The economic effects of municipal amalgamation and intermunicipal cooperation

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It is my strong belief that every dissertation serves two purposes: Firstly, it extends the current literature in new directions, providing new insights into a specific scientific field, paving the road for other scientist to expand on those insights. Secondly, it is a challenge and in most cases - at least from what I've heard around me - a struggle for the PhD student that provides insights into ones own personal strengths and weaknesses. As for the first purpose, I will leave others to judge how succesful this dissertation has been and will be, now and in due time. Considering the second purpose, however, I can wholeheartedly testify to its success: the struggle has very much been real. Consequently, I would not have been able to finish this thesis without the help, guidance and support of numerous people.

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Contents

Chapter 1 - Introduction

One of the key issues in public finance concerns optimal jurisdiction size. The size of a national government is in many cases too large for efficient delivery of public services. Through decentralization the national government can decide about which services it will deliver itself, and which are to be delivered at a lower government level. But its discretion to set policy is not limited to the selection of a particular level of government and the typical size that comes with that level of government. The size of lower level governments is not set in stone, and through restructuring the national government has alternative instruments to influence the size of both administration and of public service delivery. In fact, in some countries local governments can decide for themselves to engage in restructuring procedures.

1.1 Local government size in practice

Two developments have triggered studies that form the basis for this thesis: the existing and persisting differences in local government size between countries, and the intensified involvement of the Dutch national government in issues regarding the size of municipal service delivery.

International comparison

There is a large variation in the population size of local governments (or municipalities) between countries. Average municipality size varies remarkably (Hoorens, 2008; Warner, 2006): it is low in the Czech Republic (1,640 inhabitants) and France (1,720) and high in the UK (140,000). Average population size is 7,400 in the USA and 5,400 in the EU-countries. These large differences might provoke a quick conclusion that there is no consensus on an

optimal size for local government, but that would ignore the role of historical factors in the existence of these differences. The current state of local jurisdictions may largely be the result of historical developments in the field of public administration and not so much the outcome of recent policies.

At the same time, even a quick scan of recent local government restructuring operations paints a picture of large variation. For example, a nationwide amalgamation operation in Belgium reduced the number of municipalities in 1977 from 2,359 to 596 (De Ceuninck et al., 2010) resulting in an average population size of 16.5 thousand. In Finland the number of municipalities has been reduced by one fourth in less then ten years since the national government launched a municipal reform campaign in 2006 (Kettunen, 2015), leading to 320 municipalities of on average 17 thousand inhabitants. In Denmark, a structural reform of local government resulted in the amalgamation of 271 municipalities into 98 new ones in 2007 (Blom-Hansen et al., 2012), which on average had 55.6 thousand inhabitants. In Sweden there have even been two municipal reform operations; the first one in 1952 reduced the number of municipalities from 2,498 to 1,037, while the second one led to a further reduction of the number of municipalities to 278 (average population size 29.3 thousand) by the year 1974 (Hanes, 2014).

Hence, not only are there large differences in the average size of local governments in general, but also in the average size of municipalities resulting from various restructuring operations. The average size in different countries does not appear to converge to a certain population range.

Policy in the Netherlands

In the Netherlands, amalgamations have occurred on a very regular basis for a long period of time. Almost every year some municipalities have amalgamated, leading to a reduction of the number of municipalities from 1,121 in the year 1900 to 393 in 2015. Until 2002, local public support in municipalities that were to be amalgamated was formally not taken into account by the national government in its proposals for amalgamations to the House of Representatives. This changed when the Balkenende administration explicitly stated that broad public support in the affected municipalities would be valued as a highly important factor in the decision to propose an amalgamation.[1] In policy proposals since then, the initiative for amalgamatiosn has lied with the municipalities involved, or with the provinces in cases where an amalgamation is deemed necessary, under the condition that the preferences of municipalities are taken into account as much as possible.

Although the national government is formally responsible for any boundary reforms, it has been known – until recently – to hold back on imposing or pushing for amalgamation plans for lower levels of government. The instalment of the Rutte II administration in 2012 marked

[1] *Beleidskader gemeentelijke herindeling,* Parliamentary papers,28 750, Nr. 1, December 18th, 2002.

a change in the policy stance of the national government on the arrangement of local government. In the coalition agreement of this administration[2], one of the long term ambitions in the area of public administration was that municipalities should be increased in size. This was deemed necessary because the same administration was planning on decentralizing a number of important tasks in the fields of (youth) care and employment from the national government to municipalities. The complexity of those tasks and the expertise that was required to fulfill those tasks were expected to make it hard if not impossible for small municipalities to carry them out in an adequate manner.

