Oxford University Centre for Business Taxation

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April 2016

WP 16/05

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Working paper series | 2016

SAID BUSINESS SCHOOL

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Large and Influential: Firm Size and Governments' Corporate Tax Rate Choice*

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Abstract

Theory suggests that large firms are more likely to engage in lobbying behaviour and have better bargaining positions against their host governments than smaller entities. Conditional on jurisdiction size, public policy choices are thus predicted to depend on the shape of a jurisdiction's firm size distribution, with more business-friendly policies being enacted if economic activity is concentrated in a small number of entities. We empirically assess this prediction studying local business tax choices of German municipalities. Exploiting rich and quasi-experimental variation in localities' firm size structures, we find evidence for an inverse relationship between the concentration of economic activity and communities' business tax choices. The effect is statistically significant and quantitatively relevant, suggesting that the rising importance of large businesses may trigger shifts towards a more business-friendly design of (tax) policies.

Keywords: Firm size, corporation tax, political economy
JEL Classification: H2, H7

*We are indebted to David Agrawal, Thomas Bauer, Wolfgang Buchholz, Thiess Büttner, Michael Devereux, Carsten Eckel, Andreas Haufler, Niels Johannesen, Claus Thustrup Kreiner, Dominika Langenmayr, Jarle Moen, Dirk Schindler, Jens Südekum, Floris Zoutman and participants of seminars at the University of Oxford, University of Munich, ETH Zurich, University of Copenhagen, NHH Bergen, RWI Essen, University of Düsseldorf, University of Tübingen, University of Regensburg and University of Ulm for helpful comments and suggestions on earlier versions of this paper.

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1 Introduction

The importance of large corporations has steadily grown over recent decades (e.g. Pyror (2001), UNCTAD (2002), Cefis et al. (2009), Poschke (2014)). Many observers eye this development with scepticism and have raised concerns that the increasing fraction of economic activity concentrated in big businesses may foster the corporate sector's influence over government policies (e.g. Business Week (2000), Roach (2007), Crouch (2009), Forbes (2011), The Guardian (2014)). The purpose of our paper is to empirically assess the importance of these concerns. Using corporate tax policy as a testing ground, we investigate whether a jurisdiction's firm size structure (labelled 'firm concentration' hereafter) determines its government's business tax rate choice.

The paper starts out with a brief discussion of theories that link governments' (tax) policy choices to jurisdictions' firm size distributions.[1] Conditional on jurisdiction size, rising economic concentration at the firm level may first and foremost increase aggregate corporate lobby spending as free-riding incentives are reduced[2] and more firms take the size threshold to participate in lobbying in the presence of fixed costs. With high levels of firm concentration, jurisdictions on top become more dependent on large employers within their borders, whose relocation would impose a shock on local labor markets and jurisdictional welfare, consequently also raising the corporate sector's influence over government policies.

In the main part of the paper, we empirically test this hypothesis. Our analysis relies on data for the German local business tax, which is set autonomously by German municipalities. The setting is unique and ideal to assess the question of interest. Firstly, tax issues belong to the most pressing policy concerns of the corporate sector (see e.g. the lobbying statistics of the US NGO *Open Secrets*). Secondly, using subnational data offers the advantage that our sample localities, while autonomously choosing the local business tax rate, operate in an otherwise homogenous institutional setting. The business tax furthermore significantly contributes to the tax burden on corporations in Germany, making up around 40% of corporate tax payments on average. The focus on policy choices of subnational government tiers finally allows us to construct consistent measures for the firm size structure of our sample localities exploiting rich administrative micro-data for Germany.[3]

[1] Note that we focus on *jurisdictions'* firm size structures, as opposed to firm size distributions within *industries* or *spatial* firm concentration.

[2] Decentralized corporate lobbying for business-friendly common government policies exerts a positive externality on other firms in the jurisdiction which is not internalized by the individual firm.

[3] Consistent data on the firm size structure of countries is to the best of our knowledge not available.

We pursue two empirical strategies to assess the link between firm concentration and local business tax choices. The first exploits rich cross-sectional and longitudinal variation in firm concentration across a large number of German localities. Estimating static and dynamic models that absorb observed and unobserved differences between municipalities and host regions, we indeed find that higher levels of firm concentration are associated with significantly smaller local business tax choices. Quantitatively, an increase in the Herfindahl index by 0.1 (corresponding to about one standard deviation) is estimated to lower municipalities' local business taxes by 1.3% on average. The magnitude of the effect moreover significantly increases with locality size and with right-wing majorities in the local council. These results are robust to various robustness checks, among others to dynamic model specifications where firm concentration is instrumented with its 5-year lag. This hedges against reverse causality concerns since localities cannot credibly commit on business tax growth five years in the future (to change their firm size distribution today), given that 5-year intervals include elections that may change the composition of local councils.

The second empirical identification strategy relies on exogenous variation in firm concentration induced by community amalgamations during a major municipality boundary reform in the German state of Sachsen-Anhalt, which reduced the number of municipalities from around 1000 to around 200. While municipalities were initially free to choose partners, the state legislature forced 115 municipalities to amalgamate with predetermined partners in a later phase of the reform. The induced changes in jurisdictions' firm size structure are exploited for empirical identification. Conditional on jurisdiction size, socio-economic and budgetary components, the results again point to an inverse relationship between firm concentration and local business tax choices. Similar to the findings in the first part of the analysis, a 0.1-increase in the Herfindahl index is estimated to lower municipalities' local business tax choices by 1.6% on average. This finding moreover prevails in instrumental variable models, where empirical identification relies on predicted rather than actual forced amalgamations.

To the best of our knowledge, our paper is the first to establish a link between jurisdictions' firm size distributions and corporate tax policy choices. The paper contributes to a flourishing literature on the determinants of tax setting behaviour. In recent years, studies mainly focused on strategic interaction in corporate tax rate choices of neighbouring jurisdictions, presenting evidence in favour of inter-jurisdictional tax competition and a race-to-the-bottom of corporate tax rates (see e.g. Devereux et al. (2008), Overesch and Rinke (2011)). A recent strand of the literature qualifies this race-to-the-bottom prediction by showing that corporate tax competition is mitigated by agglomeration rents and that larger jurisdictions choose higher corporate tax rates (see e.g. Ludema and Wooton (2000), Baldwin and Krugman (2004), Jofre-Monseny and Sole-Olle (2012), Koh et al. (2013), Brülhardt et al. (2013), Luthi and Schmidheiny (2014)). Our paper adds to this literature by highlighting that, beyond effects related to the aggregated size of a jurisdiction's corporate activity, intra-jurisdictional firm size heterogeneity also impacts on governments' corporate tax rate choices.

As firm concentration varies significantly across countries and sub-national government tiers (see e.g. Garcia-Santana and Ramos (2012)), our findings help to explain observed differences in governments' corporate tax policy choices. The results moreover suggest that recent decades' merger and acquisition waves and the trend towards more concentration of economic activity (particularly in emerging markets and the developing world, see e.g. Poschke (2014)) affect governments' tax policy choices and may trigger shifts towards more favourable tax conditions for the corporate sector.

The remainder of the paper is structured as follows: in Section 2, we present theoretical considerations to motivate our empirical analysis. Section 3 provides institutional background on the German local business tax. Sections 4 and 5 present our data, the empirical identification strategy and estimation results. Section 6 concludes.

2 Theoretical Considerations

While the economic literature provides comprehensive evidence that the *aggregate* size of economic activity affects jurisdictions' corporate tax rate choices, it largely ignores the possibility that firm size *heterogeneity* drives governmental tax setting behaviour. As sketched in the Introduction, empirically testing for the latter relationship is the core aim of our paper. A theoretical link between jurisdictions' firm size structures and corporate (tax) policy may be established through two mechanisms.

The first relates to corporate lobbying activities and thus to the direct attempt of the corporate sector to influence government policy. The effect of lobbying on government behaviour has been analysed extensively in the economic literature (see e.g. Olsen (1965) and Grossman and Helpman (2001)) and growing empirical evidence confirms the effectiveness of lobbying activities in influencing policy choices (see, among others, Goldberg and Maggi (1999) for trade protection, Facchini et al. (2011) for immigration policy, Blau et al. (2013) for bank bailouts and Salamon and Siegfried (1977) and Richter et al. (2009) for tax policy choices).

While most papers link aggregate lobby spending to the size of interest groups, Bombardini (2008) emphasizes the role of firm heterogeneity in driving lobby formation and aggregate lobby spending. In particular, she argues that in the presence of a fixed cost of making political contributions, i.e. initial expenses necessary to play an active role in lobbying activities, only the largest firms participate in lobby formation since the initial fixed costs of organizing for political activity may be spread over a larger asset base. It follows that, conditional on the aggregate size of the jurisdiction[4], lobby spending becomes larger if the firm size distribution is skewed and economic activity is concentrated in relatively large entities.

An analogous prediction derives from the observation that firms benefit from favorable common business policies enforced by the lobbying of other corporates. Lobby involvement is thus affected by free-riding incentives (e.g. Olsen (1965)), making aggregate lobby spending inefficiently small from the perspective of the corporate sector. If a jurisdiction's economic activity becomes more concentrated, the positive lobbying externality on other firms is partly internalized, lowering the free-rider problem and enhancing overall corporate lobbying and hence influence over government policy.

In a world in which firms are mobile across borders, a jurisdiction's firm size structure may moreover also *indirectly* impact on governments' tax policy choices.[5] To see this, consider a scenario where corporate location decisions are a function of governments' policy choices and idiosyncratic location preferences. If firms obtain shocks to their location preferences each period, communities may lose and win firms that relocate across borders. In such a setting, welfare costs of firm turnover are plausibly higher if communities lose relatively large entities as the lost economic activity and jobs may not be compensated in the short run by the attraction or foundation of new firms, causing unemployment and related welfare losses. Even if communities can make up for the lost economic activity, search frictions in the labor market may induce significant welfare losses (in the short-run) when large employers relocate. If communities (e.g. for historic reasons) depend on large firms, they may hence be more inclined to implement

[4]Contrary to lobbying for *private* or *industry-specific* public policies, we are interested in lobbying for policies that affect *all* firms located in a jurisdiction. Note that, if given the choice, firms would prefer to lobby for private benefits (instead of favourable common policies at the industry or jurisdiction level), as this avoids free rider problems (see next paragraph of the main text) and may provide advantages over competitors. Governments, however, can hardly differentiate policy design at the firm or industry level due to administrative and legal constraints (the European non-discrimination law e.g. prohibits state aid for specific firms (Articles 101 and 107, Treaty on the Functioning of the EU)), hence creating a role for aggregate corporate sector lobbying.

