accumulated local governments' privatization proceeds, on average about 20 percent

of general government's privatization proceeds through 2009.¹² For the period 2000–09, local governments' annual privatization proceeds have been a very significant source of revenue, in many cases above 5 percent, on average, of the expenditure bill. An additional indication of the economic transformation is the increase in private sector share in GDP that has reached 70 percent, on average in 2009, from below 20 percent, on average in 1991.

For the econometric estimations, an indicator is constructed to capture the depth of privatization (*PR*) as in Gouret (2007) which includes three indicators of the EBRD: the two subjective indexes of large-scale privatization (LSP) and small-scale privatization (SSP), and the private-sector share of GDP. The LSP index is based on a score system and takes the value 1 when there is little private ownership, up to the value 4 when more than 50 percent of large-scale state-owned enterprises are in private ownership, and when significant progress has been achieved at the level of corporate governance of these enterprises. The SSP index is constructed following the same logic but considers only small companies. For the purpose of the empirical analysis, the *PR* variable is constructed based on the simple average of the three indicators, rescaled to take values between 0 and 1. This variable changes by country and on a yearly basis. For robustness purposes, two alternative indicators have been considered: (i) *WPR*: the LSP index weighted by the privatization proceeds; and (ii) *PRProceeds*: the local governments' privatization proceeds.

The banking sector reform variable (*BAR*) is based on the subjective index constructed by the EBRD on banking reform and interest rate liberalization. This index is based on information that captures the transformation of the banking system reflected by different indicators, such as the establishment of a two-tier system; significant liberalization of interest rates and credit allocation; limited use of directed credit or interest rate ceilings; and progress in the establishment of bank solvency and supervision regulations. Particularly relevant for the purpose of our empirical analysis are those indicators reflecting the extent to which there is significant lending to private enterprises, significant presence of private banks in the economy, and substantial financial deepening. For robustness purposes, two alternative indicators have been considered: (i) Asset share of foreign-owned banks (*F.Banks*): share of banks with foreign ownership exceeding 50 percent in total banking sector assets; and (ii) performing loans in the economy (*P.Loans*), which is the difference between total loans and nonperforming loans (in percent of total loans). The first of these variables reflects the degree of commitment to market reforms, and the fact that foreign-owned banks should finance only efficient projects based on objective criteria. The second formalizes the idea (as exposed by Kornai, 2001) that the higher the proportion of nonperforming loans in the credit stock of the economy, the softer the budget constraint on its corporate sector.

¹² Accumulated general government privatization proceeds were on average about 18 percent of GDP through 2009.

In this respect, banking sector reform (including privatization) has also taken place in Eastern Europe at different speeds and with particular characteristics. Privatization proceeds from the banking sector alone account for about 15 percent, on average, of the accumulated general government privatization proceeds for the period 2000–09, but they are above 30 percent in some countries in the region.

Most transition economies have introduced reforms aiming at increasing the size, stability, and efficiency of their banking sectors: banking supervision has been improved (Berglof and Bolton, 2002); substantial liberalization has been introduced to induce competition and increase intermediation (Bonin, Hasan, and Wachtel, 2005); and legislation has been updated to reduce credit risk and enhance transparency (Pistor, Raiser, and Gelfer, 2000). An illustration of the success of the banking reform process is the impressive decline in the share of nonperforming loans to the economy from an average of 18.5 percent in 1999 to an average of about 3 percent in 2007. Also in the past decade, interest rates and banks' intermediation spreads fell, leading to a substantial increase in the ratio of private credit to GDP, from about 30 percent to above 40 percent of GDP in Central and Eastern Europe, while doubling from about 10 percent to 20 percent in CIS countries.

Finally, the estimating equation (1) includes a group of control variables X that may potentially affect local government's fiscal outcomes, either through local government expenditures or revenues. Drawing on the extensive empirical literature modeling fiscal outcomes (see, as central examples, Stein (1998), Rodden (2002), and Baunsgaard and Keen (2010)), the following control variables are included: GDP per capita (*PCGDP*), potentially affecting the demand for public expenditure; local government's expenditure share (*EXPshare*, in percent of general government's total expenditures), reflecting the degree of decentralization, and also perhaps the wide range of expenditure activities; openness (*OPEN*, measured as the sum of the shares of imports and exports in GDP), which has been found to be robustly and positively associated with budget balances through its positive impact on revenues; inflation (*INF*), important in the first years of transition, with potentially powerful revenue effects, on both taxes and grants allocation, but also affecting the expenditure side through indexation and interest rates; the share of agriculture in GDP (*AGR*), reflecting the extent of an especially hard-to-tax sector; and population over 65 years of age (*POP65*), the so called "dependency ratio," potentially affecting local fiscal performance from both the revenue side and the expenditure side. Full details of the dataset and summary statistics are provided in Appendix A.

IV. RESULTS

This section reports the results of estimating Eq.(1) by the methods described in Section III.¹³ Table 1 presents the results. Column (1) reports the results for the fixed-effects specification.

