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Do fiscal transfers alleviate business tax competition? Evidence from Germany

Peter Egger [a,b,c], Marko Koethenbuerger [b,d], Michael Smart [b,e,*]

[a] Department of Economics, ETH Zurich, Weinbergstrasse 35, 8006 Zurich, Switzerland
[b] CESifo, Germany
[c] CEPR, United Kingdom
[d] Department of Economics, University of Copenhagen, Øster Farimagsgade 5, 1353 Copenhagen, Denmark
[e] Department of Economics, University of Toronto, 150 St. George Street, Toronto ON M5S 3G7, Canada

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ABSTRACT

According to theory, capacity equalization grants cause local governments to internalize the effects of their tax policies on revenues of neighboring jurisdictions and so raise equilibrium tax rates. This paper empirically analyzes the incentive effects of equalizing transfers on business tax policy by exploiting a natural experiment in the state of Lower Saxony which changed its equalization formula as of 1999. We resort to within-state and across-state difference-in-difference estimates to identify the reform effect on municipalities' business tax rates. Confirming the theoretical prediction, the reform had a significant impact on the municipalities' tax policy in the 4 years after the reform with the effect stabilizing in the fourth to fifth years. The finding is robust to various alternative specifications.

1. Introduction

It is a familiar shibboleth among public finance economists that decentralization of business taxation to lower-level governments can give rise to undesirable competition for mobile tax bases, and a "race to the bottom" in tax rates. Despite such concerns, a number of authors have recently observed that a system of intergovernmental transfers similar to those existing in many countries may in principle serve as a corrective device for local business tax competition, discouraging beggar-thy-neighbor tax policies and even under some conditions guaranteeing the efficiency of decentralized policies.

Under such transfer systems, known as capacity equalization or foundation grants, each government receives a transfer equal to the difference between a benchmark level of spending and the revenues it is deemed able to raise from its own tax bases at standard tax rates.[1] Thus a capacity equalization grant is an equity-enhancing device that insures that each jurisdiction can achieve some target level of spending determined by federal authorities.[2] As Smart (1998) and Koethenbuerger (2002) observed, however, an increase in local tax rates causes measured tax bases to decline, as taxpayers shift to other regions of the country or to other, more lightly taxed activities—and so causes capacity equalization transfers to rise. Thus the grants in effect subsidize tax increases and penalize tax cuts by local governments, and the effect is larger the greater equalization rate (sometimes referred to as "taxback rate") at which deficiencies in local fiscal capacity are compensated through the transfer formula.[3]

In this paper, we look for empirical evidence of the effects of equalization grants on local tax policy using data on a large set of German municipalities. The German case is an especially interesting one to examine, since municipalities there levy a tax on resident businesses, known as *Gewerbesteuer*, at rates that average about 16% of incomes. Since interjurisdictional mobility and the pressures of tax competition in such a setting should in principle be high, the equalization grant system may play an important, if unintended, role in maintaining current rates of taxation.

Our empirical approach relies on differences in tax-setting incentives facing municipalities that qualify for the systems of "regular" and "supplementary" equalization transfers, and in particular the court-

* Corresponding author. University of Toronto, Canada.
E-mail address: msmart@economics.utoronto.ca (M. Smart).

[1] The benchmark revenue level may be computed based on an estimate of fiscal needs of the recipient government or, under the representative tax system approach, it may be an average of actual revenues of all jurisdictions.

[2] The capacity equalization principle currently forms the basis for transfer systems in Australia, Canada, Germany, and Switzerland, as well as local school district finance formulas in many US states.

[3] This effect is clearest when considering a receiving region with a tax rate equal to the target tax rate at which capacity deficiencies are compensated: at this point, further increases in the rate will appear to create no deadweight loss to the region, as the increase in equalization transfers exactly compensates for marginal losses in private consumption. Thus equalization tends to drive tax rates above the target tax rate.

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ordered reforms in eligibility for supplementary transfers that occurred in the state of Lower Saxony (Niedersachsen) in 1999. Regular equalization transfers are available to municipalities whose fiscal capacity falls below a target level, while supplementary transfers are targeted at municipalities with considerably lower than average fiscal capacity. About three-quarters of the 1022 municipalities in Lower Saxony receive one or both types of equalization transfers. The effect of the 1999 reform was to reduce the equalization rate facing municipalities eligible for supplementary transfers, while increasing the equalization rate for other, ineligible municipalities. The former group of municipalities is therefore hypothesized to levy lower tax rates than the latter one in response to the reform.

Since the equalization formula itself implicitly defines the sets of municipalities that are eligible and ineligible for supplementary grants, identification of incentive effects of equalization must address the inherent problems of self-selection. The reason is that a jurisdiction can to some extent influence its fiscal capacity and thus the program type it is eligible for. The corresponding equalization transfer eligibility and tax policy are then both endogenous. This may generate a bias with simple mean comparison estimates of a transfer reform on the tax setting of the eligible municipalities relative to the non-eligible ones. To avoid this bias, we address the problem of self-selection by applying switching regression and matching procedures in the empirical analysis.