[5]See Han and Leach (2008) for a theoretical model on corporate tax rate choices if firms and communities bargain over corporate tax rates.

business-friendly policies to avoid relocations.[6]

In the following, we will empirically assess the proposed link between firm concentration and government policies using the German local business tax as testing ground.

3 Institutional Background

The local business tax in Germany ('Gewerbesteuer') is set autonomously by around 12,000 German localities. The definition of the tax base is determined by federal law and is thus homogenous across municipalities. The business tax rate is levied on business earnings of all incorporated and non-incorporated firms located within the communities' borders and follows the corporate and income tax law. It represents the most important revenue instrument at the communities' own discretion (see e.g. Büttner (2003) for further legal background).[7] There is no upper bound for the tax rate, but a lower bound was introduced in 2004. The majority of the local business tax revenues remains directly with the municipalities. A small share has to be transferred to the central and regional level though, as an element of the German federal equalization scheme (see also Foremny and Riedel (2014)).

The local business tax significantly contributes to the tax burden on corporations in Germany. From 2000 to 2007 (which defines our sample frame in the first part of the empirical analysis), the average tax rate set by West German communities was 16.9%, varying between 10% and 25% (cf. Table 1).[8]

Recent decades were furthermore characterized by an upward trend in local business tax rates. Between 2000 and 2007, around 60% of the West German communities raised

[6]Moreover, if profitability rates increase with firm size, so does the tax-sensitivity of corporate investments (Baldwin and Okube (2009)). Like the mechanisms discussed in the text, this predicts an inverse relationship between firm concentration and corporate tax choices.

[7]A major fraction of communities' revenues comes from state grants and redistributed tax revenues. German communities moreover autonomously set the local property tax rate. The business tax is the more important revenue source though, collecting around 70% of municipalities' own tax revenues.

[8]Note that the tax rate legislation defines the local business tax in business tax points, not percentage points (average for West Germany between 2000 and 2007: 338 tax points). To arrive at the local business tax rate in percentage points, the tax points have to be multiplied by a base rate. Until 2007, a proportional base rate of 5% applied for corporations (and for non-incorporated firms on income above EUR 48,000 (Par. 11 Local Business Tax Act)). To ease interpretation, the empirical analysis to come will approximate the local business tax rate in percentage points, calculated as the product of the community's local business tax in business tax points and the base rate of 5%. Note that the results are also robust to using an effective local business tax measure, which additionally takes into account that the local business tax was deductible from its own base until 2007.

their local business tax rate at least once, while only around 6% of the communities enacted a tax decline at least once. This pattern may on the one hand reflect increased funding needs of local municipalities as rising social costs and reforms which shifted additional obligations to the local level put pressure on community finances. Examples are the law for the provision of additional kindergarten capacities by the local level ('Gesetz zum Ausbau der Kindergartenbetreuung') and additional social security payments for the elderly and the unemployed (see e.g. Deutsche Bundesbank (2002, 2007)). On the other hand, in 2001 and 2008 the German federal government enacted a decline in the headline federal corporate tax rate ("Körperschaftssteuer"), which might - in a vertical tax competition framework - increase the communities' incentive to raise their local business tax rate.

Finally, note that municipalities in Germany operate in a homogenous institutional environment. First and foremost, they have exactly the same fiscal policy tools at hand. In all communities, a change in the local business tax rate is furthermore enacted by a simple majority of votes in the local council. Localities also face the same main responsibilities, including the construction and maintenance of roads, sewerage, kindergartens and primary schools as well as the provision of certain social benefits to the unemployed and the poor. Other responsibilities, such as the maintenance of cultural or sport facilities, tourism, and public transport are optional.

4 Baseline Approach

The baseline analysis studies the link between local business tax choices and firm concentration in West German localities between 2000 and 2007.[9]

4.1 Data

Data for the German local business tax is linked to measures for the firm size structure of our sample jurisdictions calculated from the universe of German plants provided

[9]The sample restriction to West German localities and to the years 2000-2007 is data-driven and reflects that the plant data provided by the German Employment Agency (see below), which we use to calculate the firm concentration indices, is available to us for the indicated time period only. East German localities are moreover omitted from this part of the analysis as East Germany saw major community boundary reforms within our sample frame. In the second part of our empirical analysis, we set up an empirical model where identification relies on a subset of amalgamations that were *exogenously* imposed upon communities in the East German state of Sachsen-Anhalt.

by the German Employment Agency (GEA) for 2000 to 2007. The data comprises more than 2 million plants per year and includes information on the host community and the number of employees subject to social security contributions (see also Koh and Riedel (2014)).[10] In the following, we will make use of a Herfindahl index H_{it} constructed from this data in previous research, which captures the firm concentration of jurisdiction i's economic activity in year t: $H_{it} = \sum_k (EMP_{ikt}/\sum_k EMP_{ikt})^2$, with EMP_{ik} denoting the employment of plant k located in community i at time t and $0 \leq H_{it} \leq 1$ (see Koh and Riedel (2014) for further details). In robustness checks, we will assess the sensitivity of our empirical results to the use of alternative concentration measures, namely the standard deviation of the jurisdiction's firm size distribution and the employment share of the largest firm (see Section 4.3 and the online appendix).

In the empirical analysis, we disregard small communities that host less than 10 plants since firm concentration is large by construction for these localities (as will be shown, the results are not sensitive to this sample restriction though). Our main sample comprises 6174 municipalities and 45,394 municipality-year-observations.[11]

The data is moreover augmented by rich information on the socio-economic, budgetary and political characteristics of our sample municipalities. We account for the size of economic activity as measured by the community's number of employees and economic conditions as measured by the localities' unemployment rate and the net income per capita. We furthermore add information on the level of public good provision, precisely on the municipality's number of railway stations, airports, seaports and high-way connections. We moreover include information on public good preferences and financing needs as indicated by the fraction of the community's population aged below 15 and above 65 as well as indicators for the municipalities' fiscal performance, namely public borrowing defined as the share of revenues that is generated by new credits, less amortization of debts, total outstanding debt in per capita terms[12] and grants per capita received from higher government tiers. Finally, we include information on the seat shares of the political parties in the municipal council. Table 1 presents information on variable definition, data sources and descriptive statistics.

Finally, we augment the analysis by firm-level data in Bureau van Dijk's DAFNE database (wave July 2012), which comprises rich information on firms in Germany.

[10]Plants with a least one employee subject to social security contributions are included in the data.

[11]Note that our West German sample localities were not subject to community boundary reforms.

[12]All community controls vary at the municipality level with the exception of income per capita and debt per capita, which are obtained at the county level. The latter variable, however, also includes municipality-specific information on the debt of hospitals and other city owned companies like transportation or sewage.

Main source for the data is the registrar of companies in Germany. From 2006 onwards, the data covers nearly all companies with limited liability in Germany.[13] Due to poor firm coverage, we discard data prior to 2006. DAFNE's firm-level data is linked to our sample localities via post code information. In the following, the data is used to control for the industry affiliation and legal form of firms located in our sample jurisdictions and will, complementary to the GEA data, be employed to construct the firm concentration measures.

4.2 Empirical Strategy

To assess the impact of firm concentration $H_{i,r,t}$ in municipality i of region r at time t on its local business tax choice $b_{i,r,t}$, we estimate a model of the following form

$$b_{i,r,t} = \alpha_1 b_{i,r,t-1} + \alpha_2 H_{i,r,t} + \alpha_3' X_{i,r,t} + \rho_t + \mu_r + u_{i,r,t}. \tag{1}$$

The theoretical considerations suggest that a higher concentration of firm activity is associated with lower local business tax choices and hence $\alpha_2 < 0$.

The estimation approach controls for observed and unobserved heterogeneity across municipalities and host regions. In particular, we include control variables for the size of the community's aggregate economic activity (log of the number of employees) and the other socio-economic, budgetary and political characteristics described in the previous section (subsumed in the vector $X_{i,r,t}$). In robustness checks, we also augment the set of regressors by control variables for the industry structure of firms and corporate rents from spatial firm concentration.

A full set of year fixed effects ρ_t furthermore captures common shocks to all sample municipalities over time. Unobserved heterogeneity across hosting regions is absorbed by including regional fixed effects μ_r for the German states, counties and commuting areas ("*Raumordnungsregionen*", see Bundesamt für Bauwesen und Raumordung) respectively. We furthermore run robustness checks that account for region-year fixed effects, municipality fixed effects and clustering of errors at different aggregation levels.

Further sensitivity analyses assess the robustness of our results to dynamic model specifications[14] and instrumental variables (IV) regressions where the firm size structure $H_{i,r,t}$ is instrumented with its five-year lag and with the average age of all firms

[13]In 2007 for example, more than 90% of all firms with a limited liability that are subject to the local business tax in Germany are included in the database.

[14]The respective models account for commuting area fixed effects. Since the number of municipality-year cells per commuting area is large, Nickell bias is negligible in this context.

hosted in a locality (calculated from DAFNE) to address potential reverse causality concerns.[15] In the dynamic IV specifications, the coefficient α_2 is consistently estimated if, conditional on the set of regressors, the firm size distribution in period $t-5$ is unaffected by the evolution in the local business tax in period t. For this to be violated, business tax changes, firstly, had to trigger heterogenous investment responses across small and large firms and communities must, secondly, be able to credibly commit on a future local business tax growth path, e.g. attract (large) firms today by promising a moderate local business tax growth path five years in the future. As five-year lags imply that there are local council elections in between, which may change political parties and coalitions in power, such commitments are hardly possible.

As will be shown below, the results are insensitive to the inclusion of different sets of control variables. On top, we run specifications which account for potential endogeneity of control variables. Most importantly, we treat the jurisdiction's aggregate size as endogenous as it may correlate with the locality's firm size distribution and may be directly determined by local business tax choices (see e.g. DeMooij and Ederveen (2003) and Devereux (2007)). Specifically, we follow previous work by Koh et al. (2013) and use long-lagged information from a population census in 1910 and long-lagged information on the number of train connections through our sample municipalities between 1835 and 1935[16] to construct two instruments for today's community size: the logarithm of the population density of our sample localities in 1910 and the logarithm of the number of train connections through the localities prior to 1935.

