

MUNICIPAL MERGERS AND FISCAL OUTCOMES: COMMON POOL EFFECTS AT AN EARLY STAGE?

Lars-Erik Borge and Per Tovmo

Department of Economics

Norwegian University of Science and Technology

NO-7491 Trondheim, Norway

Abstract

After the 2013 election the new conservative government in Norway announced an ambition to implement a more robust municipal structure that would contribute to more expertise and greater professionalism. In this paper we investigate common pool effects during the first stage of the merger reform. The first stage covers the local processes during 2014-2016 where the municipalities were asked to assess and clarify whether it was appropriate to merge with neighboring municipalities. The parliament decided on a merger reform in June 2017, and most of the mergers will not be implemented until 2020. Even before the merger is decided and several years before it is implemented, we find evidence of common pool effects. Merging municipalities run down funds and other financial wealth, reduce the operating surplus, and increase investments. Since Norway still has a large number of small municipalities, the analysis in this paper is of relevance for possible future merger reforms as well as for other countries considering reforms.

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1. Introduction

Soon after the election in 2013 the new conservative government in Norway announced an ambition to implement a municipal merger reform and set down an expert committee to define criteria for a future municipal structure. The expert committee delivered its report in March 2014, emphasizing that a merger reform was necessary to utilize economies of scale. In addition, a merger reform would contribute to more expertise and greater professionalism in the local governments. The central government initiated local processes where the municipalities were requested to assess and clarify whether it was appropriate to merge with neighboring municipalities. These processes were the first stage of the reform process and lasted during 2014-2016. The county governors (the central government representative in the counties) then proposed a new municipal structure in January 2017. Finally, the parliament decided on a merger reform in June 2017. The reform reduced the number of municipalities from 428 to 356.

The main contribution of this paper is to test the so called common pool hypothesis or “the law of 1/n” (Weingast, Shepsle and Johnson 1981) during the early stages of the reform process. We focus on the period 2014-2016. This captures the period after the launch of the report from the expert committee, but before the proposal from the county governors and the actual merger decision in the parliament. The hypothesis is that the announcement of the reform resulted in expectations of future mergers that affected behavior and generated common pool effects already from announcement. Even before the merger is decided and several years before it is implemented, we find clear evidence of common pool effects. Municipalities expecting to be involved in a merger run down funds and other financial wealth, reduce the operating surplus, and increase investments. Investment growth are mainly due to increased investments in primary schools. Location of schools in merged municipalities was the most debated topic after the announcements of the reform and the results indicate that municipalities invest to improve the school building to affect the future school structure. We also find evidence of common pool effects for non-merging municipalities that in the early stages of the reform probably expected a merger although they ended up with status quo.

Recently, several studies of common pool effects from other Nordic countries have appeared in the literature. Since the “old” municipalities cease to exist when the “new” municipality is formed, municipal mergers are good testing ground for the common pool hypothesis. In contrast to us, they analyze the period between the merger decision and the actual merger decision. An early study is Blom-Hansen (2009) using data for the 2007 reform in Denmark. He finds evidence of “spending before closing time”, i.e. merging municipalities increase their spending in 2006, the year before the reform was implemented. This finding is confirmed by Welling Hansen (2014, 2019). The latter contribution also takes account of politics, showing that the common pool effect is of relevance only in municipalities where the mayor is not “re-elected” as mayor of the new municipality. Tyrefors Hinnerich (2009) and Jordahl and Liang (2010) use historical reforms in Sweden to analyze the common pool effect. The papers study two different reforms where they compare behavior between merging and non-merging municipalities in the window between a merger is decided and implemented. Saarimaa and Tukiainen (2015) document a common pool effect using data from the recent Finnish reform. Their study is of special interest since the Finnish and the Norwegian reforms were quite similar in the sense that the mergers were decided voluntarily, and their results show that free-riding is a concern not only in forced mergers. Feld and Fritz (2015) investigate after merger effects of municipal amalgamations in the German state of Baden-Württemberg and find evidence of common pool exploitation. The reform was a mix of voluntary and forced mergers and they find stronger common pool effects when mergers were forced.

In the following Section 2 we describe the Norwegian reform process starting with the expert committee that delivered its report in March 2014. Section 3 discusses hypotheses, empirical operationalization, and data, while the estimation results are presented in Section 4. Finally, in Section 5 we provide some concluding remarks.

