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Fiscal Effects of Municipal Amalgamation

Evidence from a German State

Preliminary Version – Please do not quote

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Abstract

By examining the Fiscal Effects of the large scale municipal amalgamations in the German State of Baden-Württemberg from 1967-1975 this paper contributes to the economic literature on municipal public debt by focusing on the often neglected aspect of the appropriate size of local institutions. Using Data from 1964 to 1988 aggregated to the size of the 1111 municipalities still in existence after the amalgamation (down from 3379) and employing a difference in difference strategy we find, that amalgamation increases municipal debt and general expenditures. Expenditures for administrative staff, by contrast, shrinks in most specifications.

Keywords: municipal amalgamation, public debt, difference in difference
JEL code: H11, H72

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1. Introduction

The purpose of this paper is to shed some light on the question if larger municipalities can provide local public goods more efficiently and are therefore in better fiscal shape. This is done by examining the effects of the large scale municipal amalgamations taken place in the state of Baden Württemberg, mainly in the 1970s. As not all municipalities participated in this process we can make use of the variation in the data by employing a difference in difference strategy to single out the amalgamation effect on fiscal variables. We find a significant effect on debt and overall expenditure. The results therefore show that amalgamations lead, judged by the soundness of their fiscal policy, to less efficient municipalities. Only the expenditure for administrative staff seems to be reduced by amalgamation.

The remainder of the paper is organized as follows. In section two we provide an overview of the existing evidence on municipal amalgamation and related issues. Section three provides a short historical synopsis about the events in Baden-Württemberg. Section four gives a description of the data, lays down the empirical strategy and discusses the relevant variables. The results are than discussed in section 5 and 6. Section 7 concludes.

2. Existing Evidence

The optimal size of municipalities has long been discussed in public finance. Starting as early as 1925 (Anderson 1925) it was, based on the belief in strong and effective bureaucracies (Bish 2001, pp. 3), argued, that the actual state of municipalities is chaotic and ineffective and therefore needs to be reorganized along the lines of economic efficiency. As most municipalities had a rather small size[1] efficiency gains seemed to be realizable by boosting economies of scale in the production of local public goods. Economies of scale would result in lower per unit costs of government as less administrative capacity is needed. This was also seen as a way to cope with the problems of spillover effects or externalities. The larger the municipality is, the more the externalities are internalized. Also the planning and decision-making seemed to be easier, because fewer governments have to be coordinated. As only one government is responsible for local decisions, accountability towards citizens was expected to be much higher (Fields 1983, p. 23).

This view was challenged by public choice economists, especially by the work of Niskaanen (1971) and Tiebout (1956). While Niskaanen, by applying the paradigm of normative individualism to bureaucratic behavior, called the assumption of strong and

[1] see p. 6 fort the case of Baden-Württemberg

effective bureaucracies into question, Tiebout showed in a simple model that a precondition for an efficient production of public goods is a variety of offers citizens can choose from. So if citizens can make use of such offers by moving from one municipality to another the assumed chaos is rather beneficial than obstructive.

Further consideration affirmed this view. While Ostrom et al. (1961) examine the problem of monopoly in local public good production and show, that larger administrative units try to make use of their monopoly position, others took a closer look on the structure of local public goods. As most local public goods do not have pure public good characteristics, or even have the characteristics of private goods (Reiter and Weichenrieder 1997), diseconomies of scale are likely at some size (Zimmermann 1999, p. 47f). This seems to be the case for most goods municipalities are providing (King 1996, p. 55)[2]. Therefore the optimal size for the production of local public goods differs among the different goods. This view is also affirmed by the existing empirical evidence. Ostrom (1976) in a study on the production of police services in 109 cities with a size of at least 10,000 inhabitants found evidence for a positive correlation of size and per capita spending. Beyond that she also found, that overall evaluation of police activity by the citizens is negatively correlated to size. In an evaluation of New Jersey Cities Beaton (1974) found some economies of scale, but only in the range of 600-2,000 inhabitants. A study by Gyimah-Brempong (1987) found diseconomies in municipalities with a population of over 50,000. Studies about refuse collection, like Stevens (1978), found similar results, while others like Hirsch (1965) did not find any scale economies. More comprehensive studies which take a closer look on different government functions find, that the optimal size to which economies of scale can be realized differs widely among the functions from a size of 140,000 citizens in the case of water supply to a size of 5,000 for sanitation and waste removal (see Bodkin and Conklin 1971).[3] Bish in his review of the literature on local government amalgamations concludes, that "approximately 80 percent of local government activities do not possess economies of scale beyond relatively small municipalities with populations of 10,000 to 20,000. The rest occur because some specialised services are needed only infrequently by small municipalities" (Bish 2001, p. 14).

