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How low business tax rates attract MNE activity: Municipality-level evidence from Germany☆

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ABSTRACT

Most existing empirical evidences on the impact of profit taxation on multinational firm activity are based on cross-country data. One major drawback of such data is that countries differ not only with regard to taxes but also with other dimensions which might be hard to capture by means of observable characteristics. We compile a database of more than 11,000 municipalities in Germany to analyze the sensitivity of location decisions of foreign MNEs in Germany with respect to business tax rates which are levied directly by the municipalities. We find that higher business tax rates have a negative effect on three alternative measures of MNE activity, after controlling for other determinants of firm location decisions: the number of foreign MNEs, MNE employment, and MNE fixed assets. Our results suggest that tax competition among regional entities for foreign investors is a game of a few. In cross-section instrumental-variable regressions, a one-percent reduction of the municipal business tax rate (equivalent to a decline by about 0.14 percentage points) leads to an increase in the number of legally independent foreign-owned firms by about 0.45. The average municipality would have to reduce its business tax rate by about 2.2 percentage points (or 15%) from its average level to attract one foreign MNE. Hence, municipalities need to be attractive in other dimensions to be able to use tax instruments to attract foreign firms at the margin.

1. Introduction

A sizable literature in theoretical public finance argues that the location of capital in general and that of multinational enterprises (MNEs) in particular reacts sensitively to profit tax policy (Wilson, 1987; Janeba, 1995; Huizinga and Nielsen, 1997; Haufler and Wooton, 1999; Wilson, 1999; Ludema and Wooton, 2000; Davies, 2003, 2005; Devereux and Hubbard, 2003; Baldwin and Krugman, 2004; Raff, 2004; Borck and Pflüger, 2006; Bucovetsky and Haufler, 2008; this list is by no means exhaustive). When lumpy investment – i.e., firm or plant location – is sensitive to profit taxation, many of these models predict a *race to the bottom* in profit tax rates so that, in equilibrium, countries have to offer a tax rate of zero to attract investors. Otherwise, a jurisdiction will lose the whole profit tax base to its competitors. One key reason for this outcome is that – in most of the traditional models of tax competition – countries differ only in terms of profit taxes or, more precisely, low profit taxes are the only attraction governments may offer to firms.

Empirically, there is hardly any evidence of a race to the bottom in profit taxes (except for the existence of a few small tax havens). Therefore, recent theoretical work suggested mechanisms to avoid this knife-edge case. The New Economic Geography literature hypothesizes that there are factors generating agglomeration economies which, in turn, reduce the sensitivity of location decisions of foreign MNEs with respect to profit (or capital) taxation (Ludema and Wooton, 2000; Baldwin and Krugman, 2004; Borck and Pflüger, 2006). More generally, taxes are only one factor affecting firm location. There is little reason for a municipality to eliminate profit taxes provided that the overall environment – e.g. available infrastructure and human capital endowment of the work force – makes it attractive enough to locate there.

It is by now well documented in empirical research at various levels of aggregation (firms, industries, and aggregate bilateral activity) that the location of MNE activity across countries inter alia depends on national profit tax policy (Devereux and Griffith, 1998; De Mooij and Ederveen, 2003, 2006, 2008; Blonigen and Davies, 2004; Grubert and

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Mutti, 2004; Huizinga and Nicodème, 2006; Egger et al., 2009; Overesch and Wamser, 2009). However, two concerns may be raised with such work. First, for some countries, such as Germany, Switzerland, or the United States, *the* (unique) profit tax rate is an artifact, since tax authorities at the sub-national level may determine taxes on profits in their jurisdiction. Second, host countries differ in many ways rather than only in profit taxes, most importantly with regard to institutional characteristics that are hard to measure. Omission of relevant institutional determinants of MNE activity is likely in cross-country studies and may bias empirical estimates of the sensitivity of MNE activity with respect to taxation and other variables. Both problems can be avoided when considering firm location decisions at the sub-national level. Of course, a prerequisite for this is the existence of sub-national jurisdictions with tax authority and some heterogeneity in the profit tax rates.

There is a small literature on the nexus between firm births (national and foreign firms) and taxation which focuses on location decisions across regions *within* a country. For instance, Slemrod (1990; analyzing direct investments in 50 U.S. states by parent country), Papke (1991; exploiting information across 22 U.S. states), Hines (1996; analyzing foreign direct investment in 50 U.S. states by home country), List (2001; using 58 Californian counties), Swenson (2001; considering investment decisions across U.S. states by distinguishing investment types and industries of investment), and Brühlhart et al. (2007; focusing on 213 large Swiss municipalities) belong here. Of these studies, only Slemrod (1990), Hines (1996), List (2001), and Swenson (2001) focus on the location decisions of *foreign* firms (i.e., foreign MNEs) explicitly and, hence, ask questions which are comparable to ours. List (2001) analyzes the impact of the per-capita property tax rate on MNEs rather than a profit tax burden which is directly levied on businesses. Slemrod (1990) and Hines (1996) are interested not only in the impact of state-level corporate tax rates in the U.S. but also in the role of the system of double taxation relief in the recipient countries. Swenson (2001) primarily focuses on the different responsiveness of alternative types of investments in the United States.[1] Apart from the differences in the research questions posed in this paper as compared to the ones just mentioned, the number of subnational jurisdictions (i.e., the number of host locations) available is larger than in previous work by more than one order of magnitude.