Turning first to the control variables, the pattern of coefficients is broadly as expected. Openness is significant and contributes positively to the cyclically-adjusted budget balance of local governments (*BBCA*). Similarly, as expected, the dependency ratio (*POP65*) is significantly negatively related to *BBCA*. The lack of significance of per capita income may seem surprising, but other studies have found similar or even positive effects (Rodden, 2002). No strong prior emerges for the sign of the share of agriculture and inflation, because their potential positive effect on the allocation of grants may counteract the negative effects on tax revenues and higher expenditures. For the share of local expenditures, its significant positive relation with *BBCA* is taken as an indication of the potential problems associated with estimation using fixed effects (as noted in Section III). Serial correlation does not emerge as a concern.

Attention focus on the relationship between institutional aspects of fiscal decentralization and privatization reforms. As expected, there is little that fiscal autonomy or privatization can do to induce fiscal discipline at the local government level if soft financing cannot be avoided. While positively related with *BBCA*, both *FA* and *PR* are not statistically significant, and their interaction is even negative and significant. The latter may indeed be reflecting the fact that the loss of revenues associated with privatization of state-owned enterprises (through lower profits and taxes) more significantly affects the fiscal outcomes of local governments that are fiscally more independent and cannot substitute easily the loss of revenue with central government grants. Banking sector reform (*BAR*) in itself seems also insufficient to provide the right incentives (as reflected by its significant negative sign) in the absence of other institutional aspects of fiscal decentralization. However, the interaction of *FA* and *PR* with banking sector reform are both as expected positive and significant reflecting the importance of limiting access to soft financing along with institutional aspects of fiscal autonomy, and spending limits imposed by privatization of state-owned enterprises. All in all, the net effect of banking sector reform ($\beta_4+\beta_5+\beta_6$) is, as expected, highly significant and positively related to *BBCA*.

Column (2) reports the results of 2SLS estimation of the levels equation. The validity of the instruments does not seem to be a problem (as suggested by the Sargan test), and the implications are very similar to those in the fixed effects case. Again here, the interaction of *FA* and *PR* with banking sector reform and the net effect of banking sector reform are significantly positively related with *BBCA*.

¹³ All regressions include a full set of time dummies, results for which are omitted.

Column (3) presents the results using the difference-GMM estimator, which should produce fully consistent estimates. The diagnostics are satisfactory, with the Arellano-Bond (1991) test for first- and second-order serial correlation (M1 and M2) suggesting that the former is present but the latter is not, which is consistent with the underlying assumptions. Also the Hansen/Sargan statistics seem tolerable. Unlike the results in the first two columns, *PR* is also significant and positively related to *BBCA*, however, as in the previous results, this is counteracted by its interaction with fiscal autonomy. Reassurance is here provided for the hypothesis that it is privatization and fiscal autonomy associated with banking sector reform (with interaction variables positive and significant) that helps harden the budget constraints of local governments. As with the previous two estimators, the net effect of banking reform is also here significant and positively associated with *BBCA*.

The final column (4) presents system-GMM estimates that are also consistent, and show the same results as with difference-GMM. As with other estimators, the interaction of privatization and fiscal autonomy with banking reform, as well as the net effect of banking reform, are significant and positively related to *BBCA*. To illustrate the magnitude of the net effect of banking reform, the impact on *BBCA* of an increase in *BAR* by one standard deviation is estimated, for given values of *FA* and *PR*, using the system-GMM estimator. This implies an improvement in *BBCA* equivalent to about 1¼ points of GDP, on average. This effect is significant considering that one standard deviation of *BAR* is the average change in the indicator during 2005–09 (a five-year period), and considering also that the system-GMM estimator presents the most conservative coefficient for the net effect of banking reform. Interestingly, those countries with pending reforms to their banking systems are, on average, one standard deviation below the maximum possible score for *BAR*, implying that a significant improvement in local government budget balances is potentially associated with putting forward the reforms to their banking sector. As documented in Appendix B, other apparently valid instrument choices for difference and system-GMM estimates produce similar qualitative results.