More generally, and therefore closely related to the previous discussed findings, is the discussion of the fiscal effects of government fragmentation. With a sample of 757 suburban municipalities in the USA Schneider (1986) provides evidence that fragmentation has a significant negative effect on the growth of government expenditure. This effect is bigger for

[2] road maintainance or water supply may be an exception (King 1996)
[3] for a more detailed overview of the results of studies before 1970 see: Ostrom (1972), p. 489

common expenditure than for social ones, but nevertheless significant. Kellermann (2008), in a study on swiss cantons, does also find a negative effect of decentralisation on government expenditure and therefore concludes that there do not exist any "costs of smallness" (Kosten der Kleinheit). Only the study of Dolan (1990) finds an opposite effect in a study on local governments in Illinois, by using a new measure of fragmentation.[4]

In contrast to the discussion taken place about the merits of amalgamation the evidence is rather small. For the United States Mehay (1981) estimates a demand function for total municipal spending, general government, public safety and public works with data of 157 Californian Cities with a population of at least 10,000 in 1970 which proceeded some annexation. The annexation variable is significant, except for the general government equation, and assigns a positive correlation of annexation and public spending. Benton and Gamble (1984) procede a time series analyses on the city/county consolidation in Jacksonville/Florida and find an increase in the long term[5] growth rate of per capita expenditure compared to their control group Tampa/Hillsborough county.

In Europe, although huge scale amalgamations have taken place in the 1970s in most countries, only few comprehensive studies have been proceeded. One exception is Nelson (1992) who analyses the case of Sweden. By using Panel econometrics he estimates a version of Borcherdings government expenditure growth model (Borcherding 1985). The results show a significant effect of amalgamation on the growth of government, if the municipality has a size of more than 2,000 inhabitants (Nelson 1992, p. 49). Additionally recent evidence by Hinnerich (2009) shows, that amalgamations have some kind of common pool character, as amalgamating municipalities try to free ride on their future partners by fostering government expenditure even before the amalgamation.

For Switzerland Lüchinger and Stutzer (2002) provide a difference in difference analyses of administrative expenditures in amalgamating municipalities in the canton of Solothurn. Although the municipalities are very small (<500) the evidence does not suggest any economies of scale through amalgamation. The amalgamation process in Germany has, to our knowledge, so far been widely neglected by economic researchers. The amalgamation process in Lower Saxony is the sole exception (Brockmann and Rosenfeld 1984), but this analysis suffers heavily from the simple econometrics used and the resulting small samples. We therefore try to fill this gap by analysing the large scale amalgamations in the German state of Baden-Württemberg.

[4] the validity of this new measure was heavily questioned by Boyne (1992)
[5] in the short term, however, the growth rate declined (Benton and Gamble 1984, p. 195)

3. Historical Synopsis

The discussion about the merits of Municipal Amalgamation in Germany can be dated back to the 45th meeting of the German Lawyer Association (Deutscher Juristentag) in 1964 in Karlsruhe. There several participants demanded a reform of the administrative structure of municipalities (Deutscher Jusristentag 1964). Because most municipalities in Germany at the beginning of the 1960s had a rather small size, where those with a maximum size of 5,000 inhabitants made up about 95% of all municipalities (Thieme and Prillwitz 1981, p. 39), with only little administrative staff, it was questioned if they can cope with the new and rising demand for administrative planning. This view was especially put forward by Frido Wagener in his seminal work on the "new construction of the administration" (Neubau der Verwaltung), where he calculated the optimal administrative size of about 67 local government functions (Wagener 1969, p. 482). By that calculation the optimal size for small communities was about 7,000 inhabitants (p. 483), and thereby much bigger than the average size of municipalities in Baden-Württemberg, where more than 92% had a size smaller than that and about 66% a maximum size of 2,000 inhabitants (Schimanke 1978, pp. 125) which was, in Wageners view (Wagener pp. 470), the absolute minimum for all government functions.

In the state of Baden-Württemberg this discussion was additionally supplemented by various expert commissions, were the so called "Dichtel Commission" focused on aspects of effective administrative structures in municipalities and the "Reschke Commission" on aspects of higher level administrative functions (see Thieme and Prillwitz 1981, p. 114f). Both commissions agreed on the need for bigger local administrations (Reschke 1970). Therefore the government of Baden-Württemberg started the process of large scale municipal amalgamation to achieve four main goals (Mattenklodt 1981, p. 165). The first two goals have been, according to the proposals of the scientific discussion, to strengthen the administrative capacities of local communities and enhance the provision of local public goods. Because lots of the small municipalities only had part time mayors and part time administrative staff which were assumed not to be capabable to fulfill this task, bigger entities with professionalized staff were needed. These additional public goods were also seen to be necessary to achieve the third goal, namely fostering the development of "rural" communes. And last but not least, a more cautious use of public funds, although it was not the primary aim, was hoped to be achieved.

The legal conditions have then been laid down in 1968 with the "law too strengthen the administrative capacity of small municipalities" (Gesetz zur Stärkung der Verwaltungskraft kleinerer Gemeinden, FAG 1968). It determined the way municipalities

have to organize their amalgamation and how the new political body has to be formed. In the last paragraph (§34a) it also set up an incentive scheme for the amalgamation of small municipalities. In case the new municipality has more than 1,000 but less than 10,000 inhabitants and each of the amalgamating municipalities has less than 2,000 inhabitants the weight of the inhabitants which are used to calculate the unconditional grants was raised by 20% for the following five years and then faded out by a reduction of one fifth in every following year. This incentive scheme stands in line with the aim to reach an absolute minimal size of 2,000 inhabitants and a standard size (Regelmindestgröße) of about 8,000 inhabitants (Mattenklodt 1981, p. 172). In the following, because of the induced high fiscal costs, the incentive scheme was changed and switched to a one time payment of 75DM/inhabitant as of January 1st 1973 (Schimanke 1978, p. 38). With the "law to end up the rearrangement of municipalities" (Gesetz zum Abschluss der Neurodnung der Gemeinden) of July 9th 1974 the amalgamation process was terminated to end by January 1st 1975.

