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Baskaran, Thushyanthan

University of Goettingen (Gottingen) - Department of Economics

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Thushyanthan Baskaran*

University of Goettingen

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Abstract

A problematic feature of the existing empirical literature on the relationship between revenue decentralization (RD) and inflation is the use of inaccurate measures for RD. Using a newly constructed measure for RD that accounts for over-time changes in sub-national tax autonomy, this paper finds that RD leads to lower inflation.

Keywords: Fiscal decentralization, Inflation, Sub-national tax autonomy

JEL codes: E31, H29, H71

*tbaskar@uni-goettingen.de, Department of Economics, University of Goettingen, Platz der Goettinger Sieben 3, 37073 Goettingen, Germany, Tel: +49(0)-551-395-156, Fax: +49(0)-551-39-7417.

1 Introduction

There are several reasons why revenue decentralization (RD) could lead to lower inflation rates. One reason is that RD might increase the effectiveness of revenue collection, thereby reducing the need for governments to resort to inflation to deal with fiscal problems. A second reason is that in decentralized countries, the national government might have too little political power to induce the central bank to pursue inflationary policies.

On the other hand, there are also reasons why RD could lead to higher inflation. One important one is that RD might complicate policy coordination, resulting in a reduced ability of the public sector to react to inflationary pressures. Another reason is that price stability is a type of national public good. If a multitude of governments are responsible for providing this public good, prices might not be sufficiently stable in equilibrium (Treisman, 2000).

Given that the theoretical link between RD and inflation is ambiguous, an empirical literature on this question has recently emerged. Early papers by King and Ma (2001) and Neyapti (2004) found that RD reduces inflation, in particular in countries with independent central banks and/or traditionally low inflation rates. Thornton (2007), however, questions these findings. He argues that the King-Ma-Neyapti papers obtain this result only because they use an inaccurate measure for RD. This is a valid criticism since King-Ma-Neyapti construct their RD measures by simply dividing sub-national revenues by total government revenues. It has repeatedly been noted that such RD measures are problematic because they do not capture the extent of sub-national autonomy over their revenue sources (Rodden, 2004). More specifically, these measures do not take into account whether sub-national governments receive their revenues through taxes for which they can autonomously set rates and/or define bases, or through taxes whose rates and bases are effectively under the control of the central government. RD, however, is only a meaningful concept if sub-national governments have autonomous taxing powers.

Thornton (2007) uses a dataset provided by OECD (1999) to revisit the relationship between RD and inflation. In a nutshell, OECD (1999) classifies sub-national tax revenues in a given country into three broad categories. The first category are sub-national revenues

from taxes over which sub-national governments have significant control, i. e. taxes for which sub-national governments can either set rates or define bases or both. The second category are sub-national revenues from shared taxes for which the revenue split is either determined by sub-national governments or cannot be changed without their consent. The third category are all other sub-national tax revenues.

The ratio of sub-national tax revenues that fall into the first category to total government tax revenues arguably represents a more accurate measure of true level of RD in a country than the RD measures used by King-Ma-Neyapti because it takes the degree of sub-national tax autonomy into account. OECD (1999) calculates such ratios for 19 OECD countries for the year 1995. Using this measure of RD, Thornton (2007) analyzes the effect of RD and inflation in a panel regression study for these 19 OECD countries over the period 1980-2000. His results suggest, in contrast to the King-Ma-Neyapti papers, that there is no significant relationship between RD and inflation.

Even though Thornton's study takes the extent of sub-national tax autonomy into account, one problem with his RD measure is that it effectively postulates that sub-national tax autonomy has remained constant throughout the sample period in all countries. In this paper, I address this potentially problematic feature by using new panel data on RD constructed by Stegarescu (2005). The Stegarescu RD measure follows OECD (1999) and Thornton (2007) in that it is defined as the share of sub-national revenues from taxes for which sub-national governments can set rates or define bases to total government tax revenues. But in addition, the Stegarescu RD measure reflects over-time changes in sub-national tax autonomy. For example, when control over a certain tax shifts from the national to sub-national governments, it captures this change in taxing powers. Therefore, the Stegarescu RD measure represents an improvement over previously used RD measures.[1]

[1]However, the Stegarescu RD measure is not perfect either. For example, it does not control for unfunded mandates that are imposed by the central government on sub-national governments.