Table 1. Main Results^a

| | (1) | (2) | (3) | (4) |
|-------------------------------|---------------------|---------------------------|-------------------------------|-------------------------------|
| | Fixed effects | IV in levels ^b | Difference GMM ^c | System GMM ^d |
| <i>BBCA-I</i> | 0.877*** (0.040) | 0.210*** (0.071) | 0.765*** (0.074) | 0.523*** (0.026) |
| <i>FA</i> | 0.060 (0.047) | 0.142 (0.105) | 0.147 (0.146) | 0.083 (0.059) |
| <i>PR</i> | 0.071 (0.063) | 0.172 (0.128) | 0.726* (0.381) | 0.127** (0.056) |
| <i>FA x PR</i> | -0.233** (0.109) | -0.386** (0.173) | -0.885* (0.455) | -0.196** (0.089) |
| <i>BAR</i> | -0.219* (0.122) | -0.276** (0.110) | -0.924** (0.436) | -0.112* (0.057) |
| <i>BAR x PR</i> | 0.137** (0.058) | 0.155** (0.077) | 0.468** (0.246) | 0.053*** (0.019) |
| <i>BAR x FA</i> | 0.205* (0.117) | 0.271*** (0.103) | 0.906** (0.436) | 0.109* (0.070) |
| <i>Ln(PCGDP)</i> | 0.015 (0.009) | 0.021* (0.013) | -0.222*** (0.084) | -0.001 (0.002) |
| <i>EXPshare</i> | 0.041* (0.023) | 0.044 (0.064) | 0.003 (0.021) | 0.004 (0.010) |
| <i>OPEN</i> | 0.019* (0.009) | 0.013* (0.007) | -0.014 (0.027) | 0.003 (0.002) |
| <i>Ln(INF)</i> | -0.003* (0.002) | 0.001 (0.001) | -0.008 (0.009) | 0.005 (0.005) |
| <i>AGR</i> | 0.013 (0.017) | 0.008 (0.040) | -0.095 (0.191) | -0.006 (0.024) |
| <i>POP65</i> | -0.006* (0.004) | -0.007** (0.002) | -0.036** (0.016) | -0.001 (0.001) |
| $\beta_4+\beta_5+\beta_6$ | 0.123*** (0.029) | 0.149*** (0.045) | 0.450*** (0.129) | 0.050*** (0.01) |
| Serial correlation (p value) | 0.281 | | | |
| M1 (p value) | | | 0.095 | 0.154 |
| M2 (p value) | | | 0.201 | 0.221 |
| Over-identification (p value) | | Sargan: 0.216 | Hansen: 1.00 Sargan: 0.364 | Hansen: 1.00 Sargan: 0.364 |
| No. of observations | 249 | 249 | 211 | 237 |
| No. of instruments | | 49 | 62 | 127 |
| No. of countries | 20 | 20 | 20 | 20 |

Notes:

^a Dependent variable is the cyclically-adjusted local government budget balance to GDP. Full set of year dummies in all regressions. Robust standard errors, clustered by country, in parenthesis; ***(**,*) indicate significance at 1(5,10) percent.

^b Using first and second lags of *FA*, *PR*, and *BAR*, and interactions as instruments.

^c One step, instruments based on second lags of *BBCA*, *FA*, *PR*, and *BAR*.

^d Instruments based on first lag of differences in *BBCA*, *FA*, *PR*, and *BAR* in levels equation, and second lags of their levels in the differenced equation.

V. FURTHER ANALYSIS

While the previous section has provided a sense of robustness across estimators (and instrument choice), the focus here is on alternative indicators for privatization and banking sector reform. For this purpose, only difference-GMM and system-GMM estimates are provided, as no significant difference from other models arises, but with the advantage that the estimates should be fully consistent. Table 2 presents the results. In all cases, diagnostics are satisfactory, with a tolerable value for the Hansen/Sargan tests, and with the Arellano-Bond (1991) test for first- and second-order serial correlation (M1 and M2) suggesting no second-order serial correlation.

Columns (1–2) present estimates for difference-GMM and system-GMM, respectively, in which the privatization variable considers local government cumulative privatization proceeds, in percent of GDP (*PRproceeds*) instead of the privatization index (*PR*) of the previous section. This has the potential advantage of being more objective, as it does not include judgment as in the elaboration of an index. To the extent that banking reform is significantly and positively related to *BBCA* only when coupled with *PRproceeds*, the results are similar to those presented in the previous section. Also, as in previous specifications, banking sector reform alone does not suffice (neither does fiscal autonomy nor privatization) to harden the budget constraints of local governments.

Columns (3–6) use a privatization variable (*WPR*) that combines both, an index and cumulative privatization proceeds, as explained in Section III. Columns (3–4) combine *WPR* with an alternative indicator for banking sector reform that takes the asset share of foreign-owned banks (*F.Banks*). While foreign-owned banks should be almost perfectly isolated from political circumstances when deciding on lending, thus reducing the extent of soft financing, this indicator has also the advantage previously mentioned, that it does not rely on indexing. The difference-GMM estimator in column (3) shows results similar to those presented in Section 4, with the interaction of *FA* and *WPR* with banking sector reform (*F.Banks*) significant and positively related to *BBCA*. System-GMM estimator in column (4) still presents a significant and positive coefficient for the interaction of *F.Banks* with *WPR*.

In columns (5–6), the Kornai (2001) hypothesis is empirically tested, to the extent that a higher share of nonperforming loans in the economy should be associated with soft financing, thus negatively impacting fiscal outcomes. For this purpose, a variable reflecting the share of performing (or good) loans is used in the estimation, as explained in Section III and combined with the privatization indicator *WPR*. While difference-GMM estimator (column 5) only finds the interaction of performing loans and fiscal autonomy to be significantly positively related to *BBCA*, the system-GMM results (column 6) are very similar to those in Section 4. The interaction of both fiscal autonomy and privatization with performing loans is significant and positively related to *BBCA*. This result confirms the hypothesis that imposing a mechanism devise for limiting access to soft financing (as reflected in the lower share of nonperforming loans), coupled with increased fiscal autonomy and privatization provides the right incentives to induce fiscal discipline at the local government level.