In the end the amalgamation process led to a significant reduction in the number of municipalities from 3379 down to 1111 (see table 1). Thereby amalgamating 2925 into 657 municipalities, whereby the number of participating communes ranged from two to up to 19, and leaving 454 communes unchanged. Especially the very small communes with less than 2000 inhabitants, which made up nearly 76% of the communes in 1968, diminished to about 26% in 1975. Nevertheless the bulk of communes (77,5%) remained under the regular size of 8000 inhabitants (Landesarchivdirektion Baden-Württemberg1975).

Table 1
Size range in 1968 and 1975

Size	1968		1975		Reduction	
	Number	%	Number	%	Number	%
<1000	1803	53.4	100	9.0	-1703	-94.4
1.000-2.000	750	22.4	189	17.0	-561	-74.8
2.000-5.000	543	16.1	405	36.4	-138	-25.4
5.000-8.000	122	3.6	168	15.1	+46	+37.7
8.000-10.000	46	1.4	64	5.8	+18	+39.1
10.000-20.000	69	2.0	105	9.5	+36	+52.2
20.000-50.000	32	0.9	57	5.1	+25	+78.1
50.000-100.000	9	0.3	16	1.4	+7	+77.8
>100.000	5	0.1	7	0.6	+2	+40.0
Sum	3379	100.0	1111	100.0	-2268	-67,1

Source: Landesarchivdirektion Baden-Württemberg (1975), p. 14

4. Data and Empirical Strategy

The Data used are from the Office of Statistics (Statistisches Landesamt) of the State of Baden-Württemberg. It is aggregated to the size of the municipalities in 1979, i.e. after the completion of the amalgamations,[6] and ranges from 1964 to 1988. We selected this time span because of two reasons. First the rebuilding of Germany after World War II and the huge wave of immigrants arriving from the east can be seen as extraordinary events which could influence the variables we want to investigate. Especially the rapid change in the number of citizens and by that the change in per capita values can lead to a bias in the estimations. Therefore we decided to start our investigation after this wave of immigration, which died out with the building of the Berlin Wall in 1961. Additionally most economic time series provided by the Office of Statistics do only start in the 1960s. Second, to avoid an influence on the data by an additional extraordinary event, the German Reunification, the time series ends prior to it in 1988.

In the empirical strategy we make use of the variation in the data by the 454 municipalities which did not participate in the amalgamation and employ the Difference in Difference approach. This approach for evaluating non-random policy intervention, which is widely used since the 1994 study by Card and Krueger (Card and Krueger 1994) on the effects of minimum wages, makes it possible to extract the sole effect of the amalgamation on the variables of interest. By differencing the variable of interest before and after the treatment

[6] All economic variables are real values to the base year 1988 and all variables are calculated as per capita values, except the variable for the number of inhabitants (inh)

in the group to which a treatment was applied, i.e. amalgamation did occur, and in the control group, i.e. no amalgamation occurred, it can be accounted for group specific heterogeneity. Additionally by differencing these differences it can also be accounted for common trends which affect the treatment as well as the control group. The remaining difference can then be attributed to the amalgamation. To get unbiased estimates of the amalgamation effect the treatment and control group should not be systematically different, except regarding the treatment.[7] As both groups consist of municipalities in the State of Baden Württemberg to assume that this assumption holds seems to be appropriate. We therefore estimate models of the following form

$$y_{it} = \beta_0 + ß_1 \text{ part} + ß_2 \text{ post} + \beta_3 \text{ amalg} + \beta_4 X_{it} + \varepsilon_{it}$$

Where y_{it} denotes the variable of interest in municipality i at time t. As the variables of interest we chose expenditures per capita (exp_cap), and the log of debt per capita (logdebt) to check for the fiscal effects. Additionally, because it was often argued that a more efficient administration can be reached by amalgamations (Schimanke 1978, p. 36), we run a regression with expenditure per capita for administrative staff (staff_exp) as dependent variable to check for that argument. The variable part is binary and has a value of 1 if the municipality participates in the amalgamation and 0 otherwise. Variable post is also binary and its value is 1 if t > 1974, i.e. the amalgamation process has come to an end, and switches to 0 if t < 1975. The interaction variable amalgamation has a value of 1 if the municipality amalgamated and t > 1974. Otherwise its value is 0. Because we are interested in the effects of amalgamation on the fiscal variables the parameter of interest is than $ß_3$.