2 Data and methodology

Since OECD (1999) provides information regarding the extent of sub-national tax autonomy only for the year 1995, Thornton (2007) constructs what he calls a "reasonable annual time series proxy for the own-revenues over which sub-national governments have full discretion" for the 19 countries that are covered by the OECD study. In essence, he rescales a traditional RD measure, constructed as the share of sub-national revenues in total government revenues, by the share of sub-national revenues that were obtained from taxes over which sub-national governments had discretion *in 1995*.

Hence, Thornton effectively postulates that the extent of sub-national tax autonomy has remained constant in all 19 countries during the sample period[2]. As such, Thornton's RD measure does not capture changes in sub-national tax autonomy accurately and is likely to suffer from measurement error. It is well known that estimated coefficients of variables that are measured with error are biased towards zero when used as covariates in regression models (Greene, 2003, Ch. 5). Therefore, it is not surprising that Thornton's regressions indicate that RD is insignificant.

Figure 1 plots the average change in the share of sub-national to total government tax revenues against the average change in the Stegarescu measure during the 1980-2000 period for the 23 countries[3] included in the Stegarescu dataset.[4] As can be seen in this figure, most countries are either below or above the line through the origin, which suggests that a measure of RD whose variability is exclusively due to changes in the share of sub-national to total government tax revenues tends to underestimate changes in RD.[5]

[2]This is clearly a questionable assumption. For example, it is wrong for Spain and Belgium. These countries have, as a means to assuage separatist tendencies, started to grant significant fiscal autonomy to sub-national governments during the 1980s. This means that in these two countries, not only the share of sub-national tax revenues in total tax revenues has increased, but also the extent of sub-national tax autonomy.

[3]Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

[4]The data source for the share of sub-national to total government tax revenues as defined in this paper is the OECD's Revenue Statistics. Note that for several countries, the share of sub-national to total government tax revenues is lower than the equivalent Stegarescu RD measure. The reason is presumably that the OECD's Revenue Statistics classifies by default social security contributions as tax revenues (thereby leading to a greater denominator for the traditional RD measures) whereas Stegarescu excludes social security contributions from tax revenues.

[5]In fact, the Thornton measures will underestimate the true change even more than the traditional RD measure. To see why, define as $RD_{i,t}$ the share of sub-national in total government tax revenues for country i

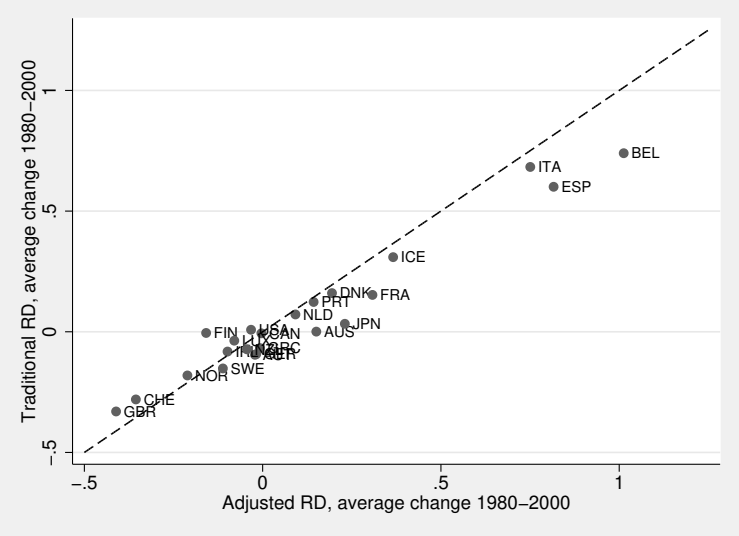

Figure 1: Average annual change in traditional and adjusted RD measures, 1980-2000: Data sources: OECD Revenue Statistics and Stegarescu (2005).