4.3 Results

The baseline results are reported in Table 2. The observational unit is the German municipality. Heteroscedasticity robust standard errors that account for clustering at the municipality level are depicted in brackets below the coefficient estimates. Specification (1) regresses the local business tax rate on the Herfindahl index and a full

[15]The idea of the latter instrument relates to the observed positive correlation between firm age and firm size (see e.g. Situm (2014)). Also note that DAFNE does not cover the universe of German firms, especially small non-incorporated firms may be missing. This adds noise to the data and hence is expected to reduce the relevance of the instrumental variable.

[16]The data is obtained from "Kaiserliches Statistisches Amt (1915), Die Volkszählung im Deutschen Reiche am 1. Dezember 1910, Kaiserliches Statistisches Amt, Berlin" and "Handbuch der deutschen Eisenbahnstrecken (1984): Eröffnungsdaten 1835-1935, Streckenlängen, Konzessionen, Eigentumsverhältnisse, Dumjahn, Mainz" and is matched to the communities in our data set based on historic maps (see Koh et al. (2013)).

set of commuting area fixed effects, state fixed effects, year fixed effects and the socio-economic, political and budgetary control variables described above. In line with our theoretical considerations, the estimates point to a statistically significant inverse relationship between the Herfindahl index and communities' local business tax choice. This finding prevails in the dynamic and instrumental variable models (cf. Columns (2) and (3)) described above.[17] Specification (4) moreover shows that the results are robust to controlling for the legal form of firms hosted in the community and the overall size of the communities' local business tax base (the latter allows for the possibility that the firm size structure impacts on the business tax base, which may then affect optimal local business tax rate choices). Quantitatively, Specification (4) suggests that an increase in the Herfindahl index by 0.1 (corresponding to about one standard deviation) lowers the local business tax in the long run by 0.23 percentage points or 14.2% of a standard deviation. Evaluated at the sample mean (=16.93%), this corresponds to a drop in the local business tax by 1.3%.[18]

The analysis moreover tests for potential heterogeneity in effect size as anecdotal evidence suggests that smaller German communities have limited room for strategic policy choices. Specifically, it is mostly larger municipalities which, besides their mandatory spending obligations, provide significant amounts of public goods and services (e.g. recreational and cultural facilities or infrastructure) - reflecting prohibitively high per capita provision costs in smaller jurisdictions (see e.g. Alesina and Spolaore (1997)).

[17] Since the Herfindahl index for the localities' firm size structure is available from 1999 onwards only, we restrict the sample to the years starting in 2004 to instrument the current Herfindahl index with its 5-year lag. Note that reestimating Specifications (1) and (2) on the restricted sample beginning in 2004 yields qualitatively and quantitatively comparable results.

[18] The long-run effect is calculated from $\hat{\alpha}_2 \times 0.1/(1-\hat{\alpha}_1) = -0.0109/(1-0.952) = 0.23$ (cf. Column (4)). Information on the share of non-incorporated firms is drawn from the German local business tax statistics and available at the county level (cf. Table 1). Similar results are obtained when we calculate the share of non-incorporated firms at the locality level from DAFNE (= difference between the total firm number in a given locality drawn from GEA and the number of incorporated firms from DAFNE (as DAFNE includes essentially the full population of incorporated firms in Germany, while the coverage of non-incorporated entities is rather poor)). The coefficient estimate for the fraction of non-incorporated firms turns out positive, suggesting that communities exploit that local business tax payments are credited against the personal income tax of owners of non-incorporated businesses. Increased local business tax rates hence redistribute tax revenue from the federal personal income tax to the local business tax while hardly raising the effective tax burden on income earned in non-incorporated businesses. Furthermore note that information on the tax base of the local business tax was obtained from the German federal statistical offices. The variable is instrumented with its county-average in Specification (4).

As localities, moreover, have limited options to take on debt[19], small jurisdictions are often reported to only adjust their local business tax rate to balance their mandatory spending. Specifications (5) to (7) and (8) to (10) test for this notion and reestimate the baseline model restricting the sample to communities that host at least 100 and 250 plants respectively. The results indeed point to larger effects in these subsamples. Specifications (7) and (10) suggest that an increase in the Herfindahl index by 0.1 lowers the local business tax rate by 0.55 and 0.99 percentage points respectively or, evaluated at the sample mean, by 3.2% and 5.4%.

Specification (11) furthermore reestimates the model in Column (10), restricting the sample to communities where the conservative and liberal parties hold the majority of seats in the local council (which is the legislative body that, with majority votes, can enact changes in the community's local business tax). The sample restriction follows the presumption that right-wing parties may be more open to business lobbying and business needs than their left-wing or civil party counterparts, implying a higher sensitivity of local business tax choices to changes in firm concentration. In line with this notion, we find larger effects than in the previous specifications. Precisely, a 0.1-increase in the Herfindahl index is found to lower the local business tax by 2.0 percentage points or 11.0% evaluated at the sample mean.

We moreover ran a large set of further robustness checks to assess whether the baseline findings are sensitive to observed and unobserved heterogeneity across our sample jurisdictions. The sensitivity analyses are presented in the online appendix and yield findings comparable to our baseline estimates when commuting area-year fixed effects, county fixed effects, municipality fixed effects as well as control variables for the jurisdiction's industry structure, industry agglomeration and the fraction of the localities' economic activity in multinational firms are included. The findings moreover prevail in models that allow for a more flexible functional form of the control variables, account for alternative definitions of the firm concentration measures and for clustering of errors at different levels. The findings also remain qualitatively and quantitatively unchanged in binary model specifications where upward and downward adjustments in local business tax choices are regressed on firm concentration measures. Finally, quantile regressions provide weak evidence that lower conditional quantiles of the local business tax distribution react more sensitively to changes in the Herfindahl index than upper conditional quantiles. See the online appendix for details.

Concluding, the findings point to an inverse relationship between firm concentration

[19]Municipality codes limit new borrowings to investment spending and the conversions of debt and there are, moreover, mandatory assessments by supervisory authorities.

and localities' local business tax choice, which is insensitive to controlling for observed and unobserved heterogeneity across host jurisdictions and regions. To corroborate this evidence, we will, in the following, reassess the effect of firm concentration on local business tax choices in a setting that allows us to exploit quasi-experimental variation in firm concentration induced by a major community boundary reform in the German state of Sachsen-Anhalt.

5 Identification from a Natural Experiment

Aiming for higher fiscal capacity of state localities (e.g. Grundlach (2013)), the boundary reform significantly reduced the number of communities in Sachsen-Anhalt from around 1000 to around 200 and, in doing so, significantly changed the firm size structure of communities. The reform was first outlined in a state-level coalition agreement between the conservative party (CDU) and the social democrats (SPD) in April 2006. Its principles and legal foundations were published in December 2006 and enacted into state law in August 2007 and February 2008. The reform aimed to create localities with more than 10,000 inhabitants (allowing for exceptions in lowly populated areas) and was implemented in two phases: during the first phase of the reform (until June 2009), municipalities were free to choose partners, in the second phase (until January 2011) 115 amalgamations were legally enforced by the state authorities (through a legal provision enacted in July 2010).[20]

Our empirical identification strategy builds on variation in localities' firm size distribution induced by forced mergers during the second phase. Note that voluntary mergers during the first reform phase are less suited to identify causal effects as prior research suggests them to be driven by strategic policy choices of communities (Freier et al. (2013) e.g. show that the partisan structures of local councils predict voluntary merger propensities). Sachsen-Anhalt's state administration moreover incentivised the voluntary mergers with special grants. The forced mergers were, in turn, exogenously imposed upon communities. At the end of the first reform phase in 2010, the state administration identified 115 localities whose population fell short from the determined minimum size and assigned them to merge with pre-determined partners.[21] All merg-

[20]Several East German states implemented boundary reforms over recent decades. Other reforms, however, triggered a smaller number of amalgamations. Moreover, with the exception of Brandenburg, none of the other reforms included *forced* amalgamations.

[21]The state government first published a draft law that specified amalgamations to be implemented during the second phase of the reform. In reaction to the draft law, a number of localities voluntarily

ers were completed by January 2011. Note that the state legislature did not publish explicit assignment rules but anecdotal evidence suggests that the state administration aimed to create localities of about equal size and merged adjacent localities with close-by community cores to maximise synergy effects and minimise frictions related to fragmented community areas. Figure 1 graphically depicts absorbing and target communities in voluntary and forced mergers.

5.1 Data and Estimation Strategy

The empirical analysis relies on a data set that comprises the 218 localities in Sachsen-Anhalt that emerged from the boundary reform. Most of these localities existed in 2006 already, but several had integrated other communities during the voluntary or forced phase of the boundary reform. Some communities were completely unaffected by the reform, others merged on equal footing to become a new locality. We create a panel data set for these 218 localities from 2006 to 2014. Locality i's firm concentration is captured by a Herfindahl index HA_{it} calculated from DAFNE for 2009 (which is the year prior to the forced merger decisions).[22] To capture changes in communities' firm size structure induced by the forced amalgamations, the Herfindahl index is extended to the years 2006-2008 and 2010-2014 and modelled to vary over time with changes in firm size structures brought about by the forced community amalgamations only. For localities that merged on equal footing, we account for the firm size structure of the larger of the two localities in the pre-reform years.

Methodologically, we estimate a difference-in-differences model where the development of local business tax rates in communities that integrated other localities in the course of forced amalgamations is compared with a control group of unaffected communities to filter out the common time trend. Figure 2 shows that the local business tax in treatment and control group follow a parallel trend in the pre-reform years before 2010. The forced community amalgamations triggered diverse changes in the firm size structure of affected localities. While firm concentration declined on average, some communities observed stark decreases in their Herfindahl index, while others experienced mild decreases or increases in firm concentration. Conditional on being treated,

amalgamated (these amalgamations are coded as voluntary in our empirical analysis). There were moreover hearings of representatives of localities affected by forced mergers. However, there is only one case, in which the absorbing community determined in the final law deviates from the absorbing community in the draft law.