We compile a large panel data-set on local business tax rates and other data at the municipality level. In Germany, municipalities may independently set a so-called *Gewerbesteuer* (or business tax rate). This business tax rate is levied on profits of companies and represents the most important source of revenues accruing to policy instruments which are at a municipality's discretion. Our data-set covers more than 11,000 German municipalities over the period 2001 to 2005. We link it with data on the location of foreign MNEs in Germany from Deutsche Bundesbank's *Micro-Database Direct Investment* (*MiDi*).[2] The set of locations (municipalities) considered here is much more homogeneous than in cross-country data. For instance, in contrast to an international setting, other tax parameters such as taxes on income are identical across German municipalities since they are levied at the national level. The variability of the effective profit tax rate across municipalities is brought about by the variability in business tax rates alone while other determinants of the tax base (such as the method of double taxation relief, withholding tax rates, depreciation allowances, etc.) are homogeneous across municipalities. Moreover, sub-national data allow one to control for the heterogeneity of locations within countries, which is more difficult with national data.

Attracting foreign-owned firms to a municipality promises jobs and local business tax income. There is anecdotal evidence of municipalities which lower their tax rates so as to explicitly attract foreign firms. One well-known example is the small town of Holzkirchen, close to Munich in Upper Bavaria, that lowered its business tax rate to appeal to Sandoz, a big pharmaceutical firm.[3] Another example constitutes the municipality of Amering which managed to lure Kathrein, the world leader in satellite dishes, to locate its headquarters there, by lowering its local business tax rate.[4]

Although these examples illustrate that some municipalities consider the attraction of foreign MNEs of prime interest, it is not only the number of MNEs that matters, but the real activity they develop. We therefore also consider two further measures of MNE activity: MNE employment and MNE real assets.

Econometrically, we have to deal with the fact that the majority of municipalities in Germany do not attract any foreign MNEs. Moreover, many of the municipalities which successfully attract foreign MNEs host only a small number of them. We use count data models (when looking at the number of foreign MNEs) as well as linear and non-linear estimation models (for all outcomes), to estimate the impact of business taxation on the foreign MNE activity in a municipality, controlling for other determinants such as population characteristics, the skill level of the work force, and geographical characteristics. We estimate both cross-section and panel data models, where business tax rates are treated as endogenous and instrumented by characteristics of neighboring municipalities. Across the board, we identify a negative impact of business tax rates on the number of MNEs in a municipality which is significantly different from zero.

For all three measures of MNE activity, we find that lower (simple or formula-apportioned) business tax rates attract MNEs, conditional on other determinants of MNE activity. We discuss the magnitude of the effects and find them to be of reasonable size. For instance, in cross-section IV regressions, a one-percent reduction of the municipal business tax rate (equivalent to a decline by about 0.14 percentage points) leads to an increase in the number of foreign MNEs there by about 0.45. The average municipality would have to reduce its business tax rate by about 2.2 percentage points (or 15%) from its average level to attract one foreign MNE. Hence, municipalities need to be attractive in other dimensions to be able to use tax instruments to attract firms at the margin.

The remainder of the paper is organized as follows. Section 2 describes the most important institutional details of the German municipal business tax. We summarize the literature on determinants of MNE location in Section 3. Section 4 describes features of the data-set. Section 5 introduces the empirical strategy for the analysis of the impact of business taxes on the number of MNEs locating in a municipality. Section 6 summarizes the empirical findings from both cross-section and panel data analyses. The last section provides some concluding remarks.

2. The German municipal business tax

German municipalities have autonomy in determining the local business tax rate (*Gewerbesteuer*), levied on profits of companies.[5] The local business tax rate is one of the most important policy instruments at a municipality's discretion, because it represents their main source of revenue. The tax base is defined by the federal tax law which

[1] Already Auerbach and Hassett (1993) suggested that alternative forms of investment should respond differently to tax policy.

[2] The work of Slemrod (1990) and Hines (1996) blends home country and host jurisdiction issues with corporate taxation. Unlike them, we do not distinguish foreign MNEs according to their country of origin. We focus on the responsiveness of MNE location (from anywhere) to host jurisdiction business tax rates for two reasons. First, we are interested in how a *given number* of foreign investments to just one country (Germany) are allocated *within* the country in response to tax rates. Hence, we disregard multilateral considerations of investors — e.g., decisions related to whether to invest in Germany at all. Second, the huge number of host jurisdictions involves a relatively large fraction of municipalities where no investment is undertaken at all. The fraction of zeros would necessarily rise more than proportionately if we distinguished investors by their country of origin. We discuss this issue further in Section 6.3.

[3] See http://www.sueddeutsche.de/wirtschaft/artikel/10/51958/ reporting that Holzkirchen had lowered its local business tax rate by 30%, making it the second-lowest in the state of Bavaria, in its (successful) attempt to attract Sandoz.

[4] See http://www.kathrein.de/de/presse/cont/texte2005/pi0553.htm.

[5] For exceptions, see Section 3 of the German business tax law.