Consolidation or Competitiveness? Economic Crises and Taxation at the Local Level *

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Abstract

How do local governments respond to economic crises? And how does local media structure these responses? After economic crises, local governments have to balance constituents' preferences for fiscal consolidation against incentives created by tax competition in decentralized countries. Underpinning this process is an institution that is viewed as essential for democracy: the local press. While the media can induce accountability, it can also expose constituents to reporting on the negative repercussions of a crisis, shifting preferences for policy responses. To make sense of these expectations, I compile a fourteen-year panel of 2,193 German municipalities, focusing on the critical areas of business and property taxation. Using a difference-in-differences design, I find that, against expectations of debt aversion, greater exposure to the crisis has a negative effect on local business tax rates. In the next step, I demonstrate that relative business tax cuts are largest in areas with a greater local media presence. I propose that a greater local media presence exposes constituents to more reporting on the negative repercussions of the crisis, increasing popular demands for responses that benefit the struggling local economy. I then present additional survey evidence to show that attitudinal changes are consistent with this mechanism. Contrasting prior work on left-ward preference shifts after economic crises, my findings highlight that constituents' perceptions of economic risk lead local governments to cut taxes for businesses.

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1 Introduction

In 2020, the Covid-19 pandemic brought on the second global economic crisis in little over a decade. Once again, governments have to balance adequate fiscal responses against the demands of their constituents. During the Great Recession, many advanced democracies pursued austerity policies to consolidate budgets (Ortiz and Cummins 2013), a response that was largely aligned with voter demands for fiscal consolidation (Bansak, Bechtel and Margalit 2021). Macro-level responses to economic crises and their relation to constituents' preferences have been studied extensively (Gourevitch 1986; Copelovitch, Frieden and Walter 2016; Hall 2018). However, scholars have paid comparatively less attention to local- rather than national-level responses. In addition, prior work on crisis responses has rarely considered the principal institution that transmits information about the economy and policy decisions to constituents – the media (Zaller 1992; Ashworth 2012; Barnes and Hicks 2018). In this paper, I therefore ask two interrelated questions. First, how do local governments respond to economic crises? Second, how does the local media environment affect these policy responses?

I study these questions using the case of the Great Recession in Germany, focusing on a critical dimension of the local-level crisis response: business and property tax rates. By explaining variance in taxation, I examine an essential function of the government that has repercussions for state capacity, income redistribution, and inequality (Tilly 1982; North and Weingast 1989; Bates 2001; Alesina and Glaeser 2004). While national governments in Europe relied on taxation to address declining revenues during the Great Recession (Frieden and Walter 2017), tax rate adjustments after crises depend on the mobility of labor and capital. At the local level, capital and labor location choices are relatively more elastic to tax rates – local governments therefore face incentives different from those at the national level (Brennan and Buchanan 1980; Levi 1989). Due to tax competition, a decentralized federal system creates incentives for reduced local taxation (Weingast 2009), which runs counter to citizens' preferences for consolidation after crises.

Before discussing my empirical approach, I lay out contradicting theoretical expectations regarding fiscal responses to economic crises. My theoretical framework focuses on the comparison between more and less strongly affected municipalities, as measured by revenue losses due to the crisis. On average, citizens in Europe and Germany favor fiscal consolidation – i.e. policies aimed at reducing deficits and debts – over expansion (Hayo and Neumeier 2017; Bansak, Bechtel and Margalit 2021). Consequently, voters may demand discipline in the form of steady or higher tax rates from local policymakers. On the other hand, tax competition in a decentralized system could lead policymakers to favor tax cuts for businesses (Rodden 2004). For two reasons, this may hold particularly true in localities more strongly affected by an economic crisis. First, crisis-induced budgetary pressures may preclude municipalities from attracting capital through infrastructure investments – these municipalities are left with tax cuts as the only available instrument to remain competitive (Crowley and Sobel 2011; Janeba and Todtenhaupt 2018). Second, constituents could demand action to alleviate their unemployment or earnings risks (Feldman 1982; Iversen and Soskice 2001). In response, municipal governments may then enact tax cuts to strengthen the local economy and decrease economic risks for workers.

Since policy responses depend on constituents' knowledge of both the repercussions of economic crises and the ability to monitor policymakers, I argue that crisis responses are inextricably linked to the local informational environment. Here, I focus on an institution that is viewed as an essential precondition for democracy – the local press (Dahl 1971; Dreze and Sen 1990; Mondak 1995). Due to dwindling readership figures and newspaper closures, many regions in advanced democracies are left with few or no local news outlets (Darr, Hitt and Dunaway 2018; Cagé 2019). The severity of this development has led commentators to decry a "democratic deficit", as the local press is not sufficiently able to hold local authorities to account (Ramsay and Moore 2016).

Theoretically, variance in local newspaper presence, as proxied by the number of available outlets, can affect crisis responses in two ways. First, a greater media presence may

make constituents better informed, thereby increasing monitoring of politicians (Snyder and Strömberg 2010; Gao, Lee and Murphy 2020). Through this accountability mechanism, a greater media presence may induce politicians to enact crisis responses that are closer to voter preferences (Ashworth 2012). Second, a larger media presence may also affect perceptions of the crisis itself, resulting in changes in the preferred policy response among constituents (Barnes and Hicks 2018; Bakaki, Böhmelt and Ward 2020). Given evidence that local newspapers frequently cover the repercussions of the crisis (see section 3), a greater media presence may lead to a heightened awareness of the adverse economic situation among constituents. Faced with coverage of the crisis, individuals may evaluate their own economic prospects more negatively (Boomgaarden et al. 2011). This may then lead to demands for policies that decrease the strain on the local economy, as individuals prefer a response that lowers their own economic risk. In addition to increasing accountability, the media may therefore serve as a "warning system" (Dreze and Sen 1990), inducing politicians to address the adverse economic effects of the crisis by cutting taxes and increasing municipal competitiveness.

Before moving on, I argue that the moderating effect of the local media landscape can resolve the question of whether tax competition or preferences for consolidation drive policy responses. If preferences for consolidation outweigh demands for a competitive local economy, a larger media presence should lead to a lower likelihood of tax cuts, as better monitoring aligns voter preferences with policy. Accordingly, the opposite result – more tax cuts in municipalities with more outlets – is more consistent with a mechanism where voters prefer policy responses that aid the local economic base.

To make sense of my theoretical expectations, I compile a fourteen-year panel data set of all West German municipalities with more than 5,000 inhabitants between 2006–2019, which covers more than 50 million inhabitants. To estimate the causal effect of the crisis on taxation, I rely on a difference-in-differences design, in which I compare municipalities that were more or less exposed to the crisis, as measured by the relative decline in municipal

revenues after 2008. While average business tax rates are growing over the whole time period, the post-crisis growth in tax rates is slower in municipalities that are more strongly affected by the crisis. This means that I observe that greater exposure to the crisis induces relative tax cuts in affected municipalities, contradicting the expectation that demands for consolidation shape policy responses.

In the next step, I examine whether this response varies with the local informational environment. I interact the crisis shock with a binary measure of local media presence, which is based on a comprehensive data set on the coverage areas of all local newspapers in Germany. I find that the negative effect on business tax rates is largest in municipalities that are covered by a greater number of local newspapers. To bolster the validity of this finding, I employ an additional identification strategy that exploits plausibly exogenous variation in the number of local newspapers that stems from overlapping newspaper market coverage areas (for similar designs, see e.g. Ansolabehere, Snowberg and Snyder 2006; Snyder and Strömberg 2010), and find that my substantive conclusions remain unchanged.

Returning to my theoretical expectations, I argue that my results are most consistent with a mechanism where voter concerns about the constitution of the local economy outweigh preferences for fiscal consolidation. Assuming that (i) more reporting increases accountability and (ii) debt aversion is the main driver of policy preferences, I would not observe larger tax cuts when there is a greater local media presence. Rather, I propose that the local press may increase concerns about the economy during a crisis, and therefore induce demands for policies that benefit the local economy. To provide evidence for this, I draw on a large-scale individual-level panel data set. I examine whether respondents in regions that were hit harder by the crisis are more likely to be concerned about both their personal and the general economic situation. I find that the crises increased concerns particularly in regions where there is a greater presence of local outlets. I argue that this is consistent with a "warning system" mechanism – the media makes constituents more acutely aware of the negative repercussions of the crisis (Dreze and Sen 1990), which in turn increases demands

for policies that help the local economic base.

My study makes several contributions to the literature on the politics of economic crises, fiscal federalism, political accountability, and the decline of local news. My results suggest an unexpected link between individual perceptions of economic hardship and pro-business policies at the local level. A common finding in the literature on preference formation is that experiences of economic hardship shift voters' social policy preferences to the left (Alesina and Giuliano 2011; Margalit 2013; Ansell 2014). In particular, this means that voters prefer greater levels of redistribution and welfare spending. In contrast, I show that municipalities where perceptions of economic hardship are strongest tend to enact *pro-business* policies in the form of tax cuts. To explain this, I argue that in the absence of available social policy instruments, municipal governments can best address individual economic risk by strengthening the local economic base. In doing so, I highlight that the connection between crisis-induced preferences and policy outcomes can vary strongly between different levels of government.

Complementing research on national and international responses to the crisis (Pontusson and Raess 2012; Frieden and Walter 2017; Hall 2018; Bremer 2018), I draw on municipal evidence to show that the crisis results in local business cuts even though the electorate overwhelmingly favors fiscal consolidation (Hayo and Neumeier 2017). To explain this, I argue that, in highly decentralized systems, tax competition between municipalities may create stronger incentives than debt aversion among constituents. In doing so, I provide a novel piece of evidence showing that the combination of economic pressures and tax competition may reduce the size of government in decentralized countries (Rodden 2003; Cai and Treisman 2005; Weingast 2009).

Finally, I demonstrate that the local media affects fiscal responses, holding constant the actual extent of the crisis. In line with prior work on the connections between media reporting and voter perceptions (Kayser and Leininger 2015; Barnes and Hicks 2018; Garz and Martin

2021), my findings emphasize that reporting on economic conditions may be more relevant for policy decisions than the underlying economic situation. Strikingly, I document a case where the media affects policy to a greater extent than government partisanship. As I discuss in section 6, the moderating effect of the local media on business tax cuts is more than twice as large as differences between left- and right-leaning municipal councils.

2 Theoretical Framework

In the following, I lay out a series of expectations regarding government responses to economic crises, as well as the moderating role of the local media. I focus on expectations regarding local tax policy.

2.1 Crisis responses

To assess how local governments may respond to economic crises, I first discuss how voter preferences relate to the economic repercussions and potential fiscal responses. I assume that there is a link between public preferences and policy responses, i.e. that voter demands at least partially affect policy.

On the most basic level, voters may draw on what Margalit (2019 p. 280) calls "long–standing views' to form opinions about adequate responses to crises. In the European context, prior research by Bansak, Bechtel and Margalit (2021) shows that austerity – i.e. spending cuts and/or tax hikes to stabilize public debts – is the preferred response to economic crises among most voters. Similarly, assessments of fiscal preferences in Germany often focus on persistent preferences for fiscal consolidation. This is apparent both in public discussions and scientific evidence – in 2015, the BBC reported on Germany's "extreme debt aversion" (BBC 2015). In a similar vein, a 2017 survey shows that about 75% of respondents favor some form of government debt reduction, while a paltry 1.9% favored additional debts

(Hayo and Neumeier 2017). Given widespread opposition to new debts, it appears plausible that constituents generally oppose tax cuts, particularly when municipal budgets are already strained by the economic crisis. Since voters appear to be "fiscal conservatives" (Peltzman 1992), a greater extent of the economic crises may therefore result in relative tax increases among affected municipalities.

An alternative view posits that, rather than drawing on preconceived notions, voters shift their preferences in response to economic shocks. As Margalit (2019) notes, economic self–interest is a prominent feature of such arguments (for examples, see e.g. Feldman 1982; Iversen and Soskice 2001). According to this approach, economic crises may induce more negative expectations of individual unemployment risk or future earnings. In response, citizens demand some form of government response to alleviate increased risks. Commonly, perceptions of increased individual risk are thought to result in demands for insurance or compensation, e.g. in the form of unemployment benefits. While prior evidence points to leftwards shifts in social policy preferences after economic shocks (Alesina and Giuliano 2011), such shifts may be less relevant for the responses of municipal governments. Chiefly, this is because municipalities cannot alter social policy instruments that are decided on the national level, such as unemployment insurance. However, municipalities can decrease unemployment risks by strengthening the local economy. They can do so either through investments into infrastructure that supports business (Hauptmeier, Mittermaier and Rincke 2012), or by directly cutting business taxes. Consequently, more exposure to economic crises may increase citizen demands for pro-business policies if individuals view these policies as a way to alleviate personal economic risks.

In addition to voter preferences, policymakers may also face distinct economic incentives that structure their response to economic crises. A key consideration for business tax decisions is tax competition with other municipalities. In systems where fiscal policy and taxation are (partially) decentralized, local governments are often viewed as constrained in their ability to increase tax rates, as mobile capital may move to places where taxes are lower

(Rodden 2003; Cai and Treisman 2005; Rodden 2006). Evidence from a range of contexts confirms this argument, as fiscal decentralization has frequently been found to correlate with lower tax rates (see e.g. Crowley and Sobel 2011; Blöchliger and Campos 2011; Hauptmeier, Mittermaier and Rincke 2012). In the German case, a number of prior studies have shown evidence for tax competition between German municipalities, (Egger, Koethenbuerger and Smart 2010; Janeba and Todtenhaupt 2018).