2. The Norwegian merger reform

In the 2013 election, the non-socialist parties won a majority of the seats in the parliament and a conservative government took office. Implementation of a local government reform was one of the first projects of which the parties supporting the government (two governing parties and two

minor cooperating parties) agreed. The aim was a more robust local government structure that would contribute to more expertise and greater professionalism in each municipality. In the next round, this would result in better services, in particular for specialized welfare services like child welfare, but also for larger services like education and care for the elderly. In the end, municipalities that are more robust can take on new tasks and be given more freedom as the need for central government micro-management is reduced.

On January 3 2014, the Ministry of Local Government appointed an expert committee to propose criteria for an efficient municipal structure. The proposed criteria addressed the municipalities' roles as service providers, government officials, community developers, and democratic arena. Based on the criteria, the committee agreed on three recommendations for a new municipal structure:

1. The municipalities should have a minimum of 15.000-20.000 inhabitants in order to solve their tasks efficiently.
2. The municipal structure should be approaching functional community development areas.
3. The central government should reduce micro-management of the municipalities and the system of political participation should be further developed in order to secure good an efficient democratic arenas.

The first criterion is particularly relevant in rural areas dominated by smaller municipalities. Currently, more than half of the municipalities have less than 5.000 inhabitants. Mergers of smaller municipalities in rural areas may also contribute to the second criterion. Moreover, the second criterion applies to larger municipalities in urban areas. The committee particularly emphasized city areas with a high degree of commuting across municipal borders. The implications of the recommendations would be a large number of mergers in both rural and urban areas, and a reduction in the number of municipalities from 428 to around 100. Most municipalities would be involved in a merger.

A large majority in the parliament supported the need for a reform of the municipal structure. By August 2014, all municipalities were asked to participate in local processes aimed at assessing and clarifying whether it is appropriate to merge with neighboring municipalities. The county governors (the state's representative in each county) and the Norwegian Association of Local and Regional Authorities (KS) were responsible for the local processes. As a main rule, the mergers should be voluntary. However, individual municipalities should not be able to block mergers that, from regional and national interest, were desirable.

The deadline for the municipal decisions was set to July 1, 2016. During this nearly two-year period, the municipalities conducted extensive studies of possible mergers. The studies reviewed future challenges and the need for mergers, as well as considerations of with whom to merge. Municipalities signed letters of intent and arranged referendums or citizen surveys to tap the local views on possible mergers. In total 275 municipalities (69%) signed a letter of intent and 210 (49%) arranged a referendum. In the end, the municipal councils made a vote on whether to merge and with whom to merge.

The local processes were finalized by explicit merger proposals from each of the county governors in January 2017. The government adapted the proposals and presented a complete merger reform for the parliament in February 2017. The parliament made some further adaptations, before explicit merger decisions were taken in June 2017. The reform implied that 119 "old" municipalities merged into 47 "new" municipalities. The average number of municipalities involved in a merger is 2.8, ranging from 2 to 5. The total number of municipalities will be reduced from 428 before the reform to 356 when the reform is completed by January 1, 2020. Most of the mergers, comprising 94 of the 119 municipalities, are voluntary in the sense that the municipalities made mutually positive decisions. For the remaining 34, at least one of the merging municipalities made a negative decision, and the merger had to be enforced by the central government.

The merger reform to be implemented differs from the recommendations from the expert committee in several ways. First, the merger reform affects less than 30% of the municipalities, compared to nearly all if the recommendations from the expert committee were followed.

Second, after the merger reform is completed there will still be a large number of small municipalities. More than $\frac{1}{3}$ of the 356 municipalities are predicted to have less than 3,000 inhabitants. Third, although several urban municipalities are involved in mergers, the new municipal structure fails to create functional community development areas in most city areas. From this point of view, the reform can be considered “unfinished” as it does not facilitate decentralization of tasks and less central government micro-management. However, as researchers we can take advantage of an “unfinished” reform since non-merging municipalities can be used as control group.

3. Hypotheses, empirical operationalization, and data

The main purpose of this paper is to investigate whether announcement of the merger resulted in common pool problems due to expectations of a future merger. Before a merger, merging municipalities have incentives to increase spending and debt and run down funds and other financial wealth. The underlying idea is that such “spending before closing time” (Blom-Hansen 2009) yields concentrated benefits to the inhabitants of the “old” municipality, while the costs in terms of higher debt and lower wealth are shared with all inhabitants of the “new” municipality. Investments may in addition affect the location of production when the merger is completed and increase the quality of future services yielding benefits for only local taxpayers after a merger.

