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Religious Heterogeneity and Fiscal Policy: Evidence from German Reunification

Ronny Freier* Benny Geys† Joshua Holm‡

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Abstract: Theoretical work based on social identity theory predicts that population diversity undermines redistributive public policies. This article tests this proposition exploiting an exogenous shock in diversity due to Germany's reunification. In contrast to previous work on ethno-linguistic or racial heterogeneity, we specifically analyze religious diversity, which is an increasingly relevant social cleavage in many countries. Our main results corroborate that increasing religious diversity leads to a change in fiscal policies in Bavarian municipalities over the 1983-2005 period. Moreover, we find some evidence of declining individual-level local identification over the post-reunification period, which suggests that the observed fiscal effects are indeed linked to the theoretical mechanism of individuals' social identification. Finally, we highlight an important mediating role for the democratic process, since the observed fiscal effects strengthen considerably following Bavarian municipalities' first local elections after the reunification migration wave (March 1996) and a legal change allowing local referenda on public policies (October 1995).

Keywords: Local identity, Fiscal policy, Redistribution, German reunification, Difference-in-differences estimation

JEL classification: H10, H11, H77

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"What is the use of the best welfare state, when the Cossacks come"

("Was nützt der schönste Sozialstaat, wenn die Kosaken kommen")

Franz Josef Strauss (Bavarian state minister 1978-88).

1 Introduction

Immigrants often differ from the native population of the region where they settle in terms of race, ethnicity, language or religion. Consequently, substantive migration flows tend to alter the composition of a jurisdiction's population and increase its heterogeneity. While such diversity can bring important benefits (Hong and Page, 2004), it may also undermine redistributive public policies. Alesina et al. (1999) and Alesina and La Ferrara (2000), for instance, build on social identity theory (Tajfel and Turner, 1986) to argue that individuals are likely to be more altruistic towards those with whom they share a common 'identity'. As a result, a community may provide more redistributive public goods when diversity is lower because "social closeness increases the value attached to other people's well-being" (Ashworth et al., 2002, 32).[1]

Previous empirical work evaluating this prediction looks at racial, linguistic and, especially, ethnic diversity (Alesina et al., 1999; Ashworth et al., 2002; Habyarimana et al., 2007; Dahlberg et al., 2012; Jofre-Monseny et al., 2016; for a review, see Stichnoth and Van der Straeten, 2013). In contrast, we focus on religious diversity.[2] As such, we gain new insights into the potential consequences of the increased religious diversity in many countries, regions, and localities. Indeed, our analysis of the comparatively

[1]Glaeser's (2005) work on the origins of hateful narratives in the practice of politics suggests that politial entrepreneurs may play an important role in this story. They might demonize certain prospective recipients of welfare by highlighting sources of social cleavage separating 'them' from 'us', and thereby undermine support for redistribution to such groups. Where Glaeser (2005) emphasizes political entrepreneurs' 'supply side' contributions to divisive discourse, our focus is nearer the 'demand side' attitudes among voters (which might make such discourse electorally advantageous).

[2]This links our work to scholarship exploring the relation between religion and economic outcomes – see Fernandez et al. (2001); Acemoglu et al.(2001); Sala-i-Martin et al. (2004); McCleary and Barro (2006); Arrunada (2010); and Durlauf et al. (2012).

proximate Catholic and Protestant beliefs (see below) might reflect a lower bound for studies involving more disparate religions.

Clearly, socio-demographic heterogeneity is generally not independent from local fiscal policies since such policies may influence migrants' location decisions (Tiebout, 1956; Fiva, 2009; Jofre-Monseny et al., 2016). This creates a crucial endogeneity concern. We therefore rely on the exceptional event of Germany's reunification in 1989/90 to develop our identification strategy. First, German reunification – which triggered sudden and substantial immigration into western Germany – happened quickly and was widely unanticipated (Frijters et al., 2004, 2005; Fuchs-Schuendlen and Schuendlen, 2005; Alesina and Fuchs-Schuendlen, 2007; Buchardi and Hassan, 2013). Hence, the reunification migration shock can reasonably be treated as exogenous. Second, the religious composition of the immigrants differed substantially from that of the native population in the West German state of Bavaria. This divergence can be exploited via a difference-in-differences (DD) estimation approach since – as we will show in more detail below – post-reunification immigration particularly strongly affected the religious composition of predominantly Catholic or predominantly Protestant Bavarian municipalities, but had a more limited effect in religiously heterogeneous municipalities.[3] Third, as post-reunification immigration was largely concentrated in larger (than average) municipalities, we can furthermore compare large and small towns to assess whether migration and changing diversity are directly driving our results.

Our main results indicate that municipalities which were religiously homogeneous *prior* to reunification record significantly slower growth in public expenditures following the migration shock (compared to ex ante religiously diverse municipalities). Importantly, this finding is strongest among larger municipalities, which saw more immigration. It is reflected in lower outlays on public utilities, public order, administration and, crucially, social welfare (including adult education programs and child

[3]From a more practical viewpoint, Bavaria also has local-level fiscal information available from 1983 onward, thus covering the period before and after the fall of the Berlin Wall.

care provisions). Interestingly, this change in fiscal policies in Bavarian municipalities closely relates to a shift in Bavarian natives' identification with their town of residence and its residents following the migration wave. Particularly, the post-reunification inflow of predominantly non-Catholic immigrants led Catholics in Bavaria to lose their feeling of 'common identity' with their fellow inhabitants at the local level to a substantially greater degree than other Bavarians. This provides some suggestive evidence that individuals' lower altruism towards those with whom they do not share a common 'identity' underlies the observed negative heterogeneity-redistribution relation (Alesina et al., 1999; Alesina and La Ferrara, 2000). Finally, and interestingly, our observed fiscal effects first arise around 1993 and gain particular traction after 1996. This timing appears to reflect an important mediating role for the democratic process, as it coincides with Bavarian municipalities' first local elections after the reunification migration wave (March 1996) and a legal change allowing local referenda on public policies (October 1995).

2 Data and descriptive statistics

We have built a panel dataset covering all 2031 municipalities in Bavaria for the years from 1983-2005.[4] Municipalities constitute the lowest of the four German governmental tiers, and have wide-ranging spending responsibilities. These include welfare services (such as child care provision and education), cultural events, sports and recreational facilities, and local infrastructure investments. Furthermore, they often supervise local public firms (e.g., water, sewage, and energy supply) and administer spending allocated from higher tiers. Local government revenues mainly derive from three sources: allocated grants, taxes and fees. Among the taxes, municipalities are free to set three local tax rates independently: the property tax A on agricultural

[4]Throughout the analysis, we exclude cities with populations over 100000 inhabitants as these may differ fundamentally in their susceptibility to heterogeneity effects in terms of social identification. Auxiliary regressions using survey-based data on individuals' social identification support this supposition (see below).

land, the property tax B on all other property and the local trade (business) tax. Revenues from these three taxes jointly account for about 50% of local tax revenues. The remaining tax revenues predominantly derive from municipalities' share of VAT revenues and income taxation. Descriptive statistics with respect to these fiscal outcome data are provided in table VII in the appendix. The underlying data derive from the state statistical office in Bavaria.[5]

We restrict attention to the southern (West) German state of Bavaria for three reasons. First, Bavaria shares a border with the former East Germany, and therefore saw massive net immigration following reunification by East Germans and individuals with German ancestry from the former Soviet Bloc (henceforth 'ethnic Germans'; note that this category does not include East Germans). Figure I shows that, while population growth was limited before 1989, the average municipality in Bavaria grew about 10 percent in the period 1989-1995 (upper panel of figure I). While ethnic Germans – though not East Germans – were subject to a placement program at the level of the *Regierungsbezirk* (a purely administrative government level just below the state), no constraints were imposed on immigrants' location choices at the municipal level. Consequently, much of this population increase was concentrated in larger (than average) municipalities. The lower-left panel of figure I shows that municipalities below 4000 inhabitants saw little to no population growth, whereas larger municipalities in the lower-right panel of figure I saw substantial growth (about 18 percent between 1989 and 1995).[6]

Figure I here

Second, the religious composition of the immigrants was very different from that

[5]All data are publicly available at https://www.statistik.bayern.de/regionalstatistik/index.php.