[22] Note that firm size is proxied by firms' total assets since information on the number of employees is poorly covered in DAFNE.

the average change in the Herfindahl index is -0.1, varying between -0.37 and 0.2. We hence estimate a variant of the difference-in-differences model that accounts for these differences in treatment intensity, and regress the local business tax choice b_{it} of community i at time t on the Herfindahl index HA_{it} (that varies with forced community amalgamations only, see above), conditioning on full sets of community and year fixed effects (ϕ_i and ρ_t).[23] Formally, the model reads

$$b_{it} = \beta_0 + \beta_1 HA_{it} + \beta_2 R_{it} + \rho_t + \phi_i + \epsilon_{it}. \tag{2}$$

As the boundary reform alters community characteristics in several dimensions, we furthermore include time-varying community-characteristics in the vector R_{it}, most importantly community size and socio-economic locality characteristics. We also control for the party composition of the local council[24] and run robustness checks which augment the model by control variables for communities' per capita spending, grants received and the size of the local business tax base.[25] Finally, we augment the vector of regressors by the predicted local business tax rate, which corresponds to the community's local business tax rate in 2005 and varies only for those localities that are affected by amalgamations. Specifically, for them, the variable corresponds to the predicted local business tax rate of the amalgamated communities, calculated as the population-weighted average of their 2005 local business tax rates in the after-reform years. This absorbs unobserved heterogeneity in determinants of the local business tax choice, e.g. related to underlying preferences of the population.

Finally note that analogously to the first part of the empirical analysis, we again disregard localities which host less than 10 firms. Furthermore, some of the communities that merged (voluntarily or forced by the state administration) settled agreements

[23]Following our argumentation in the first part of the paper, we again define the local business tax measure b_{it} as the product of the local business tax rate in business tax points and the base rate of 5% (cf. Footnote 8) to approximate the local business tax rate in percentage points and to ease interpretation. Since the analysis focuses on the local business tax choices of localities, we moreover refrain from calculating effective tax measures which take into account that the local business tax was deductible from its own base until 2007 and that the base rate changed in 2008.

[24]Note that, contrary to voluntary mergers, partisan effects plausibly do not drive forced merger decisions in our context though - especially given that Sachsen-Anhalt's state level government was a coalition between the conservative CDU and left-wing SPD at the time of the reform.

[25]Note that due to changes in community accounting provisions, information on the control variables related to the localities' budgetary accounting (grants received and spending per capita) are not published by Statistical Offices for the later sample years. The construction of the corresponding control variables hence follows the construction of the Herfindahl index, starting with their 2005 values and then capturing variation - based on the 2005 values - brought about by community amalgamations.

determining that their prevailing local business tax rates were sustained in the old community area for one or several post-reform years. The corresponding community-year observations are dropped from the analysis.

5.2 Results

The results are presented in Table 4. In Specification (1), we regress the communities' local business tax rate on the Herfindahl index described above, which captures variation in firm concentration induced by forced community amalgamations in the second phase of the reform. Controlling for a full set of municipality fixed effects and year fixed effects, the model yields a negative and statistically significant coefficient estimate for the Herfindahl index, as expected. This result prevails when the model is augmented by the socio-economic, political and budgetary control variables described above (cf. Specification (2)). Quantitatively, Specification (2) suggests that an increase in the Herfindahl index by 0.1 (corresponding to an increase by about half of a standard deviation) reduces the local business tax rate by 1.7% on average.[26]

Specification (3) moreover adds control variables that indicate whether localities absorbed other communities in voluntary and forced mergers during the reform up to year t and a control variable for the number of absorbed communities up to year t, hence allowing for the possibility that voluntary and forced amalgamations exert unobserved effects on local business tax choices. Identification in these specifications thus relies on differences in the treatment intensity of communities subject to forced mergers. This yields results that are qualitatively and quantitatively comparable to the previous specifications. Specification (4) furthermore shows that the results are robust to augmenting the set of regressors by the community's local business tax base.

In Specification (5), we present evidence that these results prevail in an instrumental variable model where variation in the Herfindahl index induced by both, voluntary and forced mergers, is instrumented with variation related to forced amalgamations only. Finally, Specification (6) addresses concerns about potential systematic assignment of target localities to neighboring municipalities based on characteristics that correlate with firm size structures and future local business tax choices. While we do not consider such a correlation likely, we define an instrumental variable which captures variation in the Herfindahl index induced by predicted (rather than actual) assign-

[26]Note that we lose 4 observations when including the control variables due to missing values. Rerunning Specification (1) on the sample of Specification (2) yields qualitatively and quantitatively unchanged results though.

ments of target communities, following anecdotes that the state administration aimed to create localities of about equal size and amalgamated communities with close-by centroids (to avoid fragmented community areas).

The construction of the instrumental variable consequently assigns sparsely populated target municipalities (where the relative population gain of the smallest adjacent neighbour would be small in case of assignment) to the nearest neighbouring municipality in the same county as measured by the distance between the two centroids. Large target municipalities (where the relative population gain for the smallest neighbour is high) are, in turn, assigned to the least populated municipality among the five nearest neighbors in the same county.[27] In Specification (6), we instrument variation in the Herfindahl index reflecting actual changes in the firm size distribution related to community amalgamations with predicted changes based on these assignment rules. In doing so, sparsely populated targets are defined as communities whose population is less than 5% of any of its neighbouring localities' population; the results are, however, not sensitive to the choice of particular cutoff values for this definition. The estimates confirm the negative effect of firm concentration on local business tax choices. Quantitatively, Specification (6) suggests that an increase in the Herfindahl index by 0.1 lowers the local business tax rate by 2.0%. While the effect is thus somewhat larger when identification relies on predicted rather than actual amalgamations, the difference is not statistically significant as standard errors increase as well. Note also that the first stage F-test confirms the relevance of the instrument. Overall, the results are consistent across the two different empirical strategies. The second approach yields point estimates that are slightly larger in magnitude, but so is the size of the (emerging) communities in Sachsen-Anhalt compared to the average community in West Germany.

6 Summary and Conclusion

The paper presents evidence for a systematic link between jurisdictions' firm size distribution and government policies. Using the German local business tax as a testing

[27]When determining the five nearest neighboring municipalities, we take all voluntary mergers as given and exclude municipalities that are themselves a target during the second reform phase. Note moreover that we assign localities to one of their five nearest neighbors (measured by the distance between locality centroids) as more than 80% of the target communities have been assigned to one of the five nearest neighbors. Increasing the number of potential partners would obviously raise this fraction but would come at the cost that more of the potential partners would not share a common border with the target community (leading to a lower overlap of predicted and actual assignments).

ground, we find that higher levels of firm concentration in German communities are associated with lower local business tax choices. The effect turns out statistically significant and quantitatively relevant and prevails in various sensitivity checks, including empirical models that draw on exogenous variation in jurisdictions' firm size distribution induced by a major boundary reform in the German state of Sachsen-Anhalt.

The results confirm prior descriptive and anecdotal evidence, e.g. suggesting that the German cities of Wolfsburg, Ingolstadt and Ludwigshafen, which host the headquarters of leading car and chemical manufacturers Volkswagen, Audi and BASF, set considerably lower local business taxes than otherwise comparable jurisdictions with a more even firm size distribution.[28]

Several implications follow from the analysis. Firstly, the findings suggest that differences in firm concentration across jurisdictions add to explaining observed heterogeneity in governments' (corporate tax) policy choices. Secondly, it follows that recent decades' merger and acquisition waves and the trend towards more concentration of economic activity (especially in emerging markets and the developing world) may not be neutral in terms of governments' (tax) policy choices and may lead to more favourable (tax) conditions for the corporate sector. Thirdly, the findings feed into debates about the assignment of taxing rights and spending responsibilities across government tiers.[29]

[28]Local employment of Audi and BASF (Volkswagen) amounts to around one third (one half) of overall city employment. Ludwigshafen and Wolfsburg charged local business tax rates of 360 business tax points, Ingolstadt of 400 business tax points in 2007, which fall short from the average rate of other German cities of comparable size (around 420 business tax points, see also Footnote 8). The low rate in Ludwigshafen partly relates to BASF pressing the city to lower its business tax rate in 2002 by threatening to relocate production (Neue Lu (2002)).

[29]As firm concentration, on average, declines at higher aggregation levels, the results in our paper predict corporate sector influence on government policy to be higher with lower government tiers; there may, however also be countervailing effects, e.g. related to higher government tiers having more policy instruments at hand to accommodate the corporate sector.

7 References

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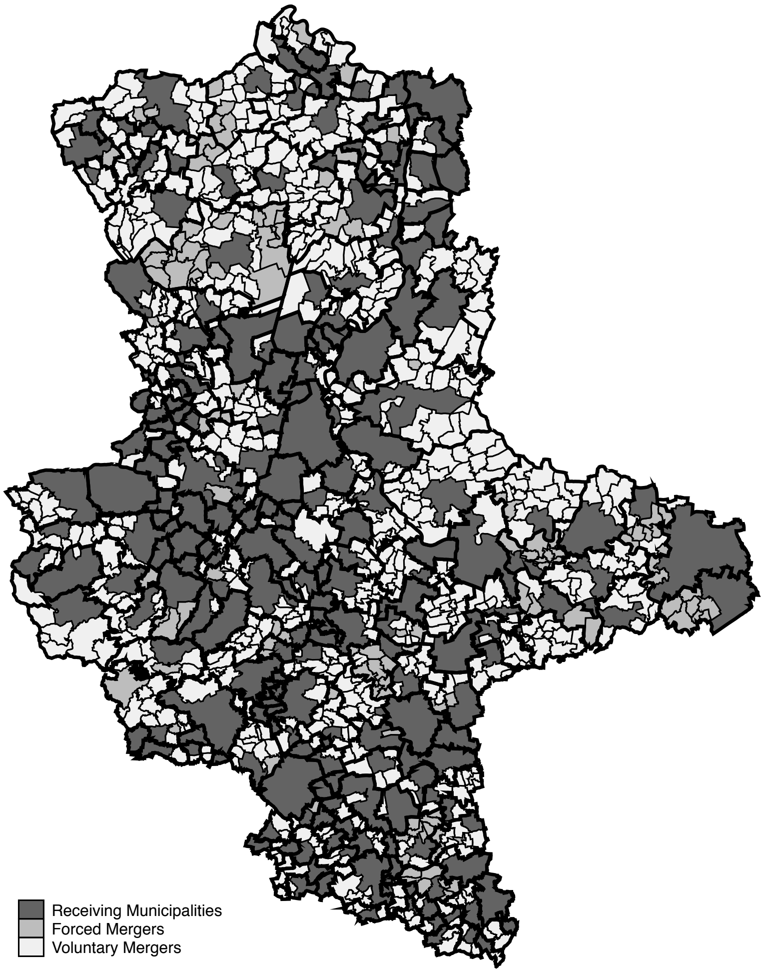