To check, if other variables have also an effect on the fiscal variables and to avoid biased estimates several covariates X_{it} are added to the regression. One of the most widely discussed issues are unconditional grants ($grant_{it}$) (see Boadway and Shah 2007) which are given to the municipality by higher order levels of government so that they have enough resources to fulfill their obligations. The expected effect is not quite clear. On the one hand they could foster expenditure by weakening the budget constraint. On the other hand they could be used to reduce public debt. Also the demographic situation may have some influence, as older and younger people may demand more public goods, e.g. theaters or public schools, than those of working age. Therefore we ad old_{it}, the percentage of inhabitants older than 65, and $young_{it}$,[8] the percentage of inhabitants younger than 20, and expect positive signs. Just alike the percentage of in-commuters ($comu_{it}$) may lead to higher per capita spending. Since a

[7] For a thoroughly description of the Difference in Difference methodology see Baskaran (2009)
[8] unfortunately due to data problems this variable can not be accounted for in this version, but will be considered in a next version

lot of public goods are complementary to economic production, income taxes are mostly paid in the municipality of residence. The variables in_{it} and $dens_{it}$ account for Wagners and Brechts Law. While Wagners Law suggests, that a richer community tends to be demand a higher level of public goods, [9] Brechts Law attributes this to higher population density.[10] As data on disposable income is not available for this time period we use the local revenue from the federal income tax[11] as a proxy for Wagners Law.[12] For Brechts Law we use inhabitants per are. Despite these characteristics of municipalities a vast strand of literature also attributes the size of expenditure to partisan politics (see Alesina and Rosenthal 1995), which expects higher expenditures when the legislature is dominated be leftist parties. The variable $left_{it}$ accounts for that.[13] ε_{it} is a normally distributed error term.

Because some authors suggest that the relationship between the fiscal variables and the size of a municipality is not linear (Bish 2001), we also estimate models for the different size categories. Here we follow Brisson (1996) and Bish and Clemens (1999), who found cost reductions through amalgamations in municipalities with a size smaller than 5,000 or respectively higher expenditure than in municipalities with a size of 5,000 up to 15,000, we add the number of inhabitants (measured in 1000) inh_{it} and the squared number of inhabitants sqr_inh_{it} to check for a non-linear relationship in the data. Additionally we also run different regressions for municipalities with <5,000, 5,000-15,000 and >15,000 inhabitants. Here we exclude Stuttgart, as it is much larger than all other municipalities and, as capital, has different obligations.

Last but not least we also ad a dummy variable (inc) to check if the change of economic incentives granted from the state government, from a 20% premium in the municipal fiscal equalization scheme to a one time premium of 75DM per head in 1973, has any effect on the fiscal parameters.

[9] for an investigation of Wagners Law see: Peacock and Scott (2000)
[10] for an investigation of Brechts Law fort he German States see: Büttner et al. (2004)
[11] since 1970 an additional revenue for municipalities was created by redistributing 14% and since 1980 15% of the federal income tax, whereby the redistribution is equivalent to the income of the citizens of the respective community, see: Bundesministerium der Finanzen (2009)
[12] As these kind of revenue only starts on 1970 we calculate the values from 1964 until 1969 by the change of inhabitants, implicitly assuming, that the income distribution stayed the some over that period
[13] unfortunately due to data problems this variable can not be accounted for in this version, but will be considered in a next version

5. Results

The results obtained by estimating the model presented above are given in table 2. To address problems of autocorrelation we use autocorrelation-robust standard errors by clustering on the municipality level.[14]

The results in table 2 indicate that amalgamation influenced the fiscal behaviour of municipalities. Debt and general expenditure seem to be driven up by amalgamations, whereas administrative expenditure diminishes. Providing administrative services therefore seems to reveal economies of scale. The level of general expenditure and debt seem to be unaffected from that, or other mechanisms which could go in hand with amalgamations, like a widening of the common pool problem, are overcompensating this effect.

Although the effect of amalgamation is significant in all estimations, the group and time specific variable seem to have, in some cases, an even larger influence. Municipalities which, at some point in time, take part in an amalgamation have higher debt and general expenditure and even administrative expenditure levels. This can be due to self selection, as municipalities with weaker fiscal behaviour have an incentive to amalgamate, so that the consequences have also to be beard by the future amalgamation partners. Additionally, as Hinnerich (2009) shows, municipalities who expect a future amalgamation try to free ride on their counterparts by raising expenditure right before it is executed. The coefficient for post has the same sign as the amalgamation coefficient.[15] Thus indicating that there seems to be a time trend after 1974 leading to higher general expenditure and lower expenditure for administrative staff.

Unconditional grants[16] have a negative impact on all dependent variables indicating, that they are used to strengthen the fiscal position. The influence of the proportion of inhabitants older than 65 shows the expected positive coefficient. An exception is the sign in the equation for general expenditure, where it is negative. However, although the coefficient indicates a quite large effect, it is not significant. The impact of in-commuters on the fiscal stance of a municipality is in line with economic theory, but the magnitude regarding expenditure is quite surprising.

Income seems only to play a role in the expenditure equation, where it, in line with the suggestions of Wagners Law, raises per head expenditure. Regarding debt and staff expenditure the influence is negative, but insignificant. In contrast to Wagners Law the evidence for Brechts Law is quite strong, indicating agglomeration effects.