Finally, for all model specifications (columns 1–6) the coefficient of the privatization indicator alone is not statistically significant and its interaction with fiscal autonomy is either not statistically significant or negatively related to *BBCA*. This result is consistent with the hypothesis that privatization alone can do little to induce fiscal discipline at local government.

Table 2. Robustness Results

| Privatization with: | <i>PRproceeds</i> | | <i>WPR</i> | | | |
|----------------------------------|--------------------------------|-----------------------------|--------------------------------|----------------------------|--------------------------------|------------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | Difference GMM ^b | System GMM ^c | Difference GMM ^b | System GMM ^c | Difference GMM ^b | System GMM ^c |
| <i>BBCA-I</i> | -0.703*** (0.219) | 0.439*** (0.088) | -0.293 (0.244) | 0.518*** (0.042) | 0.013 (0.136) | 0.369*** (0.102) |
| <i>FA</i> | -0.325 (0.251) | -0.083 (0.082) | -0.019 (0.195) | -0.009 (0.032) | -0.399** (0.171) | -0.416 (0.257) |
| <i>Privatization</i> | 0.034 (0.060) | 0.001 (0.003) | 0.293 (0.301) | 0.008 (0.048) | 0.031 (0.027) | -0.062 (0.076) |
| <i>FA x Privatization</i> | -0.039* (0.020) | 0.002 (0.003) | -0.404 (0.447) | -0.041 (0.071) | -0.008 (0.022) | -0.085** (0.042) |
| <i>BAR</i> | -0.338 (0.358) | -0.094 (0.078) | | | | |
| <i>BAR x Privatization</i> | 0.049** (0.023) | 0.017** (0.009) | | | | |
| <i>BAR x FA</i> | 0.561 (0.485) | 0.116 (0.109) | | | | |
| <i>F.Bank</i> | | | -0.467 (0.304) | -0.063 (0.048) | | |
| <i>F.Bank x Privatization</i> | | | 0.245** (0.141) | 0.031* (0.019) | | |
| <i>F.Bank x FA</i> | | | 0.655* (0.387) | 0.076 (0.055) | | |
| <i>P.Loans</i> | | | | | -0.208 (0.131) | -0.348* (0.194) |
| <i>P.Loans x Privatization</i> | | | | | 0.015 (0.021) | 0.109** (0.067) |
| <i>P.Loans x FA</i> | | | | | 0.451** (0.202) | 0.524* (0.297) |
| M1 (p value) | 0.021 | 0.111 | 0.125 | 0.137 | 0.103 | 0.109 |
| M2 (p value) | 0.509 | 0.184 | 0.156 | 0.190 | 0.212 | 0.179 |
| Over-identification (p value) | Hansen:1.00 Sargan:0.634 | Hansen:1.00 Sargan:0.473 | Hansen:1.00 Sargan:0.06 | Hansen:1.00 Sargan:0.11 | Hansen: 1.00 Sargan:0.807 | Hansen: 1.00 Sargan:0.102 |
| No. of observations | 211 | 237 | 194 | 219 | 205 | 231 |
| No. of instruments | 47 | 96 | 57 | 119 | 46 | 125 |
| No. of countries | 20 | 20 | 20 | 20 | 20 | 20 |

Notes:

^a Dependent variable is cyclically-adjusted local government budget balance to GDP. Full set of year dummies and control variables in all regressions, results for which are omitted to preserve space. Robust standard errors, clustered by country, in parenthesis; ***(**,*) indicate significance at 1(5,10) percent.

^b Instruments based on second lags of *BBCA*, *FA*, *PRproceeds* (or *WPR*), and *F.Bank* (or *P.Loans*).

^c Instruments based on first lag of differences in *BBCA*, *FA*, *PRproceeds* (or *WPR*), and *BAR* (or *F.Bank*, or *P.Loans*) in levels equation, and second lags of their levels in the differenced equation.

VI. DISCUSSION AND CONCLUSIONS

Further fiscal decentralization in transition economies may be hindered unless appropriate intergovernmental arrangements are designed and effectively implemented to counteract incentives for subnational governments to fiscally misbehave. This paper has focused on the role of privatization of state-owned enterprises and banking sector reform as a mechanism to harden the budget constraint of local governments, thus inducing fiscal discipline.

Theory predicts that the combination of large vertical fiscal imbalances—dependence on central government financing through grants—with high borrowing autonomy, a picture that broadly reflects the reality of many transition economies, may generate incentives for higher subnational spending and overborrowing. With privatization of state-owned enterprises having played a significant role in local government finance, the question arises as to the extent to which privatization has provided the right incentives for avoiding fiscal profligacy. While theory in this regard is inconclusive, many authors have argued, based mostly on the experience of transition countries, that privatization is not a sufficient condition for fiscal discipline. Attention has consequently turned to the key aspect of soft financing. It has been argued that in the context of decentralization, privatization can induce subnational governments to contain fiscal deficits only if the design of intergovernmental relations avoids unlimited access to bank financing. As a result, a comprehensive reform of the banking sector should accompany privatization of state-owned enterprises to support fiscal discipline.