Figure 1: Mergers of Municipalities in Sachsen Anhalt 2006-2014

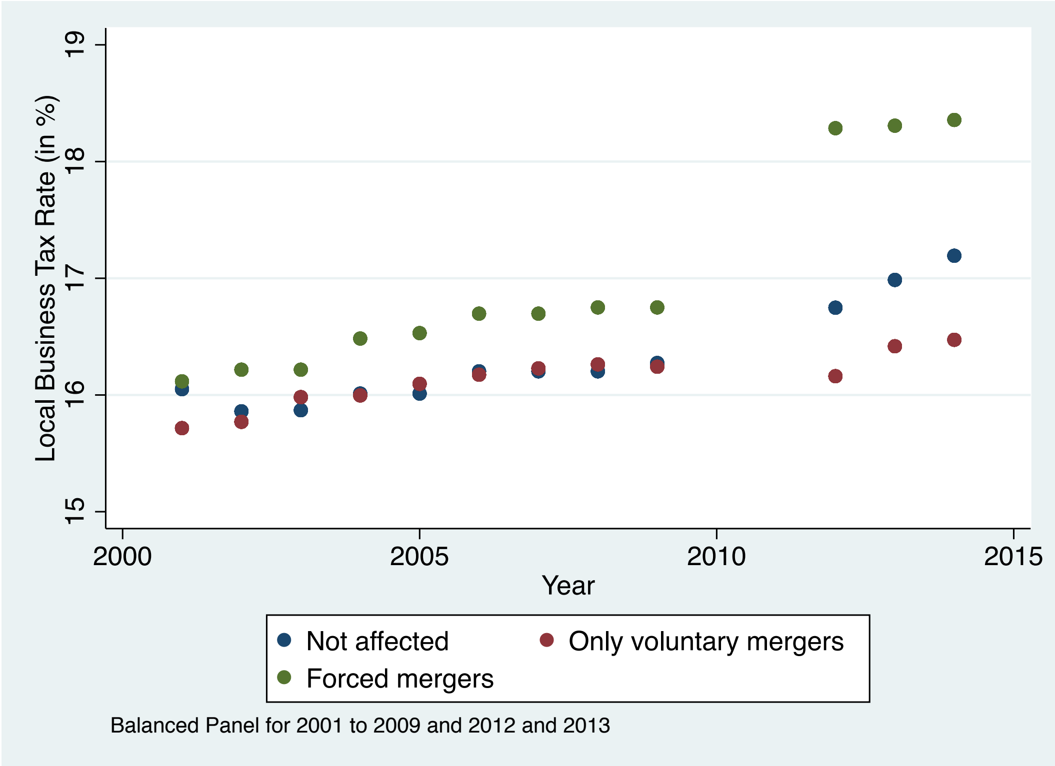

Figure 2: Common Trend Assumption

8 Tables

Table 1: Descriptive Statistics, Baseline Analysis (Section 4)

Variable	No. of Obs.	Mean	Std. Dev.	Min	Max
Local Business Tax					
Local Business Tax (Perc. Points)	45,394	16.859	1.585	10	25
Herfindahl Index, Firm Concentration	45,394	.103	.107	.002	.863
Socio-Economic Characteristics					
Number of Employees	45,394	3482.822	17,793.51	12	695,650
Population Share Aged > 65	45,394	.176	.032	0	.415
Population Share Aged < 15	45,394	.167	.023	0	.279
Unemployment Rate	45,394	.030	.012	0	.118
Income pC⋆	45,394	17.546	1.793	13.222	28.872
Rural Community	45,394	.756	.429	0	1
Share Non-Incorporated Firms	21,288	.732	.081	.231	1
Party Seat Shares Local Council					
Share Conservative Party (CDU/CSU)	45,394	.309	.224	0	1
Share Social Democrats (SPD)	45,394	.199	.177	0	1
Share Liberals (FDP)	45,394	.013	.035	0	.583
Share Green Party	45,394	.018	.038	0	.375
Share Farleft Parties	45,394	.000	.003	0	.118
Share Farright Parties	45,394	.001	.006	0	.226
Budgetary Characteristics					
Administrative Grants pC⋆	45,394	.076	.133	-.134	8.679
Investment Grants pC⋆	45,394	.195	.118	-.067	4.316
Credits	45,394	-.001	.069	-.995	.643
Debt pC⋆	45,394	2.236	.881	.491	6.831
Log Tax Base, Local Business Tax	21,201	5.155	1.889	0	12.863
Infrastructure					
Number of Highway Accesses	45,394	.186	.624	0	21
Number of Railway Stations	45,394	.686	1.007	0	13
Number of Airports	45394	.062	.252	0	2
Number of Seaport	45394	.025	.175	0	4
Instrumental Variables					
Herfindahl Index, 5-Year Lag	21,288	.105	.110	.002	.853
Avg. Firm Age	21,288	14.238	4.858	0	122
Log Population 1910	21,288	7.514	1.098	4.248	13.359
Log Number of Rail Connections < 1935	21,288	.215	.491	0	4.357

⋆ in thousands of euros. 'Local Business Tax (Perc. Points)' depicts the local business tax in percentage points. 'Herfindahl Index, Firm Concentration' stands for the Herfindahl concentration measure defined in Section 3. 'Number of Employees' is the number of employees who work in the considered community and are subject to social security payments. 'Population Share > 65' and 'Population Share < 15' indicate the share of a locality's inhabitants older than 65 and younger than 15. 'Income pC' indicates average income at the level of German counties. 'Credits' depicts the new credits minus repayment as a share of annual revenues, 'Debt pC' stands for the total outstanding debt in per capita terms. This value is obtained at the county level, but it also includes municipality-specific information on debt of hospitals and other city owned companies like transportation or sewage. 'Investment Grants pC' and 'Administration Grants pC' depict investment and administration grants in per capita terms, 'Share Conservative Party (CDU/CSU)', 'Share Social Democrats (SPD)', 'Share Liberals (FDP)', 'Share Farleft Parties', 'Share Farright Parties' indicate the seat shares in the local councils for the respective parties and party groups. Note that the shares do not sum up to one as a significant fraction of local council seats is held by civil parties that are difficult to classify in the traditional left-right-spectrum. All of the described control variables were obtained from the Federal Statistical Offices in Germany. The 'Number of Highway Accesses' moreover indicates a community's number of highway accesses; 'Number of Railway Stations', 'Number of Airports' and 'Number of Seaports' depict the number of stations, airports and seaports respectively. The latter information was drawn from the INKAR data provided by the Federal Institute for Research on Building, Urban Affairs and Spatial Development. We moreover define 'Rural Communities' following the classification of the Federal Institute for Research on Building, Urban Affairs and Spatial Development. The 'Share (of) Non-Incorporated Firms' was drawn from the population of local business tax returns in 2004 aggregated at the county level for confidentiality reasons. In terms of the instrumental variables, 'Herfindahl Index, 5-Year Lag' stands for the 5-year lag of the 'Herfindahl Index, Firm Concentration'-variable defined above. 'Avg. Firm Age' depicts the average age of all firms in a locality as determined from the date of incorporation in DAFNE. Finally, 'Log Population 1910' and 'Log Number of Rail Connections' stand for the log of the communities' population in 1910 and the number of rail connections through the localities before 1935 (see Koh et al. (2013) for details).

Table 2: Baseline Analysis (Section 4) - Dependent Variable: Local Business Tax Rate

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Local Business Tax, Lag		0.945***	0.952***	0.952***		0.942***	0.946***		0.942***	0.951***	0.939***
		(0.003)	(0.004)	(0.004)		(0.004)	(0.005)		(0.005)	(0.007)	(0.012)
Herfindahl Index	-0.332***	-0.045***	-0.077***	-0.109**	-1.508***	-0.202***	-0.299***	-2.128***	-0.290***	-0.484***	-1.240***
	(0.124)	(0.017)	(0.027)	(0.045)	(0.360)	(0.046)	(0.087)	(0.765)	(0.086)	(0.163)	(0.327)
Log Number of Employees	0.131***	0.002	0.008*	0.034	0.423***	0.011**	0.103**	0.555***	0.015**	0.097**	0.172**
	(0.016)	(0.002)	(0.005)	(0.027)	(0.035)	(0.004)	(0.044)	(0.054)	(0.007)	(0.048)	(0.082)
Share Non-Incorporated Firms				0.143***			0.224***			0.355**	0.234
				(0.034)			(0.085)			(0.146)	(0.253)
Log Base Local Business Tax				-0.024			-0.069*			-0.061	-0.138*
				(0.026)			(0.036)			(0.041)	(0.078)
Community Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Commuting Area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample Starting in	2000	2000	2004	2004	2000	2000	2004	2000	2000	2004	2004
Estimation Method	OLS	OLS	IV	IV	OLS	OLS	IV	OLS	OLS	IV	IV
Firm Number	>10	>10	>10	>10	>100	>100	>100	>250	>250	>250	>250
											Right Wing
Cragg-Donald Wald F Statistic			2153.470	46.249			32.775			29.530	9.528
Hansen J Statistic (p-value)			0.2926	0.3071			0.8637			0.6766	0.3186
Observations	45,394	40,227	21,288	21,201	19,659	17,317	8,785	9,795	8,647	4,239	1,497
R-squared	0.651	0.960	0.913	0.913	0.749	0.972	0.937	0.777	0.975	0.951	0.938
Sample Avg. Local Business Tax	16.859	16.880	16.932	16.931	17.406	17.442	17.530	18.113	18.151	18.250	18.476
Sample Std. Dev Local Business Tax	1.585	1.595	1.596	1.598	1.892	1.903	1.917	2.092	2.100	2.122	2.201

Notes: See the notes to Table 1 for the variable definition. Heteroscedasticity robust standard errors adjusted for clustering at the municipality level are presented in parentheses. *, **, ***indicate significance at the 10%, 5%, 1% level. All specifications include the full set of community controls outlined in Section 4. 'Commuting Area FE', 'State FE' and 'Year FE' moreover indicate that full sets of commuting area ('Raumordnungsregionen'), state and year fixed effects are included in the specifications respectively.