[14] Angrist and Pischke (2008)
[15] An exception is the debt equation, where the coefficient is slightly negative but insignificant
[16] loggrant in the case of the debt equation

Table 2
Impact of the Amalgamation on fiscal variables, 1964-1988, basic OLS models

	logdebt b/t	exp_cap b/t	staff_cap b/t
part	0.096***	-42.166**	24.872***
	(2.878)	(-2.411)	(5.221)
post	0.027	1376.345***	-143.303***
	(0.660)	(37.417)	(-34.618)
amalg	0.106***	144.967***	-17.453***
	(2.751)	(4.645)	(-3.263)
grant	-0.061**	-0.435**	-0.034***
(loggrant)	(-2.137)	(-2.240)	(-3.089)
old	2.725***	-1.6e+03***	376.624***
	(3.533)	(-3.818)	(7.950)
comu	0.665***	2021.748***	132.038***
	(3.118)	(5.782)	(5.929)
inco	-0.000	1.545***	-0.017
	(-0.927)	(9.625)	(-1.358)
dens	-0.022***	-64.731***	-3.166***
	(-2.829)	(-10.294)	(-4.156)
inh	0.010***	11.311***	2.473***
	(7.509)	(10.819)	(10.034)
sqr_inh	-0.000***	-0.010***	-0.003***
	(-6.252)	(-6.312)	(-7.048)
constant	6.558***	974.600***	147.988***
	(37.693)	(12.796)	(24.624)
Adj. R^2	0.092	0.585	0.491
N	2.7e+04	2.8e+04	2.7e+04
* p<0.10, ** p<0.05, *** p<0.01			

The influence of the size of inhabitants and its squared value is highly significant and has different signs, but the value of the coefficients for the squared variable is near zero. The existence of a U-shaped relationship is therefore likely.

6. Robustness checks

To check, if the size of the municipality plays a more prominent role in determining fiscal behavior, as it is possible to control for in the baseline estimation, we additionally run separate regressions for large (>15,000 inh), medium (5,000<inh<15,000) and small (<5,000) municipalities. The results are presented in table 3. For large municipalities the impact of amalgamation is not quite clear, as the coefficients have different signs and in all equations they are not significant. For medium and small municipalities amalgamation has a positive sign and the influence is significant in the case of debt and expenditure. In contrast to the baseline regression in table 2 the influence of amalgamation on staff expenditure is positive in large and medium municipalities. For small ones it is negative. However it is insignificant for all size classes. This indicates a larger effect in small and medium municipalities. As in large

municipalities the additional commune is relatively smaller and therefore has a smaller impact on municipal politics, than in it is the case in small and medium ones, this does not very much surprise. The influence of grants and the percentage of inhabitants older than 65 stays the same in all size classes. Only the percentage of in-commuters changes its sign in the debt equation for large municipalities. Agglomeration economies seem to exist in all size classes, although for large municipalities the effect is significant only for expenditures. Also the effect of income is widely confirmed, with a highly significant positive influence on expenditure and a negative, but often insignificant, influence on debt and staff expenditures.

To control for the influence of the different incentive schemes we introduced a dummy variable (inc) where those municipalities who amalgamated before the shift in the incentive scheme to a one time contribution of 75DM per head in 1973 have value of 1 and 0 otherwise. In the basic setting the impact of amalgamation does not change, although the inc variable is significant in the debt and administrative staff regression. There the effect is negative, indicating that the additional payments from the equalization scheme have been used to reduce debt and staff payment. In the expenditure equation the impact is positive, but not significant (see table 5). Also in the regressions for different size classes (see table 6) the impact of the amalgamation variable does only change for expenditures of large municipalities when the inc variable is introduced. For large municipalities the sign of the incentive coefficients is positive but not significant. For small and medium municipalities the sign is negative and for medium size, in the case of staff expenditures, significant. Therefore in medium sized municipalities the incentive seems to have worked in the intended direction, as municipalities with at least the warranted minimum size used it to foster their fiscal stance by making use of economies of scale in the administration.

As an additional robustness check we also estimated fixed effects models with country and year fixed effects to account more for the time series characteristics of the data. The post and port variable have therefore been dropped from the equation as they are perfectly linear with the fixed effects. As can be seen from table 7 in the appendix, the coefficients only change signs in the case of inh_{it} and sqr_inh_{it}, therefore questioning the existence of a U-shaped relationship. The results for different size classes, as can be seen in table 8, show a positve and, on the 5 per cent level, significant effect of amalgamation for large municipalities, even in the case of staff expenditure. For medium and small ones it is negative, but not significant. Agglomeration economies or indicated on a much smaller scale and are in most cases insignificant. In large municipalities it even raises debt. The impact of income is also

Table 3
Impact of the Amalgamation on fiscal variables, 1964-1988, basic OLS models for different size classes