Two sources of heterogeneity enable the identification of the reform effect on tax rates. First, we compare the change in tax rates following the 1999 reform of municipalities eligible for supplementary transfers to that of a control group. The construction of the latter group should pay attention to the problem of self-selection into supplementary transfer eligibility. Second, since municipal equalization schemes differ among German states (Länder), one can identify the effect of a transfer reform by comparing the change in tax policy between municipalities in the reforming and a non-reforming state. In our analysis, we estimate the reform effect on municipalities in Lower Saxony by a comparison with the 2056 municipalities in the state of Bavaria, which experienced no reform in the equalization rates over our 1994–2004 sample period.

We find a significant effect of the reform on local business tax rates. As hypothesized, tax rates in eligible municipalities fell gradually in the 4 years following the reform, relative to ineligible municipalities' rates. The overall impact on the gap in business tax rates amounted to about 1% point, about 6% of their original level.

The magnitude of the effect appears to be roughly comparable to that estimated in the most closely related previous study, Buettner (2006). Buettner's estimates imply that a 10% point increase in the marginal contribution rate of the transfer system—the parameter α in the theoretical model of Section 2—is associated with an increase in local business tax rates of about 1.5% points. In our data, the share of tax base equalized decreased by 50% in the treatment group, relative to the control group, following the reform, implying a relative change in marginal contribution rates of about 6% and so an estimated impact of marginal contribution rates on taxes that is broadly similar to Buettner's estimate.

In contrast, Smart's (2007) estimates that a 50% increase in the inclusion rate of the Canadian equalization system are associated with an increase in affected tax rate of about 30% of base levels—much larger than the 6% increase estimated here. One explanation for this difference, consistent with the theory proposed by Smart (2007), is that the greater degree of horizontal tax competition among German municipalities tends to mitigate the tax-raising effect of equalization grants there.

Our estimated average treatment effect however masks important heterogeneity in response to the reform. According to our estimates, the magnitude of the estimated exogenous treatment effect is downward biased by about 83%. On the basis of the between-state difference in difference analysis, moreover, we conclude that the reform raised the average level of taxes in the reform state. These results are robust to alternative choices of the estimation procedures and the inclusion of alternative control variables.

The paper is organized as follows. Section 2 develops the theoretical hypotheses. Section 3 reviews the features of the German municipal equalization system and explains the reform effects from a theoretical perspective. The data are presented in Section 4, while Sections 5 and 6 summarize the empirical strategy and the results. The last section concludes with a summary of the major findings.

1.1. Previous literature

Empirical work on the incentive effects of equalization programs has evolved only recently. Baretti et al. (2002) provide evidence that the equalization system among German states implicitly taxes tax revenues allocated to states through revenue-sharing arrangements. States do not have explicit taxing powers. Thus, the effect of fiscal equalization on tax policy cannot be identified therein. Hayashi and Boadway (2001) report empirical results consistent with the idea that Canadian provinces conform in their tax rate setting to the tax rate of the province of Ontario which predominantly determines the average provincial tax rate used to compute the standard fiscal capacity in the Canadian equalization formula. Smart (2007) extends their approach and finds a robust effect of equalization on the tax policies of grant-receiving governments in Canada. Dahlby and Warren (2003) find a similar incentive effect for Australia.

Buettner (2006) examines the combined effect of vertical (revenue-sharing) and horizontal (equalization) grants on the tax policies of municipalities in the German state of Baden-Württemberg, and finds significant responses. The identification of this effect however relies on year-to-year changes and within-state/year cross-sectional variation in the equalization rate, which may be subject to the self-selection problems just discussed. More precisely, in the German system of fiscal arrangements, municipalities are required to levy a tax on their business tax bases that is transferred to higher-level (county and state) governments, as well as receiving payments from or contributing to the equalization grant system. Formally, vertical revenue sharing has an effect that is analogous to horizontal equalization, to the extent that county-level taxes are “passed on” to firms by municipalities. Buettner (2006) estimates the combined effect of the two. In contrast, our paper looks at the effect of horizontal equalization alone. As well, Buettner's approach to identifying the tax-raising effect relies on variation in county-level tax rates, which may be correlated with other determinants of tax rates of municipalities within the county. In contrast, our estimates are identified solely from the asymmetric changes in equalization rates induced by a state-wide policy reform, which entails a natural experiment.

The problem of self-selection has not yet surfaced at the heart of existing research on the incentive effects of equalization programs. Furthermore, previous work has not exploited information on a large-scale reform of the equalization system in one state of a federal union to identify the effect on tax rates. Only the latter enables an identification of the reform-induced effects on different groups of municipalities according to their transfer eligibility status. The reason is that, with the eligibility status being endogenous, intra-state variation in the outcome variable is required to identify the differential impact on treatment and control in the reform state, Lower Saxony, while inter-state variation is required to identify the average effect in the reform state (across-state difference in difference analysis).

2. Equalization and tax competition

To understand the incentive effects of equalization grants, consider a version of the model in Koethenburger (2002) and Bucovetsky and