[6]The threshold of 4000 inhabitants was chosen to fall between two administrative cut-offs at which population size induces an increase in council size (i.e. 3000 and 5000 inhabitants). Although this avoids our inferences being affected by such administrative shifts (Eggers et al., 2016), our results are robust to alternative choices of the population threshold (see below).

of native Bavarians (which was remarkably stable between the 1840 census and the fall of the Berlin Wall; Landesamt für Statistik und Datenverarbeitung, 2008, 113). Bavaria's religious composition around the time of reunification is illustrated in table I. Using information on the shares of religious denominations in each Bavarian municipality in the 1987 census (the most recent census before reunification), we display the Herfindahl-Hirschman Index (HHI) based on the shares of all religious denominations (including non-believers as one group), as well as the shares of Catholics and Protestants in the municipal population. Although the average Bavarian municipality was very homogeneous in religious confession before reunification (the average HHI is 0.740), table I also illustrates that this religious homogeneity reflects a predominance of Catholics in some towns and of Protestants in other towns (see also the Kernel distribution plots of these variables in Figure IV in the appendix).

Table I here

The religious composition of post-reunification immigrants is presented in table II using information from the German SOEP (Socio-Economic Panel, 2011). This shows that, around 1990, East Germans were predominantly non-religious. Ethnic Germans were more religious in general, but included a lower share of Catholics and a higher share of Protestants compared to Bavaria's population. This different religious make-up of Bavarians and immigrants is central to our identification strategy. The underlying idea is that immigration substantially affected the religious diversity of Bavarian municipalities which were religiously homogeneous *before* the reunification migration wave (either predominantly Catholic or predominantly Protestant), while it had a much more limited effect on religious diversity in already religiously heterogeneous municipalities.[7]

[7]Comparing columns 2 and 3 also illustrates that the East Germans who migrated were broadly similar in religious make-up to those who did not migrate. This indicates that religion was *not* a primary determinant in the migration decisions of East and ethnic Germans.

Table II here

Third, religion remains important to many Bavarians in spite of a general declining trend in religious identification in Germany (including Bavaria). For instance, the annual German ALLBUS surveys (GESIS, 1980-2008) indicate that the share of self-identifying Catholics in western Germany reporting at least monthly church attendance fell from 46.5 percent in 1980 to 40.5 percent in 2004. Among self-identifying Protestants, the trend was weakly increasing from 14.7 percent in 1980 to 19.5 percent in 2004. These trends are closely paralleled when looking at weekly (or greater) church attendance, and in other available proxies for religiosity. Crucially, Bavarians – and particularly Bavarian Catholics – consistently stand out in terms of their church attendance and overall religiosity (relative to their counterparts elsewhere in western Germany). This makes Bavaria a particularly informative setting for our purposes.

3 Empirical strategy

Several authors have previously made use of the German reunification as a natural experiment to strengthen causal inferences (Frijters et al., 2004, 2005; Fuchs-Schuendlen and Schuendlen, 2005; Alesina and Fuchs-Schuendlen, 2007; Redding and Sturm, 2008; Buchardi and Hassan, 2013). In line with such contributions, we exploit the migration wave triggered by German reunification as the basis for a difference-in-differences (DD) model. This migration wave was substantial, with net migration from East to West estimated at about 2 million people (Wolff, 2007), while another 2 million ethnic Germans migrated to (mainly West) Germany from the states of the former Eastern Bloc.

Whereas reunification provides the first 'difference' for our DD model (i.e., before/after 1989), the second 'difference' derives from the comparison of ex ante religiously homogeneous to ex ante religiously heterogeneous municipalities. We thereby divide the

towns in our sample depending on whether they have an HHI value above/below the median.[8] This second 'difference' captures the fact that the religious composition of the migrants presented a different 'treatment' to municipalities in Bavaria depending on their ex ante degree of religious homogeneity.[9]

Our central regression equation reads as follows:

$$Y_{i,t} = \alpha_i + \beta_1 HighHHI_i * Post_t + \beta_2 HighHHI_i + \beta_3 Post_t + X_{i,t}\gamma + z_t + \epsilon_{i,t}. \quad (1)$$

where the outcome variables $Y_{i,t}$ for municipality i in year t are indicators of local fiscal policy such as total expenditures, disaggregated spending categories, and (non-)fiscal revenue sources. The coefficient of interest is β_1, which we expect to be negative. We also include a number of control variables in $X_{i,t}$. Specifically, as immigration necessarily increases population size, we control for population effects by introducing linear and quadratic measures of population size. By interacting them with the post-reunification dummy, we allow for different size effects before and after the fall of the Wall. As a further precaution, we include a number of population class dummies, which control for the fact that municipalities in certain size classes have different responsibilities (Ade and Freier, 2013). Lastly, we include a complete set of year dummies and municipality fixed effects in all models, and cluster standard errors at the municipality level (Bertrand et al., 2004).

[8]The exact cutoff employed – HHI = 0.670 – is based on the sample of towns between 4000 and 100000 inhabitants, which saw most immigration and are therefore of prime concern in the analysis. We experiment with the precise cutoff in the robustness section. As an alternative, we also repeated all tests using an indicator variable taking the value one if the municipality has an above-median share of Catholic inhabitants (i.e. 80.2 percent). The results of these two treatments are nearly identical, reflecting that Catholics are the dominant religious group in Bavaria.

[9]Germany, and Bavaria, also witnessed substantial immigration from the former Yugoslavia in the early to mid 1990s. This, however, is unlikely to undermine our identification strategy due to *a)* the comparatively low numbers of Croatians and Slovenians that moved into Bavaria (Statistisches Bundesamt, 2013), and *b)* the fact that immigrants from the former Yugoslavia substantially differed from Bavarians on other dimensions than religion. We are grateful to James Fearon for fruitful discussion on this point.

Naturally, the fall of the Wall implied many changes. Redding and Sturm (2008), for instance, argue that firms – and thus municipalities' finances – benefited from the change in access to new markets. Also, reunification changed the tax competition environment, at least for municipalities close to the border (Geys and Osterloh, 2013). Identification of the effect we are interested in thus requires the following assumptions. First, both religiously homogeneous and heterogeneous municipalities are ex ante similar in their trends in public policy variables (common trend assumption). Second, the unexpected shock of reunification affects religiously homogeneous and heterogeneous municipalities similarly except for the channel of social identity and in-group favoritism (common shock assumption). We provide evidence in section 4 in support of the common trend assumption, the social identification mechanism, and the fact that other influences (such as economic considerations) are likely to have been similar across all municipalities in Bavaria.

It is furthermore necessary that ex ante religiously homogeneous and heterogeneous municipalities are distributed throughout Bavaria (to allow differentiating the effect of heterogeneity from geography) and face similar levels of net immigration. The first issue is illustrated in figure V in the appendix, which provides a map of the spatial distribution of religious heterogeneity in 1987 across Bavaria. Despite substantial clustering in the east of the state (an issue we return to in the robustness section), large parts of Bavaria have homogeneous and heterogeneous towns side by side. The second issue is illustrated for municipalities above 4000 inhabitants in figure VI in the appendix. Population growth occurred across municipalities in the northern and southern parts of Bavaria (see upper panels), as well as across both ex ante homogeneous and heterogeneous municipalities (see lower panels).[10] This similarity in part reflects the placement of immigrating ethnic Germans without concern to geography

[10]The year 1987 produces some very obvious outliers in figure VI. These are due to corrections of estimated population figures based on the census that year, but are controlled for in the analysis by year fixed effects.

or religion (see above).