To investigate whether the insignificant effect of RD on inflation found in Thornton's study is indeed due to measurement error, I replicate his regressions using the Stegarescu RD measure. The dataset consists of 23 OECD countries and covers the period 1980-2000. I use a transformation of the inflation rate[6], i. e. $p = [\text{inflation rate}/(1 + \text{inflation rate})]$, as the dependent variable to deal with the fact that some countries have had very large inflation rates during the sample period, which may unduly influence the estimates. As control variables, I include government spending as share of GDP[7] (GOV), real GDP growth per capita[8] ($GROWTH$), the sum of export and imports divided by GDP to capture economic openness[9] ($OPEN$), and two measures of monetary policy: the Cukierman index of central bank independence[10] (CBI) and a dummy variable capturing whether or not a country is characterized by a fixed exchange rate regime[11] (FX_{fixed}).

in year t. Thornton's measure is constructed as $TRD = \alpha RD$, with $0 \leq \alpha \leq 1$. Thus, the change between two periods in Thornton's measure is $\Delta TRD = \alpha \Delta RD \leq \Delta RD$.

[6]Data source: OECD Key Short-Term Economic Indicators.

[7]Data source: Penn World Tables 7.0.

[8]Data source: Penn World Tables 7.0.

[9]Data source: Penn World Tables 7.0.

[10]Data source: Cukierman et al. (1992) and Polillo and Guillén (2005)

[11]Data source: Sturzenegger and Levi-Yeyati (2005)

3 Results

Table 1: Panel regressions for inflation with cross-section fixed effects, 1980-2000

	(I) b/se	(II) b/se	(III) b/se	(IV) b/se	(V) b/se	(VI) b/se
Constant	1.326***	1.399***	1.310***	1.389***	1.481***	1.573***
	(0.243)	(0.232)	(0.244)	(0.232)	(0.276)	(0.261)
RD	-0.010*		-0.010*		-0.008	
	(0.006)		(0.006)		(0.008)	
RD_{adj}		-0.016***		-0.016***		-0.019***
		(0.004)		(0.004)		(0.006)
CBI			0.011	0.011		
			(0.012)	(0.012)		
GROWTH	-0.018***	-0.019***	-0.018***	-0.019***	-0.017***	-0.018***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
OPEN	-0.001	-0.001	-0.002	-0.001	-0.002	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
GOV	-0.029	-0.026	-0.029	-0.026	-0.045*	-0.037
	(0.020)	(0.020)	(0.020)	(0.020)	(0.023)	(0.023)
FX_{fixed}					-0.079*	-0.047
					(0.047)	(0.047)
R^2	0.040	0.062	0.042	0.064	0.049	0.069
RMSE	0.257	0.254	0.257	0.254	0.266	0.263
Cross-sections	23	23	23	23	23	23
Observations	480	480	480	480	422	422

[1] Inflation is measured as $p = [\text{inflation rate}/(1 + \text{inflation rate})]$
[2] Stars indicate significance levels at 10%(*), 5%(**) and 1%(***)
[3] Standard errors in parentheses

Table 1 presents the regressions results. I report fixed effects regressions using the traditional RD measure (the share of sub-national to total government tax revenues), labeled *RD* in the regression table, and the Stegarescu RD measures that are adjusted for the extent of sub-national tax autonomy, labeled RD_{adj}.

The results show that while the traditional RD measure displays a negative and in two out of three regressions a weakly significant coefficient, the estimated coefficient for the Stegarescu RD measure is always negative and highly significant. These results suggest that when over-time changes in sub-national tax autonomy are explicitly taken into account, the negative effect of RD on inflation found in the King-Ma-Neyapti studies is reaffirmed. Consequently, it appears that the insignificance of the adjusted measure of RD in Thornton's study was primarily due to the fact that his adjustment did not accurately reflect changes in sub-national tax autonomy over time, and not because RD is genuinely insignificant for inflation.

4 Conclusion

This paper studies the effect of RD on inflation using an improved measure of RD that explicitly takes over-time changes in sub-national tax autonomy into account. The results show that when such changes are taken into account, RD has a significantly negative effect on inflation.

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