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Tax policy and the macroeconomy: Measurement, identification, and non-linearities ^{☆,☆☆}



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ABSTRACT

This paper examines the measurement and identification of tax policy shocks using novel multi-country databases on tax rates. On the measurement front, we argue that there is no substitute for using tax rates, a true policy instrument, as opposed to the much more popular revenue-based measures, such as cyclically adjusted revenues.

On the identification front, we argue that the narrative approach (whereby changes in tax rates are classified into exogenous or endogenous to the business cycle based on contemporaneous economic records) is the most accurate method. When properly measured and identified, tax multipliers for both industrial and developing countries are, on average, about -2. Further, we find important non-linearities with multipliers becoming bigger (in absolute value) as both the level of initial taxes and the size of tax changes become larger.

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Política tributaria y macroeconomía: medición, identificación y no linealidades

RESUMEN

Este artículo estudia la medición e identificación de los choques de política tributaria por medio de bases novedosas de datos multinacionales de tasas de impuestos. Desde el punto de vista de la medición, se argumenta que no existe un sustituto para las tasas de impuestos, un verdadero instrumento de política, en contraposición a las mediciones basadas en la renta mucho más populares, como la de renta ajustada por el ciclo.

En cuanto a la identificación, se argumenta que el enfoque narrativo (donde los cambios en las tasas fiscales se clasifican en exógenos o endógenos al ciclo coyuntural en función de los registros económicos contemporáneos) es el método más preciso. Cuando se miden e identifican adecuadamente, los multiplicadores fiscales para los países industriales y en desarrollo están, en promedio, en torno a -2. Asimismo, se encuentran no linealidades importantes al incrementar los multiplicadores (en valor absoluto) a medida que tanto el nivel de los impuestos iniciales como el tamaño de los cambios en los impuestos es mayor.

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1. Introduction

In the aftermath of the global financial crisis of 2008–2009 and ensuing recession, many governments across the world enacted aggressive countercyclical fiscal policies. More recently, and in the midst of sovereign debt crises in many Eurozone countries and the end of high commodity prices for many emerging markets, fiscal consolidation (the euphemism in vogue for fiscal contraction) has become the order of the day. Not surprisingly, this sequence of fiscal expansion followed by fiscal retrenchment has triggered a large academic literature on fiscal policy and, particularly, on fiscal multipliers.¹

Interestingly enough, most of the work has focused on the spending side of fiscal policy (as opposed to the revenue, or tax, side). The main reason behind this is probably the measurement problems that arise on the revenue side. While, in principle, data on government spending (the policy instrument) is easy to come by, the same is *not* true of tax policy. The readily available data covers tax *revenues*, a crude, at best, measure of policymakers' tax policy given that revenues are greatly influenced by the fluctuations of the tax base over the business cycle. While alternative measures have been used as a proxy for tax policy – particularly cyclically adjusted revenues – their validity remains in question. In other words, how to measure tax policy has been, in and of itself, a major research challenge.

Yet another critical research challenge has been how to identify in the data tax shocks that are *exogenous* to the business cycle. Failure to do so will, of course, invalidate any estimate of the effects of tax policy on output. As the workhorse of empirical work in this area – the Blanchard and Perotti (2002) identification method – has been repeatedly called into question, new identification techniques – most notably the narrative approach pioneered by Romer and Romer – have become more common. The big drawback of the Romer-Romer methodology, however, is the enormous demands in terms of time, effort, and data sources that it imposes on the researcher.

Based on our own work, this paper reviews the main problems and solutions related to measurement and identification of tax shocks.² Perhaps even more importantly, it will show how measurement and identification are much more than obscure technicalities that academics obsess over. In fact, correct measurement and identification of tax shocks critically affect the conclusions that one may draw regarding the cyclical properties of tax policy, the size of tax multipliers, and the presence of non-linearities in the effects of tax changes on output.