The empirical literature typically test the common pool hypothesis in a difference-in-difference framework where merged municipalities are treated and compared to untreated non-merging municipalities. We rely on the same framework but since there were no merging decisions taken in the period we study, the “treatment” given to the treated municipalities in our case is expectations of a merger. The main challenge is to identify which municipalities are treated, i.e. they expect to be involved in a merger, and who are not. As a point of departure, we define the municipalities that were involved in one of the mergers decided in June 2017 as treated. The intuition behind is that these municipalities at some point of time before the merger decisions, if not from the beginning, realized that they would merge with other municipalities. One exception might be those forced into a merger but we allow involuntarily merged municipalities to behave

differently in the empirical analyses. A weakness with this approach is that we are likely to exclude some municipalities expecting merger, and likewise include some who do not, resulting in heterogeneity among both treated and untreated municipalities. The consequence is that the estimated treatment effect of the treated municipalities will be a downward-biased estimate of the common pool problem. A clear advantage is that it provides us with information about future merging partners and that opens for allowing heterogeneity in the incentives to exploit the common pool as described below.

The first model formulation is a simple comparison of merging and non-merging municipalities. The key variable is a dummy variable that equals one if the municipality is involved in a merger and zero otherwise. We denote this variable $Treated_i$ in the empirical analysis.

The dummy formulation may be intuitive but does not take into account that the merging municipalities have different incentives to exploit the common pool. The incentives are particularly strong for municipalities that are small relative to the new municipality. In the literature this reasoning is described as “the exploitation of the great by the small” (Olson 1971) and “the law of 1/n” (Weingast, Shepsle, Johnson 1981). We follow Tyrefors Hinnerich (2009) and Jordahl and Liang (2010) who measure the incentives to exploit the common pool as:

$$Freeride_i = \left[1 - \frac{Pop_i}{Pop_j} \right] \quad (1)$$

In equation (1) Pop_i is the population size of the “old” municipality, while Pop_j is the population size of “new” municipality, i.e. the sum of the population of the merging municipalities. It follows from (1) that $Freeride_i$ takes a value between zero and one for merging municipalities and the value is higher the smaller in terms of population size the municipality is relative to the new municipality. For non-merging municipalities $Pop_i = Pop_j$ and the value of $Freeride_i$ is zero. Saarimaa and Tukiainen (2015) allow the incentives to exploit the common pool to depend on

the relative size of the tax base to capture income differences beyond different size by replacing Pop in (1) with the size of the tax base.¹

We use a two-period specification where we merge the pre-treatment years into a first period and the post-treatment years into a second period. Bertrand et al. (2004) show that such an averaging procedure improves the reliability of difference-in-differences-type models in the case with serially correlated dependent variables. The tests of the common pool problem are based on the following difference-in-difference specifications:

$$\Delta Y_i = \alpha + \beta Freeride_i + \gamma' X_i + \varepsilon_i \quad (2)$$

$$\Delta Y_i = \alpha + \beta Treated_i + \gamma' X_i + \varepsilon_i \quad (3)$$

We consider (2) as the benchmark specification, while (3) is considered as robustness. Y is the outcomes of interest and we have two group of outcome variables. The first group includes municipal debt, assets and the current surplus (deficit). Increasing the debt or decreasing the stock of assets is one way of shifting the cost of current spending and investment to future merger partners. The second group of variables is real capital investments. Merging municipalities have incentives to invest in projects that will generate local benefits in the future new and larger municipality. In addition to testing the impact on total investments, we test whether the impact differs between sub-categories of investments.

The vector X includes controls to capture changes in the municipalities' fiscal situation that might coincide with the announcement of the merger reform. Private income, the level and change in exogenous revenues and population size and characteristics of the settlement pattern are included. The model for investments is extended with forecasts for population growth and changes in the age composition of the population² since the need for investments depends largely on future population changes affecting the future demand for services. Different forecasts are

¹ We have tried this formulation and the results do not differ much from by using population shares. This may reflect ambitious tax equalization based on tax revenues per capita.

² The forecasts are produced and published by Statistics Norway and are publicly available.

presented depending on the assumptions for immigration, fertility rates and life expectancy. We have used the forecast for 2030 denoted by Statistics Norway as the main alternative.

The treatment period is the period 2014-2016. This captures the period after the merger process was initiated, but before the proposals from the county governors and the decision in parliament. β is the parameter of interest and a significant β implies that there is a different trend for the merging municipalities. To get an equal length of the pre- and post-treatment period we consider 2011-2013 as the pre-treatment period. When conducting the analyses we experimented with longer pre-treatment periods to control for potential longer pre-treatment trends but the results were mainly unaffected.