In relation to my argument, it is useful to assess how tax competition is affected by revenue declines due to the economic crisis. Janeba and Todtenhaupt (2018) propose that larger public debts may induce municipalities to lower business tax rates, as debts may preclude them from providing sufficient levels of public goods or infrastructure to attract businesses. To compensate for this disadvantage, they may then set lower business tax rates. A similar conclusion follows from the results of Hauptmeier, Mittermaier and Rincke (2012), who show the local governments in Germany react to business tax cuts in neighboring municipalities by lowering their own taxes and by investing in transportation infrastructure. During economic crises, budgetary constraints may preclude such investments. As a result, municipalities that experienced smaller revenue declines may now be more attractive to mobile capital since they can provide a larger amount what Hauptmeier, Mittermaier and Rincke (2012) term "public inputs" for firms. Faced with increased competition, municipalities that lost more money may resort to the only instrument that remains available to them: lower taxes on capital.

In summary, fiscal responses to economic crises depend on whether tax competition and the need to assist the struggling local economy can counteract deep-seated preferences for fiscal consolidation among the populace.

2.2 Government responses and the local informational environment

Government responses to economic crises hinge on both (i) constituents knowledge about the repercussions of the economic crisis and (ii) their ability to monitor policymakers. I therefore argue that crisis responses are inextricably linked to the local informational environment. Hence, I focus my argument on an institution that is often viewed as essential for democracy: the local press. A large body of research assesses how local media, or the lack thereof, affects political outcomes, such a turnout or polarization (see e.g. Gentzkow, Shapiro and Sinkinson 2011; Darr, Hitt and Dunaway 2018; Moskowitz 2021). A common assumption in this literature is that a lower presence of local media outlets results in diminished exposure to local news, including news on local politicians or economic conditions (Martin and McCrain 2019). Based on prior research, I expect that greater local media presence should (i) result in constituents that are better informed about the decisions of their elected representatives and (ii) are more exposed to reporting on local economic conditions. To formulate expectations about how local media moderates responsiveness to economic crises, I now consider these two points separately.

Regarding information on elected officials, local news may increase congruence between public preferences and political decisions, as proposed by, for example, Snyder and Strömberg (2010). If this is the case, responses to economic crises in regions with a greater local media presence should be more congruent with voter preferences. As an example, consider the scenario where voters are indeed strongly in favor of fiscal consolidation, but politicians are hesitant to raise taxes due to concerns about competitiveness. In this case, I would expect that relative tax increases after economic crises are more likely in regions where the local media presence is greater. However, the precise direction of this effect depends on voter preferences.

In addition to providing information about officials, media reporting may also directly affect attitudes towards government policy (Barnes and Hicks 2018; Bakaki, Böhmelt and Ward 2020). I argue that greater exposure to the *local* economic repercussions of economic crises may lead individuals to be less supportive of higher business taxes. This argument is related to my prior discussion of economic self-interest, In response to reporting about economic crises, individuals may form more negative perceptions about both their own economic prospects, but also about local-level economic developments (Boomgaarden et al. 2011 provides evidence for this). This could then induce individuals to espouse policies that benefit rather than strain the local economy and therefore reject higher taxes for businesses. In sum, a greater local media presence not only provides citizens with information about political decisions but may also draw attention to pressing economic matters. As such, local news may serve as what Dreze and Sen (1990 p. 264) call a "warning system", putting pressure on politicians to address the negative repercussions of economic crises.

3 Institutional background

To analyze local responses to economic crises, I study the case of Germany during and after the Great Recession.[1] I draw on data from about 2,200 German municipalities between 2006–2019, which enjoy a relatively high level of fiscal autonomy. In particular, I focus on the critical areas of business and property taxes. In addition, I measure the structure of the local informational environment through data on the coverage areas of all German local newspapers. Below, I provide additional contextual information on both municipal finances and fiscal policy, as well as on the role of the local press.

[1]For the remainder of the paper, "the economic crisis" always refers to the Great Recession.

3.1 Municipal finances

As the lowest level of government, German municipalities are tasked with providing a number of public goods and services. These include local transportation infrastructure, utilities, kindergartens and primary schools, cultural and sports facilities as well as certain social benefits for the unemployed and the poor (Foremny and Riedel 2014). While municipalities have to finance some social policy instruments[2], they cannot alter the specific amount of unemployment benefits or other transfer payments that are provided to beneficiaries (Bundesbank 2007). Redistributive policies are decided at higher levels of government, and municipalities can therefore not provide additional direct benefits to, for example, those who become unemployed due to the economic crisis.

Municipal revenue derives from two main sources – fiscal transfers from federal and state governments, as well as direct revenues from local business and property taxes. All major municipal finance decisions are made via majority votes in elected municipal councils. While the administrative structure varies between states, elected mayors generally have little or no influence on municipal finance policy (Garmann 2017).

3.2 Business and property taxes

Local governments derive their revenue from two main sources, fiscal transfer from higher levels of government, as well as direct revenue from two local tax instruments. These are property and business taxes, of which business taxes constitute a relatively larger share of municipal incomes than property taxes – local business taxes account for about three-quarters of total local tax revenues (see also table 1). In my sample, combined local taxes account for about one-third of total municipal incomes.

[2]As an example, a 2005 unemployment insurance reform shifted some of the costs of providing accommodations to unemployed individuals from the federal to the municipal level.

Local business taxes are levied on firm profits and account for between 60%-70% of all taxes levied on firm profits (Fuest, Peichl and Siegloch 2018). Local business taxes only apply to profits derived from economic activity within the boundary of the municipality that levies the tax. For firms that are located in more than one municipality, profits are apportioned to each respective municipality based on payroll shares. Tax rates at the municipal level are set based on a national base rate (*Steuermesszahl*), which was 5% prior to 2008, and 3.5% afterwards.[3] Municipalities can then set a percentage multiplier on this base rate, which averaged 352% in 2007. The final tax rate is then the product of the base rate and the multiplier, which results in a rate of 17.6% in 2007 in my sample.[4]

Local property taxes are similarly determined by a national base rate and a local multiplier, which is determined by municipal councils. Local property taxes consist of two components, *Grundsteuer A* and *Grundsteuer B*. The former only applies to agricultural properties, while the latter applies to all residential and commercial properties in a given municipality. Since the former is only a marginal component of the total property tax incidence (Asatryan, Baskaran and Heinemann 2017), I focus on the latter. National base rates for properties depend on housing types. All properties except for single-family and two-family properties are subject to a base rate of 0.35% of the assessed value, while the two aforementioned property types are subject to slightly lower base rates. Löffler and Siegloch (2018) estimate that the average base rate in West Germany is 0.32%. Given an average multiplier of 332%, the annual average property tax rate in my sample is about 1.06% of the assessed value of the property.

[3]While this base rate change coincides with the economic crisis, it does not vary across municipalities, since the base rate is set on the national level. Feasibly, the base rate change may have affected local tax rate decisions. However, this should not introduce bias into my empirical estimates, as the base rate change affected all municipalities equally, and does not correlate with either my treatment or moderator variables.

[4]Throughout the rest of the paper, I use the terms 'business tax rate' and 'business tax multiplier' interchangeably, since across–municipality variation in local business tax rates is determined entirely by the multipliers.

Local property taxes do not track property value increases. This is caused by strict assessment rules – assessed property values are based on land and building values in 1964, and therefore do not represent price increases after that year (Löffler and Siegloch 2018). Properties are assessed by federal states rather than municipalities, and reassessments are only conducted after 'significant changes' are made to a property – property sales do not lead to reassessments. As a result, Löffler and Siegloch (2018) estimate that assessed values were about 80% lower than actual property values in 2013.

Both property and business tax multipliers are decided by municipal councils, which are elected every four to six years, depending on the federal state. Both business and property tax multipliers can be changed every year, such that tax rates in year t are set in year $t-1$. Even if tax rates are kept constant, all municipalities have to conduct an annual vote on the issue of tax rate changes. Over the period between 2006–2019, about 80% of municipalities raised property tax multipliers at least once, while about 75% of municipalities raised business tax multipliers at least once. Multipliers for both taxes are increasing over time throughout the period covered by my sample, as I show in figures A.4 and A.5 in the SI.

3.3 Local media presence

The second core question of my paper is whether government responses to the crisis are structured by the local media landscape. Although the relative importance of local newspapers has declined over time (Vogel 2014), local newspapers remain a key source of information about local politics. In general, the German media landscape is characterized by relatively high levels of newspaper circulation, strong professionalization among journalists and the early development of mass-circulation outlets (Hallin and Mancini 2004).

Local newspapers in particular remain a trusted and widely-used source of information. In 2011, local newspapers reached about 55.8% of all German adults (Bundesverband Deutscher

Zeitungsverleger 2011; Vogel 2014). Local newspapers are generally considered to be one of the most reputable types of media – in a representative survey from 2018, local newspapers are viewed as more trustworthy than either national outlets or public television news. In the same survey, respondents report that local news about their region is the main reason for subscribing to local newspapers, edging out national and international news (Nic et al. 2018 p. 81). Accordingly, local newspapers form what Leupold, Klinger and Jarren (2018 p.960) term the "informational backbone of what people know about social life in their city".

In my theoretical argument, I focus on two aspects of local reporting – coverage of local politics and local economic conditions. Local newspapers frequently cover issues related to economic conditions and the labor market. I use additional data from the German Longitudinal Election Study (GLES, see also Roßteutscher et al. 2017) to show this. Between 2010–2013, the GLES included a large-scale content analysis of 14 German local newspapers. Based on data, I find that about one in five articles dealt with either the economic situation or the labor market between 2010–2012, with this number dropping to about one in ten in 2013.[5] The fact that economic coverage decreased as the economy recovered suggests that economic reporting after 2008 mainly focused on the repercussions of the crisis.

In addition to reporting on local economic conditions more, local outlets provide citizens with information on the actions of their elected officials. Prior research suggests that local politicians are acutely aware of the fact that local newspapers inform citizens about policy decisions. Based on a survey of local politicians, Amann, Dohle and Raß (2013) find that local politicians rate local newspapers as the medium most likely to affect public perceptions about local politics. In a related survey of local politicians, 90% of respondents rate local newspapers as 'relevant' or 'highly relevant" for their work (Fawzi, Baugut and Reinemann 2018). In addition, 85% of surveyed local politicians report that they make statements in local outlets "to increase the transparency of the political process" (p. 36). Taken together, prior evidence, therefore, suggests that (i) local newspapers frequently report on the

[5]For more information, see the discussion in section A.1.3 in the SI.

actions of local politicians and (ii) local politicians recognize that local newspapers provide information about local politics to citizens.

4 Data

I combine data from different sources to construct an annual panel of about 2,200 municipalities in West Germany, covering all years between 2006–2019. This data includes information on municipal revenues, spending, taxation, voting behavior, and local media presence. Given frequent changes of administrative boundaries and municipality mergers in East Germany during this time period, I do not use East German data. This decision is in line with prior work using similar municipal data, such as Fuest, Peichl and Siegloch (2018) or Löffler and Siegloch (2018). In addition, I also exclude the city-states of Bremen, Hamburg, and Berlin. Since municipal finance data is available primarily for municipalities with more than 5,000 inhabitants, my final sample comprises about 2,200 municipalities or about 25% of all West German municipalities. In sum, these municipalities had about 50.5 million inhabitants in 2007, which translates to about 75% of the West German population at the time.

4.1 Municipal panel data

To measure municipal spending, revenue and debt, I draw on data constructed by the Bertelsmann Foundation. Specifically, I use data from the *Wegweiser Kommune* (municipality guide, see also https://www.wegweiser-kommune.de/) project, which collects and combines data on municipal finances from a multitude of sources, such as state statistical offices and private data providers.[6] The Bertelsmann Foundation does not collect data on all municipalities, but rather only on municipalities with more than 5,000 inhabitants.

[6]Given the highly decentralized administrative system in Germany, the Federal Statistical Office does not collect data on municipal finances. To my knowledge, the data collected by the Bertelsmann Foundation is the most comprehensive available data.

While the Bertelsmann data includes a large set of indicators, I focus on three fundamental measures of municipal finances in addition to property and business taxes: municipal revenues, spending, and debts, all measured per capita. Following Fuest, Peichl and Siegloch (2018), I add two control variables from the Federal Statistical Office, which are both measured on the county level: unemployment rates and GDP/capita, which I observe annually.

4.1.1 Treatment: revenue decline due to the Great Recession

To measure how strongly municipalities are affected by the crisis, I use an indicator that is readily observable to local governments: declines in municipal revenues. Based the per-capita revenue measure from the Bertelsmann data, I define my main treatment as the relative per-capita revenue decline between 2008 and 2009, and then dichotomize this variable through a mean split.[7] The variation in revenue declines that I examine mainly stems from reduced tax income from local businesses, and should therefore be viewed as indicative of a general downturn of the local economy in a given municipality.

While the great recession began already in 2008, the 2008–2009 revenue change is the most sensible way to code the treatment. The reasons for this are as follows: first, the crisis reached its climax in late 2008, which means that the repercussions likely became most apparent in 2009. I provide additional evidence for this in figure A.1, where I show that year-on-year revenue declines were most pronounced between 2008-2009. As is shown in table 1, the median municipality experiences are revenue decline of 5.65% between 2008 and 2009. In total, about 70% of municipalities in my sample experienced some revenue decline after the crisis (see also figure A.2). Second, my treatment definition implies that the first post-treatment period is 2010. As discussed in section 3, municipal fiscal and tax outcomes observed in year t are usually based on decisions made in the previous year. Given that the revenue effects of the crisis became most apparent in 2009 and given the one-year lag in

[7] Formally the relative revenue decline is defined as $\Delta r_i = (r_{i2009} - r_{i2008})/r_{i2008}$ for per-capita revenues r_{it} in municipality i in year t.

policy decisions, it makes sense to consider 2010 to be the first year in which fiscal and tax responses would take effect.

4.2 Local newspaper coverage data

After assessing unconditional patterns of responsiveness, I aim to examine whether the media landscape moderates how local governments respond to the crisis. To do so, I rely on comprehensive data set on the coverage area of all local newspapers in Germany in 2011.[8] I source this proprietary data set from the market research firm *Zeitungsmarktfoschung Gesellschaft* (ZMG, see also https://www.zmg.de/ for more information). ZMG is owned by the "Federation of German Newspaper Publishers" (BdZV), which is the trade organization of German newspaper publishers. To my knowledge, this data set contains the most accurate information on newspaper coverage areas, since it (i) stems directly from the newspaper trade organization and (ii) is normally employed for purposes of targeted advertising, which requires high standards of data reliability. This data allows me to measure the number of local newspapers that cover a given municipality. As shown in table 1, the median municipality is covered by two newspapers – there are no municipalities where there are no local newspapers at all.