As a numerical guideline, a minimum population size of 100,000 was stated (whereas the average population of a municipality at the time was a little over 40,000), although this number would not be upheld in a strict manner in lesser populated areas of the country. Minister Plasterk of Interior and Kingdom Relations later stated that this ambition meant striving for a doubling of the number of amalgamations each year. As one of the means to achieve this, the amalgamation policy with regard to the role of the provinces (regional governments) was changed in 2013. In the new national policy for municipal amalgamations[3], provinces were allowed to take the initiative for amalgamating municipalities if they deemed this necessary to ensure an adequate quality of local government and if the bottom-up process did not progress sufficiently.

The ambition of decentralizing tasks to municipalities and scaling up the municipalities was linked to a reduction of the municipality fund, a fund used for the distribution of money from the national government to municipalities. In the long term, this reduction would gradually build up to a structural amount of 975 million euros per year, approximately 6% of the total size of the municipality fund per 2012. This number was based only on a general remark on the expected economies of size, reduced supervision, simplification of regulations and a reduction of redundant tasks as a result of the scaling up of municipalities.

An operation aimed at decentralization of three government tasks in the social domain to municipalities (taking up 18 billion euros in annual government spending) was also included in the coalition agreement, and it was stated that these decentralizations were ‘in principal aimed at 100,000+ municipalities’[4]. Although the numerical criterion of a minimum of 100,000 inhabitants was later on declared by the minister to be a long-term directive more than a demand[5], and as a result there appeared to be less emphasis on amalgamations to comply with this criterion, the complexity of the decentralized tasks did put pressure on smaller municipalities to either find suitable amalgamation partners, or to engage in intermunicipal cooperation.

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[2] *Bruggen slaan,* Coalition agreement VVD – PvdA, October 29th, 2012.
[3] *Beleidskader gemeentelijke herindeling,* Parliamentary papers, 28 750, Nr. 53, May 28th, 2013.
[4] *Bruggen slaan,* Coalition agreement VVD – PvdA, October 29th, 2012.
[5] *Decentralisatiebrief,* Parliamentary papers,33 400 VII, Nr. 59, February 19th, 2013.

While the Dutch situation illustrates that restructuring operations have occurred, partly out of efficiency related motivations, the international differences in the size of local governments imply that no clear idea exists on an optimal size. Economic research could play an important role in the debate on this topic, both in theoretical and in empirical form.

1.2 The theory on optimal size

The first question to be raised is how the optimal size of local governments should be determined. A standard approach here, as in most fields of economics, is to aim for an optimization of efficiency, leading to a maximization of utility. From a national point of view, the relevant measure of utility is the total utility created for all of its inhabitants by their respective local governments. This is of course under the condition that these local governments do not interfere with the effort to maximize utility by the national government itself.

We distinguish two types of efficiency, productive efficiency and allocative efficiency, each of which are affected in different ways by the size of the local government.

Productive efficiency

Productive efficiency has its origins in the works of classical economists such as Adam Smith, and concerns the question of how a certain production unit (in our case the local government) can maximize output at given inputs, or minimize the inputs needed to produce a given output.

There are a number of channels through which a larger size may increase this type of efficiency. Smith introduces division of labour and specialization, which are closely related mechanisms. Specialization is related to how broad an individual worker's task is. He states that the smaller the task of an individual worker is (and thus the more times he is able to repeat that task in a given time period), the more proficient he will become in that task. Consequently, assigning more people to a certain set of tasks, allowing them to split up these sets of tasks into smaller sets per individual, will lead to a higher degree of specialization.

In the context of local governments, the idea is that officials working for smaller municipalities can not be occupied full time by certain tasks. As a result, they will be assigned a broader set of tasks, but since they only work on each of these tasks for a limited time, they will not become fully proficient. In larger municipalities, it is possible to have officials working on limited tasks full time, allowing them to specialize and as a result increase their individual proficiency and with that the efficiency of their department as a whole.

A second mechanism that results in economies of size is the existence of certain costs that do not increase proportionally with the size of the municipality. When a municipality doubles in size, for instance, it is not expected that size of the city offices will double, and

neither does the number of elected politicians, typically. This has led proponents of municipal mergers to being convinced that larger jurisdictions will lead to economies of size in service production as well as lower administrative expenditures (Oates 1985, King 1984). Thirdly, larger jurisdictions have greater bargaining power with regard to the acquisition of goods and services from private suppliers, allowing them to lower their purchase prices (Dollery and Fleming 2006). A fourth positive effect is that the chances of random events affecting the re-election of politicians are smaller. Assuming that these random events happen with the same frequency and affect the same number of voters, the share of voters affected by these events is smaller because the total number of voters is larger. The smaller impact of random events means that accountability mechanisms in general are enforced (Kessing 2010).