Table 3: Descriptive Statistics, Natural Experiment (Section 5)					
Variable	**No. of Obs.**	**Mean**	**Std. Dev.**	**Min**	**Max**
Local Business Tax	865	16.658	2.017	10	22.5
Predicted Local Business Tax	865	16.187	1.857	10	22.5
Herfindahl Index (Time Variation: All Mergers)	865	.267	.213	.025	1
Herfindahl Index (Time Variation: Forced Mergers)	865	.307	.206	.033	1
Number of Employees	861	4391.409	13,454.01	18	105,107
Population Share Aged $<$ 15	863	.108	.012	.064	.150
Population Share Aged $>$ 65	863	.231	.031	.151	.314
Spending pC⋆	865	1.562	.847	.758	7.532
Investment Grants pC⋆	865	.203	.310	.024	4.179
Other Grants pC⋆	865	.092	.040	.002	0.379
Seat Share Conservative Party (CDU)	865	.323	.151	0	.692
Seat Share Social Democrats (SPD)	865	.140	.115	0	0.6
Seat Share of Far Left (DIE LINKE)	865	.130	.109	0	0.5
Log Tax Base Local Business Tax	865	5.350	1.723	-2.303	10.050

Notes: ⋆ in thousands of euros. 'Local Business Tax' depicts the community's local business tax in percentage points, 'Predicted Local Business Tax' stands for the local business tax of the respective community in 2005. The variable varies with forced amalgamations, i.e. corresponds to the population-weighted average local business tax rate of the target and absorbing community after the amalgamation (calculated based on the 2005 values of the local business tax rates). 'Herfindahl Index (Time Variation: All Mergers)' stands for the Herfindahl index for the locality's firm size structure, calculated based on total asset information from DAFNE for the year 2009. It only varies with forced or voluntary mergers, capturing changes in the firm size structure induced by the mergers. Analogously, 'Herfindahl Index (Time Variation: Forced Mergers)' is the Herfindahl index for the locality's firm size structure in 2009 and captures changes in the Herfindahl index induced by forced amalgamations during the second phase of the reform only. 'Number of Employees' is the number of employees in the municipality, 'Population Share Aged $<$ 15' and 'Population Share Aged $>$ 65' depict the share of inhabitants aged below 15 or above 65. 'Seat Share Conservative Party (CDU)', 'Seat Share Social Democrats (SPD)' and 'Seat Share of Far Left (DIE LINKE)' depict the seat share of the conservative party, the social democrats and the far left (DIE LINKE, formerly PDS) in the local council. 'Spending pC', 'Investment Grants pC' and 'Other Grants pC' stand for the community's total spending per capita, investment and other grants per capita (in thousands of Euro). 'Log Tax Base Local Business Tax' is the natural logarithm of the local business tax base. To avoid losing the singular municipality-years where the local business tax base takes on a weakly negative value by the log-transformation, we replace according observations with a small positive number. Finally note that information on 'Spending pC', 'Investment Grants pC' and 'Other Grants pC' is available in consistent format up to 2007 only. The construction of these control variables hence starts from its 2005 values and then varies over time by voluntary and forced amalgamations (calculated as population-weighted average of the amalgamated localities' 2005-values in post-reform years).

Table 4: Natural Experiment (Section 5) - Dependent Variable: Local Business Tax Rate						
	(1)	(2)	(3)	(4)	(5)	(6)
Herfindahl Index	-1.013**	-2.750***	-2.605***	-2.642***	-2.560***	-3.311**
	(0.488)	(0.581)	(0.584)	(0.555)	(0.645)	(1.416)
Log Employees		0.150**	0.0391	0.158**	0.0424	0.0111
		(0.0710)	(0.0727)	(0.0699)	(0.0839)	(0.102)
Population Share Aged < 15		8.915*	9.147*	9.032*	17.72***	20.69**
		(4.802)	(4.682)	(4.824)	(6.721)	(8.160)
Population Share Aged > 65		-1.699	0.958	-1.943	2.449	4.390
		(2.856)	(3.069)	(2.827)	(4.161)	(5.878)
Seat Share Conservative Party		2.002***	2.361***	1.977***	1.729***	1.716***
		(0.321)	(0.337)	(0.317)	(0.373)	(0.409)
Seat Share Social Democcrats		2.013***	2.69s7***	2.066***	2.859***	3.164***
		(0.555)	(0.582)	(0.547)	(0.717)	(0.869)
Seat Share 'DIE LINKE'		1.884**	1.911**	1.908**	3.032***	3.339**
		(0.931)	(0.909)	(0.933)	(1.139)	(1.410)
Predicted Local Business Tax		0.456***	0.612***	0.448***	0.569***	0.615***
		(0.128)	(0.137)	(0.128)	(0.168)	(0.171)
Investment Grants pC		0.101	0.0508	0.114	0.411**	0.469**
		(0.125)	(0.128)	(0.129)	(0.179)	(0.203)
Other Grants pC		2.062	1.880	1.826	5.349*	6.380*
		(2.256)	(2.274)	(2.260)	(3.250)	(3.854)
Spending pC		-0.740**	-0.600	-0.728*	-0.824*	-0.852*
		(0.376)	(0.367)	(0.374)	(0.444)	(0.450)
Any Amalgamation			-0.288*			
(since 2006)			(0.160)			
Any Forced Amalgamation			0.303			
(since 2006)			(0.301)			
Number of Integrated			0.0691***			
Localities			(0.0140)			
Log Tax Base Local				-0.0301		
Business Tax				(0.0283)		
Estimation Method	OLS	OLS	OLS	OLS	IV	IV
Endogenous Regressor					All Amalg.	All Amalg.
Instrument					Forced Amalg.	Distance / Rel. Size
Cragg-Donald Wald F Statistic					60.314	18.525
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
# of Observations	865	861	861	861	861	861

Notes: See the notes to Table 3 for the variable definition. Heteroscedasticity robust standard errors are presented in parentheses. *, **, ***indicate significance at the 10%, 5%, 1% level. 'OLS' and 'IV' stand for ordinary least squares estimation and instrumental variable strategies respectively. In the 'Endogenous Regressor' line, 'All Amal.' indicates that the Herfindahl index used in the specification as endogenous regressor varies with both, voluntary and forced amalgamations. In the 'Instrument' line, 'Forced Amal.' indicate that the endogenous regressor in the instrumental variable strategy is instrumented with a Herfindahl index that varies with forced amalgamations only. 'Distance/Rel. Size', in turn, is an instrument which models variation in the Herfindahl Index based on assignment rules in the second forced phase of the reform. Namely, here, the target communities wed during the reform are assigned to the adjacent community with the closest centroid if they are small (their population amounts to less than 5% of any of the 5 nearest neighbours). If they are larger, they are assigned to the smallest adjacent locality in terms of population size, reflecting the aim to create entities of similar size. 'Municipality FE' and 'Year FE' indicate that full sets of municipality and year fixed effects are included in the analysis.

9 Online Appendix

Table A1 presents coefficient estimates of the control variables in Specifications (1)-(11) of Table 2 in the main text. In Table A2, we moreover show that the baseline results are robust to controlling for unobserved heterogeneity across refined regional units and time. Specifically, Specifications (1)-(4) add a full set of commuting area year fixed effects to the control variables, Specifications (5)-(8) county fixed effects and Specifications (9) to (12) county-year fixed effects. This yields results that are qualitatively and quantitatively comparable to our baseline estimates both, in the full sample and the subset of communities that host more than 100 plants. Specifications (1) and (2) of Table A3 moreover allow for a more flexible functional form of the control variables by adding second-order polynomials of all regressors. Specification (3) rejects non-linearity in the effect of firm concentration on localities' local business tax rate choice. Specifications (4) and (5) augment the set of regressors by interactions between all control variables and locality size. This again leaves our prior results unchanged. Specifications (6) and (7) furthermore control for the fraction of economic activity in multinational enterprises (determined as the share of the locality's overall total assets in multinational firms, calculated from DAFNE[30]) to account for the fact that multinational status may go hand in hand with tax avoidance opportunities (and international mobility) that may put pressure on communities' business tax rates and may correlate with firm size. In line with expectations, the results suggest that municipalities with a high fraction of multinational activity set lower tax rates than municipalities with a more domestic asset base. The baseline estimates for the firm concentration index are, in turn, neither qualitatively nor quantitatively affected.

Specifications (1) and (2) of Table A4 moreover control for the industry structure of the localities by adding a full set of industry controls that capture the share of the communities' total assets for each 2-digit NACE industry, as determined by DAFNE. Specifications (3)-(4) and (7)-(8) moreover control for agglomeration rents at the industry level ('Index Industry Agglomeration Rents'), as proxied by an agglomeration index drawn from prior work (Koh et al. (2013), $Log\ L^{o2}_{i,t}$ defined therein). The coefficient estimates for the Herfindahl index for firm concentration remain unchanged in all model specifications, suggesting that our results are not driven by unobserved heterogeneity in industry structures. To control for inter-jurisdictional tax competition,

[30]Note that we rely on total asset shares instead of number of employees as the coverage of the latter variable is rather poor. Firms are moreover defined to belong to multinational entities if either the global ultimate owner is non-German or if the entity owns directly or indirectly (via other entities in the same group) foreign subsidiaries.

Specifications (5)-(6) and (9)-(10) furthermore add the distance-weighted average of neighbouring jurisdictions' local business tax rate to the set of regressors. Specification (11) reestimate the instrumental variable model presented in Column (4) of Table 2 in the main text, where 'Index Industry Agglomeration Rents' and 'Neighbor Local Business Tax' are added as regressors and instrumented with the distance weighted size average of neighbouring localities and the long-lagged number of railway connections (see also Section 4.2). Again, the coefficient estimates for the firm concentration variable largely resemble our baseline estimates. Specification (12) finally drops the restriction of the sample to localities with more than 10 plants. In line with the intuition spelled out in the main text, the coefficient estimate for the Herfindahl index turns out smaller than in the baseline model, albeit still statistically significant.

Table A5 acknowledges that a significant number of localities do not change their local business tax at all within our sample frame and hence present results of logit models that assess whether firm size structures impact on the binary decision to raise or lower the business tax. Similar to the baseline findings, the results in Specification (6) and (8) suggest that an increase in the Herfindahl index by 0.1 lowers (increases) a community's propensity to raise (reduce) its local business tax rate by 0.9 (0.4) percentage points or, evaluated at the sample mean, by 10.7% (26.5%).[31] The results in Table A6 moreover show that the significance of the firm concentration effect on local business tax choices prevails when we account for clustering of errors at larger geographic units (at the commuting area, commuting area-year and state-year-level).