We also estimate the model on yearly data where we allow year specific treatment effects within the treatment period as well as time dummies for the pre-treatment period. Equation (2) will now be:

$$\Delta Y_{it} = \alpha_0 + \alpha_1 Pre_t + \alpha_2 Post_t + \beta_0 Treated_i + \beta_1 Freeride_i Post_t + \gamma' X_{it} + \varepsilon_{it} \quad (4)$$

In equation (3) *Pre* is year dummies for the pre-treatment period and *Post* are three year dummies for 2014-2016. In the alternative specification the pre-treatment period is defined as 2005-2013.

We have also constructed an alternative treatment measure based on the citizens' preferences with respect to a merger for their residential municipality. The measure is based on the results from 217 consultative referendums and 240 citizen surveys held in the municipalities. The sum is higher than the number of municipalities meaning that some municipalities conducted both referendums and surveys. There is substantial variation in the way these referendums and surveys are conducted, for instance with respect to how many and which alternatives that are presented for the inhabitants. We have examined each and all of them and if the results clearly indicate that the majority of the inhabitants prefer their municipality to merge with one or several of the neighboring municipalities, we have constructed a dummy (*positive*) equal to one. The dummy equals zero if the majority want their municipality to remain as before or if the results are non-conclusive. The idea is that preferences of the inhabitants are linked to expectations and

we assume that municipalities preferring to merge expect that this will actually happen, and they have incentives to free-ride on the future partners. On the other hand, exploiting the common pool may make the municipality less attractive as a merging partner. Since we have no information on the future partners we are unable to allow the incentives to depend on relative size of the municipalities.

The dataset contains 428 local governments from 2005-2016. All data are from Statistics Norway except information on mergers, which are published by the “The Centre of Competence on Rural Development”. Table 1 presents descriptive statistics of the outcome variables separately for treated and untreated municipalities (treatment is merged). The pre-treatment data are period averages for the period 2011-2013 while post-treatment are averages for the 2014-2016 period. Due to missing or incomplete data for some municipalities, we ended up with 394 observations. Debt is defined as the long term net debt, i.e. long term debt minus unused borrowed capital and lent capital. The growth in the debt stock is similar in treated and untreated municipalities and does not hint at any common pool problems³. This is in contrast to the growth in financial assets where untreated municipalities have a significant higher growth in shareholdings and funds compared to the treated municipalities. The funds are total funds per capita and includes investment funds, rainy-day funds and other unspecified funds. The difference between the two groups are especially evident for funds earmarked for investment purposes where treated municipalities reduce their funds while untreated municipalities on average have 17 per cent increase. The last outcome variable is the current surplus. Untreated municipalities have on average higher surpluses (lower deficits) but the treated municipalities have improved the current results more than untreated. To sum up, the observed pattern in the raw data is consistent with a common pool effect for funds and shareholdings.

The lower panel of table 1 displays the development of investments and reveals some interesting differences between the two groups of municipalities. Treated municipalities invest less than untreated in both periods, but the growth in total investments between the periods is stronger. Moreover, there are changes in the composition of investments. Merging municipalities increase

³ None of the variables are deflated since we are interested in the differences between the two groups which is independent of whether we look at real or nominal values.

the investments in the primary education sector considerably more than non-merging ones. Likewise, they increase the infrastructure investments more. This category includes investments in water supply, sewage and waste disposal. On the other hand, untreated municipalities have a larger growth in investments related to health care.

Table 1: Descriptive statistics for the outcome variables

	<u>Treated</u>			<u>Untreated</u>		
	Pre-treatment	Post-treatment	Growth, %	Pre-treatment	Post-treatment	Growth, %
Debt	50481	61433	21.7	50808	62472	23.0
Shareholdings	6023	6450	7.1	7870	8823	12.1
Funds	12770	13755	7.7	10719	13164	22.8
Investment funds	7631	7308	-4.2	4807	5640	17.3
Current result	1398	1817	30.0	2464	2790	13.2
Total investments	7713	11310	46.6	9621	12082	25.6
Primary education	1422	2291	61.1	2088	2300	10.2
Child care	521	510	-2.1	620	570	-8.1
Health care	873	1320	51.2	857	1584	84.8
Infrastructure	1261	2250	78.4	1448	2055	41.9
# municipalities	106	106	106	288	288	288