4 Empirical findings

4.1 Main results

We start our analysis by illustrating a "first-stage" effect of the migration shock on religious heterogeneity. This is important for two reasons. First, our empirical strategy directly builds on the idea that the migration wave *increased* religious diversity more in religiously homogeneous municipalities. Second, since most immigrants faced no constraints on their location choices, sorting by migrants according to the religious composition of destination towns might induce a further *decrease* in the religious diversity of ex ante homogeneous municipalities. Colum 1 of Table III presents the results from estimating equation 1 with town-level religious composition measured via the HHI as the dependent variable. Panel 1 focuses only on larger towns, which saw the overwhelming share of population growth (see figure I). Panel 2 reports a difference-in-difference-in-differences (DDD) model in which we add town size as the third 'difference' (i.e. above/below 4000 inhabitants). Lacking detailed religion data on the population flows into particular municipalities, we employ data on the religious compositions of Bavarian municipalities using information from the 1987 and 2011 population censuses.[11] The statistically significant and negative coefficient estimates in Table III suggest that Bavarian municipalities which were religiously homogeneous in 1987 (whether predominantly Catholic or Protestant) became significantly less so by 2011 – reflecting a diminution of local religious majorities. As such, there is an important "first-stage" effect of migration on religious heterogeneity, and its negative sign further indicates that immigrants did *not* sort according to the religious composition of destination towns.

[11]No detailed religious compositions of Bavarian municipalities are available beyond the 1987 and 2011 censuses. The comparison nonetheless allows us to highlight long-term changes in religion.

Table III here

Our main results – using total expenditures (per capita and per year) as the outcome variable – are presented in column 2 and 3 of table III. The top panel of table III again includes data only for towns larger than 4000 inhabitants, i.e. those with extensive post-reunification immigration. As above, the bottom panel includes all Bavarian municipalities under 100000 inhabitants, and again adds town size as the third 'difference' in a DDD model (i.e. above/below 4000 inhabitants). The latter specification also emphasizes that our findings cannot be driven by some general shift in redistributive preferences among individuals in the dominant religious groups. If this were the case, we would expect the effects of this decline to be evident in *both* smaller and larger towns. All models in table III are specified including year and municipality fixed effects. Detailed population controls are included in column 3.

The main finding shows a negative coefficient estimate for the interaction variable of interest and is statistically significant at the 5% level. The result thus supports the idea that the disruption of social identity in religiously homogeneous Bavarian towns following the reunification affected public spending levels. (We return to this disruption of social identity below.) Since public expenditures trended upward throughout the sample period, ex ante religiously homogeneous municipalities had a *slower* increase in total spending per capita and per year after the reunification. The effect size represents a relative difference of 9 percent in the level of expenditures (i.e., 133.1 Euro on an average yearly budget of 1520 Euro per capita).

Panel 2 of table III confirms that the results are indeed stronger in larger towns, which saw substantial migration. Figure II presents this observation visually using the full-sample results from column 2. The spending level in larger towns (left panel) clearly diverges between high- and low-HHI towns after reunification, while no similar divergence is observed in smaller towns (right panel). This substantiates the idea that

post-reunification migration is driving our results. Note that figure II also underscores the validity of the common trend assumption, as it illustrates that both high- and low-HHI towns had similar, steady increases in expenditure levels per capita and per year before reunification (i.e. 1983-1988).

Figure II here

Apart from the effect on overall spending levels, table VI in the appendix also investigates the revenue and the tax side of the municipal budgets over the period 1983-2005. For revenues, we find that tax and fee revenues drop significantly in towns with high ex ante homogeneity (compared to ex ante heterogeneous towns), but no significant effect arises for grant revenues. The latter is reassuring, as grants are mainly allocated through pre-defined formulas which are unrelated to towns' religious diversity. The results further substantiate that the three independently set local tax rates underwent a relatively slower increase after reunification in ex ante highly concentrated towns. [12]

Although not reported here in detail due to space constraints, we also investigated more detailed expenditure data. Unfortunately, we do not have data prior to German reunification on this level of disaggregation, which precludes the use of our DD design. Nevertheless, comparison of later years' raw differences remains somewhat informative since overall spending levels of ex ante religiously homogeneous and heterogeneous towns were similar before the reunification (see above). Examining these detailed

[12] A simple back-of-the-envelope calculation using the coefficients on tax rates in Table VI and the mean tax rates reported in Table VII suggests that we would expect tax revenues to decrease by roughly 3.5% under a constant tax base (i.e. 1.2% for property tax A, 1.5% for property tax B and 0.6% for the trade tax). Yet, panel1 of Table VI indicates a much larger drop in tax revenues (approximately 12.5%). At least part of this difference arises because we only report tax rate effects for the three taxes under the direct responsibility of the municipalities (covering about 50% of tax revenues), while our measure of tax revenues instead includes all tax revenues. Moreover, at least part of the difference between the tax rate and tax revenue effects might derive from increased tax evasion and avoidance strategies following the migration shock. Recent emprical evidence suggests that patriotic sentiments can support tax morale and compliance (Konrad and Qari, 2012; Qari et al., 2012). Hence, reduced social identification with one's town might undermine tax compliance.

expenditure data (averaged across the 1998-2005 period), we find that religiously homogeneous towns appear to disproportionately de-emphasize policies potentially benefiting immigrants (e.g. adult education and child care) and emphasize policies certainly favoring 'natives' (e.g. spending on elderly care and churches) (Full details available in the working paper version, see Freier et al., 2013).[13]

4.2 Robustness checks

The robustness of our main findings is tested beginning in table IV. Throughout these tests we use our preferred specification with detailed population controls. In column 1, we include an interaction of the distance to each town's closest local urban center and the year.[14] The concern here is that local urban centers (and nearby municipalities) may have shown a differential trend in economic growth after reunification. Next, in column 2, we exclude two regions in the east of Bavaria. These display some clustering in terms of religious homogeneity (see figure V in the appendix), and fell under a subsidy scheme (*Zonenrandförderung*) before reunification supporting public activities in areas close to the countries of the Warsaw Pact. In column 3, we include region-specific time trends to capture the possibility that certain regions may have experienced differential trends in their economic activity after reunification. The results remain very comparable throughout.[15]

Table IV here

[13]Even though large ex ante religiously homogeneous towns appear to have had somewhat lower spending levels compared to large ex ante religiously heterogeneous towns even prior to the migration wave (see left-hand side of figure II), this spending gap clearly increased substantially after the reunification. Our analysis here documents where such spending differences are mainly located in the post-migration period. Clearly, some caution is required in the interpretation of these patterns, since we cannot infer changes in spending patterns based on the available information. Note also equivalent results are observed when excluding homogeneous Catholic towns from the sample.

[14]We calculated the distance between the geographical center of the municipality and the center of the closest county-free city (*Kreisfreie Städte*).

[15]The same is true when excluding each of the seven Bavarian regions one by one to ensure that the results are not driven by municipalities in a single region. The results of a number of additional robustness tests can be found in the working paper version (see Freier et al., 2013).

In columns 4 and 5 of table IV, we experiment with different thresholds for the homogeneity measure. We cut the distribution at the 60th percentile of the HHI distribution (HHI = 0.719) in column 4 and the 70th percentile (HHI = 0.761) in column 5 instead of the median. The results here suggest that the main findings are driven more by towns around the median of the HHI distribution, rather than those with exceptionally homogeneous populations. This observation is consistent with the tenets of social identity theory and group threat theory (Blalock, 1967). These indeed argue that the relative size of the outgroup is "a crucial indicator of actual intergroup competition" (Schlueter and Scheepers, 2010, 287). Consequently, the most homogeneous communities arguably can 'afford' to admit at least some outsiders without fearing that the position of their social group is undermined. In less extremely homogeneous towns, individuals might more readily perceive additional outgroup members as a threat to their social group's position.[16]

Since most religiously homogeneous Bavarian towns have a Catholic majority (about 94%), column 6 checks the robustness of our findings when *excluding* homogeneous majority Catholic towns. This leaves us with about 7000 observations, and roughly 200 of these relate to homogeneously Protestant towns. Although this reflects a relatively small share of the estimation sample, inference on the religious heterogeneity effects in this case derives exclusively from predominantly Protestant towns. As such, it helps assess whether our results truly result from changes in religious heterogeneity, rather than, say, the general conservatism of Bavarian Catholics. Although the

[16]To examine this last issue more closely, we extend the analysis in two ways. First, we implement a series of regressions in which the HHI threshold moves in 5 point increments over the interval between the 35th and 75th percentile of the HHI distribution. The estimated treatment effects are stable at approximately -130 euro per capita for thresholds up to the 50th percentile; above this point they gradually weaken substantively and statistically, losing significance at conventional levels above the 70th percentile. Second, we include dummies for the three upper quartiles of the HHI distribution (leaving the least homogeneous towns in quartile 1 as the reference group). The estimated treatment effects in this case are negative for all three quartiles, but are strongest in magnitude and statistical significance for the third quartile. Thus, consistent with group threat theory, the strongest effects in our analyses are retrieved where the threat immigrants pose to the ingroup's position is arguably most pronounced.

point estimate in column 6 is closely equivalent to those found for the entire sample, statistical significance is lost due to a lack of statistical power in this highly restricted sample.