Using a dataset that includes local government data for 20 transition economies for the period 1991–2009, this paper finds empirical evidence supporting the hypothesis that indeed, privatization alone may not be an appropriate device for inducing fiscal discipline at the local level. However, reforms to the banking sector, preventing access to soft financing, are found effective at hardening the budget constraints of local governments when coupled with fiscal autonomy and privatization.

The results here do not point, however, to any simple solution to the challenges faced by transition economies in the ongoing fiscal decentralization reforms, with intergovernmental relations across countries following a very uneven process of reform in the last two decades. It points, however, to the potential importance of banking sector reform, along with privatization to assure fiscal sustainability of subnational governments, a key element to be considered in the progress toward successful fiscal decentralization.

APPENDIX A. DATA

The countries in the sample are the following: Armenia, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Mongolia, Poland, Romania, Russian Federation, Slovak Republic, Slovenia, and Ukraine.

Local government budget balance (*BB*) is taken from Government Finance Statistics (GFS), relative to GDP. Fiscal autonomy (*FA*) is calculated as the difference between local government total revenues and central government grants, relative to local government total revenues, both taken also from GFS. Privatization proceeds (*PRproceeds*) are local government proceeds from sales of nonfinancial assets, taken from GFS, yearly accumulated and expressed in percent of GDP. Other privatization indicators such as *PR* and *WPR* are constructed as indicated in the text, based on large-scale and short-scale privatization indicators, and the share of the private sector in GDP, all of them provided by the EBRD.

The banking sector reform variable (*BAR*) is based on the subjective index constructed by the EBRD on banking reform and interest rate liberalization, as indicated in the text. The indicator on performing loans (*P.Loans*) is the difference between total loans and non-performing loans (in percent of total loans). Nonperforming loans in percent of total loans is taken from the EBRD database. The indicator on asset share of foreign-owned banks (*F.Banks*) takes the share of banks with foreign ownership exceeding 50 percent in total banking sector assets, taken also from EBRD.

Inflation is the annual change in the CPI, taken from the International Financial Statistics (IFS) database, expressed in logs. Per capita GDP (*PCGDP*) is calculated in constant (2000) U.S. dollars, taken from the World Bank's World Development Indicators (WDI) database, expressed in logs. Share of agriculture (*AGR*) is the share of agriculture in aggregate value added, taken from the WDI database. Openness (*OPEN*) is calculated as imports plus exports in percent of GDP, taken from IFS database. Share of population above 65 years of age (*POP65*) is taken from the WDI database. Local government expenditure share (*EXPshare*) is local government expenditures, relative to general government total expenditures, taken from GFS database. Table A.1 summarizes the data.

Table A.1. Descriptive Statistics

| | | Observations | Mean | Maximum | Minimum | Std. Dev. |
|--|------------|--------------|---------|----------|---------|--------------|
| Budget Balance, local government (In percent of GDP) | BB | 289 | -0.15 | 5.41 | -11.72 | 1.40 |
| Cyclically Adjusted Budget Balance, local government (In percent of GDP) | BBCA | 289 | -0.01 | 5.59 | -11.53 | 1.39 |
| Fiscal Autonomy (In percent of local government revenues) | FA | 289 | 65.63 | 100.00 | 16.91 | 16.86 |
| Local Government Privatization Proceeds, Accumulated (In percent of GDP) | PRproceeds | 289 | 1.79 | 13.24 | 0.00 | 2.19 |
| Privatization Index | PR | 289 | 0.79 | 0.95 | 0.30 | 0.16 |
| Privatization Index weighted by Privatization Proceeds | WPR | 289 | 0.53 | 1.00 | 0.00 | 0.33 |
| Bank Reform Index | BAR | 287 | 0.71 | 1.00 | 0.25 | 0.19 |
| Asset share of foreign-owned banks (In percent) | F.Banks | 254 | 47.94 | 99.40 | 0.00 | 32.30 |
| Performing Loans (In percent of total loans) | P.Loans | 272 | 89.10 | 99.80 | 28.00 | 11.54 |
| Inflation (In percent) | INF | 289 | 38.94 | 2221.00 | -1.10 | 169.07 |
| Per capita GDP (2000 USD) | PCGDP | 289 | 3366.34 | 13788.81 | 227.15 | 2771.28 |
| Share of Agriculture in GDP (In percent) | AGR | 285 | 11.75 | 52.20 | 2.30 | 10.18 |
| Expenditure Share, local governments (In percent of general government expenditures) | EXPshare | 260 | 22.89 | 90.66 | 5.01 | 10.56 |
| Openness (In percent of GDP) | OPEN | 289 | 104.56 | 203.20 | 44.25 | 31.08 |
| Share of population above 65 years of age | POP65 | 289 | 12.81 | 17.68 | 3.74 | 3.43 |

APPENDIX B. ROBUSTNESS TO INSTRUMENT CHOICE

The results reported in Table 1 and Table 2 for the difference and system-GMM estimators reflect the use of the second lag of *BBCA*, *FA*, *PR* (or *PRproceeds*, or *WPR*), and *BAR* (or *F.Banks*, or *P.Loans*) as instruments. This appendix provides some robustness to the extent of instrument choice by adding second to third lags of the above mentioned variables. Table B.1 and Table B.2 present the results for the difference-GMM and system-GMM estimators, respectively.