4. Estimation results

Table 2 displays the results from the benchmark model in equation (2) where we use *Freeride* as treatment variable. The coefficients of main interest are in general statistically significant at conventional levels (t-values above 2 in absolute value). The smaller the municipalities' share of the future common pool is, the more they reduce their shareholdings and funds and they run lower surpluses. The quantitative effects are rather large. Increasing the freeride variable from zero to one reduces total funds with more than 2200 NOK per capita, which amount to as much as 20 per cent of the average pre-treatment value. Reduced funds for investments contribute significantly to the effect on total funds. We also estimated the effect on other funds, as for instance rainy-day-funds, and found a negative effect although not statistically significant at conventional levels. The effect on shareholdings is also significant with a reduction of 15 per

cent of the pre-treatment value. The quantitative effects are very similar to those reported by Samrimaa and Tuikianien (2015) after the merger reform in Finland. The effect on the net operating surplus is even larger as the estimated effect is as large as 75 per cent of the average pre-treatment value. Although the treatment effect for debt has the expected positive sign, it is far from being statistically significant.

Table 2: Estimation results I, financial outcomes with the benchmark formulation

	I	II	III	IV	V
Dependent variable	Δ Debt	Δ Share holdings	Δ Total Funds	Δ Investment Funds	Operating surplus
<i>Freeride</i>	149 (0.08)	-877 (2.03)	-2238 (2.19)	-1933 (2.15)	-1057 (2.76)
Controls	Yes	Yes	Yes	Yes	Yes
R2	0.02	0.02	0.02	0.02	0.13
# observations	394	394	394	394	394

Controls: Population size, average private income, growth and level of per capita exogenous municipal revenue (shared taxes and general purpose grant) and share of population in urban areas.

Table 3 shows the estimation results for the specification with the dummy formulation of the treatment variable. The results support the common pool hypothesis for all outcome variables except the stock of debt. For shareholdings and funds the coefficient is statistically significant only at ten per cent level.

Table 3: Estimation results II, financial outcomes with the dummy formulation

	I	II	III	IV	V
Dependent variable	Δ Debt	Δ Share holdings	Δ Total Funds	Δ Investment Funds	Operating surplus
<i>Treated</i>	-325 (0.23)	-614 (1.66)	-1104 (1.67)	-941 (1.75)	-632 (2.46)
Controls	Yes	Yes	Yes	Yes	Yes

R2	0.02	0.02	0.02	0.02	0.13
# observations	394	394	394	394	394

Controls: Population size, average private income, growth and level of per capita exogenous municipal revenue (shared taxes and general purpose grant) and share of population in urban areas.

When comparing the results for the two alternative formulations of the common pool problem it appears that the coefficients are more precisely estimated when allowing the incentives to freeride differ according to the relative size of the merging municipalities, indicating that the latter formulation is to prefer. A further test is to subject the two measures to a horserace by including them by including them simultaneously in the model as propose by Saarimaa and Tuikiainen (2015). The test points to the same conclusion as they reached, a model with heterogeneity in the incentives as the most preferable. Rather surprisingly, Jordahl and Liyang reached the opposite conclusion.

Table 4 and table 5 present the results for investment with the continuous and the discrete treatment measure, respectively. Again, the quantitative effects are larger when we apply the continuous measure of treatment. The results show that the pattern in the raw data with larger growth in investments among merging municipalities holds when controls are included. The analyses of the sub-categories show that investments in the primary education sector contribute to a large part of the growth. In the local debates on the merger reform, the effect on the primary education was discussed extensively and in particular the impact on the future localization of schools. A concern in many municipalities was that merged municipalities will close down small rural schools to utilize economies of scale. One possible explanation is that the results reflect strategic behavior aiming at affecting future decisions on school structure. Closing down schools are politically costly and closing down a new school is clearly more costly than a school where the buildings are in decay.

Table 4: Estimation results III, investments with benchmark specification

	I	II	III	IV	V
Dependent variable	Δ Total	Δ Primary education	Δ Child care	Δ Health care	Δ Infrastructure
<i>Freeride</i>	3216 (2.01)	1461 (2.16)	22 (0.09)	-111 (0.19)	589 (1.68)
Controls	Yes	Yes			
R2	0.06	0.02	0.04	0.03	0.03
# observations	394	394	394	394	394

The impact on infrastructure investments is also positive, although statistically significant only at 10 per cent level, while investments growth in child-care and health care are equal in merging and non-merging municipalities. There were less attention to these services in the debate on the merger reform. It might appear like a paradox that we find that investments in primary education are affected while child-care is not. However, private alternatives for child-care services are widespread. Saarimaa and Tuikiainen (2015) looked at total investments in Finnish municipalities and found that merging municipalities invested more. They did not study whether the composition of investments were affected by the reform. We do find some indications of a positive effect on infrastructure investments. Blom-Hansen (2009) found that merging municipalities in Denmark increased spending on road maintenance. Although maintenance is not an investment it will certainly generate local benefits in the new merged municipality in the future.