4.3 Individual-level panel data

To assess attitudinal mechanisms behind my main results, I employ data from the German Socio-Economic Panel Survey (SOEP, see also Liebig et al. 2021). The SOEP is a large-scale annual panel survey that covers the same time period (2006–2019) as my main municipal

[8] I note that the coverage data was measured shortly after the economic crisis. It could therefore be subject to post-treatment bias if the crisis shock led to large-scale newspaper closures. However, I argue that this is likely negligible, as the number of newspapers in Germany decreased by only about 1% between 2007 and 2011 (*Tageszeitungen - Deutschland 2018* 2018).

Table 1: Summary statistics

Variable	Mean	Median	SD	Min	Max	N
Background characteristics						
Population (1000s)	23.36	11.65	55.82	4.23	1302.07	2164
Population density	433.81	267.08	451.17	22.39	4181.15	2162
Unemployment rate (%)	6.81	6.23	2.37	2.42	18.22	2164
GDP / capita	28304.76	25826.84	9764.14	14706.02	87549.48	2164
Voting						
Turnout	68.51	69.86	7.22	48.45	84.62	2193
CDU/CSU vote share	37.61	36.20	7.30	19.32	66.29	2193
Fiscal and tax measures						
Revenue / capita	1383.83	1279.00	508.07	168.00	10582.00	2193
Spending / capita	1147.85	1073.00	371.63	116.00	5349.00	2193
Current debt / capita	791.09	568.00	770.01	0.00	6611.00	2193
Property tax / capita	105.60	103.00	29.94	0.00	317.00	2193
Business tax / capita	339.02	250.00	412.06	0.00	7467.00	2193
Property tax multiplier	332.17	330.00	57.43	140.00	600.00	2151
Business tax multiplier	352.71	340.00	40.12	240.00	490.00	2164
Revenue change due to crisis (%)	-6.07	-5.65	15.59	-91.34	130.65	2193
Media landscape						
Number of local outlets	1.91	2.00	1.02	1.00	8.00	2121

Notes: The table presents summary statistics for the municipalities that constitute the sample used for all main results. The sample is West German municipalities for which there is municipal finance data available, which is a total of 2,193 municipalities. The quantities presented in this table are all measured in 2007, except for the voting outcomes (measured for the 2009 federal election) and the number of local outlets (measured in 2011). All variables are measured at the municipality level, except for unemployment rates and GDP/capita, which are measured at the county level.

data. It primarily focuses on demographic and economic indicators. I use the SOEP survey to obtain data on individual perceptions about the economy, both before and after the crisis. In particular, I measure (i) how respondents evaluate the economy in general and (ii) how they assess their own economic situation. I provide more details on these two items in section A.3 in the SI. Since the SOEP contains information on the municipalities that respondents reside in, I can link it to both the municipal and the newspaper coverage data.

5 Empirical Strategy

My empirical strategy is structured around two questions. First, I assess how local governments react to revenue losses brought on by the Great recessions. Second, I examine whether these reactions vary with the local informational environment, i.e. if there is more reporting on both the crisis and local governments.

5.1 Government responses

In a first step, I examine whether government spending, debt, and taxation change after municipalities experience revenue shocks brought on by the Great Recession. While the majority of my empirical analysis focus on tax rates as the main outcome, I also show results for municipal spending and debt to provide context on non-tax responses. Since I have annual panel data, I rely on a standard difference-in-differences model of the following form:

$$Y_{ijt} = \mu_i + \delta_{jt} + \tau(\text{Post}_{it} \times T_i) + \varepsilon_{ijt}$$

Here, Y_{ijt} is a given fiscal policy outcome, measured for municipality i in year t and state j. The treatment indicator T_i is equal to one if a municipality experiences revenue loss between 2008 and 2009 that are greater than the average revenue loss across all municipalities.[9] In the results section, I also present results using the continuous measure of relative revenue decline rather than the binary measure. However, I prefer the binary measure, since (i) it is not subject to large outliers and (ii) it results in fewer assumptions about the functional form of the relationship between government responses and the crisis. The quantity of interest in this

[9]Formally the relative revenue loss is defined as $\Delta r_i = (r_{i2009} - r_{i2008})/r_{i2008}$ for per-capita revenues r_{it} in municipality i in year t. Then, the treatment indicator $T_i = 1$ if $\Delta r_i < \overline{\Delta r_i}$. Additional information on Δr_i is given in table 1, where it is listed as "Revenue change due to crisis".

specification is τ, which represents the difference-in-differences estimate of the effect of the crisis shock on government responsiveness. In all specifications, I always include municipality fixed effects, as well as year*state fixed effects. In addition, I also present additional results where I include two time-varying covariates, county-level GDP/capita and unemployment rates.

The key assumption behind my empirical strategy is that, in the absence of the treatment, outcomes in treated and control municipalities would have evolved in parallel. In section 6.1, I provide evidence that trends in business and property taxes evolve in parallel prior to the crisis. However, I note that my treatment definition introduces differential trends in municipal finance outcomes. Since my definition of the crisis shock is based on larger municipal revenue declines between 2008-2009, I force revenue trends to diverge during the height of the Great Recession. As a result, I advise readers to exercise caution when interpreting the difference-in-differences results for the municipal spending and debt outcomes. For the tax multiplier results, which the majority of my discussion focuses on, there is little reason to suspect violations of the key identification assumption, as I discuss in more detail in section 6.4.

To assess dynamic effects of the crisis shock, I further estimate an event-study specification of the following form:

$$Y_{ijt} = \mu_i + \delta_{jt} + \sum_{k=-4}^{9} \beta_k \big(T_j \times \mathbf{1}_{t=k}\big) + \varepsilon_{ijt}$$

Here, I am interested in the coefficients β_k, which can be interpreted as period-specific difference-in-differences estimates relative to the last pre-treatment period. I do not include the interaction for the last pre-treatment period (2009, which would correspond to β_{-1}) which serves as the baseline for all estimated treatment effects.

5.1.1 Matching on pre-treatment characteristics

To strengthen the plausibility of the parallel trends assumption, I present additional results where use propensity score weighting to balance treated and control municipalities on a number of pre-treatment characteristics. My main treatment – the crisis shock – is correlated with a number of municipality characteristics, as I show in figure A.3 in the SI. On average, revenue losses are greater in municipalities where pre-treatment per-capita GDP is larger, local governments spend more money, there is less unemployment, and population densities are higher. Such level differences are in itself not an issue for my difference-in-differences design, since the design only requires that *changes* in the outcome would evolve in parallel in the absence of the treatment.

However, pre-treatment differences in baseline covariate levels may be indicative of a violation of the parallel trends assumption. I emphasize that the observed pre-treatment differences are relatively small, and never exceed $\sim$0.2 standard deviations. Still, municipalities that are different to begin with may also follow different trajectories in terms of future fiscal or tax policy. To alleviate such concerns, I use a supplementary weighting approach based on the Covariate Balance Propensity Score (CBPS, Imai and Ratkovic 2014). I rely on CBPS weights to balance treated and control municipalities along a number of relevant pre-treatment characteristics, measured both as levels and pre-treatment changes (see e.g. Abadie 2005 for a discussion of weighting methods in difference-in-differences designs). As shown in figure A.3, this weighting approach removes practically all differences mentioned earlier – after weighting, treated and control municipalities are almost perfectly balanced. I employ this weighting approach to supplement results from all my main difference-in-differences analysis, which I discuss in more detail in section 6.1.

5.2 Heterogeneity

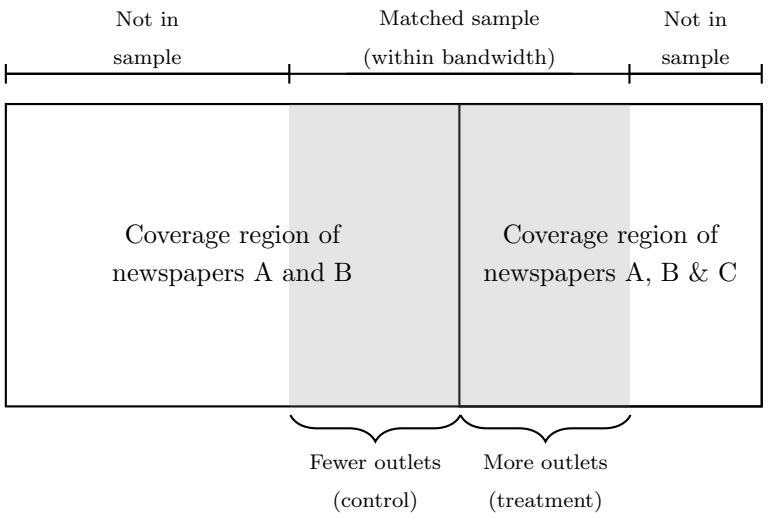
In a second step, I examine whether responses to the crisis, particularly with response to business taxes, differ when there is a greater local media presence. To facilitate this, I interact the media presence indicator M_i with the $\text{Post}_{it} \times T_i$ term, which results in the following specification:

$$Y_{ijt} = \mu_i + \delta_{jt} + \tau(\text{Post}_{it} \times T_i) + \gamma(\text{Post}_{it} \times M_i) + \lambda(\text{Post}_{it} \times T_i \times M_i) + \varepsilon_{ijt}$$

Accordingly, the parameter of interest is λ, which measures how the effect of the crisis is mediated by a greater local media presence. The variable M_i is defined in a similar manner as T_i – it is equal to one if the number of available local newspapers in a given municipality is larger than the mean number of newspapers in all municipalities. As is standard, I also include the $\text{Post}_{it} \times M_i$ interaction. The constituent terms M_i and T_i are perfectly correlated with the municipality fixed effects μ_i, and are therefore not included in the specification.

While I cannot directly measure newspaper readership, the number of outlets is a proxy for news consumption. Based on the ZMG data, per-capita local newspaper circulation is about 0.4 standard deviations higher in municipalities for which $M_i = 1$, i.e. where there are an above-average number of local outlets. An additional advantage of using the number of outlets rather than readership figures is that problems of endogeneity are likely harder to address for readership figures. As I discuss in the next section, using the number of outlets enables me to employ an additional identification strategy to decrease the likelihood that the moderator is correlated with potentially unobserved municipal characteristics.

Figure 1: Visualization of the overlapping markets design



Notes: The figure visualizes the overlapping markets strategy. The rectangles represent newspaper coverage areas. The shaded areas represent the matched sample, i.e. the region surrounding the boundary of the coverage area of newspaper C, which is denoted by the solid vertical line.

5.2.1 Overlapping markets design

While the difference-in-differences strategy can account for unmeasured confounding that is constant over time, the interaction specification is more susceptible to differences between municipalities with a larger or smaller local media presence. To address the fact that local media presence likely correlates with other factors, I present additional results that utilize plausibly exogenous variation in media presence that stems from overlapping newspaper coverage areas, and is thus less vulnerable to confounding. This design is very similar to the one implemented in Hilbig and Riaz (2021), and is partially based on similar empirical designs in, for example, Ansolabehere, Snowberg and Snyder (2006) or Snyder and Strömberg (2010).

In essence, I compare municipalities that are similar with respect to a variety of observable characteristics and are situated in regions where the coverage regions of two or more newspapers overlap. As an example, I compare a municipality that is covered by newspapers A and B with a neighboring municipality that is covered by newspapers A, B, and C –

this scenario is visualized in figure 1. The boundary of the coverage area of newspaper C intersects with the coverage area of newspapers A and B. As a result, municipalities in the vicinity of the boundary of newspaper C's coverage area are covered by one additional outlet if they fall just within newspaper C's coverage area. In this setting, the key identification assumption is that the greater media presence in the municipality that is covered by A, B, and C is as good as randomly assigned close to the boundary of the coverage area of newspaper C. I provide more details on the veracity of this assumption, as well as on the implementation of the overlapping markets design in section A.2 in the SI.

6 Results

6.1 Government responses to the Great Recession

Table 2: Fiscal and tax responses to revenue declines

	Spending per capita	**Debt per capita**	**Business tax multiplier**	**Property tax multiplier**
Shock * post	-0.037^{**}	0.038	-0.076^{***}	-0.021
	(0.016)	(0.032)	(0.023)	(0.022)
Municipality FE	Yes	Yes	Yes	Yes
State*year FE	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes
N	23,660	23,661	27,960	27,960
R^2	0.891	0.736	0.872	0.866

Notes: The table presents estimates from the base specification. The treatment is equal to one if the percentage decline in government revenues between 2008 and 2009 is greater than the average decline in revenues across all municipalities. All outcomes are standardized. The sample includes all years between 2006 and 2016 for the first two outcomes, and all years between 2006–2019 for the tax multiplier outcomes. Standard errors clustered at the municipality level are given in parentheses. $^{***}p < .01$; $^{**}p < .05$; $^{*}p < .1$

In table 2, I present the first set of results. In municipalities that are more affected by the crisis, I observe a significant decline in overall spending. In addition, there is a concurrent increase in debts of similar magnitude (however, this effect is not precisely estimated).

Regarding tax responses, I find that business taxes decrease in affected municipalities, while I do not observe significant changes in property taxes. In supplementary specifications in figure A.12 in the SI, I further show that these effects do not vary with the partisan composition of local councils. Municipal councils dominated by right-wing parties are not more likely to lower business taxes or curtail spending than councils where left-wing parties are stronger.