Table A7 presents results of dynamic panel models with municipality fixed effects. To avoid Nickell bias, we follow Anderson and Hsiao (1982) and estimate the model in first-differences, where the lagged dependent variable is instrumented with deeper lags. Specification (1) presents results for the full sample, Specification (2) results for localities that host more than 100 plants and Specification (3) results for localities with more than 250 plants and a right wing majority in the local council. While the point estimates in all three specifications are similar to the baseline estimates, standard errors are inflated and the estimates are less precise, reflecting limited time variation in the concentration variable, where the between component of the standard deviation is 0.11, while the within-deviation amounts to 0.02 only. Note that the coefficient estimate for the firm concentration variable gains statistical significance at conventional significance levels in Specification (3).

Specifications (1) to (6) of Table A8 moreover assess the sensitivity of our results to us-

[31]Note that the average propensity to raise and decrease the local business tax rate is 8.7% and 1.7% respectively in Specifications (6) and (8).

ing alternative measures for communities' firm size structure, namely the standard deviation of the firm size distribution ($S_{it} = \sqrt{\frac{1}{K}\sum_{k=1}^{K}(EMP_{ikt} - \overline{EMP_{it}})^2}$, where $\overline{EMP_{it}}$ depicts the average plant employment in community i at time t ($\overline{EMP_{it}} = \frac{\sum_k EMP_{ikt}}{K}$) (following Bombardini (2008))) and the employment share of the largest firm, as constructed from DAFNE ($M_{it} = \max EMP_{ikt}/\sum_k EMP_{ikt}$). Specifications (1) and (2) moreover rerun the baseline model with a Herfindahl index calculated from DAFNE. In line with previous findings, the coefficient estimates turn out negative and statistically significant in all specifications. Note that the quantitative effects are also comparable to the baseline findings, suggesting that an increase of the Herfindahl index/standard deviation/maximum employment share by one standard deviation lowers the local business tax rate by 1.2%/2.6%/1.1% (cf. Specifications (1), (3) and (5)).[32]

Finally, we ran quantile regressions. While OLS regression approximates the conditional mean of the outcome variable distribution, quantile regression models the qth quantile of the outcome distribution as a function of explanatory variables. Specifically, while the OLS regression coefficients are defined as

$$\hat{\alpha} = \arg\min_{\alpha} \sum_{t=1}^{T}\sum_{i=1}^{N}(b_{i,r,t} - \alpha_1 - \alpha_2 H_{i,r,t} - \alpha_3' X_{i,r,t})^2,$$

the qth quantile regression estimator $\hat{\alpha}_q$ can be obtained as

$$\hat{\alpha}_q = \arg\min_{\alpha_q} \sum_{t=1}^{T}\sum_{i=1}^{N} c_q(b_{i,r,t} - \alpha_1 - \alpha_2 H_{i,r,t} - \alpha_3' X_{i,r,t}),$$

with

$$c_q(u_{i,r,t}) = \big(q1(u_{i,r,t} \geq 0) + (1-q)1(u_{i,r,t} \leq 0)\big)|u_{i,r,t}|.$$

The main benefit of quantile regressions is that they are robust to outliers and provide a more complete picture of the relationship between firm concentration and local business tax choices. The results are presented in Table A9. The upper panel presents results for the full set of localities and suggest that lower conditional quantiles of the business tax distribution tend to react more sensitively to differences in the firm size structure than upper conditional quantiles of the business tax distribution. Interestingly, this pattern is less pronounced if the sample is restricted to larger localities which host more than 100 plants (see the results presented in the lower panel of Table A9).

[32]Note that the average local business tax rate in the respective models is 17.0%, and one standard deviation in the Herfindahl index/standard deviation/maximum employment share amounts to 0.22/6.32/0.23. In the long run, it hence follows that an increase in the Herfindahl index by one standard deviation lowers the local business tax rate by 0.2 percentage points, as calculated from $= -0.027 \cdot 0.22/(1-0.97)$ or, evaluated at the sample mean, by 1.2%.

Table A1: Baseline - Dependent Variable: Local Business Tax Rate, Control Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Rural Community	-0.158***	-0.018***	-0.008	-0.007	-0.006	-0.006	0.014	-0.015	-0.008	0.009	0.011
	(0.038)	(0.005)	(0.007)	(0.007)	(0.049)	(0.006)	(0.011)	(0.078)	(0.010)	(0.014)	(0.018)
Number of Highway Accesses	0.110*	-0.001	-0.007*	-0.005	0.009	-0.005	-0.008**	-0.040	-0.006	-0.005	-0.004
	(0.057)	(0.004)	(0.004)	(0.004)	(0.048)	(0.004)	(0.004)	(0.050)	(0.004)	(0.004)	(0.010)
Number of Railway Stations	0.010	-0.002	-0.003	-0.003	-0.025	-0.003	-0.007**	-0.037	-0.005	-0.010***	-0.006
	(0.018)	(0.002)	(0.003)	(0.003)	(0.019)	(0.002)	(0.003)	(0.024)	(0.003)	(0.004)	(0.007)
Number of Airports	0.153***	0.012*	0.002	0.001	0.017	0.009	-0.009	0.011	0.015*	0.004	-0.005
	(0.057)	(0.006)	(0.009)	(0.009)	(0.056)	(0.007)	(0.010)	(0.066)	(0.008)	(0.011)	(0.021)
Number of Seaports	0.431***	0.023**	0.020	0.025*	0.239**	0.015	0.024*	0.115	0.012	0.019	0.014
	(0.114)	(0.011)	(0.014)	(0.014)	(0.096)	(0.011)	(0.014)	(0.097)	(0.012)	(0.016)	(0.019)
Income pC	-0.031**	-0.007***	-0.006***	-0.004**	-0.054***	-0.009***	-0.002	-0.043*	-0.009***	-0.001	0.010
	(0.015)	(0.002)	(0.002)	(0.002)	(0.018)	(0.002)	(0.003)	(0.026)	(0.003)	(0.004)	(0.008)
Seat Share, Conservatives	-0.284***	-0.006	-0.019	-0.020	-0.507***	0.026	0.005	-0.951***	0.038	-0.046	-0.015
	(0.060)	(0.008)	(0.012)	(0.012)	(0.124)	(0.018)	(0.026)	(0.286)	(0.040)	(0.049)	(0.141)
Seat Share, Social Dem.	0.239***	0.037***	0.039**	0.040**	0.674***	0.113***	0.125***	1.241***	0.165***	0.153***	0.227*
	(0.083)	(0.013)	(0.018)	(0.018)	(0.167)	(0.024)	(0.032)	(0.345)	(0.046)	(0.056)	(0.119)
Seat Share, Liberal Party	-0.123	-0.038	-0.046	-0.042	0.021	-0.058	-0.012	1.188	0.048	0.045	0.062
	(0.354)	(0.057)	(0.077)	(0.075)	(0.474)	(0.067)	(0.085)	(0.722)	(0.109)	(0.137)	(0.188)
Seat Share, Green Party	2.610***	0.097*	0.011	0.019	1.811***	0.042	-0.080	1.603***	-0.012	-0.131	-0.404**
	(0.402)	(0.052)	(0.073)	(0.073)	(0.443)	(0.057)	(0.080)	(0.603)	(0.081)	(0.102)	(0.165)
Seat Share, Far Left	13.863*	0.613	0.677	0.746	5.787	0.659	0.545	4.564	0.729	0.286	2.157
	(7.637)	(0.537)	(0.668)	(0.667)	(6.457)	(0.538)	(0.635)	(4.989)	(0.555)	(0.627)	(1.678)
Seat Share, Far Right	5.434**	-0.016	0.160	0.223	3.354	0.003	0.297	3.990	-0.018	0.105	-0.200
	(2.691)	(0.242)	(0.294)	(0.303)	(2.463)	(0.260)	(0.328)	(3.244)	(0.345)	(0.421)	(0.882)

Table A1: Baseline - Dependent Variable: Local Business Tax Rate, Control Variables, Continued

Investment Grants pC	0.064	-0.004	-0.010	-0.006	0.012	-0.034	-0.042	0.436**	-0.028	0.020	-0.161
	(0.071)	(0.010)	(0.014)	(0.013)	(0.149)	(0.034)	(0.057)	(0.215)	(0.042)	(0.094)	(0.121)
Other Grants pC	1.226***	0.075***	0.177***	0.103*	1.622***	0.064**	-0.014	2.313***	0.138***	0.056	-0.124
	(0.167)	(0.017)	(0.030)	(0.059)	(0.214)	(0.028)	(0.078)	(0.286)	(0.045)	(0.090)	(0.218)
Credit	-0.285***	0.083***	0.082***	0.070**	-0.427***	0.179***	0.060	-0.481*	0.274***	0.052	-0.118
	(0.072)	(0.023)	(0.032)	(0.034)	(0.160)	(0.049)	(0.069)	(0.267)	(0.072)	(0.112)	(0.137)
Debt pC	0.132***	0.008**	0.017***	0.016***	0.339***	0.017***	0.022***	0.439***	0.016**	0.019***	0.029*
	(0.029)	(0.003)	(0.004)	(0.004)	(0.043)	(0.005)	(0.005)	(0.054)	(0.007)	(0.007)	(0.017)
Population Share Aged > 65	-0.795	-0.006	-0.173	-0.237**	-3.538***	-0.032	-0.493**	-6.471***	-0.098	-0.322	-0.322
	(0.559)	(0.074)	(0.108)	(0.115)	(0.988)	(0.140)	(0.195)	(1.552)	(0.222)	(0.255)	(0.414)
Population Share Aged < 15	-3.637***	-0.294***	-0.298*	-0.252	-7.930***	-0.729***	-0.495	-11.679***	-0.892**	-0.491	0.021
	(0.817)	(0.108)	(0.175)	(0.185)	(1.551)	(0.230)	(0.376)	(2.635)	(0.438)	(0.536)	(0.831)
Unemployment Rate	5.277***	-0.270	-0.772***	-0.736**	3.345	-0.499	-0.816*	0.616	-1.003**	-1.075*	-0.938
	(1.429)	(0.225)	(0.291)	(0.290)	(2.320)	(0.336)	(0.424)	(3.308)	(0.502)	(0.590)	(1.034)
Commuting Area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Dependent variable: local business tax rate. The table presents the coefficient estimates for the control variables in Specifications (1)-(11) in Table 2. See the notes to Table 1 for a variable definition. Heteroscedasticity robust standard errors adjusted for clustering at the municipality level are presented in parentheses. *, **, ***indicate significance at the 10%, 5%, 1% level.