The paper proceeds as follows. Section 2 focuses on different measures that have been used in the literature to capture tax policy, in particular cyclically adjusted revenues. It argues, however, that there is really no good substitute for using tax *rates* which are, after all, the main tax policy instrument. Section 3 turns to the two main identification techniques that have been used to identify exogenous tax shocks (Blanchard–Perotti and the narrative approach) and argues that the narrative approach is the best one. Section 4 puts our machinery to use and estimates tax multipliers for a sample of 35 countries (18 industrial and 17 developing), showing the biases that would arise if the Blanchard–Perotti technique were used and illustrating the presence of important non-linearities. Specifically, the initial level of taxes and the size of the tax rate changes thus critically matter for the size of tax multipliers. Section 5 concludes.

¹ See, among many others, Auerbach and Gorodnichenko (2013), Barro and Redlick (2011), Hall (2009), Ilzetzki et al. (2013), IMF (2010), Perotti (2011), and Ramey (2011).

² Unless otherwise noticed, this review is based on Vegh and Vuletin (2015), Gunter, Riera-Crichton, Vegh, and Vuletin (2016) and Riera-Crichton et al. (2016).

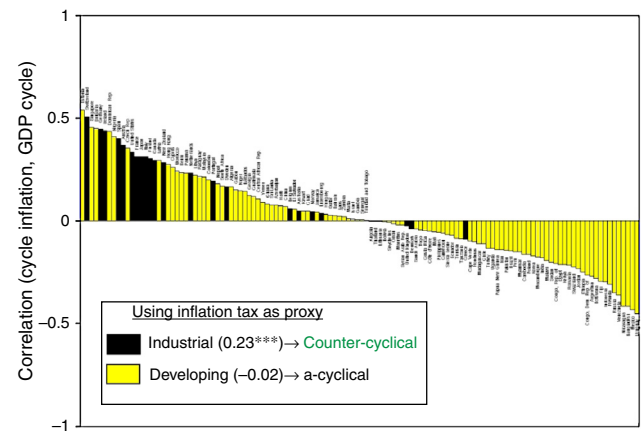


Fig. 1. Country correlations between the cyclical components of inflation tax and real GDP.

2. Measurement

An obvious, yet critical, observation is that policymakers' main policy instrument on the tax side is the tax *rate*. However, the most common measure of tax policy in multi-country databases is tax *revenues*. By definition,

$$\text{Tax revenues} = \text{tax rate} \times \text{tax base}.$$

While the tax rate is the policy instrument, tax revenues are a policy *outcome* since the tax base is heavily influenced by the business cycle and many other non-policy factors. The lack of easily available multi-country data on tax rates have led researchers to look for alternative measures of tax policy. Arguably, though, most measures are seriously flawed. We now take a look at the most common measures.

2.1. Inflation tax

Since it is very easy to compute, the inflation tax has often been used as a proxy for the overall stance of tax policy.³ The idea is, of course, not without merit since viewing inflation as “just another tax” can be traced all the way back to Phelps (1973) and has been greatly refined ever since (see, for example, Chari and Kehoe (1999)). There is, however, little empirical support for this idea.⁴ Perhaps at best, the inflation tax can be thought of as “just another tax” only when central bank independence is low, as argued by Delhy Nolinov and Vuletin (2014).

Fig. 1 shows the correlation between the cyclical components of the inflation tax and real GDP for 124 countries.⁵ Black (dark) bars denote industrial countries while yellow (light) bars indicate developing countries. The average correlation for industrial countries is 0.23 and significantly different from zero at the one percent level, indicating, in principle, countercyclical tax policy.⁶ In contrast, the average correlation for developing countries is not significantly different from zero, indicating an acyclical policy. As will be shown below, this result for developing countries is simply not right since

³ See, for instance, Gavin and Perotti (1997), Kaminsky, Reinhart, and Vegh (2004), and Talvi and Vegh (2005).

⁴ See, for example, Roubini and Sachs (1989), Poterba and Rotemberg (1990), and Edwards and Tabellini (1991).

⁵ The inflation tax is computed as $\pi/(1+\pi)$, where π is the inflation rate.

⁶ Throughout this paper, a positive (negative) correlation between the cyclical components of tax policy and real GDP is defined as countercyclical (procyclical) tax policy.

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