Table 3: Business tax changes in response to the Great Recession

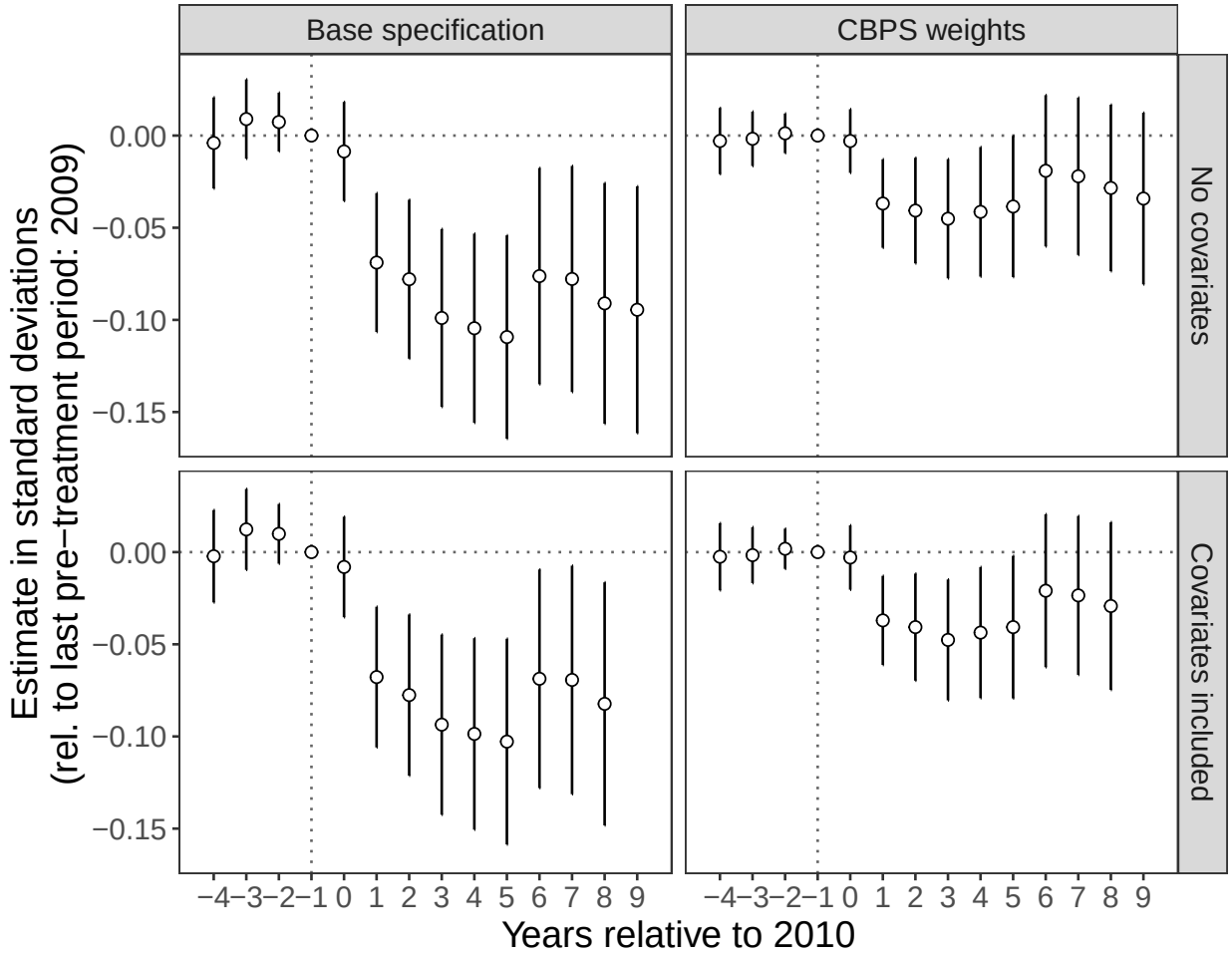
	Business tax multiplier					
Shock * post	-0.081^{***}	-0.076^{***}	-0.031^{***}	-0.028^{***}	-0.044^{*}	-0.045^{**}
	(0.024)	(0.023)	(0.011)	(0.010)	(0.024)	(0.023)
Treatment	Binary	Binary	Continuous	Continuous	Binary	Binary
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
State*year FE	Yes	Yes	Yes	Yes	Yes	Yes
Covariates	No	Yes	No	Yes	No	Yes
CBPS matching	No	No	No	No	Yes	Yes
N	30,109	27,960	28,583	26,543	30,086	27,937
R^2	0.867	0.872	0.867	0.872	0.877	0.893

Notes: The table presents estimates from the base specification. I use two different treatments, (i) a binary version that is equal to one if the percentage decline in government revenues between 2008 and 2009 is greater than the average decline in revenues across all municipalities and (ii) a standardized version of the continuous measure of percentage decline in revenue. For the continuous treatment, I drop the 5% most extreme values, which leads to a lower sample size. The outcome is standardized. The sample includes all years between 2006 and 2019. Standard errors clustered at the municipality level are given in parentheses. $^{***}p < .01$; $^{**}p < .05$; $^{*}p < .1$

In the next step, I more closely examine the effect on business taxes. In table 3, I present results from a range of specifications and treatment definitions. In particular, I present results with and without covariates, as well as using either the binary or continuous treatment definition. Finally, I also include specifications where use covariate-balancing propensity scores as weights to balance treated and control groups along pre-treatment levels and trends (I elaborate on this more in section 5.1.1). Across all specifications, I find that the effects are similar in magnitude and significance.

In addition to the aggregate results in tables 2 and 3, I can further utilize the panel

Figure 2: Effect of revenue shock on business tax rates over time



Notes: The figure contains lags and leads estimates of the effect of the 2008 revenue shock on business tax multipliers. The outcome is standardized. The treatment is equal to one if the percentage decline in government revenues between 2008 and 2009 is greater than the average decline in revenues across all municipalities. The sample includes all years between 2006 and 2019. Coefficients are differences relative to the last pre-treatment period, 2009. For raw trends, see figure A.4 in the appendix.

structure of the data to trace how government responses vary over time. I do this in figure 2, where I present results from the lag/lead specification described in section 5.1. Here, I again present results from the baseline specification, as well as from specifications that (i) add time-varying controls and (ii) adjust for pre-treatment imbalance through CBPS weights. Reassuringly, there is little evidence for pre-existing trends in business tax changes prior to the Great Recession. All effect estimates prior to the crisis are small and insignificant. What is more, there is little evidence that changes prior to the crisis already follow the trends I

observe after the crisis. After municipalities have experience the revenue shock, I observe marked negative effects on the change in business tax rates, which confirms the aggregate results in table 3.

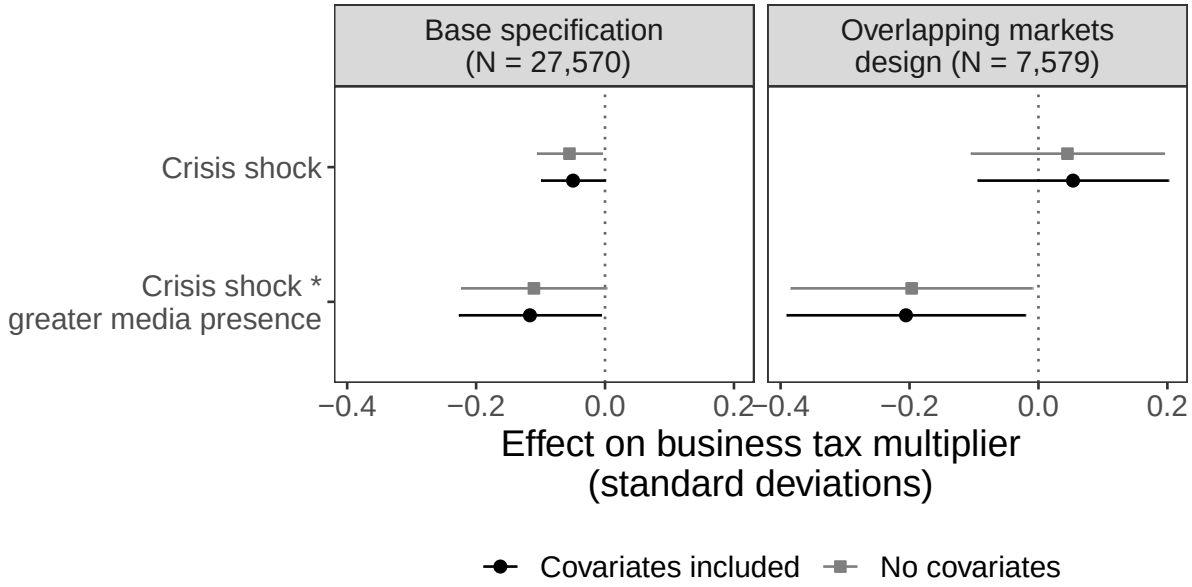
I emphasize that the negative difference-in-differences estimate does not stem from an absolute decline in tax rates in treated municipalities. As I show in figure A.4 in the SI, business tax multipliers increase both in municipalities that are more or less strongly affected by the crisis. However, while the growth in tax rates is similar in both groups prior to the crisis, it is relatively smaller in municipalities that lose more revenue after 2009. This means that the negative effects shown in table 3 and figure 2 stem from a *smaller growth* in tax rates in treated municipalities relative to control municipalities, rather than from tax rate declines. While tax rates are higher in control municipalities than in treated municipalities prior to the crisis, this pattern reverses after the crisis. This reversal is persistent, as the resulting gap in tax rates never closes again.

6.2 The local informational environment and crisis responses

Having demonstrated that the crisis has repercussions particularly for business tax rates, I now discuss whether this form of responsiveness is conditioned by a greater or smaller presence of the local media. In doing so, present evidence based on the specification described in section 5.2. In addition, I also present evidence from the overlapping markets strategy, which I employ to ensure that potential heterogeneity is not an artifact of unmeasured confounding. In figure 3, I show that the crisis has a larger effect in municipalities where there is a greater local media presence. Stated differently, local councils in municipalities that are strongly affected by the crisis are less likely to raise business tax rates when their municipality is covered by a larger number of newspapers.

This result does not appear to stem from other factors that correlate with local newspaper presence. In the second panel of figure 3, I find similar effects when I limit the sample

Figure 3: Effect of revenue shock on business taxes conditional on local media presence

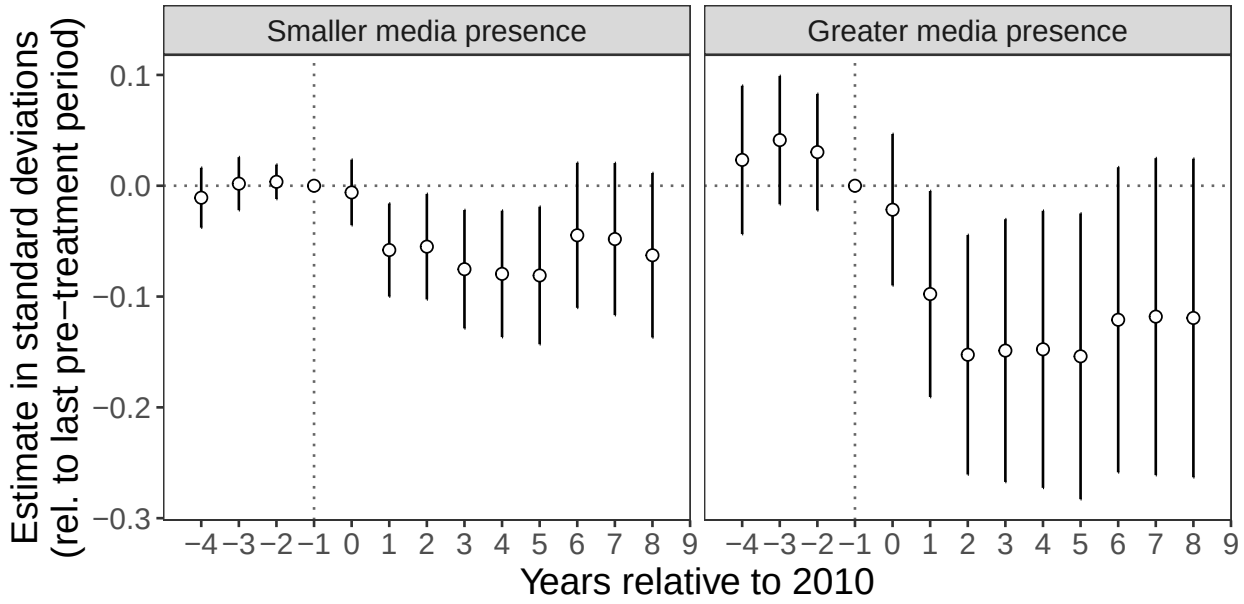


Notes: The figure presents estimates from the interaction specification described in section 5.2. The treatment is equal to one if the percentage decline in government revenues between 2008 and 2009 is greater than the average decline in revenues across all municipalities. I interact this treatment with an indicator that is equal to one of a given municipality is covered by more newspapers than the average municipality. The sample includes all years between 2006 and 2019. The left-hand side panel shows results from the base specification. The right-hand side panel is based on the overlapping market designs, where I exploit variation in the number of newspapers that stems from the intersection of overlapping newspaper coverage areas. Standard errors are clustered at the municipality level.

to municipalities that are geographically close and similar with respect to a number of covariates. In this sample, variance in media presence stems primarily from the fact that some municipalities are just inside the coverage areas of a given newspaper, which results in a greater local media presence than in the case of neighboring municipalities just outside the coverage area.

Like the previous set of results, I also present period-specific effects. In figure 4, I show lags and leads estimates, separately for municipalities with a smaller and larger presence of local media outlets. In both subsets, I observe negative effects on business taxes. When comparing the two subsets, I find that year-specific estimates for municipalities with fewer outlets are markedly closer to zero than for municipalities where there are a larger number of outlets, confirming the interaction results in table A.2. For both subsets, I again find

Figure 4: Effect of revenue shock on business taxes over time, conditional on local media presence



Notes: The figure contains lags and leads estimates of the effect of the 2008 revenue shock on business tax multipliers. The outcome is standardized. The treatment is equal to one if the percentage decline in government revenues between 2008 and 2009 is greater than the average decline in revenues across all municipalities. The sample includes all years between 2006 and 2019. Coefficients are differences relative to the last pre-treatment period, 2009. For raw trends, see figure A.6 in the appendix.