Productive efficiency can also be negatively affected by the occurrence of certain diseconomies of size. Unit costs of production might rise if an organization exceeds a certain size due to reduced managerial capabilities in terms of higher coordination and communication costs (Coase 1937). In terms of local government, each official involved in translating voters' preferences into public services has his own preference function, which results in increasing levels of noise in this process and thus in more inefficiency. Additionally, information transmission costs will grow with the size of the municipal organization. These costs might grow linearly and possibly even exponentially with organization size (Tullock 1969). When looking for a more specific definition of these officials' preference functions, one important theory is that bureaucrats take advantage of information asymmetries in order to maximize budgets and slack, above efficient levels (Niskanen 1971, Wyckof 1990). The larger the municipal organization, the larger the number of levels at which these information asymmetries can be found.

An increase in size can also negatively affect productive efficiency indirectly. Assuming a fixed national population, the number of local jurisdictions decreases when their average size increases. As a means of evaluating local government performance, inhabitants may engage in comparing the performance of their own government with that in other jurisdictions. Since these comparisons make inefficiency more apparent to the voters, this stimulates local governments to reduce inefficiency, engaging in so called yardstick competition. However, as the number of jurisdictions decreases, this mechanism is weakened, since there are less local governments to compare with (Allers 2012), and probably less local governments that have similar characteristics.

To summarize, productive efficiency can be affected both positively and negatively by increasing size of the municipality.

Allocative efficiency

Full allocative efficiency is attained when actual production exactly matches consumers' preferences, or in the governmental context when the total of public services (including provision of public goods) delivered by the government matches the preferences of the

inhabitants. Allocative efficiency can be influenced both negatively and positively by an increase of size of local government.

A direct negative consequence of larger jurisdictions is that the possibilities for inhabitants to change local policy through voting are limited. Firstly, larger jurisdictions allow for larger informational advantages of politicians over the voters, making it easier for them to pursue selfish goals that are not in line with maximizing social welfare (Oates 2005). Even if some voters are able to correctly evaluate the performance of politicians, the influence of this group of knowledgeable voters is relatively small in larger municipalities, weakening governance mechanisms that increase allocative efficiency (Lassen and Serritzlew 2011).

Oates' decentralization theorem states that tasks should be decentralized as long as the benefits outweigh the costs (Oates 1972). In his view, the costs are caused firstly by the fact that any cost savings induced by centralization (discussed in our section on productive efficiency) are consequently reduced when tasks are decentralized, and secondly by interjurisdictional externalities (which we will discuss below). The benefits mainly stem from the fact that each local government is (to a nationally set degree) free to choose which public services to deliver (and at what quality) and by doing that it is able to match the preferences of the inhabitants more closely. Assuming a variation in the preferences of inhabitants, the average degree to which local policies match the preferences of the inhabitants will decrease with the size of the jurisdiction.

There are also negative consequences that we classify as indirect, since they are not caused directly by the larger size of jurisdictions but are instead a consequence of the smaller number of jurisdictions. Tiebout (1956) states that people - in addition to voting for politicians that match their preferences - can choose to go live in a jurisdiction where local policy best suits their preferences. It follows that the variation in local policies to choose from decreases if the number of jurisdictions is reduced. In other words, the less jurisdictions there are for a person to choose from, the larger the minimum attainable difference is between his own preferences and the public services delivered by the best matching jurisdiction. Hence, an increased jurisdiction size reduces allocative efficiency.

There is also an important theoretical advantage to a larger size for jurisdictions, being the reduction of spillover effects. When a local government decides on offering a certain public service, it is assumed to only (or mainly) take into account the (positive or negative) welfare effects for its own inhabitants. Welfare effects outside its own borders (also called interjurisdictional externalities) are neglected or heavily discounted, leading to suboptimal decision making that does not take into account the preferences of all people affected. Having larger jurisdictions leads to the inclusion of more affected citizens within the jurisdiction itself, which decreases the magnitude of the externalities, improving local government decision making and allocative efficiency (Oates 1972).

Hence, as for productive efficiency, counteracting effects of local government size on allocative efficiency are to be expected, and it is not feasible to deduce from theory which effects are stronger for which size ranges.

Additional theoretical complications

Since economies of size are especially relevant for smaller municipalities, while diseconomies of size are expected to be relevant mostly for larger municipalities, the efficiency curve for municipalities is generally believed to be shaped as a u-curve. This has empirical implications: even though the shape of this curve is unknown, amalgamation effects might differ depending on the size of the amalgamated municipalities, as well as the size of the newly formed municipality. A second consequence is that there should be an optimal size for municipalities that maximizes efficiency. However, the existence of such an optimal size is contested theoretically (Treisman 2007).

First and foremost, a municipality does not have a single production process, but a multitude of processes. These processes have different characteristics that determine the extent to which economies of size are to be expected at all, as well as for which size ranges these economies of size can be attained (Hirsch 1959). This means that in order to find an optimal size for a municipality, one has to either split up a multipurpose unit into single-purpose units, or average an optimal size across several different public outputs (Ostrom 1972). Thus, even if it would be feasible to find an optimal size for single processes theoretically, finding an incontestable procedure to combine these findings into a general conclusion about an optimal size for jurisdictions is a whole different story.