To assess the sensitivity of our results to potential outliers, we successively omitted larger numbers of towns at the extremes of the expenditure distribution (until we excluded the top and bottom 1% of towns). While the magnitude of the DD result eventually declines to -52.8 Euro per capita, we always retain statistical significance at the 95% confidence level or better. The decline of the estimated effect size is less pronounced in the DDD model. Hence, our main inferences are not fundamentally driven by those municipalities with extremely high or low expenditure levels, though the lower bound of the effect size is probably best seen as lying around 3.5 percent of average annual expenditures per capita (i.e., 52.8 Euro / 1520 Euro). Also a log specification for expenditures signals a similar effect size: i.e. around 2.1% in the DD model and a more robust 7.2% in the DDD model (although only the latter is statistically significant).[17]

In table V, we experiment with a number of additional outcome variables to rule out certain mechanisms behind the observed fiscal effects. As our main analysis employs per capita expenditures as the dependent variable, we first investigate whether population growth is endogenous to the shock in religious diversity – and thereby contributes to our observed effects (column 1). We therefore replace the outcome variable in equation 1 with the year-to-year percentage change in population size. The result documents a negative and significant effect of 0.33 percentage points. This effect indicates that ex ante religiously homogeneous towns grew by slightly *less* than het-

[17]Given that there may be sources of correlation at higher levels of aggregation in our setting, we also experimented with clustering standard errors at the level of Bavaria's 71 Landkreis districts (rather than the municipality level). Given the smaller number of clusters, statistical significance levels tend to decline in these estimations – falling just short of the 90% confidence level in the DD model, but remaining above the 95% confidence level for the DDD model. In the outlier-trimmed samples, significance levels always remain above the 90% confidence using Landkreis-clustering.

erogeneous towns.[18] However, the effect is very small economically, and we conclude that a possible population growth effect is not of great importance to our story.

Table V here

Next, we also wish to evaluate measures of town-level economic growth and activity to exclude the possibility that our findings are driven by a differential trend in towns' economic environments. These would also help assess potential sorting based on migrants' economic characteristics. Unfortunately, data for many municipality-level economic characteristics are unavailable for a sufficiently long time frame spanning the reunification period. We therefore constructed a number of less direct measures of town-level economic activity based on available sources. The first is the ratio of the number of social security program participants employed in a town to the town's total population, while the second is the share of the town population paying income taxes. Both variables cover the entire 1983-2005 period, although the tax data are available only triannually. In columns 2 and 3, we report results from our DD specifications using these economic indicators as the respective dependent variables. The results indicate no statistically significant effects. Moreover, all estimated coefficients are substantively very small. These findings make it unlikely that the economic weakness or strength of the migrants is an important driving force behind the observed spending effects.

4.3 Mediating role of the democratic process?

While figure II underscores the validity of the common trend assumption, it also illustrates that the expenditure level of ex ante religiously homogeneous and heterogeneous towns first starts diverging around 1993 and gains traction mostly from 1996. This

[18] Additional investigation highlights that no similar effect arises in the DDD specification focusing on the effect in larger municipalities (where our main findings tend to be larger).

late-period divergence clearly drives the effects observed above, and two pieces of evidence indicate that the democratic process might be playing an important mediating role in our German setting.

On the one hand, the March 1996 local elections constituted Bavarian voters' first opportunity after the immigration wave to signal changed preferences with respect to local fiscal policies. In columns 4-7 in table V, we show that the party dominating Bavarian politics before and after the reunification (the center-right CSU, the Bavarian sister-party to the CDU of current Chancellor Angela Merkel) experienced a significant negative shock to its seat share (column 4) and its probability of achieving absolute majorities (column 6) in these elections in ex ante homogeneous municipalities. The main opposition party in Bavaria (the social-democratic SPD, column 5) significantly strengthened.[19] We hypothesize that the reduction in spending after 1996 in these towns may well be a response to that electoral shock. In line with this interpretation, data on party manifestos from the Manifesto Research Group at WZB Berlin (Volkens et al., 2012) suggest a substantial shift away from active support for the welfare state in the CDU/CSU party programs beginning in the mid 1990s. Interestingly, the German social-democratic party SPD and liberal party FDP followed this move only some years later, and no similar decline can be observed around this time in other western European countries such as Austria, Switzerland or Belgium (full details upon request).

On the other hand, a legislative reform in Bavaria made it possible to organize local referenda on public policies as of October 1995 (Arnold and Freier, 2015; Asatryan et al., 2015). Direct democracy has often been argued – and shown – to shift enacted public policies nearer those preferred by the median voter (e.g., Bowen, 1943; Pommerehne, 1978; Romer and Rosenthal, 1979; Gerber, 1996; Hainmueller and Hangartner, 2015).

[19]This analysis builds on a DD design using election outcomes as the dependent variables. The dataset includes all local council elections in Bavaria within our time period: 1984, 1990, 1996 and 2002.

Consequently, this legislative reform is likely to have tilted public policy after 1995 more in the direction favored by the median voter, who – in ex-ante religiously homogeneous towns – arguably became less supportive of redistribution. This view is supported by analyses of referenda usage across ex ante religiously homogeneous and heterogeneous towns. Indeed, whether we specify a binary dependent variable (equal to one for towns that held at least one referendum since 1995) or a continuous dependent variable (equal to the number of referenda held since 1995), a significantly more prominent use of referenda is observed in ex ante religiously heterogeneous towns. This is in line with our main findings since a recent study on the effect of direct democracy in Bavarian municipalities indicates that – in stark contrast to evidence from Switzerland and the US – referenda have a positive impact on expenditures and revenues in Germany (Asatryan et al., 2015).

Our interpretation thus far assumes that preferences shifted among 'native' voters. However, similar effects might arise if immigrants differ in their voting patterns. To rule out this alternative explanation, we collected data on individual-level voting intentions and policy preferences from the Politbarometer surveys (Forschungsgruppe Wahlen, 1993/1994). The 1993 and 1994 waves of this survey allow identification of respondents in western Germany who had previously lived in the former East, along with the timing of their migration.[20] We exploit this information to estimate whether voting intentions and party preferences differ systematically between respondents who had lived in the former East Germany and those who had not (controlling for their gender, age, marital status, education level, employment status, and level of political interest).

The results indicate that respondents who arrived from the former East after 1989 are statistically significantly less likely to report leaning toward either of Germany's

[20]Of all respondents in western Germany, 1223 report having moved from the former East Germany (173 after 1989), while 16878 never lived there. Among respondents in Bavaria, 164 moved from the former East (36 after 1989) and 3146 never lived there. Note that corresponding figures for ethnic German immigrants are not available.

major political parties, and more likely to report *no* political leaning ("Generally speaking, do you lean towards a particular political party? If so, which?"). They are also less likely to report intentions to participate in an upcoming election ("If there were national elections this coming Sunday, would you turn out to vote?"). Restricted sample sizes severely limit statistical significance in Bavaria-specific subsamples, but key qualitative results are in line with those for western Germany as a whole. Taken together, we interpret these results as suggesting that any post-migration changes in the composition of towns' *electorates* are much diluted relative to changes in towns' *populations*. This makes it distinctly unlikely that our results are driven by votes of immigrants, rather than altered policy preferences among native voters. In particular, given their lack of alignment to the major parties, these new potential voters seem unlikely to have simultaneously driven both the decrease in one party's seats (CSU, column 4) and the increase in another's (SPD, column 5).