Table A2: Baseline Results - Robustness Check I: Region Year Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Local Business		0.951***		0.952***		0.929***		0.918***		0.940***		0.939***
Tax Rate, Lag		(0.003)		(0.003)		(0.004)		(0.005)		(0.003)		(0.005)
Herfindahl Index	-0.328***	-0.042**	-1.468***	-0.174***	-0.214*	-0.041**	-1.266***	-0.209***	-0.203*	-0.035**	-1.238***	-0.165***
	(0.125)	(0.016)	(0.365)	(0.044)	(0.109)	(0.017)	(0.294)	(0.048)	(0.112)	(0.017)	(0.314)	(0.047)
Control Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Number	> 10	> 10	> 100	> 100	> 10	> 10	> 100	> 100	> 10	> 10	> 100	> 100
Region Fixed	Comm.	Comm.	Comm.	Comm.	County	County	County	County	County	County	County	County
Effects	Area Year	Area Year	Area Year	Area Year					Year	Year	Year	Year
State FE	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations.	45,394	40,227	19,659	17,317	45,394	40,227	19,659	17,317	45,394	40,227	19,659	17,317
R-squared	0.658	0.964	0.758	0.976	0.733	0.961	0.824	0.973	0.743	0.966	0.836	0.979

Notes: Dependent variable: local business tax rate. All regressions include the full set of control variables ('Control Var.') described in Sections 3 and 4. See Table 1 for a definition of the variables. Heteroscedasticity robust standard errors adjusted for clustering at the municipality level are presented in parentheses. *, **, ***indicate significance at the 10%, 5%, 1% level.

Table A3 - Robustness Checks II: Flexible Form of Controls and Share MNEs							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local Business Tax, Lag	0.944***	0.941***	0.941***	0.944***	0.941***	0.945***	0.942***
	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)
Herfindahl Index	-0.045***	-0.188***	-0.252**	-0.045***	-0.188***	-0.044***	-0.198***
	(0.017)	(0.046)	(0.099)	(0.017)	(0.046)	(0.017)	(0.046)
Herfindahl Index, Squared			0.185				
			(0.269)				
Share Multinationals						-0.068*	-0.240***
						(0.037)	(0.088)
Firm Number	> 10	> 100	> 100	> 10	> 100	> 10	> 100
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables Squared	Yes	Yes	Yes	Yes	Yes		
Interaction Controls & Size				Yes	Yes		
Commuting Area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	40,227	17,317	17,317	40,227	17,317	40,227	17,317
R-squared	0.961	0.972	0.972	0.961	0.972	0.960	0.972

Notes: Dependent variable: local business tax rate. Specifications (1) to (5) include the full set of control variables described in Sections 3 and 4, with first and second order polynomials. Specifications (4) and (5) furthermore include interaction terms of all control variables with locality size. ***, **and *indicates significance at the 1%, 5% and 10% level.

Table A4 - Robustness Checks III: Agglomeration Rents, Avg. Neighbor Tax and Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Lag Local Business Tax	0.970***	0.962***					0.945***	0.943***	0.945***	0.943***	0.948***	0.941***
	(0.005)	(0.006)					(0.003)	(0.004)	(0.003)	(0.004)	(0.005)	(0.003)
Herfindahl Index	-0.096***	-0.147	-0.431***	-1.623***	-0.337***	-1.518***	-0.045***	-0.195***	-0.047***	-0.201***	-0.207**	-0.021**
	(0.030)	(0.095)	(0.127)	(0.374)	(0.124)	(0.359)	(0.017)	(0.046)	(0.017)	(0.046)	(0.089)	(0.009)
Index Industry			0.319***	0.124**			-0.001	-0.007			0.054	
Agglomeration Rents			(0.055)	(0.053)			(0.005)	(0.006)			(0.038)	
Neighbor Local Business					0.084	0.248***			0.038***	-0.022	0.002	0.059***
Tax					(0.065)	(0.094)			(0.015)	(0.022)	(0.034)	(0.014)
Firm Number	> 10	> 100	> 10	> 100	> 10	> 100	> 10	> 100	> 10	> 100	> 10	ALL
Sample Starting in	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2004	2000
Estimation Method	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	IV	OLS
Industry Shares	Yes	Yes										
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Commuting Area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,643	4,926	45,394	19,659	45,394	19,659	40,227	17,317	40,227	17,317	21,201	49,862
R-squared	0.973	0.983	0.656	0.750	0.651	0.749	0.960	0.972	0.961	0.972	0.912	0.957

Notes: Dependent variable: local business tax rate. All specifications include the full set of control variables described in Sections 3 and 4. Specifications (1) and (2) moreover account for a full set of industry controls that capture the share total assets in a community per 2-digit NACE industry, as determined by DAFNE. Specifications (3)-(4) and (7)-(8) moreover include a control variable for agglomeration rents at the industry level ('Index Industry Agglomeration Rents'), which was drawn from prior work (Koh et al. (2013) and corresponds to the industry agglomeration measure $LogL^{o2}_{i,t}$ defined therein). Specifications (5)-(6) and (9)-(10) add the distance-weighted average of neighbouring jurisdictions' local business tax rate, denoted 'Neighbor Local Business Tax'. Specification (11) reestimates Specification (4) of Table 2, with 'Index Industry Agglomeration Rents' and 'Neighbor Local Business Tax' being included in the regressors and treated as endogenous. 'Neighbor Local Business Tax' is instrumented with the distance weighted size average of neighbouring localities, 'Index Industry Agglomeration Rents' with the long-lagged railway instrument. Specification (12) drops the sample restriction to localities with more than 10 plants. *, **, ***indicate significance at the 10%, 5%, 1% level.

Table Appendix A5 - Robustness Checks IV: Binary Dependent Variable

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable	Incr.	Incr.	Decr.	Decr.	Incr.	Incr.	Decr.	Decr.
Local Business		-0.035***		0.024***		-0.033***		0.020***
Tax, Lag		(0.002)		(0.003)		(0.002)		(0.005)
Herfindahl Index	-0.235	-0.399*	2.092***	2.403***	-0.544	-1.305**	1.889**	3.003***
	(0.174)	(0.208)	(0.467)	(0.529)	(0.509)	(0.632)	(0.894)	(1.118)
Firm Number	> 10	> 10	> 10	> 10	> 100	> 100	> 100	> 100
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Comm. Area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Binary dependent variables, indicating tax increases ('Incr.') and tax decreases ('Decr.'). All specifications include the full set of control variables described in Sections 3 and 4. ***, **and *indicates significance at the 1%, 5% and 10% level.

Table Appendix A6 - Robustness Checks V: Clustering

	(1)	(2)	(3)	(4)	(5)	(6)
Local Business	0.945***	0.945***	0.945***	0.942***	0.942***	0.942***
Tax, Lag	(0.006)	(0.004)	(0.008)	(0.007)	(0.006)	(0.009)
Herfindahl Index	-0.045**	-0.045**	-0.045**	-0.202***	-0.202***	-0.202***
	(0.020)	(0.018)	(0.017)	(0.039)	(0.048)	(0.041)
Clustering	Commuting Area	Commuting Area Year	State Year	Commuting Area	Commuting Area Year	State Year
Firm Number	> 10	> 10	> 10	> 100	> 100	> 100
Commuting Area FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	40,227	40,227	40,227	17,317	17,317	17,317
R-squared	0.960	0.960	0.960	0.972	0.972	0.972

Notes: Dependent variable: local business tax rate. All specifications include the full set of control variables described in Sections 3 and 4. The specifications moreover account for clustering of errors at the commuting-area level, the commuting-area-year level and state-year level. ***, **and *indicates significance at the 1%, 5% and 10% level.

Table Appendix A7 - Robustness Checks VI: Municipality Fixed Effects			
	(1)	(2)	(3)
Local Business Tax Rate, Lag	0.636***	0.724***	0.667***
	(0.052)	(0.080)	(0.215)
Herfindahl Index	-0.063	-0.457	-3.586***
	(0.103)	(0.542)	(1.351)
Firm Number	> 10	> 100	> 250
			Right-Wing
Control Variables	Yes	Yes	Yes
State-Year FE	Yes	Yes	Yes
Observations	29,071	12,435	2,233

Notes: Dependent variable: local business tax rate. All specifications include the full set of control variables described in Sections 3 and 4. Equation estimated in first differences. Lagged dependent variable is instrumented following Anderson and Hsiao (1982) with deeper, namely the second and third lag of the dependent variable. ***, **and *indicates significance at the 1%, 5% and 10% level.

Table Appendix A8 - Robustness Checks VII: Other Concentration Measures						
	(1)	(2)	(3)	(4)	(5)	(6)
Local Business Tax, Lag	0.971***	0.965***	0.971***	0.965***	0.971***	0.965***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Herfindahl Index (DAFNE)	-0.027**	-0.061**				
	(0.014)	(0.028)				
Standard Deviation (DAFNE)			-0.002**	-0.001*		
			(0.001)	(0.001)		
Employment Share Largest Firm					-0.023*	-0.045**
(DAFNE)					(0.013)	(0.023)
Firm Number	> 10	> 100	> 10	> 100	> 10	> 100
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Comm. Area FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,643	4,926	11,466	4,915	11,643	4,926
R-squared	0.973	0.983	0.973	0.983	0.973	0.983

Notes: Dependent variable: local business tax rate. All specifications include the full set of control variables described in Sections 3 and 4. Firm concentration measures for our sample localities are calculated from DAFNE (the Herfindahl index in Specifications (1) and (2), the standard deviation of the firm size distribution as determined by total assets in Specifications (3) and (4) and the employment share of the largest firm in the locality in Specifications (5) and (6)). ***, **and *indicates significance at the 1%, 5% and 10% level.

Table A9 - Robustness Check VIII: Quantile Regression					
Quantiles	10th	25th	50th	75th	90th
Firm Number >10 - Baseline					
Herfindahl Index	-.345***	-.180***	-.159***	-.037	.112
	(.068)	(.036)	(.040)	(.045)	(.089)
Firm Number >100					
Herfindahl Index	-1.765***	-1.188***	-1.014***	-.953***	-1.377***
	(.277)	(.133)	(.213)	(.130)	(.177)
Community Controls			Yes		
State FE			Yes		
Commuting Area FE			Yes		
Year FE			Yes		

Notes: Dependent variable: local business tax rate. All specifications include the full set of control variables described in Sections 3 and 4. ***, **and *indicates significance at the 1%, 5% and 10% level.

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