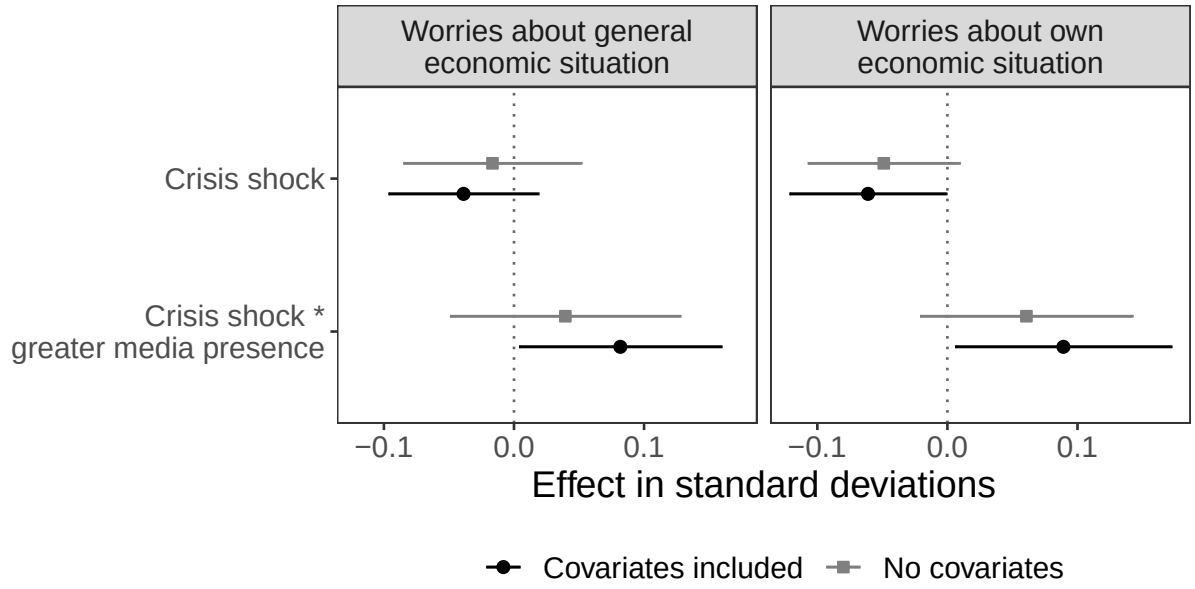
little evidence that municipalities that were more severely affected by the crisis experience differential trends in business tax rates prior to 2008, which provides support for the parallel trends assumption within each of the two subsets.

6.3 Evidence on the mechanism – concerns about economic risk

Finally, I examine how the crisis shock affects individual attitudes, conditional on local media presence. In figure 5, I show that the crisis increases worries about the economic situation among constituents, both for their assessments of the general economic situation and their own economic prospects. This is only the case for individuals in areas where there is a greater local media presence, which likely translates to greater exposure to news about the crisis.

These results are consistent with a mechanism whereby greater exposure to reporting

Figure 5: Effect of revenue shock on individual-level attitudes, conditional on local media presence



Notes: The figure presents estimates from the interaction specification described in section 5.2. The treatment is equal to one if the percentage decline in government revenues between 2008 and 2009 is greater than the average decline in revenues across all municipalities. I interact this treatment with an indicator that is equal to one of a given municipality is covered by more newspapers than the average municipality. The sample includes all years between 2006 and 2019. The outcomes are (i) whether individuals are more concerned about the general economic situation and (ii) whether they are more concerned about their own economic situation. For the survey items, see section A.3 in the SI. Additional information on the results is given in table A.3 in the SI. Standard errors are clustered at the municipality level.

about the negative repercussions of the crisis induces individuals to evaluate the economic situation more negatively. This, in turn, may then lead individuals to demand policies that help the struggling local economy, such as lower business tax rates. Regarding perceptions of the local economy, I note that about two-thirds of the total employment in Germany is in small or mid-sized enterprises (Eurostat 2021) Therefore, my results should be viewed as indicative that constituents may demand actions to assist smaller enterprises that make up the local economic base, rather than large, multinational companies.

6.4 Robustness

In addition to the main results, I conduct six robustness checks.

First, I present additional difference-in-differences specifications in which use CBPS weights to balance pre-treatment levels and trends between treatment and control groups. These additional specifications include the final two models in table 3 as well as the right-hand side panels in figure 2. In general, my conclusions remain unchanged when I use the weighted sample.

Second, I provide additional evidence on the parallel trends assumption for the tax multiplier outcomes by drawing on more pre-treatment periods. This is possible since the German Federal Statistical Office has data on tax multipliers for periods prior to 2006, which are not part of the Bertelsmann data. This data goes back until 1992, and therefore allows me to assess a total of 17 pre-treatment periods. I present event study results using this additional data in figure A.10 in the SI. For both tax multiplier outcomes, the estimates prior to the treatment are never significant between 1992 and 2008, which strongly suggests that differential trends are unlikely to underlie my main results for the tax multiplier outcomes.

Third, I present additional results to assess whether my results are driven by one specific federal state. In doing so, I estimate the same specification as for the results in table 2, one-by-one excluding one of the seven federal states in my sample. I present the results in figure A.9. I find that the results are comparable to my main results, which suggests that my results are not driven by one state.

Fourth, I estimate the lag and leads specification described in section 5.1 using alternative estimators proposed by Callaway and Sant'Anna (2020) and Roth and Sant'Anna (2021). This is motivated by a recent literature that proposes new estimators for difference-in-differences designs with multiple periods. I note that these papers primarily focus on staggered treatment designs, which is not the case in my setting. In figure A.11 in the SI, I demonstrate that results using these alternative estimators are very similar to my main results.

Fifth, I rely on the overlapping markets design described in section 5.2.1 to address

potentially unobserved confounding in the interaction specifications. In figure 3 (right-hand side panel) and table A.2 (final two models), I show that the results in the overlapping markets sample are similar to the interaction results that I obtain from the full sample. If anything, the interaction results in the overlapping markets sample are somewhat more indicative of a moderating effect of the local media, although I do not want to over-interpret this evidence.

Sixth, I present additional evidence that the findings from the overlapping markets design are not sensitive to the choice of the maximum allowed distance between matched municipalities. In figure A.13 in the SI, I show that the interaction results shown in figure 3 are stable across alternative distance calipers.

7 Discussion

How do local governments respond to economic crises? In this paper, I draw on 14-year panel of 2,193 German municipalities and a difference-in-differences design to evaluate (i) whether municipal governments change local tax rates after negative revenue shocks and (ii) whether this response is structured by the local media environment. I find that municipalities that lose more revenue subsequently react by enacting relative tax cuts for businesses, while there is no evidence for changes in property taxes. I then show that business tax cuts as a response to the crisis are more pronounced in municipalities where the local media presence is larger, as measured by the number of outlets that cover the municipality. Through a series of robustness checks and two additional empirical strategies, I demonstrate that these results are unlikely to be driven by differential trends between either municipalities that are more or less affected by the crisis, or by unobserved differences that correlate with local media presence.

My results are consistent with a mechanism whereby relative tax cuts serve to (i) provide

a stimulus to local firms and (ii) increase tax competitiveness vis-a-vis other municipalities. My second set of results highlights the crucial role of the local media for tax policy decisions. I propose that a larger local media presence leads to greater exposure to information about the negative repercussions of the crisis. As a result, constituents are more acutely aware that the local economic base is struggling, and politicians respond by enacting larger relative business tax cuts. To substantiate this argument, I provide additional evidence from a large-scale individual panel survey, where I analyze respondents' concerns about the economic situation. In doing so, I show that the crisis shock has a particularly strong positive effect on both individual and general economic concerns in municipalities that are covered by a larger number of outlets.

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A Supporting information

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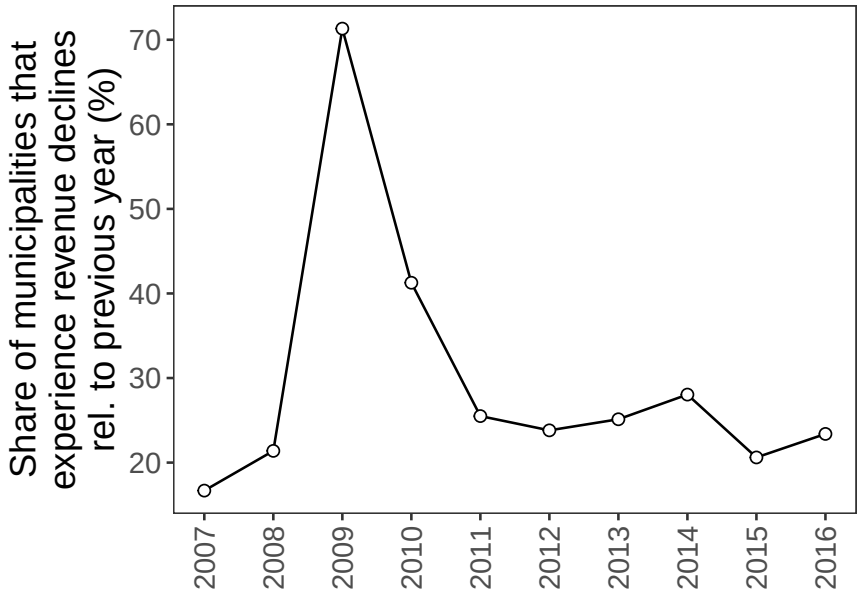
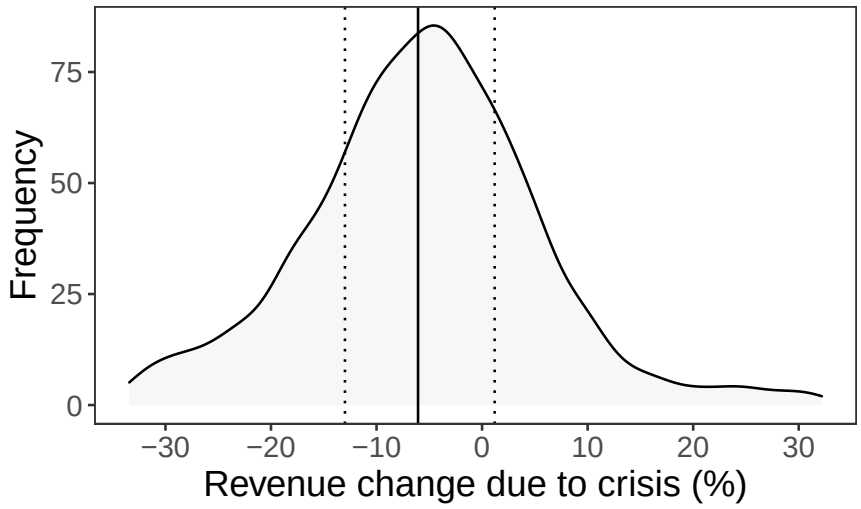
A.1 Additional descriptive information

Figure A.1: Share of municipalities that experience revenue declines per year



Note: The figure shows the percentage share of municipalities in a given year that experiences revenue declines relative to the previous year.

Figure A.2: Distribution of relative municipal revenue changes between 2008–2009.

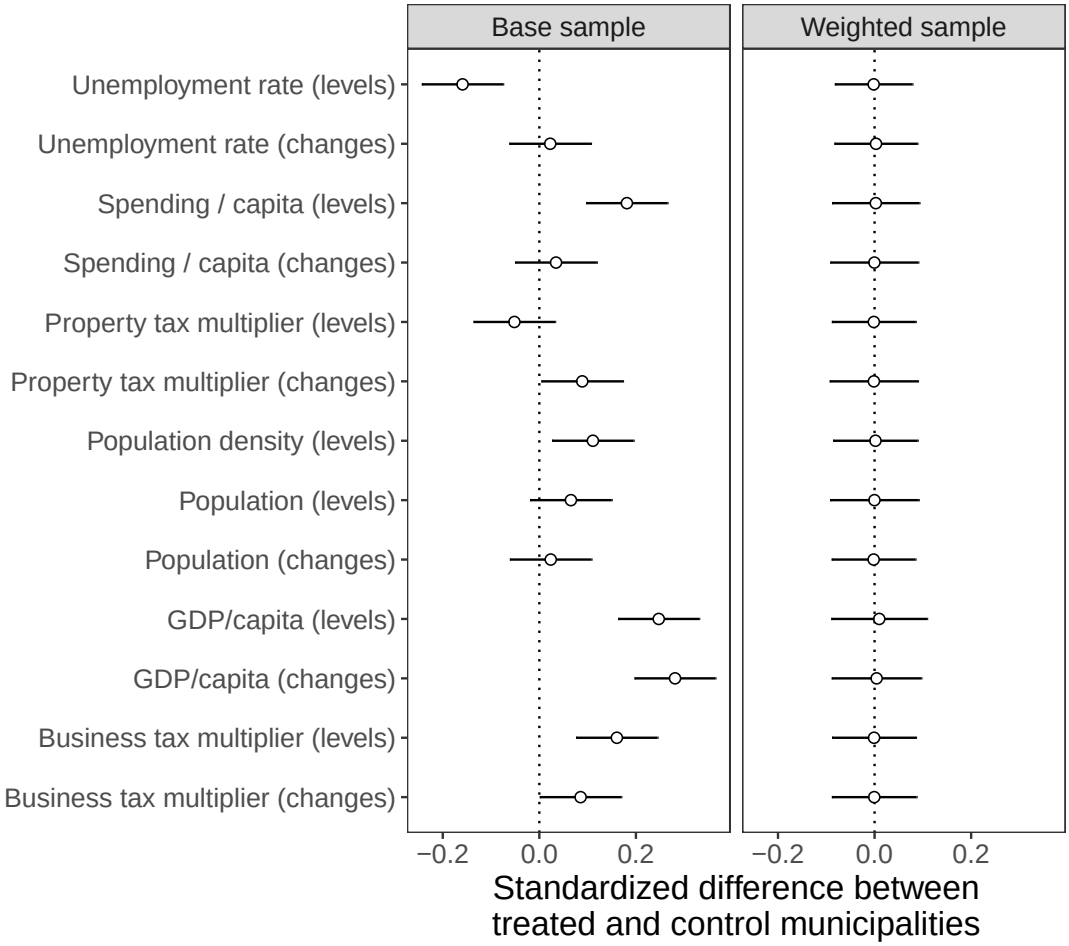


Note: The figure shows the distribution of percentage changes in municipal revenues between 2008–2009. Negative values mean that a given municipality has lost per-capita revenue in 2009 relative to 2008. The solid vertical line is the mean while the dotted vertical lines indicate the first and fourth quartiles of the distribution. For presentation purposes, I exclude the most extreme 5% of observations.