4.4 Social identification

Finally, in this section we provide suggestive evidence linking our observed fiscal effects to changes in individuals' social identification following the migration wave (Alesina et al., 1999; Alesina and La Ferrara, 2000). To do so, we analyze data on the strength of individuals' identification with their home towns and their fellow inhabitants from the 1991 and 2008 German ALLBUS surveys (GESIS, 1980-2008).[21] Figure III reports the results of simple ordered logit regressions with social identification to one's town and its inhabitants as the dependent variable and an indicator variable for Catholics as the main independent variable (with the reference group being all non-Catholics in the left panel, and Protestants only in the right panel). We focus on Catholics since

[21]The exact question is: Regarding your emotional connection to your community and its inhabitants, do you feel strongly connected, quite connected, little connected, or not at all connected? (Sind Sie Ihrer Gemeinde und ihren Bürgern gefühlsmässig stark verbunden, ziemlich verbunden, wenig verbunden oder gar nicht verbunden?). These data are, unfortunately, available only for 1991 and 2008, and do not contain information on respondents' home-town.

they are the predominant religious group in Bavaria, and are more likely to have lived in religiously homogeneous towns prior to reunification. Controls for individuals' levels of income and education, as well as their political leaning and town size are included throughout. We run these models separately for 1991 and 2008 to assess any change in the strength of individuals' identification after reunification. To evaluate whether trends observed in Bavaria are reflective of broader developments in Germany, we perform the tests both for Bavarians (darker symbols) and other West Germans (lighter symbols). The results reported are for individuals living in municipalities with 2000 to 100000 inhabitants (Note that we start from 2000 rather than 4000 inhabitants due to the population size thresholds provided by ALLBUS).

Figure III suggests that Catholics reported a somewhat stronger local connection in 1991 than did non-Catholics generally (left panel) and Protestants in particular (right panel). By 2008, after the reunification migration wave, Catholics were significantly less likely to strongly identify with their communities (statistically significant at the 90 percent confidence level or better in both panels). Catholics in Bavaria thus appear to have lost their feeling of 'common identity' with their fellow inhabitants at the local level to a substantially larger degree than other Bavarians. In the Alesina et al. (1999) and Alesina and La Ferrara (2000) framework, this would underpin their lower preference for redistributive public policies. Interestingly, West German Catholics outside Bavaria – who were subject to a weaker shock due to non-Catholic immigration after reunification – show the opposite pattern (with a weakly *stronger* post-reunification local attachment). Note also that replicating the analysis for inhabitants of towns over 100000 inhabitants shows no significant difference in the local identification of either Catholics or non-Catholics, in either 1991 or 2008 (substantiating the idea that very large towns differ fundamentally in their susceptibility to heterogeneity effects in terms of social identification; see above).

Figure III here

5 Conclusion

Exploiting insights from social identity theory, Alesina et al. (1999) and Alesina and La Ferrara (2000) argue that a population's willingness to redistribute among its members decreases in its heterogeneity because such heterogeneity undermines individuals' perceptions of sharing a common identity. Previous empirical work tends to support the former part of this prediction – i.e. a negative heterogeneity-redistribution relationship – but *i)* restricts attention to linguistic, racial, or ethnic heterogeneity (for a survey, see Stichnoth and Van der Straeten, 2013) and *ii)* fails to test the theoretical mechanism – i.e. weakening social identification – underlying this relation.

In this article, we studied the effect of religious heterogeneity, and accounted for the potential endogeneity of local-level heterogeneity by exploiting the immigration shock induced by the fall of the Berlin Wall (see Dahlberg et al., 2012, for a similar identification strategy). The analysis reveals that, facing a substantial inflow of individuals with diverging religious characteristics, religiously homogeneous communities demonstrate slower growth in per capita public expenditures compared to religiously heterogeneous communities facing the same immigration wave. The size of these effects (i.e. 3.5 to 9 percent of average annual spending) is somewhat smaller than the impact of ethnic heterogeneity. Alesina et al. (1999), for instance, find reductions between 8 and 17 percent in various spending categories in US cities, metropolitian areas and counties, while Jofre-Monseny et al. (2016) show that Spanish municipalities reduced their spending on social services by 29.2 percent following a massive immigration wave between 1998 and 2006.

In keeping with social identity theory's concept of targeted altruism, we also found that the inflow of (largely non-Catholic) immigrants induced a trend among Bavarian Catholics between 1991 and 2008 toward substantially weaker identification with their communities and their fellow inhabitants (relative to other Bavarians). This relative

weakening in social identification makes them less inclined to support redistributive public policies. Further support for the central role of social identity is provided by the fact that our findings appear strongest in the third quartile of the heterogeneity distribution. This result is consistent with the idea that the perceived threat to the ingroup posed by immigrants is more prominent in such communities.

At the national level in Germany, the inclusion of the East mattered greatly in the formation of public policy by West German politicians (who kept a near-monopoly on political power well into the early 2000's). The Hartz reforms in the early 2000's, for instance, included massive cutbacks in the generosity of basic social welfare and affected East Germans disproportionately. Our analysis shows a similar pattern arising at the local level, driven by the massive immigration of members of religious 'outgroups' and the ensuing decline in local-level social identification.

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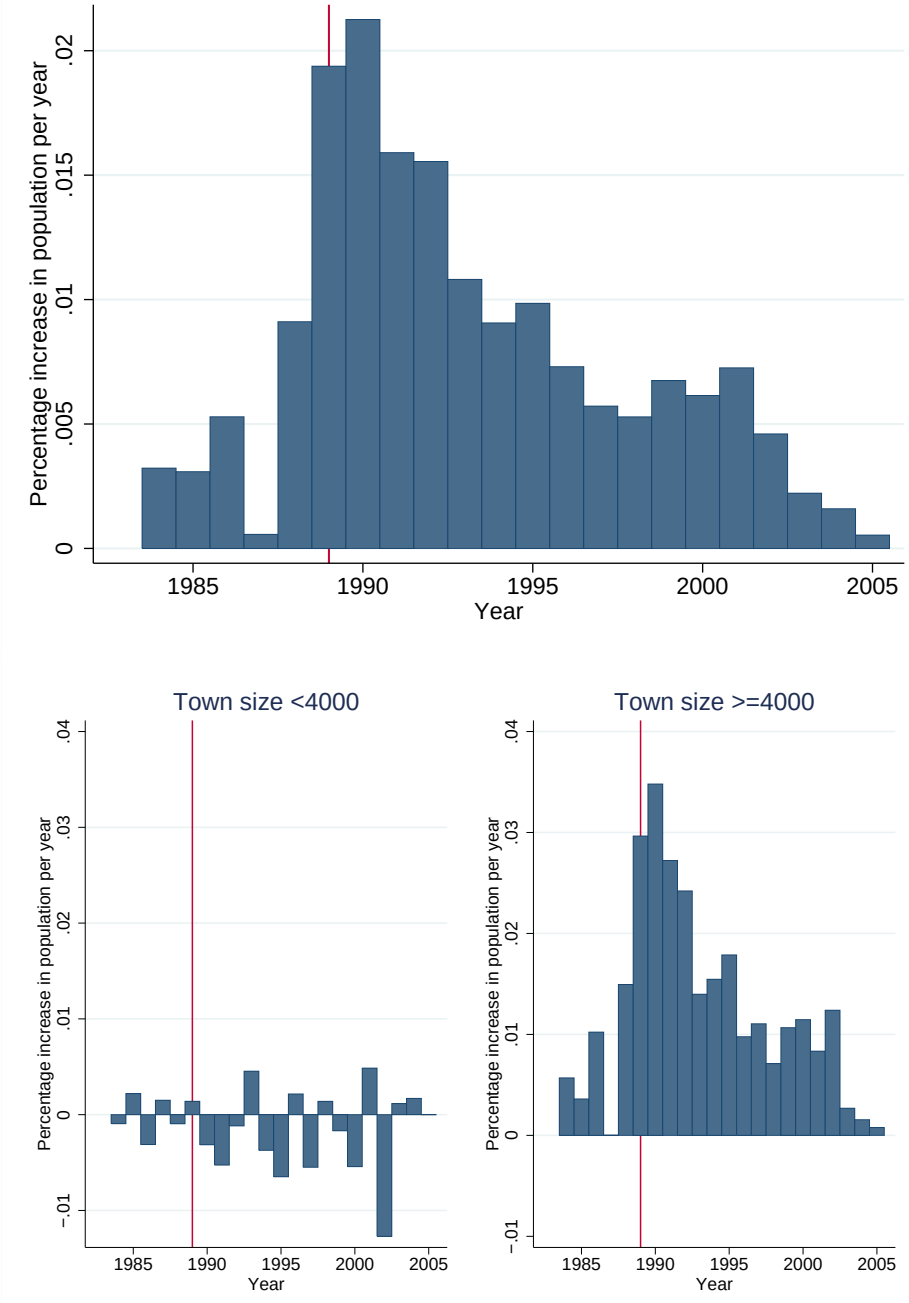
6 Tables and figures