For the difference-GMM estimator (Table B.1), in all model specifications privatization alone is not significant when explaining *BBCA*, and its interaction with fiscal autonomy is either negative or not significant. As in previous results, however, the interaction of privatization with banking sector reform (columns 1–3) and the interaction of fiscal autonomy with banking sector reform (columns 1,2, and 4) are significant and positively related to *BBCA*.

For the system-GMM estimator (Table B.2), only in column (1), the coefficient of privatization is significant and positively related to *BBCA* when considered in isolation. Again here, interaction of privatization with banking sector reform is significant and positively related to *BBCA* for all model specifications except for column (3) for which the Hansen statistic shows signs of misspecification. Fiscal autonomy is significant and presents the expected positive sign when considered in isolation (in column (1)) and when interacted with performing loans (in Column 4).

Table B.1. Robustness to instrument choice: Main results^a

| Privatization with: Laglimits ^b | <i>PR</i> | | <i>PRproceeds</i> | | <i>WPR</i> | |
|---|---------------------|--------------------|--------------------|---------------------|------------|-----|
| | 2 3 | 2 3 | 2 3 | 2 3 | 2 3 | 2 3 |
| | (1) | (2) | (3) | (4) | | |
| <i>BBCA-1</i> | 0.228*** (0.083) | 0.043 (0.109) | 0.089 (0.096) | 0.094 (0.175) | | |
| <i>FA</i> | -0.031 (0.082) | -0.212* (0.129) | -0.029 (0.033) | -0.354** (0.141) | | |
| <i>Privatization</i> | 0.068 (0.114) | -0.006 (0.014) | -0.030 (0.040) | 0.029 (0.058) | | |
| <i>FA x Privatization</i> | -0.357* (0.199) | -0.001 (0.005) | 0.018 (0.053) | 0.142** (0.063) | | |
| <i>BAR</i> | -0.554** (0.247) | -0.233* (0.138) | | | | |
| <i>BAR x Privatization</i> | 0.301** (0.134) | 0.027* (0.014) | | | | |
| <i>BAR x FA</i> | 0.507** (0.252) | 0.299* (0.190) | | | | |
| <i>F.Bank</i> | | | -0.046 (0.052) | | | |
| <i>F.Bank x Privatization</i> | | | 0.072** (0.037) | | | |
| <i>F.Bank x FA</i> | | | 0.093 (0.080) | | | |
| <i>P.Loans</i> | | | | -0.089 (0.063) | | |
| <i>P.Loans x Privatization</i> | | | | -0.078 (0.069) | | |
| <i>P.Loans x FA</i> | | | | 0.308** (0.152) | | |
| M1 (p value) | 0.089 | 0.138 | 0.090 | 0.101 | | |
| M2 (p value) | 0.161 | 0.120 | 0.109 | 0.150 | | |
| Hansen (p value) | 0.075 | 0.103 | 0.041 | 0.139 | | |

Notes:

^a Dependent variable is cyclically-adjusted local government budget balance to GDP. Full set of year dummies and control variables in all regressions. Robust standard errors, clustered by country, in parenthesis; ***(**,*) indicate significance at 1(5,10) percent.

^b Laglimits means lagged levels 2 to 3 used in GMM difference equation. The estimates reported in Tables 1 and 2 are laglimits (2 2).