	Large municipalities			Medium municipalities			Small municipalities		
	logdebt	exp_cap	staff_exp	logdebt	exp_cap	staff_exp	logdebt	exp_cap	staff_exp
	b/t	b/t	b/t	b/t	b/t	b/t	b/t	b/t	b/t
part	0.160	59.279	-57.815*	-0.222***	7.540	-9.091	-0.032	80.695**	-2.909
	(1.191)	(0.437)	(-1.663)	(-2.988)	(0.178)	(-1.047)	(-0.609)	(2.547)	(-0.435)
post	-0.263	1886.477***	-348.456***	-0.058	1445.674***	-151.030***	0.076	1334.707***	-137.805***
	(-1.197)	(10.395)	(-6.028)	(-0.562)	(28.476)	(-18.734)	(1.640)	(26.500)	(-31.448)
amalg	0.183	-123.030	95.508	0.241***	128.523**	1.050	0.140***	70.263*	-1.381
	(0.802)	(-0.673)	(1.596)	(2.860)	(2.550)	(0.121)	(2.869)	(1.871)	(-0.220)
grant	-0.024	-0.715**	-0.099**	-0.053	-0.532***	-0.034**	-0.062	-0.497*	-0.004
(loggrant)	(-0.520)	(-2.132)	(-2.360)	(-1.290)	(-3.255)	(-2.035)	(-1.364)	(-1.723)	(-0.361)
old	7.426***	-4.7e+03**	952.070***	4.127***	-3.1e+03***	570.873***	2.337**	-1.9e+03***	336.218***
	(6.364)	(-2.283)	(6.161)	(3.401)	(-4.413)	(6.566)	(2.259)	(-3.815)	(5.700)
comu	-0.876***	3190.924***	137.192***	0.791*	1803.163***	192.963***	0.926***	1606.239***	83.675***
	(-3.390)	(4.569)	(3.330)	(1.939)	(4.561)	(4.595)	(3.633)	(3.675)	(3.381)
inco	-0.000	2.297***	-0.104**	-0.001***	1.411***	-0.094***	-0.000	2.028***	-0.006
	(-0.916)	(6.279)	(-2.072)	(-2.909)	(8.147)	(-5.075)	(-1.387)	(8.204)	(-0.394)
dens	-0.014	-54.001***	-1.702	-0.031**	-51.784***	-4.991***	-0.050**	-104.525***	-9.498***
	(-1.221)	(-5.056)	(-0.952)	(-2.453)	(-5.999)	(-4.619)	(-2.362)	(-6.877)	(-5.329)
inh	0.005***	10.029***	1.815***	0.030	-77.998**	12.505***	0.158**	-178.703***	16.639***
	(4.103)	(9.363)	(7.065)	(0.575)	(-2.539)	(2.894)	(2.372)	(-3.317)	(2.673)
sqr_inh	-0.000***	-0.010***	-0.002***	-0.000	4.376***	-0.367	-0.015	29.658***	-0.523
	(-3.188)	(-6.602)	(-5.472)	(-0.076)	(2.606)	(-1.563)	(-1.257)	(3.204)	(-0.445)
constant	6.352***	680.899***	278.460***	6.729***	1483.072***	123.902***	6.427***	1234.974***	125.972***
	(25.238)	(3.156)	(6.894)	(18.684)	(9.902)	(6.080)	(22.500)	(9.112)	(12.178)
Adj. R^2	0.261	0.673	0.561	0.077	0.632	0.495	0.063	0.544	0.451
N	2799.000	2799.000	2799.000	8068.000	8068.000	8064.000	1.7e+04	1.7e+04	1.6e+04
* p<0.10, ** p<0.05, *** p<0.01									

insignificant in most cases and the U-shaped relationship can once more called into question. In contrast to the OLS regressions of table 2 and 3 the Fixed Effects indicate an even stronger impact of amalgamation on the fiscal variables of municipalities.

7. Conclusion

The aim of this paper was to investigate whether the large scale municipal amalgamations carried out in the German state of Baden-Württemberg in the late 1960s and 1970s had an impact on the fiscal outcomes of the municipalities. In all three regressions we find a significant effect. While debt per capita and expenditure per capita are increasing when municipalities are amalgamating, expenditure for administrative staff is shrinking.

These results are widely affirmed, when we carry out several robustness checks, by estimating separate regressions for different size classes or adding an additional variable to control for the effect of different incentive schemes. Additional fixed effects estimation also confirm the previous results.

We can therefore conclude, that the large scale amalgamations had a loosening effect on local fiscal policy.

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Appendix

Table 4
Impact of the Amalgamation on fiscal variables, 1964-1988, basic OLS models (without Stuttgart)

	logdebt b/t	exp_cap b/t	staff_cap b/t
part	0.096***	-42.166**	24.872***
	(2.878)	(-2.411)	(5.221)
post	0.027	1376.345***	-143.303***
	(0.660)	(37.417)	(-34.618)
amalg	0.106***	144.967***	-17.453***
	(2.751)	(4.645)	(-3.263)
grant	-0.061**	-0.435**	-0.034***
(loggrant)	(-2.137)	(-2.240)	(-3.089)
old	2.725***	-1.6e+03***	376.624***
	(3.533)	(-3.818)	(7.950)
comu	0.665***	2021.748***	132.038***
	(3.118)	(5.782)	(5.929)
inco	-0.000	1.545***	-0.017
	(-0.927)	(9.625)	(-1.358)
dens	-0.022***	-64.731***	-3.166***
	(-2.829)	(-10.294)	(-4.156)
inh	0.010***	11.311***	2.473***
	(7.509)	(10.819)	(10.034)
sqr_inh	-0.000***	-0.010***	-0.003***
	(-6.252)	(-6.312)	(-7.048)
constant	6.558***	974.600***	147.988***
	(37.693)	(12.796)	(24.624)
Adj. R^2	0.092	0.585	0.491
N	2.7e+04	2.8e+04	2.7e+04
* p<0.10, ** p<0.05, *** p<0.01			