Figure I: Yearly changes in population figures for 1984-2005 (in percent)



Notes: This figure shows the year-to-year increases in population (in percent) in the period 1984-2005. The upper part of the figure shows the average population growth across all Bavarian municipalities, while the lower part differentiates between municipalities below 4000 inhabitants (the lower-left panel) and above 4000 inhabitants (the lower-right panel). The year 1987 is notably different from other years because there was a general census in which population numbers were corrected. The vertical line indicates the year 1989 in which the reunification process began. *Source:* Own calculations.

Table I: Descriptive statistics on religious diversity

Variable	Mean	Std. dev	Median	Min	Max
# of inhabitants	4105	4595	2521	186	51440
Herfindahl Index	0.741	0.143	0.769	0.369	0.976
Share of Catholics	0.745	0.265	0.862	0.035	0.988
Share of Protestants	0.215	0.260	0.096	0.006	0.962

Notes: This table presents key descriptive statistics on the towns in the analysis. We highlight the mean, standard deviation, and median as well as min and max of all variables. The first row gives an indication of town sizes. In the following rows, we provide information on the religious diversity within the municipalities *prior* to reunification via the share of Catholics, Protestants and the Herfindahl-Hirschman Index (using the share of all religious denominations including non-religious). Data on religious denominations derives from the 1987 census. *Source*: Own calculations.

Table II: Religious denomination of Bavarians, East Germans and migrants

	Sample (from GSOEP)			
			Migrants in the West after 1997	
	Bavaria 1990	East Germany 1990	East Germans	Ethnic Germans
	1	2	3	4
Catholic	64.87	6.12	5.56	52.90
Protestant	24.76	30.46	24.10	31.90
Other Christian religions	2.22	0.58	0.81	6.13
Other religions	2.09	0.14	0.48	0.94
No confession	6.06	62.71	69.05	8.13

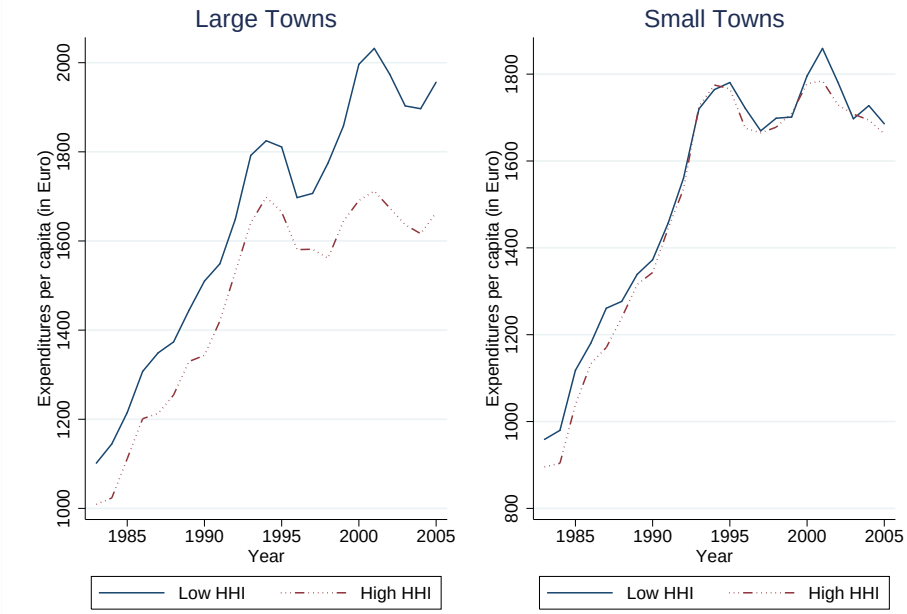
Notes: This table presents the religious denominations in respective samples from the German Socio-Economic Panel. The first column lists the shares of particular religions in the sample of the Bavarian population in 1990. In column 2, we show how religion was distributed in the former East in that same year. Columns 3 and 4 highlight the religious composition for the samples of individuals who migrated to the former West Germany. These last samples come from 1997 and later, and are separated into immigrants from the former East Germany (column 3) and ethnic Germans (column 4) who migrated from elsewhere in the former Soviet Bloc.

Table III: Main results for first stage and the effects of religious homogeneity on spending

	First stage: HHI score	Main specification: Total spending	
	FE	FE	FE
	1	2	3
	Panel 1: DD comparing high to low concentration towns		
Interaction			
Post 89 * high HHI	-0.069***	-96.7**	-133.1**
	(0.003)	(44.7)	(63.7)
N	1278	14427	14427
	Panel 2: DDD high-low concentration within town size		
Interaction			
Post 89 * high HHI * large town	-0.011**	-154.2***	-163.0***
	(0.004)	(44.1)	(45.7)
N	4102	46713	46713
Pop controls	yes		yes
Year effects	yes	yes	yes

Notes: Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are robust and clustered at the level of the individual municipalities. The outcome variable is the HHI Score (first stage in column 1) and yearly total expenditure per capita (column 2 and 3). The main results are in panel 1, where the parameter of interest is the interaction between a dummy indicating that the observation is post 1989 and a dummy indicating that the municipality was relatively religiously homogeneous in 1987 (i.e., the HHI is above the median for all larger towns). In panel 2, in addition to the comparison between pre- and post-1989 and the measure of religious heterogeneity is HHI (being above the median), we add an indicator equal to one for towns with more than 4000 inhabitants, *largetown*: i.e. those towns of the size which actually saw substantial migration. The parameter of interest is now the triple interaction between pre-vs-post 1989, high-vs-low HHI and small-vs-large towns. *Source*: Own calculations.

Figure II: Trends in expenditures, 1984-2005 (by low vs. high religious concentration)



Notes: This graph illustrates the trend in total per capita spending in Bavarian municipalities with more than 4000 inhabitants (left panel) and with fewer than 4000 inhabitants (right panel). Separate trendlines are shown for towns with high and low religious concentrations. *Source:* Own calculations.

Table IV: Robustness checks

	Comparing high to low concentration towns					
	Distance	Exclude two regions	Region (Bezirke) trends	Alter. distr. threshold Alt 1	Alt 2	Excl. homogen. Catholic towns
	1	2	3	4	5	6
Interaction						
Post 89 * high HHI	-154.4**	-137.3*	-138.9**	-95.3*	-69.3	122.7
	(63.0)	(72.9)	(70.4)	(53.1)	(48.8)	(99.8)
Pop controls	yes	yes	yes	yes	yes	yes
Year effects	yes	yes	yes	yes	yes	yes
N	14427	11263	14427	14427	14427	7378