In table 5 we re-estimated the model for investment with the dummy formulation of the common pool measure. The sign of the coefficients are not altered but are statistically significant only for infrastructure investments, again indicating that it is important to allow heterogeneity in the incentives to exploit the common pool.

Table 5: Estimation results IV, investments with the dummy formulation

	I	II	III	IV	V
Dependent variable	Δ Total	Δ Primary education	Δ Child care	Δ Health care	Δ Infrastructure
<i>Treated</i>	1770 (1.77)	7.27 (1.58)	65 (0.43)	-137 (0.38)	480 (2.20)
Controls	Yes	Yes			
R2	0.06	0.02	0.04	0.03	0.03
# observations	394	394	394	394	394

As discussed above, there might be heterogeneity with respect to merger expectations both among treated and untreated municipalities. Moreover, with voluntary mergers it is possible that merging municipalities agree on not to exploit the common pool. In more than half of the mergers (69 out of 119), the merging municipalities had written a letter of intent. An investigation of the agreements reveals substantial variation in the content, but the main impression is that they were very informal without imposing any restrictions on fiscal decisions. Some included some guidelines for the period between the merger decision and the actual merger, but the documents typically stated that the municipalities should inform the future partners about economic decisions like borrowing and investments that could affect the new municipality. We have found no agreement stating that such decisions had to be jointly approved by the merging municipalities. Some of the merging municipalities constituted a temporary joint board, but again, we have not found any letter of intent granting formal decision-making power to this board and it appears like a place for information sharing. A large share of the municipalities not merging had also a letter of intent. Between 2014 and 2017 as many as 275 (69%) of the municipalities had written into at least one letter of intent and many of them had entered into several with different constellations of municipalities. Our understanding, supported by statements from local politicians, is that the purpose of many of the letters of intent mainly was to please the government by showing that the municipality participated in the process even though the municipality had no real intentions of being involved in a merger. However, we test empirically whether these agreements affected the estimated common pool effects. We extend the model with a dummy that equals unity for treated municipalities having entered into an agreement. We allow the dummy to affect the outcome directly and through the exploitation of

the common pool. In the upper panel of table 5 the dummy *intent* equals one if there exist a letter of intent between the merging municipalities before the merger decision. In the lower panel, we have constructed an alternative dummy, *requirement*, that equals one if the agreements include some statements about the economic decisions before the merger. A typical formulation is “should not reduce stocks and funds”. We also attribute the value one when there are requirements about sharing information on economic decisions before the merger as information sharing could limit the possibilities to exploit the common pool.

The coefficient for *freeride* is still negative and significant for shareholdings, funds and the current surplus. The quantitative effects are somewhat larger than above and might indicate that municipalities with a letter of intent are less prone to utilize the common pool. However, the content in the letters of intents does not seem to matter since the results are the same for the *intent* and *requirement* variables. The coefficients for these variables are imprecisely estimated and in most cases statistically significant, but taken at face value, the results indicate that the common pool effect is reduced for shareholdings while the presence of a letter of intent increases the stock of funds independent of incentives to utilize the common pool.

Table 6: Estimation results V, letters of intent, financial outcomes with the benchmark specification

Dependent variable	I Δ Debt	II Δ Share holdings	III Δ Total Funds	IV Δ Investment Funds	V Operating surplus
Freeride	-460 (0.22)	-1543 (2.02)	-2570 (2.27)	-1702 (1.79)	-1454 (2.91)
Freeride*intent	3609 (0.62)	2705 (1.81)	-3426 (1.43)	-3535 (1.57)	480 (0.55)
Intent	-2028 (0.61)	-1205 (1.24)	3198 (2.51)	2484 (2.03)	182 (0.43)
Freeride	304 (0.15)	-1304 (2.56)	-2430 (2.35)	-1712 (2.03)	-1264 (3.32)
Freeride*Requirement	1790 (0.29)	3750 (1.57)	-5654 (1.47)	-318 (0.21)	-7332 (1.85)
Requirement	-1748 (0.55)	-1692 (0.97)	4779 (2.26)	862 (0.99)	4944 (2.30)
# observations	394				