A.1.1 Correlates of revenue losses and balance after weighting

I use CBPS weights to balance pre-treatment characteristics between treated and control units. In the figure below, the y-axis indicated the pre-treatment variable. For each variable, I either measure levels in 2007, or changes between 2006–2007, which is indicated on the y-axis. I use the weighted sample for the results presented in table 3 and figure 2.

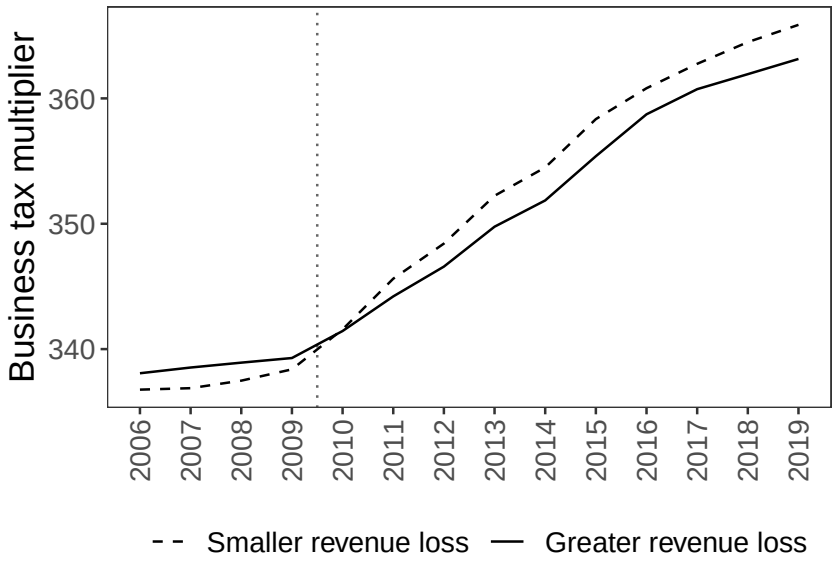
Figure A.3: Standardized differences between municipalities with smaller and greater revenue losses



Note: The figure presents standardized differences between municipalities that experience greater or smaller revenue losses between 2008 and 2009. All variables are either measured as levels in 2007, or as changes between 2006 and 2007. The left-hand panel uses CBPS, which are discussed in section 5.1.1.

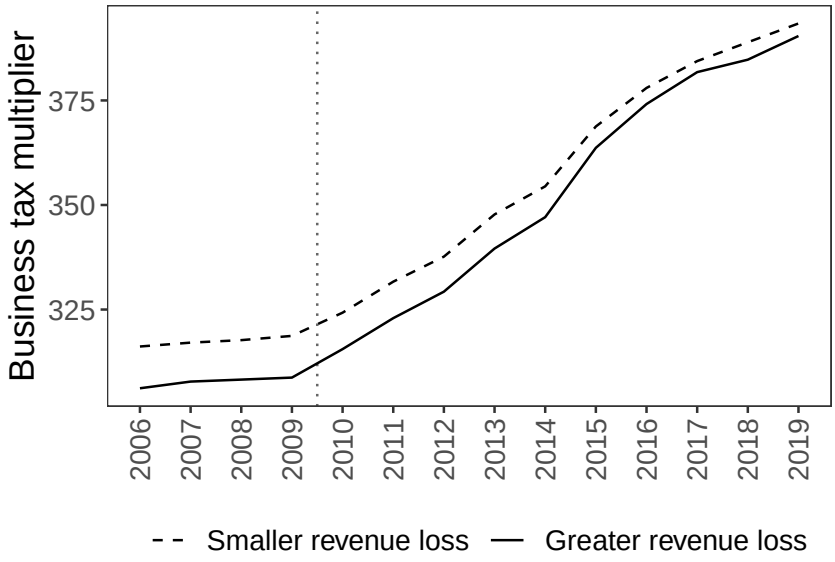
A.1.2 Local tax multiplier trends

Figure A.4: Business tax multipliers conditional on year and treatment status



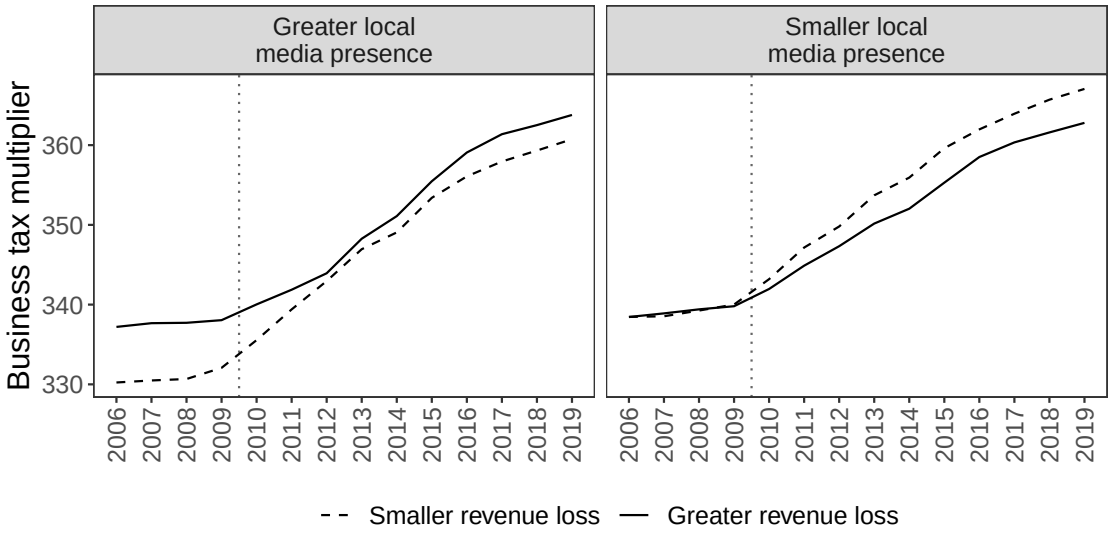
Note: The figure presents average business tax rates by year and treatment status. See section 4 for the definition of the treatment. In accordance with the main specification, I de-mean business tax rates by state before calculating conditional means.

Figure A.5: Property tax multipliers conditional on year and treatment status



Note: The figure presents average property tax rates by year and treatment status. See section 4 for the definition of the treatment. In accordance with the main specification, I de-mean property tax rates by state before calculating conditional means.

Figure A.6: Business tax multipliers conditional on year, treatment status, and media presence

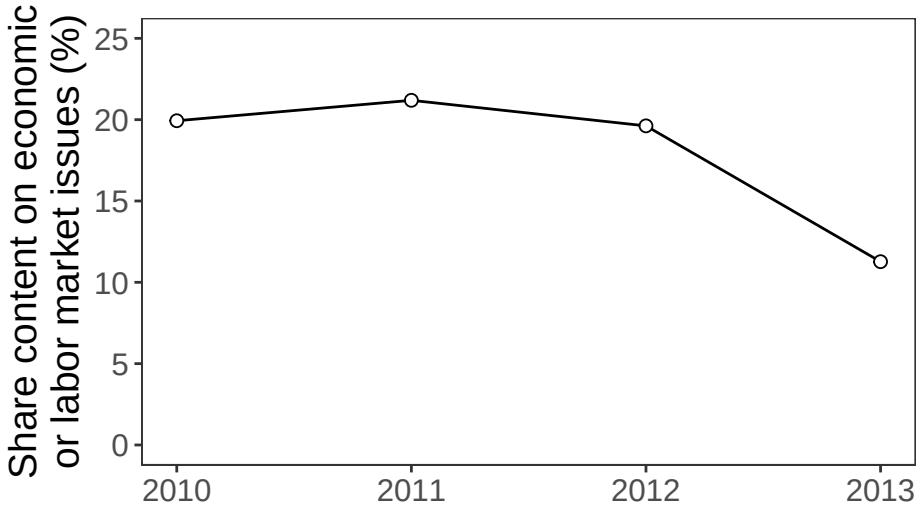


Note: The figure presents average business tax multipliers by year, treatment status and local media presence. See section 4.1 for the definition of the treatment. In accordance with the main specification, I de-mean business tax rates by state before calculating conditional means.

A.1.3 Local newspaper reporting

To assess how frequently local newspapers cover topics related to the economic situation or the labor market, I draw on data from the German Longitudinal Election Study (GLES, see also Roßteutscher et al. 2017), which includes a large-scale content analysis for 14 local newspapers between 2009–2013. I use this data to assess the frequency of reporting on economic or employment topics. To do so, I first select all articles that talk about the following sub-issues, as defined in the original GLES data: the general economic situation, economic crises, firm bankruptcies, the export economy, tax policies, the labor market in general, unemployment insurance, precarious work conditions. I then calculate the total share of content on economic or labor market issues as follows: I calculate the weighted share of articles on the above topics, using the total number of articles as the denominator, and using the length of each article as the weights. This means that longer articles receive more weight relative to shorter ones. In the figure A.7, I present the weighted share of articles on economic conditions or the labor market, separately for all four years that are included in the data.

Figure A.7: Share of local newspaper content that deals with economic conditions or the labor market



Notes: The figure shows the share of local newspaper content that deals with either the economic situation of the labor market. I discuss the construction of this measure in more detail above.

A.2 Details on the overlapping markets design

As discussed in section 5.2.1, I employ an additional empirical strategy to analyze whether government responsiveness is moderated by local media presence. At the core of this strategy is the comparison between adjacent municipalities that are located in areas where the coverage regions of multiple local newspapers overlap. This overlap creates plausible exogenous variation in the number of outlets, which I then exploit to estimate whether a greater presence of local newspapers affects government responses. This empirical strategy is similar to prior designs in, for example, Ansolabehere, Snowberg and Snyder (2006) or Snyder and Strömberg (2010). In particular, I use a very similar design as Hilbig and Riaz (2021), who employ the same newspaper coverage data, and implement the design in a similar manner.

To implement the overlapping markets design, I rely on a matching algorithm, which consists of the following steps. For each treated municipality, I first select all control municipalities that are located within z kilometers of that municipality.[10] I then impose an additional condition: the control municipality has to be covered by at least one local news outlet that also covers the treated municipality, with the treated municipality being covered by at least one additional outlet. I visualize this restriction in figure 1, where the control municipalities are covered by newspaper A and B, while the treated municipality is additionally covered by newspaper C. From the resulting set of control municipalities, I then select the one that is most similar to a given treated municipality, as measured by the Mahalanobis covariates distance. To sum up, my design matches on control unit to each unit – the machted control municipality is subject to three requirements: (i) it has to be geographically close, (ii) it has to share at least one outlet with the treated municipality and (iii) it has to be similar in terms of pre-treatment characteristics.

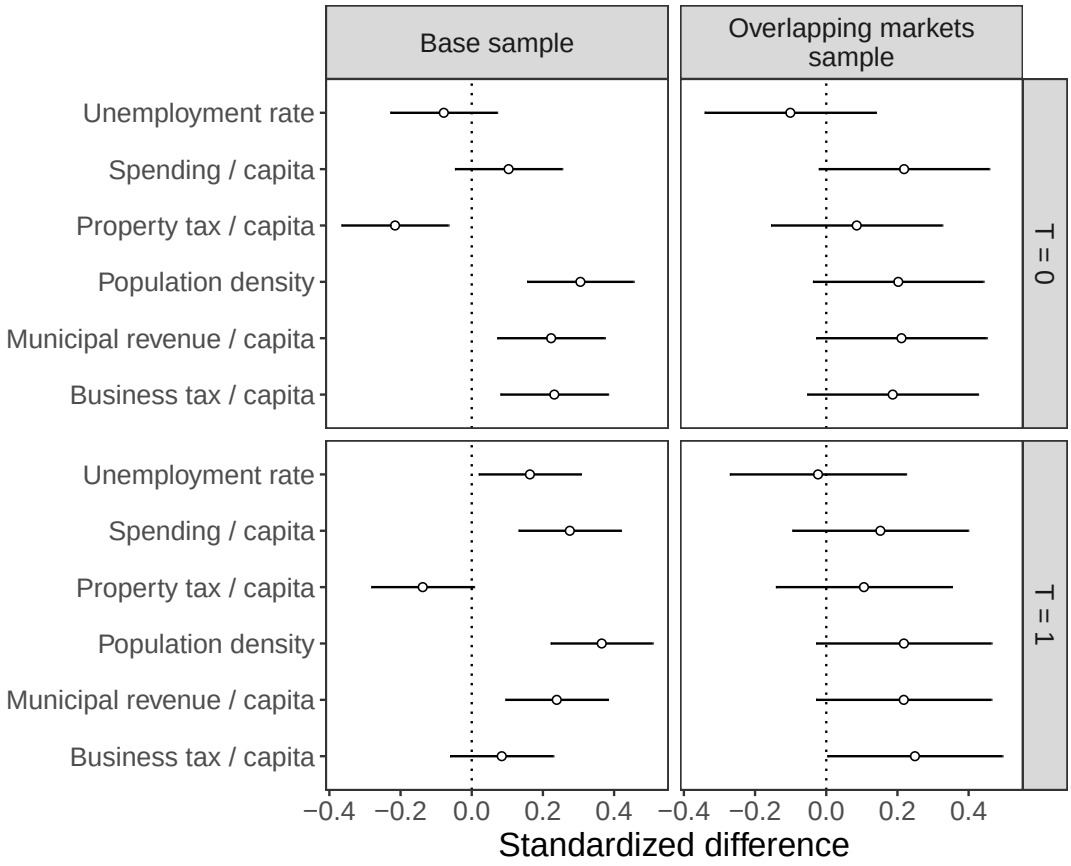
To ensure comparability, I match on unemployment rate, population density, spending / capita, revenue / capita, property taxes / capita and business taxes / capita, all measured prior to the treatment. I present balance before and after the matching procedure in figure A.8, separately within levels of the main treatment, the municipal revenue shock. I also show results for different values of z, the maximum permitted distance between matched municipalities. The final sample does not include treated municipalities for which no match within a given radius of z kilometers can be found. I also match with replacement – a given control municipality can be matched to multiple treated units. Similar to treated municipalities for which no match can be found, unused control municipalities are also not

[10] In this discussion, I use 'treated' and 'control' to refer to values of the binary moderator variable, local media presence. Municipalities are 'treated' if they are covered by more than two outlets.

included in the final sample. For the $z = 25$km sample, which I use for the results in figures 3 and table A.2, the final sample includes about one quarter of the municipalities that form my full sample.