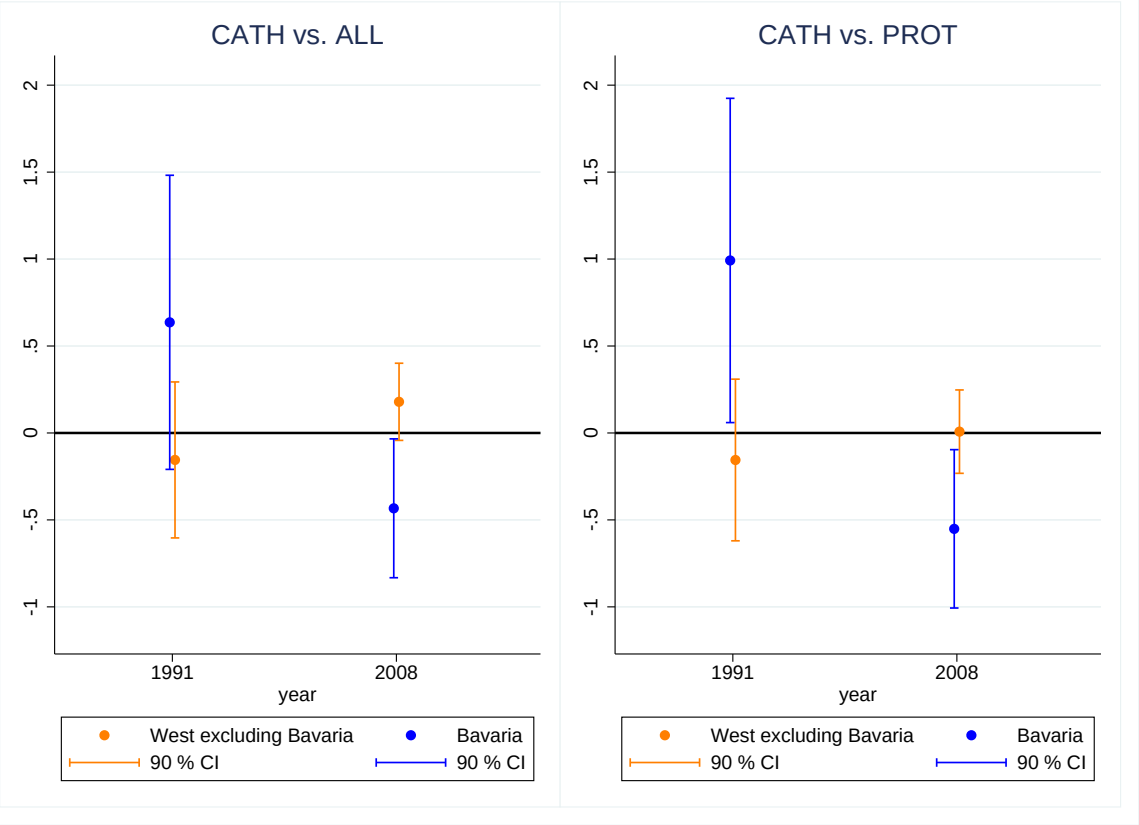
Notes: Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are robust and clustered at the level of the individual municipalities. The table presents a number of robustness tests for the difference-in-differences regression analysis above. The outcome variable is again yearly total expenditures per capita. The parameter of interest remains the interaction of ex ante homogeneous and ex ante heterogeneous municipalities (based on the HHI) before and after 1989. In column 1, we include a variable which measures the distance to the nearest large center of economic activity (county-free city). In column 2, we test for changes if we exclude the two regions to the north-east of Bavaria (*Oberpfalz* and *Niederbayern*) which may have received particularly high subsidies before reunification, and which demonstrate comparatively little variation in religious heterogeneity. In column 3, we include regional dummies and regional time trends for each of the seven Bavarian regions (*Bezirke*). Finally, in column 4 and 5, we specify alternative thresholds for the cutoff on the religious heterogeneity distribution. Respectively, these use the 60th and 70th percentiles of the HHI distribution in 1987 instead of the median. In column 6, we exclude all homogenous Catholic majority towns. All regressions include year and municipality fixed effects as well as detailed population controls. *Source*: Own calculations.

Table V: Additional outcome variables

	Additional outcome variable:						
	Pop growth	Econ. development		Election outcomes			
	Year-to-year changes	Share of SocSec Jobs	Share of taxpayers	CSU Seats	SPD Seats	Abs Maj CSU	Abs Maj All
	1	2	3	4	5	6	7
Post 89 * high HHI	-0.0033***	0.0002	0.0018	-0.284**	0.203*	-0.084**	-0.045
	(0.0007)	(0.0052)	(0.0013)	(0.136)	(0.112)	(0.037)	(0.039)
N	14427	14427	4809	2489	2489	2489	2489

Notes: Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are robust and clustered at the level of the individual municipalities. The table shows the results from difference-in-differences regression analyses where the main parameter of interest is the interaction between a dummy indicating that the observation is post 1989 and a dummy indicating that the municipality was relatively religiously homogeneous in 1987 (i.e., the HHI is above the median for all larger towns). In column 1, the dependent variable is the year-to-year change in the municipal population size. In columns 2 and 3, the dependent variables are two indicators of town-level economic activity. Finally, in columns 4 to 7, the dependent variables are the seat shares of CSU (Column 4) and SPD (column 5), and indicator variables for obtaining an absolute majority by CSU (colum 6) or any party (column 7), respectively. *Source*: Own calculations.

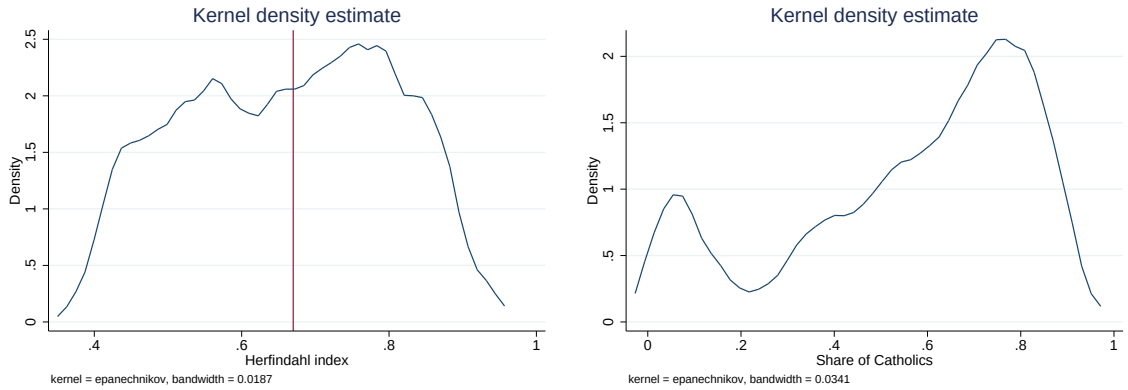
Figure III: Marginal effect of Catholic religion on local identification



Notes: This figure depicts the result of two series of ordered logit regressions (for 1991 and 2008), one based on individuals living in Bavaria (darker-colored dots) and one based on individuals in all West German states excluding Bavaria (lighter-colored dots). The dependent variable is reported attachment to one's town measured on a four-point scale ('strong attachment' (4) to 'no attachment' (1)). The variable of interest is an indicator for Catholics, and the dots in the figure reflect the marginal effect of this variable on reported attachment (with the whiskers representing 90 percent confidence intervals). Controls for individual income level, education level, political leaning and town size included in both model. To replicate the town size restriction in our main analysis as closely as possible, only respondents in municipalities between 2,000 and 100,000 inhabitants are included. *Source*: Own calculations.