The mix of voluntary and forced mergers makes us in principle able to test whether there is a difference between forced and voluntary mergers. Saarimaa and Tuikiainen (2015) argue that common pool problems are less likely to occur in voluntary mergers since the municipalities can agree on not to utilize the common pool or freeriding could even cancel a planned merger. Feld and Fritz (2015) argue that municipalities that are forced into an amalgamation have stronger incentives to exploit the common pool to compensate their forced surrender of independence and find empirical support for this hypothesis. In section 3 we argue for the opposite effect, municipalities that are forced into a merger do not expect to merge, and consequently, have no common pool to exploit. In table 7 and table 8 we test this by extending the model with a term allowing different impact of the freeride variable between voluntary merging municipalities and

those forced to merge. In general, the results support our understanding of common pool exploitation driven by merger expectations. For total funds and investments funds the qualitative effect for voluntary merged municipalities is larger and there is a statistically significant difference in the effect between municipalities that have merged voluntarily and those forced to merge. For the other variables, except the surplus, the results point in the same direction with larger quantitative common pool effects, although the difference between the two groups of merging municipalities is not significant statistically.

Table 7: Estimation results I, financial outcomes with the benchmark formulation

	I	II	III	IV	V
Dependent variable	Δ Debt	Δ Share holdings	Δ Total Funds	Δ Investment Funds	Operating surplus
<i>Freeride</i>	1089 (0.48)	-950 (1.88)	-3043 (2.39)	-2698 (2.36)	-798 (1.78)
<i>Freeride * Forced</i>	-2810 (0.98)	226 (0.34)	2488 (2.00)	2362 (2.24)	-800 (1.33)
Controls	Yes	Yes	Yes	Yes	Yes
R2	0.02	0.02	0.02	0.02	0.13
# observations	394	394	394	394	394

Controls: Population size, average private income, growth and level of per capita exogenous municipal revenue (shared taxes and general purpose grant) and share of population in urban areas.

The results for investments in table 8 indicate stronger common pool effects for total investments and investments in primary education for voluntary merged municipalities. For the latter the difference between the municipalities is statistically significant. The results for infrastructure is not in line with our hypothesis of less common pool exploitation for municipalities forced to merge as the interaction term is positive and there is no sign of a common pool problem for municipalities merging voluntarily.

Table 8: Estimation results III, investments with benchmark specification

	I	II	III	IV	V
Dependent variable	Δ Total	Δ Primary education	Δ Child care	Δ Health care	Δ Infrastructure
<i>Freeride</i>	3770 (1.76)	2219 (2.67)	44 (0.15)	202 (0.27)	61 (0.20)
<i>Freeride</i> *	-1500 (0.65)	-2054 (2.05)	-60 (0.11)	-850 (1.02)	1428 (2.03)
Controls	Yes	Yes	Yes	Yes	Yes
R2	0.06	0.03	0.04	0.03	0.04
# observations	394	394	394	394	394

Below we explore heterogeneity in the control group of untreated municipalities. In table 9, the untreated municipalities are split by including a dummy, *Ref*, that equals one for non-merging municipalities that either have a letter of intent or have held a referendum, or both. The idea is that municipalities that expect to merge will have done at least one of these two. Given that this assumption is correct, the reference group will now include the municipalities with lowest merging expectations and as such be less prone to utilize a common pool. The quantitative effect for the *freeride* variable is larger for all the dependent variables, indicating that some non-treated municipalities respond to treatment. This means that we probably underestimate the true treatment effect. Saarimaa and Tuikiainen (2015) did a similar robustness check by splitting the control group between municipalities that voted for a merger that never took place and other municipalities. In contrast to our study, they found that only the merger group responded to treatment.

Table 9: Estimation results VI, neither letter of intent nor referendum

	I	II	III	IV	V
Dependent variable	Δ Debt	Δ Share holdings	Δ Total Funds	Δ Investment Funds	Operating surplus
Freeride	1199 (0.54)	-1094 (1.56)	-3850 (1.99)	-2982 (1.68)	-1760 (3.35)
Ref	1283 (0.92)	-266 (0.55)	-1973 (1.27)	-1285 (0.92)	-860 (2.05)
Controls	Yes	Yes	Yes	Yes	Yes
R2	0.02	0.02	0.03	0.14	0.14
# observations	394	394	394	394	394

An alternative expectation measure

In table 10 and table 11, we present the results for the alternative treatment measure based on the citizens' preferences for a merger as described in section 3. The variable *Positive* is a dummy equaling unity when the inhabitants prefer that their municipality merges with one or several other municipalities. In total, 94 of the 394 municipalities in the sample stated preferences in favor of a merger. 60 of the municipalities preferring a merger ended up being merged in 2017. With the high correlation in mind, it is not surprising that the results are quite similar to those obtained with the dummy for merged municipalities. One difference is that the estimated effect on debt growth now is significant. The results for investments are also quite similar but the point estimates are somewhat larger with the preference based expectation measure.