A.2.1 Covariate balance

Figure A.8: Standardized differences between municipalities with greater or smaller local media presence



Note: The figure presents standardized differences between municipalities with greater or smaller local media presences. As implied by my empirical strategy, I only compare covariate balance within levels of the main crisis shock treatment. The left-hand side is the base sample, while the right-hand side is the sample used in the overlapping markets design.

A.3 Details on attitudinal outcomes (SOEP data)

As discussed in section 4.3, I probe the mechanism underlying my findings by drawing on data from the German Socio-Economic Panel Survey (SOEP, see Liebig et al. 2021). The data is constructed as follows: I first select all respondents who respond to the survey between 2006–2019 and live in one of the 2,193 municipalities in my sample. I then measure personal and general economic perceptions through the following two items, which are measured annually:

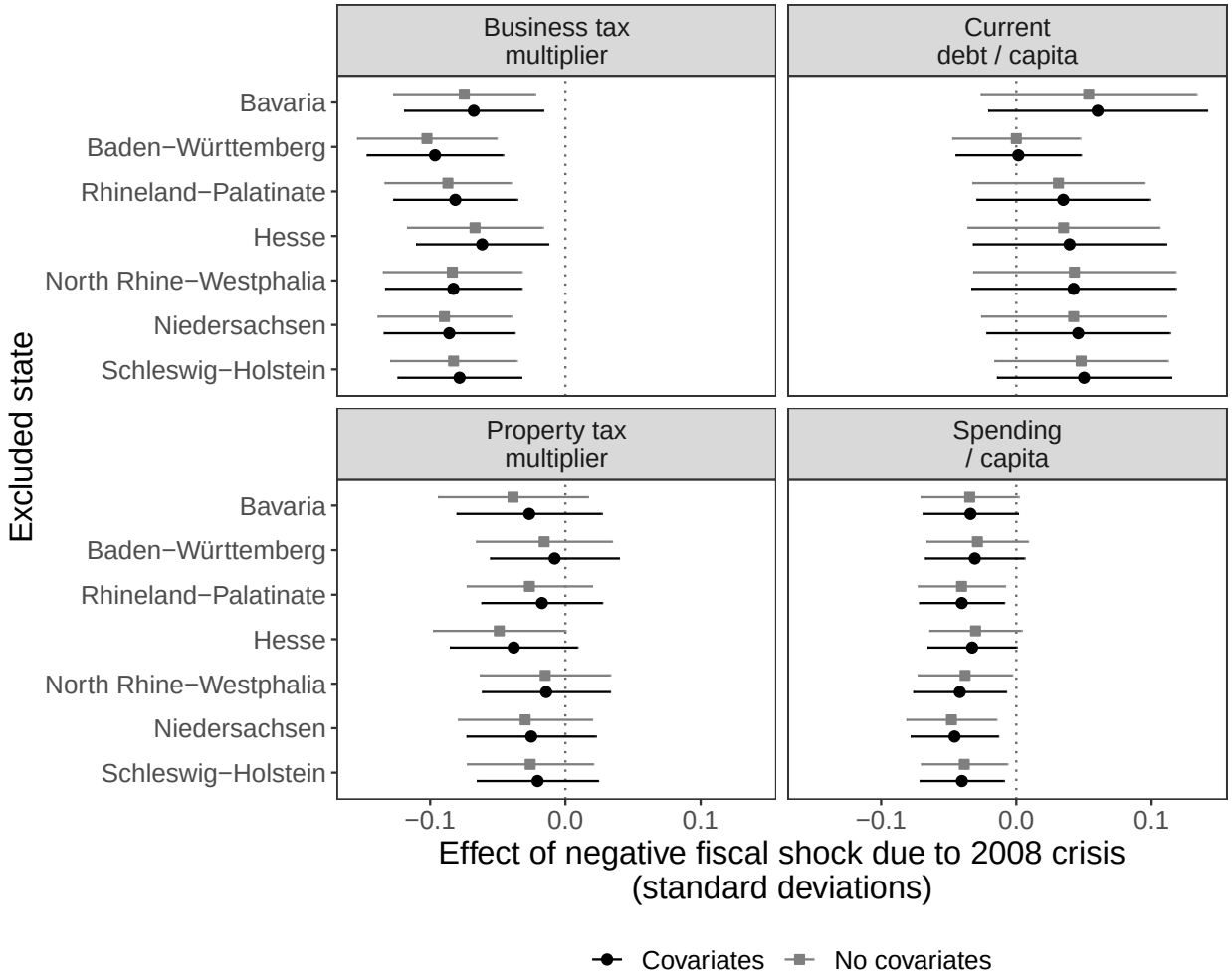
1. "How concerned are you about the following issues?: The economy in general."
2. "How concerned are you about the following issues?: Your own economic situation."

Respondents can then choose between three different responses, which are: not concerned at all, somewhat concerned, not concerned at all. I convert these responses to a scale that ranges from one to three, where higher values indicate greater concern. Before estimating the specification that forms the base for the results presented in figure 5, I standardize both outcomes.

A.4 Additional difference-in-differences results

A.4.1 Excluding states one-by-one

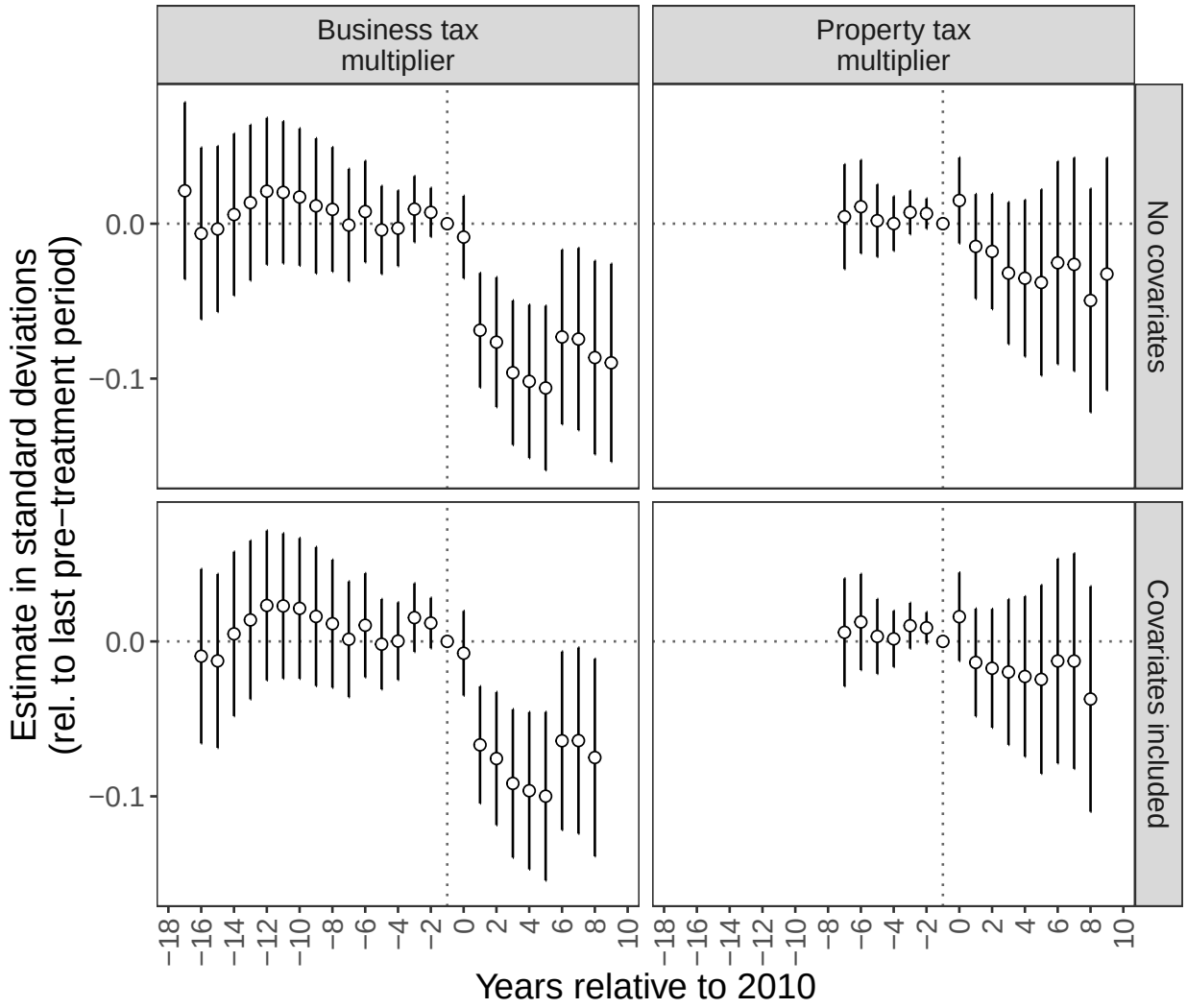
Figure A.9: Fiscal and tax response to revenue declines – excluding states one-by-one



Notes: The figure presents estimates from the base specification. The treatment is equal to one if the percentage decline in government revenues between 2008 and 2009 is greater than the average decline in revenues across all municipalities. I present specifications where I exclude states one-by-one, which are indicated on the y-axis. All outcomes are standardized and listed at the top of each panel. The sample includes all years between 2006 and 2019. Standard errors clustered at the municipality level are given in parentheses.

A.4.2 Additional pre-treatment periods

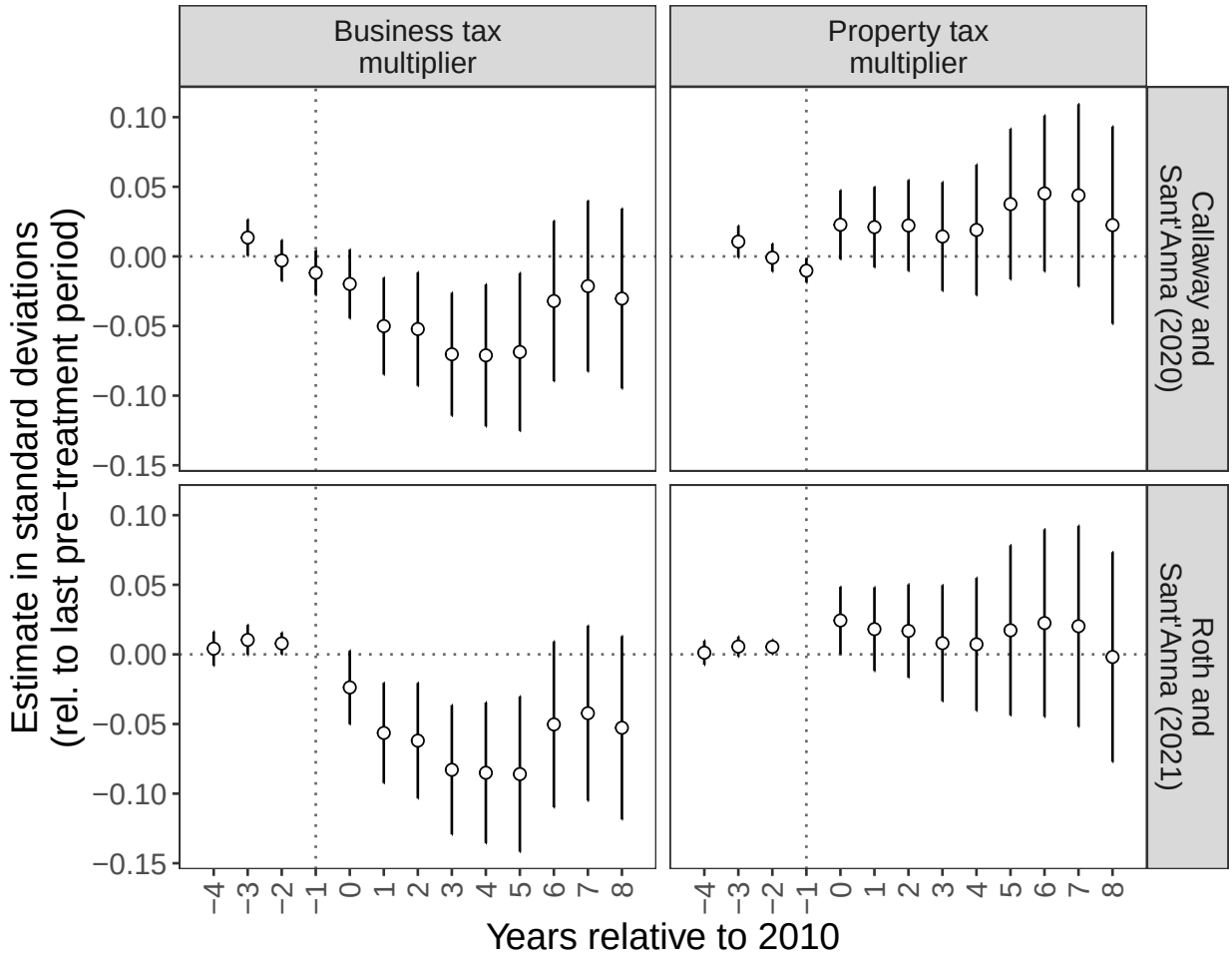
Figure A.10: Effect of revenue shock on tax multipliers over time, using more pre-treatment periods



Notes: The figure contains lags and leads estimates of the effect of the 2008 revenue shock on business and property tax multipliers. The outcome is standardized. The treatment is equal to one if the percentage decline in government revenues between 2008 and 2009 is greater than the average decline in revenues across all municipalities. The sample includes all years between 1992 (business tax multipliers) or 2003 (property tax multipliers) and 2019. Coefficients are differences relative to the last pre-treatment period, 2009. The reason why there are estimates for some periods in the top but not bottom panels is missing covariates.