Table B.2. Robustness to Instrument Choice: Further Results^a

| Privatization with: Laglimits ^b | <i>PR</i> | | <i>PRproceeds</i> | | <i>WPR</i> | |
|---|---------------------|---------------------|---------------------|----------------------|------------|---|
| | 2 | 3 | 2 | 3 | 2 | 3 |
| | (1) | (2) | (3) | (4) | | |
| <i>BBCA-I</i> | 0.484*** (0.038) | 0.432*** (0.048) | 0.532*** (0.013) | 0.437*** (0.057) | | |
| <i>FA</i> | 0.107*** (0.030) | -0.060 (0.065) | -0.015 (0.019) | -0.240*** (0.074) | | |
| <i>Privatization</i> | 0.166*** (0.060) | -0.016* (0.009) | -0.021 (0.016) | -0.001 (0.042) | | |
| <i>FA x Privatization</i> | 0.220** (0.095) | -0.001 (0.003) | 0.012 (0.020) | -0.026 (0.024) | | |
| <i>BAR</i> | -0.019 (0.048) | -0.085 (0.066) | | | | |
| <i>BAR x Privatization</i> | 0.044* (0.027) | 0.017** (0.009) | | | | |
| <i>BAR x FA</i> | 0.105 (0.088) | 0.096 (0.090) | | | | |
| <i>F.Bank</i> | | | -0.008 (0.016) | | | |
| <i>F.Bank x Privatization</i> | | | 0.012 (0.010) | | | |
| <i>F.Bank x FA</i> | | | 0.008 (0.021) | | | |
| <i>P.Loans</i> | | | | -0.159** (0.064) | | |
| <i>P.Loans x Privatization</i> | | | | 0.014** (0.006) | | |
| <i>P.Loans x FA</i> | | | | 0.277*** (0.085) | | |
| M1 (p value) | 0.149 | 0.133 | 0.151 | 0.128 | | |
| M2 (p value) | 0.224 | 0.202 | 0.205 | 0.193 | | |
| Hansen (p value) | 0.087 | 0.142 | 0.000 | 0.112 | | |

Notes:

^a Dependent variable is cyclically-adjusted local government budget balance to GDP. Full set of year dummies and control variables in all regressions. Robust standard errors, clustered by country, in parenthesis; ***(**,*) indicate significance at 1(5,10) percent.

^b Laglimits means lagged levels 2 to 3 used in system-GMM equation. The estimates reported in Tables 1 and 2 are laglimits (2 2).

REFERENCES

- Afonso A., L. Agnello, and D. Furceri, 2009, "Fiscal policy responsiveness, persistence, and discretion," *Public Choice* 145, pp. 503–30.
- Aizenman, J., 1998, "Fiscal Discipline in a Union," in Sturzenegger, F. and M. Tomassi (eds.), *The Political Economy of Reform* (Boston: MIT Press).
- Akin, Z., Z. Cevik, and B. Neyapti, 2011, "Does Fiscal Decentralization Promote Fiscal Discipline?" Discussion Paper 11/01, Department of Economics, Bilkent University.
- Alesina, A. and R. Perotti, 1996, "Fiscal Expansions and Adjustment in OECD Economies," *Economic Policy* 21, pp. 205–40.
- Alm, J., and R. Buckley, 1994, "Decentralization, privatization, and the solvency of local governments in reforming economies: The case of Budapest," TWURD Working Paper 13/94 (Washington: The World Bank).
- Arellano, M., and S. Bond, 1991, "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations," *Review of Economic Studies* 58, pp. 277–97.
- Baltagi, B., 2008, *Econometric Analysis of Panel Data*, 4th Edition (Hoboken, NJ: Wiley).
- Baunsgaard, T., and M. Keen, 2010, "Tax revenue and (or?) trade liberalization," *Journal of Public Economics* 94, pp. 563–77.
- Berglof, E., and G. Roland, 1997, "Soft budget constraints and credit crunches in financial transition," *European Economic Review* 41, pp. 807–17.
- Berglof, E., and G. Roland, 1998, "Soft budget constraints and banking in transition economies," *Journal of Comparative Economics* 26, pp. 18–40.
- Berglof, E. and P. Bolton, 2002, "The Great Divide and Beyond: Financial Architecture in Transition," *Journal of Economic Perspectives* 16, pp. 77–100.
- Bignebat, C., and F. Gouret, 2008, "Determinants and consequences of soft budget constraints," *The Economics of Transition* 16(3), pp. 503–35.
- Bird, R., R. Ebel, and C. Wallich (eds.), 2005, "*Decentralization of the Socialist State: Intergovernmental finance in transition economies*," World Bank Regional and Sectoral Studies (Washington: The World Bank).

- Blanchard, O., 1993, "Suggestions for a New Set of Fiscal Indicators," in H. Verbon and F. van Winden, editors, *The New Political Economy of Government Debt* (Amsterdam: Elsevier).
- Blundell, R. and S. Bond, 1998, "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models," *Journal of Econometrics* 87, pp. 115–43.
- Bonin, J., and M. Schaffer, 1995, "Banks, Firms, Bad Debts and Bankruptcy in Hungary 1991–94," *Közgazdasági Szemle* 43, pp. 93–113.
- Bonin, J, I. Hasan, and P. Wachtel, 2005, "Bank Performance, Efficiency and Ownership in Transition Countries," *Journal of Banking and Finance* 29, pp. 31–53.
- Chow, C., 1960, "Tests of Equality between Sets of Coefficients in Two Linear Regressions," *Econometrica* 28, pp. 591–605.
- Crivelli, E., A. Leive, and T. Stratmann, 2011, "Subnational health spending and soft budget constraints in OECD countries," IMF Working Paper 10/147 (Washington: International Monetary Fund).
- Dabla-Norris, E., 2006, "The challenge of Fiscal Decentralization in Transition Countries," *Comparative Economic Studies* 48, pp. 100–31.
- Davis, J., R. Ossowsky, T. Richardson, and S. Barnett, 2000, "Fiscal and macroeconomic impact of privatization," IMF Occasional Paper 194, (Washington: International Monetary Fund).
- Dewatripont, M., and E. Maskin, 1995, "Credit and efficiency in centralized and decentralized economies," *Review of Economic Studies* 62, pp. 541–55.
- Estrin, S., J. Hanousek, E. Kocenda, and J. Svejnar, 2009, "The Effects of Privatization and Ownership in Transition Economies," *Journal of Economic Literature* 47(3), pp. 699–728.
- Fatas, A. and I. Mihov, 2003, "The case for restricting fiscal policy discretion," *The Quarterly Journal of Economics* 118(4), pp. 1419–47.
- Fatas, A. and I. Mihov, 2006, "The macroeconomics effects of fiscal rules in the US States," *Journal of Public Economics* 90(1-2), pp. 101–17.
- Gouret, F., 2007, "Privatization and output behavior during the transition: Methods matter!" *Journal of Comparative Economics* 35(1), pp. 3–34.