Table 10: Estimation results VII, the dummy formulation

	I	II	III	IV	V
Dependent variable	Δ Debt	Δ Share holdings	Δ Total Funds	Δ Investment Funds	Operating surplus
<i>Positive</i>	1940 (1.66)	522 (0.90)	-1169 (1.82)	-698 (1.27)	-906 (3.71)
Controls	Yes	Yes	Yes	Yes	Yes
R2	0.02	0.01	0.02	0.02	0.14
# observations	394	394	394	394	394

Controls: Population size, average private income, growth and the level of free revenues, share of inhabitants in urban areas.

Table 11: Estimation results VIII, investments

	I	II	III	IV	V
Dependent variable	Δ Total	Δ Primary education	Δ Child care	Δ Health care	Δ Infrastructure
<i>Positive</i>	2441 (2.40)	960 (2.08)	207 (1.35)	248 (0.61)	37 (0.19)
Controls	Yes	Yes			
R2	0.06	0.02	0.04	0.03	0.02
# observations		394			

5. Concluding remarks

After the 2013 election the new conservative government in Norway announced an ambition to implement a more robust municipal structure that would contribute to more expertise and greater professionalism. In this paper we have investigated common pool effects during the first stage of the merger reform. The first stage covers the local processes during 2014-2016 where the municipalities was asked to assess and clarify whether it was appropriate to merge with neighboring municipalities. The parliament decided on a merger reform in June 2017, and most of the mergers will not be implemented until 2020. Even before the merger is decided and

several years before it is implemented, we find evidence of common pool effects. Merging municipalities run down funds and other financial wealth, reduce the operating surplus, and increase investments. Since Norway still has a large number of small municipalities, the analysis in this paper is of relevance for possible future merger reforms.

References

- Bertrand, M., E. Duflo and S. Mullainathan (2004): How much should we trust differences-in-differences estimates? *Quarterly Journal of Economics* 119, 249-275.
- Blom-Hansen, J. (2009): Municipal amalgamations and common pool problems: The Danish local government reform in 2007. *Scandinavian Political Studies* 33, 51-73.
- Feld, L. and B. Fritz (2015): The political economy of municipal amalgamation: Evidence of common pool effects and local public debt, *Freiburger Diskussionspapiere zur ordnungswirtschaft*, No. 15/10, Albert-Ludwigs-Universität Freiburg.
- Jordahl, H. and C-Y Liang (2010): Merged municipalities, higher debt: on free-riding and the common pool problem in politics. *Public Choice* 143, 157-172.
- Olson, M. (1971): *The logic of collective action*. Harvard University Press, Cambridge MA.
- Saarimaa, T. and J. Tuikiainen (2015). Common pool problems in voluntary municipal mergers. *European Journal of Political Economy* 38, 140-152.
- Tyrefors Hinnerich, B. (2009): Do merging local governments free ride on their counterparts when facing boundary reforms? *Journal of Public Economics* 93, 721-728.
- Weingast, B.R., K.A. Shepsle, and C. Johnsen (1981): The political economy of benefits and costs: A neoclassical approach to distributive politics. *Journal of Political Economy* 89, 642-664.
- Welling Hansen, S. (2014): Common pool size and project size: an empirical test on expenditures using Danish municipal mergers. *Public Choice* 159, 3-21.
- Welling Hansen, S. (2019): Exploiting the common pool or looking to the future? A study of free-riding leading up to the 2007 municipal amalgamations in Denmark. *Local Government Studies*, forthcoming.

Appendix

Table A1: Estimation results IX, annual data

	I	II	III	IV
Dependent variable	Δ Debt	Δ Share holdings	Δ Funds	Δ Current surplus
Freeride 2014	2324 (1.01)	-269 (0.84)	-302 (0.45)	-489 (0.73)
Freeride 2015	2829 (1.38)	-64 (0.25)	31 (0.05)	-1038 (2.02)
Freeride 2016	1261 (0.56)	189 (0.40)	-938 (1.12)	491 (0.67)
Freeride	-915 (1.18)	-62 (0.38)	-154 (0.45)	-58 (0.18)
Controls	Yes	Yes	Yes	Yes
R2	0.09	0.01	0.02	0.12
# observations	4318			

Annual data, ols estimates, time dummies included