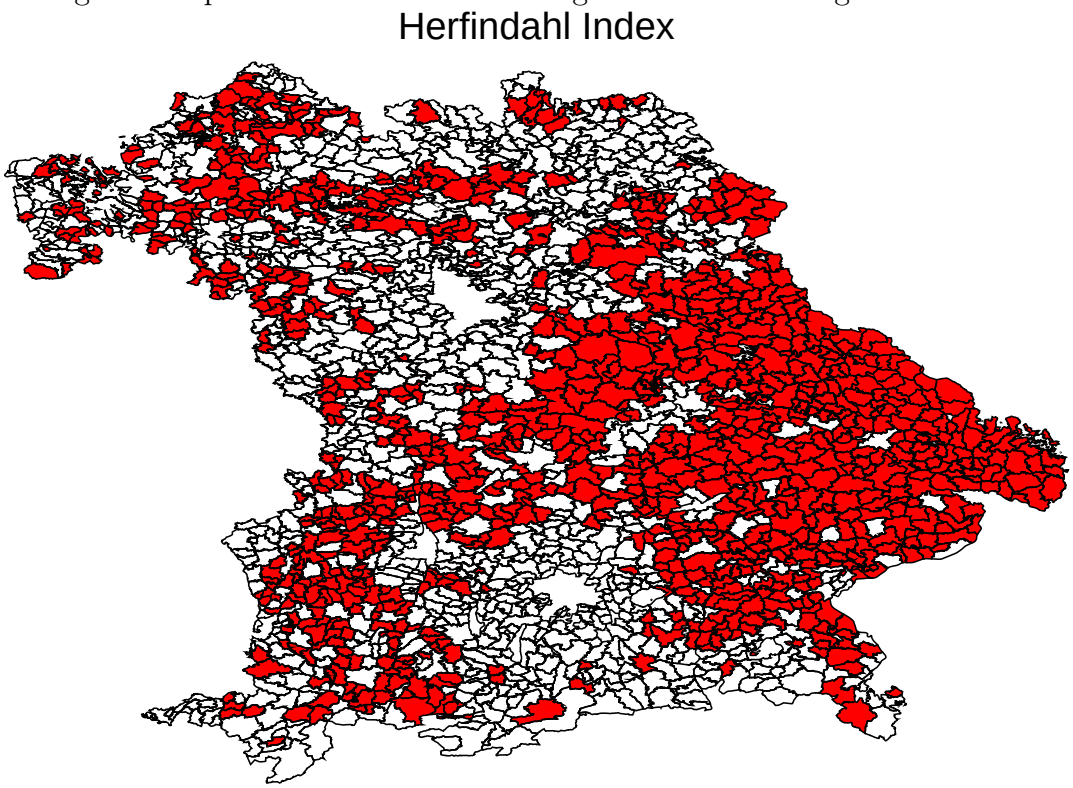
A Appendix - additional tables and figures

Figure IV: Kernel densities for HHI and the share of Catholics



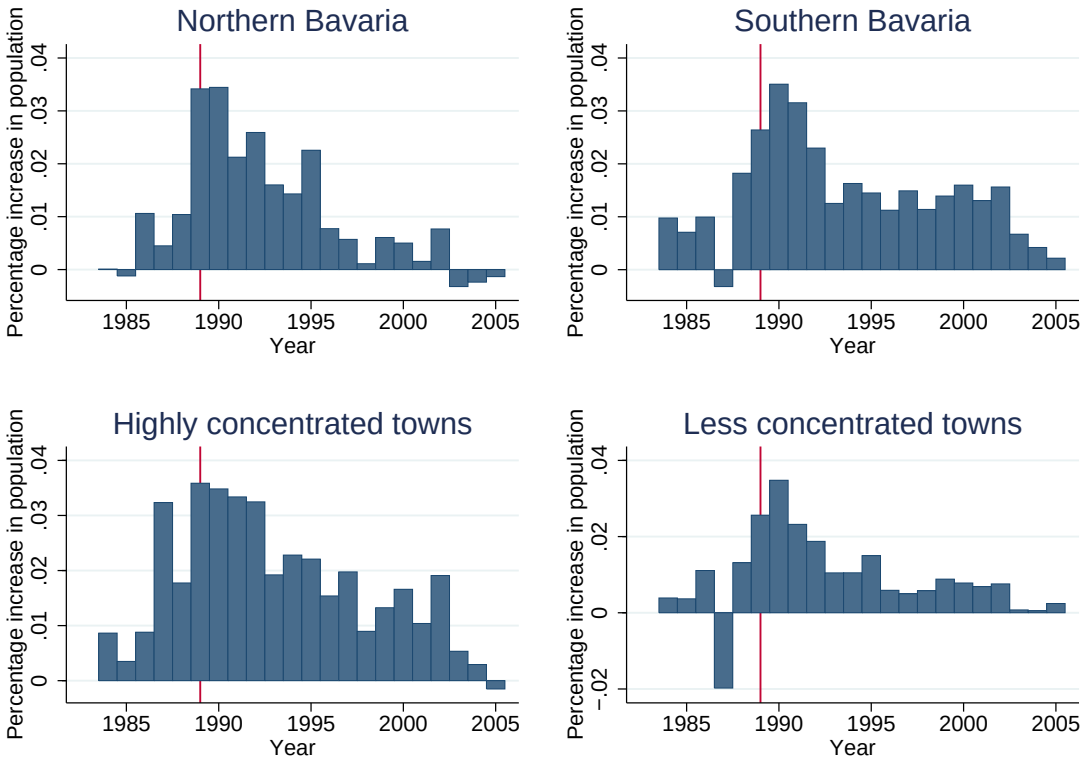
Notes: This figure plots the kernel densities of the Herfindahl Index and the share of Catholics for the towns above 4000 inhabitants (our main sample). *Source:* Own calculations.

Figure V: Spatial distribution of homogeneous and heterogeneous towns



Notes: This map illustrates the spatial dispersion of religiously homogeneous and heterogeneous towns in Bavaria. The religion Herfindahl index is used to divide the sample in two: municipalities are either above or below the median HHI. The more homogeneous towns are indicated with the darker shading. *Source:* Own calculations.

Figure VI: Yearly changes in population figures in subgroups for 1984-2005 (in percent)



Notes: This figure presents population growth (in percent) for four subgroups. The two upper panels represent population changes across Bavaria's northern and southern regions, as coded by administrative borders. The north includes Unter-, Ober- and Mittelfranken as well as Oberpfalz. The south includes all municipalities of the districts of Schwaben, Ober- and Niederbayern. The lower two panels address municipalities' religious composition. The sample is divided into those municipalities with above- and below-median religion HHI scores. Note that 1987 differs from other years in that the general census that year allowed corrections to estimated population numbers. The vertical line indicates the year 1989 in which the process of reunification started, first with open migration of East Germans through Hungary and finally the fall of the Wall in November 1989. As the graph illustrates, the wave of migration in the ensuing years was substantial in every subgroup.
Source: Own calculations.

Table VI: Results for selected revenue and tax categories

	Comparing high to low concentration towns		
	1	2	3
	Panel 1: Selected categories of revenues		
	tax revenues	revenues from fees	revenues from grants
Post 89 * high HHI	-53.8**	-14.7**	2.9
	(21.3)	(6.7)	(5.8)
	Panel 2: Selected categories of taxes		
	property tax A	property tax B	trade tax
Post 89 * high HHI	-3.69**	-4.61***	-2.04*
	(1.59)	(1.47)	(1.04)

Notes: Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are robust and clustered at the level of the individual municipalities. The table shows the results from difference-in-differences regression analysis. Panel 1 focuses on revenue subcategories, while panel 2 shows the results for the three independently set tax rate multipliers (property tax A on agricultural land, property tax B on all other land and the trade tax on local businesses). The parameter of interest is the interaction between a dummy indicating that the observation is post 1989 and a dummy indicating that the municipality was relatively homogeneous in 1987 (i.e. the religion HHI is above the median). All regressions include year and municipality fixed effects as well as detailed population controls. *Source*: Own calculations.

Table VII: Descriptive statistics on fiscal outcome data

Variable	Obs	Mean	Std. dev	Median	Min	Max
Total spending	46713	1517.42	771.06	1407.15	27.61	36617.25
Revenue from taxes	46711	429.15	367.97	385.13	0	55939.68
Revenue from fees	46710	120.10	120.64	92.74	0	4798.72
Revenue from grants	46326	286.10	176.66	254.31	0.26	4254.64
Prop tax A multiplier	46713	316	58	300	140	800
Prop tax B multiplier	46713	309	49	300	150	800
Trade tax multiplier	46712	317	22	320	230	520

Notes: This table shows descriptive statistics for the fiscal outcome data in the analysis, pooling the information from all 2031 municipalities over 23 years. All information on spending and revenue is per capita and year. We present information on the number of observations, the mean, standard deviation, median as well as min and max of all variables. In the top panel, we present total spending. In the middle panel, we present the data on revenues from taxes, fees and grants. Note that we have deleted a very small number of observations which had obvious mistakes in the data (negative spending or revenues). In the lower rows, we show the statistics for the tax multipliers set by the municipalities, which are the local decision variables with respect to taxation. These multipliers are arguments in the tax formula for the local property and business (trade) taxes. They are bounded between 0-800 (in the period of observation). *Source*: Own calculations.