- Hodrick, R. and E. Prescott, 1997, "Postwar U.S. Business Cycles: An Empirical Investigation," *Journal of Money, Credit, and Banking* 29 (1), pp. 1–16.
- Kornai, J., 1979, "Resource-constrained versus demand-constrained systems," *Econometrica* 47, pp. 801–19.
- Kornai, J., 2001, "Hardening the budget constraint: The experience of the post-socialist countries," *European Economic Review* 45, pp. 1573–99.
- Kornai, J., E. Maskin, and G. Roland, 2003, "Understanding the Soft Budget Constraint," *Journal of Economic Literature*, Vol. 41(December): pp. 1095–136.
- Lin, J. and Z. Li, 2008, "Policy burden, privatization and soft budget constraint," *Journal of Comparative Economics* 36, pp. 90–102.
- Maskin, E., 1999, "Recent Theoretical Work on the Soft Budget Constraint," *American Economic Review*, Vol. 89 (March), pp. 421–25.
- Meggison, W. and J. Netter, 2001, "From State to Market: A Survey of Empirical Studies on Privatization," *Journal of Economic Literature*, Vol. 39, pp. 321–89.
- Oates, W., 1999, "An Essay on Fiscal Federalism," *Journal of Economic Literature*, Vol. 37, pp. 1120–49.
- Perotti, E., 1993, "Bank lending in transition economies," *Journal of Banking and Finance* 17, pp. 1021–32.
- Perotti, E., and O. Carare, 1997, "The Evolution of Bank Credit Quality in Transition: Theory and Evidence from Romania," CERT Discussion Papers 9702, Centre for Economic Reform and Transformation, Heriot Watt University.
- Pistor, K., M. Raiser, and S. Gelfer, 2000, "Law and Finance in Transition Countries," *Economics of Transition* 8, pp. 325–68.
- Quian, Y., and C. Xu, 1998, "Innovation and bureaucracy under soft budget and hard budget constraints," *Review of Economic Studies* 65, pp.151–64
- Rodden, J., 2002, "The Dilemma of Fiscal Federalism: Grants and Fiscal Performance around the World," *American Journal of Political Science*, Vol. 46 (July), pp. 670–87.
- Roy, S., 1957, *Some Aspects of Multivariate Analysis*, (Hoboken, NJ: Wiley).

- Sanguinetti, P., and M. Tommasi, 2004, "Intergovernmental Transfers and Fiscal Behavior: Insurance versus Aggregate Discipline," *Journal of International Economics* 62 (January), pp. 149–70.
- Schaffer, M, 1998, "Do firms in transition economies have soft budget constraints? A reconsideration of concepts and evidence," *Journal of Comparative Economics* 26, pp. 80–103.
- Stein, E., 1999, "Fiscal Decentralization and Government Size in Latin America," *Journal of Applied Economics* 2, pp. 57–91.
- Sutherland, D., R. Price, and I. Joumard, 2005, "Fiscal Rules for Sub-central Governments: Design and Impact," OECD Economics Department Working Papers, No. 465 (Paris: Organisation for Economic Co-operation and Development).
- Svejnar, J., 2002, "Transition Economies: Performance and Challenges," *Journal of Economic Perspectives* 16(1), pp. 3–28.
- Tanzi, V., 2000, "On Fiscal Federalism: Issues to Worry About," mimeo, Fiscal Affairs Department (Washington: International Monetary Fund)
- Ter-Minassian, T., and J. Craig, 1997, "Control of Subnational Borrowing," in Ter-Minassian, T. (ed.), *Fiscal Federalism in Theory and Practice* (Washington: International Monetary Fund).
- Weingast, B., K. Shepsle, and C. Johnsen, 1988, "The Political Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics," *Journal of Political Economy* 89, pp. 642–64.
- Zellner, A., "An efficient method of estimating seemingly unrelated regression and tests for aggregation bias," *Journal of the American Statistical Association* 57, pp. 348–368.