Table 5
Impact of the Amalgamation on fiscal variables, 1964-1988, OLS models with inc

	logdebt b/t	exp_cap b/t	staff_cap b/t
part	0.131***	-46.844**	28.824***
	(3.684)	(-2.252)	(5.649)
post	0.026	1376.571***	-143.498***
	(0.646)	(37.439)	(-34.805)
amalg	0.107***	144.957***	-17.440***
	(2.759)	(4.645)	(-3.264)
grant	-0.060**	-0.437**	-0.032***
(loggrant)	(-2.099)	(-2.249)	(-2.981)
old	2.696***	-1.6e+03***	373.043***
	(3.497)	(-3.820)	(7.847)
comu	0.661***	2021.791***	132.003***
	(3.183)	(5.795)	(5.859)
inco	-0.000	1.544***	-0.015
	(-0.886)	(9.610)	(-1.261)
dens	-0.020***	-64.905***	-3.020***
	(-2.693)	(-10.297)	(-3.994)
inh	0.009***	11.391***	2.406***
	(7.383)	(10.644)	(9.898)
sqr_inh	-0.000***	-0.010***	-0.003***
	(-6.099)	(-6.210)	(-6.910)
inc	-0.108**	14.157	-11.960***
	(-2.457)	(0.502)	(-3.537)
constant	6.552***	975.145***	147.531***
	(37.730)	(12.803)	(24.531)
Adj. R^2	0.094	0.585	0.492
N	2.7e+04	2.8e+04	2.7e+04

* p<0.10, ** p<0.05, *** p<0.01

Table 6

Impact of the Amalgamation on fiscal variables, 1964-1988, OLS models with inc for different size classes

	Large municipalities			Medium municipalities			Small municipalities		
	logdebt	exp_cap	staff_exp	logdebt	exp_cap	staff_exp	logdebt	exp_cap	staff_exp
	b/t	b/t	b/t	b/t	b/t	b/t	b/t	b/t	b/t
part	0.150	29.382	-59.501*	-0.174**	29.752	-3.085	-0.012	80.813**	-0.777
	(1.115)	(0.221)	(-1.718)	(-2.287)	(0.636)	(-0.327)	(-0.212)	(2.288)	(-0.106)
post	-0.267	1876.955***	-348.993***	-0.061	1444.237***	-151.415***	0.074	1334.695***	-138.022***
	(-1.213)	(10.388)	(-6.040)	(-0.596)	(28.484)	(-18.913)	(1.599)	(26.439)	(-31.501)
amalg	0.183	-122.123	95.559	0.242***	128.691**	1.101	0.140***	70.264*	-1.363
	(0.803)	(-0.669)	(1.598)	(2.887)	(2.551)	(0.128)	(2.874)	(1.870)	(-0.218)
grant	-0.024	-0.742**	-0.100**	-0.053	-0.527***	-0.032*	-0.062	-0.497*	-0.004
(loggrant)	(-0.540)	(-2.217)	(-2.403)	(-1.309)	(-3.240)	(-1.946)	(-1.354)	(-1.723)	(-0.332)
old	7.517***	-4.4e+03**	966.370***	3.949***	-3.1e+03***	547.583***	2.358**	-1.9e+03***	338.378***
	(6.442)	(-2.300)	(6.342)	(3.102)	(-4.469)	(6.273)	(2.274)	(-3.808)	(5.718)
comu	-0.939***	3007.577***	126.851***	0.763*	1794.553***	190.601***	0.920***	1606.207***	83.086***
	(-3.347)	(4.711)	(3.059)	(1.857)	(4.541)	(4.578)	(3.622)	(3.676)	(3.339)
inco	-0.000	2.348***	-0.101**	-0.001***	1.436***	-0.087***	-0.000	2.028***	-0.004
	(-0.868)	(6.304)	(-2.012)	(-2.838)	(8.319)	(-4.829)	(-1.346)	(8.200)	(-0.313)
dens	-0.014	-53.931***	-1.698	-0.029**	-50.702***	-4.698***	-0.048**	-104.516***	-9.344***
	(-1.216)	(-5.025)	(-0.948)	(-2.362)	(-5.887)	(-4.426)	(-2.286)	(-6.823)	(-5.274)
inh	0.006***	10.416***	1.836***	0.029	-78.518**	12.361***	0.158**	-178.704***	16.620***
	(4.167)	(9.673)	(7.141)	(0.554)	(-2.539)	(2.879)	(2.362)	(-3.317)	(2.674)
sqr_inh	-0.000***	-0.010***	-0.002***	-0.000	4.345**	-0.376	-0.015	29.656***	-0.556
	(-3.284)	(-7.093)	(-5.555)	(-0.102)	(2.563)	(-1.603)	(-1.280)	(3.205)	(-0.475)
inc	0.066	186.718*	10.531	-0.107	-49.914	-13.492***	-0.053	-0.309	-5.608
	(0.798)	(1.752)	(1.149)	(-1.372)	(-1.385)	(-2.896)	(-0.904)	(-0.009)	(-1.134)
constant	6.347***	660.797***	277.326***	6.731***	1481.961***	123.621***	6.421***	1234.943***	125.379***
	(25.412)	(3.095)	(6.888)	(18.818)	(9.839)	(6.124)	(22.435)	(9.098)	(12.174)
Adj. R^2	0.263	0.675	0.561	0.081	0.632	0.498	0.064	0.544	0.451
N	2799.000	2799.000	2799.000	8068.000	8068.000	8064.000	1.7e+04	1.7e+04	1.6e+04