A.4.3 Alternative estimators

Figure A.11: Effect of revenue shock on tax multipliers over time, using alternative estimators



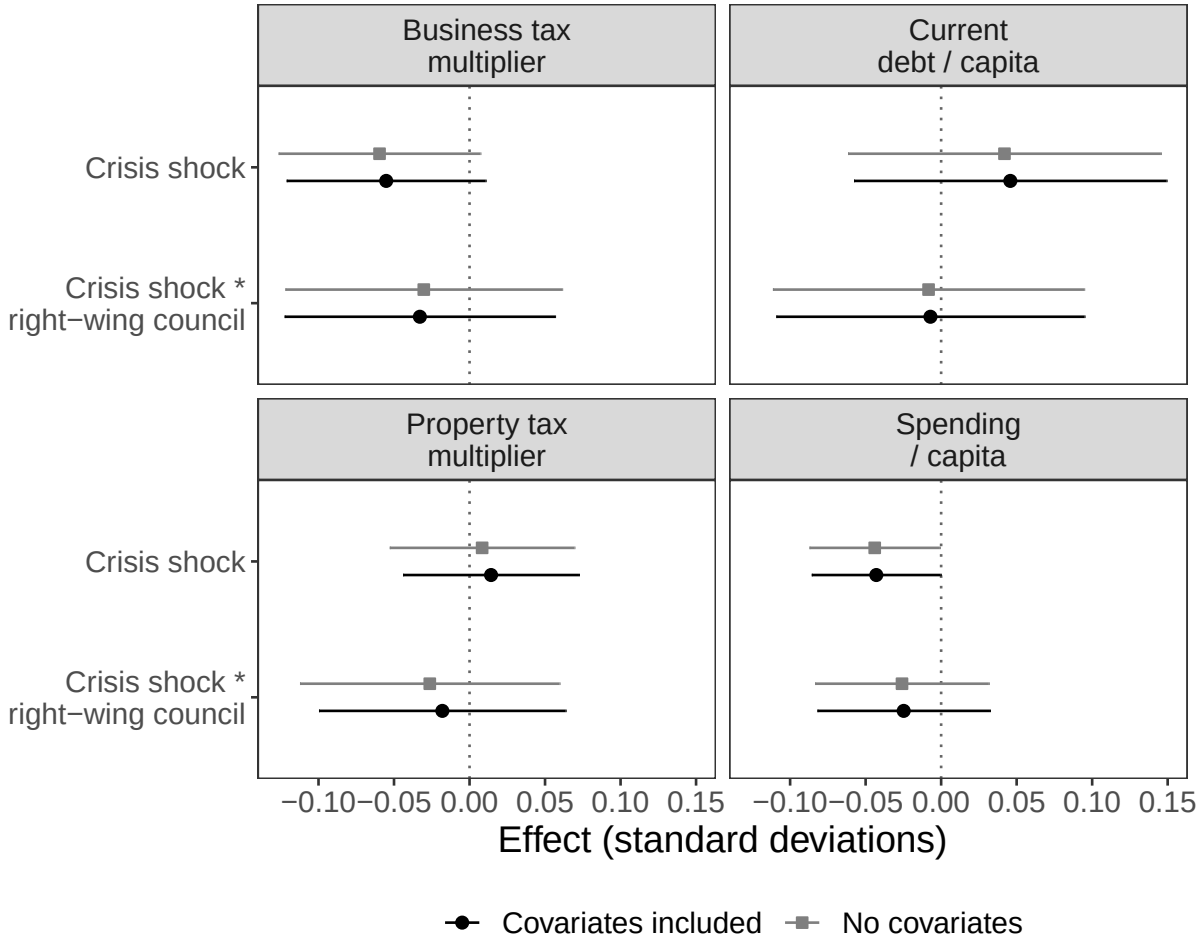
Notes: The figure contains lags and leads estimates of the effect of the 2008 revenue shock on business and property tax multipliers. The outcome is standardized. The treatment is equal to one if the percentage decline in government revenues between 2008 and 2009 is greater than the average decline in revenues across all municipalities. The sample includes all years between 2006 and 2018. I present results for the two tax multiplier outcomes, using the estimators proposed by Callaway and Sant'Anna (2020) and Roth and Sant'Anna (2021). Coefficients are differences relative to the last pre-treatment period, 2009.

A.5 Additional interaction results

A.5.1 Heterogeneity by local council partisan composition

To assess whether effects of the crisis differ by the composition of the local council, I estimate the specification described in section 5.2, using a dummy variable that equals one if the right-wing CDU/CSU and FDP parties command a plurality of votes in the most recent municipal council election prior to 2009.

Figure A.12: Effect of revenue shock conditional on the local council partisan composition



Notes: The figure presents estimates from the interaction specification described in section 5.2. The treatment is equal to one if the percentage decline in government revenues between 2008 and 2009 is greater than the average decline in revenues across all municipalities. I interact this treatment with an indicator that is equal to one if the share of votes for the CDU/CSU and FDP parties is larger than the combined share of all other parties, based on the most recent municipal elections prior to 2009. Each panel corresponds to a different outcome. Standard errors are clustered at the municipality level.

Table A.1: Effect of revenue shock on fiscal and tax responses to revenue declines, conditional on the local media presence

	Spending per capita	**Debt per capita**	**Business tax multiplier**	**Property tax multiplier**
Shock * post	−0.026	0.048	−0.049**	−0.039
	(0.017)	(0.039)	(0.025)	(0.024)
Shock * post * media presence	−0.070	−0.044	−0.116**	0.042
	(0.050)	(0.054)	(0.056)	(0.052)
Municipality FE	Yes	Yes	Yes	Yes
State*year FE	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes
N	23,330	23,331	27,570	27,533
R-squared	0.890	0.736	0.871	0.868

Notes: The table presents estimates from the interaction specification described in section 5.2, for four different outcomes. The treatment is equal to one if the percentage decline in government revenues between 2008 and 2009 is greater than the average decline in revenues across all municipalities. I interact this treatment with an indicator that is equal to one of a a given municipality is covered by more newspapers than the average municipality. Standard errors clustered at the municipality level are given in parentheses. ***p < .01; **p < .05; *p < .1

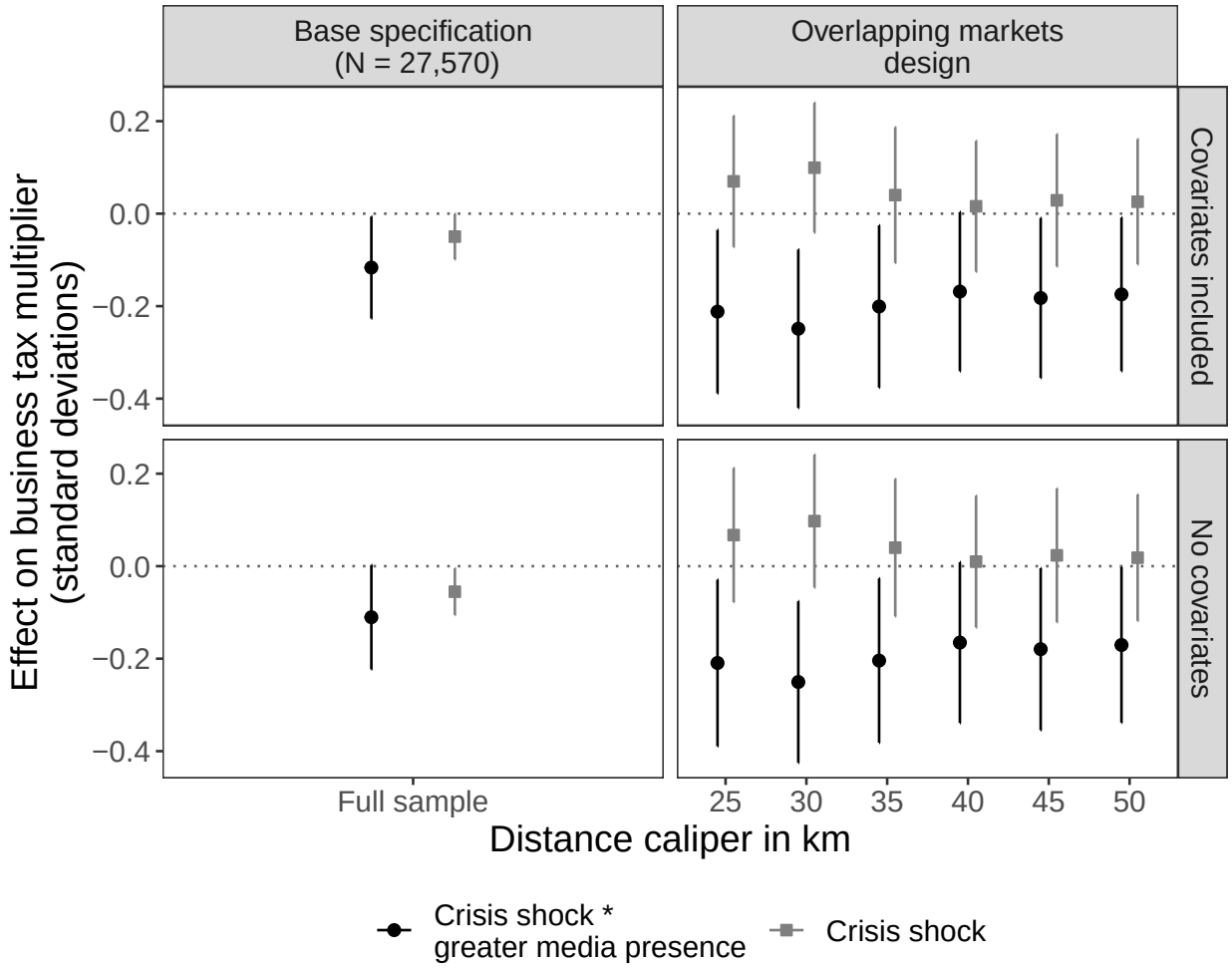
Table A.2: Effect of revenue shock on business taxes conditional on the local media presence

	Business tax multiplier			
Shock * post	−0.055**	−0.049**	0.043	0.050
	(0.025)	(0.025)	(0.070)	(0.070)
Shock * post * media presence	−0.109*	−0.116**	−0.186**	−0.192**
	(0.056)	(0.056)	(0.088)	(0.088)
Municipality FE	Yes	Yes	Yes	Yes
State*year FE	Yes	Yes	Yes	Yes
Covariates	No	Yes	No	Yes
Overlapping markets	No	No	Yes	Yes
N	27,570	27,570	7,579	7,579
R-squared	0.871	0.871	0.844	0.845

Notes: The table presents estimates from the interaction specification described in section 5.2. The treatment is equal to one if the percentage decline in government revenues between 2008 and 2009 is greater than the average decline in revenues across all municipalities. I interact this treatment with an indicator that is equal to one of a a given municipality is covered by more newspapers than the average municipality. I present results from from the base specification as well as from the overlapping market designs, where I exploit variation in the number of newspapers that stems from intersection of overlapping newspaper coverage areas. The quantities shown in this table are the same as in figure 3. Standard errors clustered at the municipality level are given in parentheses. ***p < .01; **p < .05; *p < .1

A.5.2 Varying distance calipers for the overlapping markets design

Figure A.13: Effect of revenue shock on business taxes conditional on the local media presence – sensitivity



Notes: The figure presents estimates from the interaction specification described in section 5.2, for different distance calipers used in the overlapping markets design. The treatment is equal to one if the percentage decline in government revenues between 2008 and 2009 is greater than the average decline in revenues across all municipalities. I interact this treatment with an indicator that is equal to one of a given municipality is covered by more newspapers than the average municipality. The sample includes all years between 2006 and 2019. The left-hand side panel shows results from the base specification. The right-hand side panel is based on the overlapping market designs, where I vary the maximum permitted distance. Standard errors are clustered at the municipality level.

A.6 Details on the individual-level results

Table A.3: Individual-level panel results

	DV: Worries about general economic situation		**DV: Worries about own economic situation**	
Shock * post	−0.017	−0.039	−0.049	−0.061**
	(0.022)	(0.019)	(0.021)	(0.022)
Shock * post * media presence	0.039	0.082**	0.061	0.089**
	(0.029)	(0.025)	(0.030)	(0.030)
Municipality FE	Yes	Yes	Yes	Yes
State*year FE	Yes	Yes	Yes	Yes
Covariates	No	Yes	No	Yes
N	153,583	153,583	161,379	161,379

Notes: The table presents estimates from the interaction specification described in section 5.2. The treatment is equal to one if the percentage decline in government revenues between 2008 and 2009 is greater than the average decline in revenues across all municipalities. I interact this treatment with an indicator that is equal to one of a a given municipality is covered by more newspapers than the average municipality. The sample includes all years between 2006 and 2019. The outcomes are (i) whether individuals are more concerned about the general economic situation and (ii) whether they are more concerned about their own economic situation. For the survey items, see section A.3 in the SI. Standard errors are clustered at the municipality level.$^{***}p < .01$; $^{**}p < .05$; $^{*}p < .1$