* p<0.10, ** p<0.05, *** p<0.01

Table 7
Impact of the Amalgamation on fiscal variables, 1964-1988, basic Fixed Effects models

	logdebt b/t	exp_cap b/t	staff_cap b/t
amalg	0.088***	111.553***	-16.186***
	(7.171)	(8.596)	(-11.291)
grant	0.025***	-0.162***	-0.026***
(loggrant)	(3.060)	(-3.167)	(-4.543)
old	-0.302	2018.368***	-988.419***
	(-1.092)	(7.026)	(-30.835)
comu	-0.050	2215.445***	-77.809***
	(-0.535)	(23.604)	(-7.513)
inco	-0.000	0.819***	-0.025**
	(-0.460)	(8.410)	(-2.350)
dens	-0.083***	-119.865***	-3.944***
	(-7.029)	(-9.558)	(-2.859)
inh	-0.024***	16.954***	7.497***
	(-4.164)	(2.788)	(11.242)
sqr_inh	0.000***	-0.037***	0.001*
	(4.533)	(-6.129)	(1.835)
constant	6.898***	2449.461***	191.391***
	(79.583)	(31.433)	(22.153)
Adj. R^2	0.050	0.797	0.703
N	2.7e+04	2.8e+04	2.7e+04
* p<0.10, ** p<0.05, *** p<0.01			

Table 8
Impact of the Amalgamation on fiscal variables, 1964-1988, basic Fixed Effects models for different size classes

	Large municipalities			Medium municipalities			Small municipalities		
	logdebt	exp_cap	staff_exp	logdebt	exp_cap	staff_exp	logdebt	exp_cap	staff_exp
	b/t	b/t	b/t	b/t	b/t	b/t	b/t	b/t	b/t
amalg	0.230***	62.506	24.392**	0.165***	88.970***	-0.956	0.102***	33.944*	-2.144
	(4.539)	(0.943)	(2.189)	(6.134)	(3.603)	(-0.333)	(6.192)	(1.915)	(-1.336)
loggrant	-0.021	-0.101	-0.221***	-0.012	-0.284***	-0.018*	0.053***	-0.195***	0.022***
	(-1.318)	(-0.709)	(-9.168)	(-0.899)	(-3.527)	(-1.883)	(4.565)	(-2.775)	(3.426)
old	-2.213**	7866.258***	-2.4e+03***	-4.183***	-931.684*	-951.608***	0.719*	361.482	-587.129***
	(-2.085)	(5.631)	(-10.008)	(-6.869)	(-1.672)	(-14.698)	(1.955)	(0.943)	(-16.591)
comu	-1.841***	3417.321***	-294.142***	-0.199	2452.248***	10.666	0.441***	1867.441***	-7.971
	(-8.952)	(12.956)	(-6.634)	(-1.058)	(14.506)	(0.543)	(3.619)	(15.136)	(-0.712)
inco	-0.000**	1.870***	0.021	-0.000	0.191	0.030	0.000	0.666***	0.004
	(-2.038)	(6.171)	(0.420)	(-0.756)	(1.222)	(1.627)	(1.545)	(4.986)	(0.330)
dens	0.077***	-51.424	-9.885	0.027	7.553	2.979	0.015	-29.742	-4.793**
	(2.749)	(-1.404)	(-1.606)	(1.253)	(0.376)	(1.277)	(0.638)	(-1.181)	(-2.110)
inh	-0.030***	12.833	10.974***	-0.233***	-156.093***	-0.847	-0.418***	-602.900***	-13.723*
	(-4.387)	(1.449)	(7.371)	(-7.256)	(-5.310)	(-0.248)	(-5.598)	(-7.523)	(-1.898)
sqr_inh	0.000***	-0.031***	-0.005***	0.004***	3.241**	0.291*	0.038***	63.396***	3.244***
	(3.019)	(-4.219)	(-3.879)	(2.668)	(2.411)	(1.860)	(3.882)	(6.007)	(3.407)
constant	8.457***	-1.7e+03***	360.565***	8.621***	1068.061***	325.292***	6.718***	3674.394***	147.906***
	(30.053)	(-4.926)	(6.261)	(44.588)	(6.546)	(17.154)	(43.839)	(24.711)	(10.867)
Adj. R^2	0.120	0.893	0.806	0.095	0.861	0.762	0.045	0.755	0.696
N	2799.000	2799.000	2799.000	8068.000	8068.000	8064.000	1.7e+04	1.7e+04	1.6e+04
* p<0.10, ** p<0.05, *** p<0.01									