Supralocal public service production

In the theoretical discussion on the effects of municipal size on productive and allocative efficiency so far, we have assumed that municipalities produce all public services at a local level. In practice, however, this is far from the truth. There are various ways in which local governments can choose to produce public services on a larger size than that of their own jurisdiction.

Firstly, it is an option to engage in intermunicipal cooperation in order to join forces with (mostly) neighbouring municipalities. This can either be done by founding a new governmental body to which the production of one or more public services is delegated, or by one or more municipalities outsourcing that production to another municipality for an agreed upon fee. A second option is contracting out, where a municipality purchases the delivery of public services from a company that often services multiple municipalities or from another municipality.

These alternatives for public service delivery create the possibility to set different scales for production of these services on the one hand, and administration on the other. Consequently, it is theoretically possible to have a variety of production scales for different public services, depending on which size is deemed optimal from an efficiency point of view.

This possibility in itself complicates the debate on the optimal size of local governments. But the option of supralocal production raises other questions as well. For instance, in what way is policy setting influenced by cooperation partners and to what extent is allocative efficiency affected by an increased distance between the producer and the administration? These questions make it even more difficult to find decisive answers to questions about the optimal size of local governments.

Effects from administrative consequences of an amalgamation

So far we have focussed on the question of how size affects efficiency of municipalities. Municipal amalgamations are of course highly relevant to this question because they are an instrument to increase the size of municipalities rigorously. However, apart from these size-related effects, municipal amalgamations can also affect municipal efficiency by the administrative changes they imply, both temporarily and structurally.

Already before the amalgamation itself, effects on public spending are to be expected because of the creation of a so-called common pool. This phenomenon originates from a setting formalized by Weingast et al. (1981), wherein multiple jurisdictions share a budget for public investments. They state that when (i) individual legislators care mainly (or exclusively) about the public projects that flow into their own jurisdictions (or benefit their inhabitants), (ii) the tax system that finances public projects is fixed and "decoupled" from the projects and (iii) the legislature is believed to adopt a norm of universalism, in which all projects proposed are passed, public spending will exceed efficient levels. This setting can be transformed into a two-period model that fits the situation that amalgamated municipalities are in (Tyrefors Hinnerich 2009). In this model, a credible announcement is being made that an amalgamation will take place. Now, all municipalities involved will know that any debts acquired for investments that are mainly beneficial to their own inhabitants, will be repaid from the newly formed common pool of taxes after amalgamation. Symmetrically, any reserves not depleted before amalgamation will end up in a common pool as well. This creates an incentive to increase public spending and raise debt levels before amalgamation above efficient levels.

There are also several types of disruptive restructuring costs that can be expected around the time of amalgamation: both politicians and officials might get distracted from running the current municipality while focussing on the reorganization and their position thereafter, senior staff may opt for an early retirement or leave the organization due to uncertainty (leading to loss of expertise and organizational memory), staff morale might be damaged, and strategic decisions may be postponed in anticipation of the amalgamation (Andrews and Boyne 2012). These effects are expected to decrease efficiency temporarily.

On the other hand, some structural benefits may arise as well. A restructuring operation resulting from an amalgamation may force the administrative organizations to evaluate their current procedures and operations. This provides them with an opportunity to adopt the most efficient practices from each other or introduce new practices altogether, probably

improving on well-established and possibly outdated ways of doing things (Hansen et al. 2014).

1.3 The need for empirical research and the position of this thesis therein

So far, we have seen that the question of what size is optimal for local governments is answered with great ambiguity by governments internationally, even in relatively similar countries in Western Europe. At the same time, restructuring operations occur quite regularly and - in general - appear to aim for scaling up the size of local governments. Often, as is the case in the Netherlands, financial motivations and expectations of efficiency gains play a key role in the reasoning behind these operations.

Yet the theory on efficiency effects of size presents us with two types of efficiency that are relevant in the discussion, a large variety of counteracting effects and number of additional complicating factors. Hence, since the question is highly topical and theory alone is unable to give conclusive answers, the need for empirical research is apparent.

This thesis presents the results of empirical studies on two instruments used to increase size or scale, namely municipal amalgamation and intermunicipal cooperation, and their effects on efficiency. The third instrument available, scaling up through contracting out of public services is outside the scope of this thesis.

The economic effects of municipal amalgamation

The empirical research on effects of municipal amalgamations is quite extensive. Two meta-analyses of literature on the topic have been published (Fox and Gurley 2006; Holzer 2009), and both conclude that the evidence of the existence of any effects is mixed. It should be noted that the studies covered by these authors consist mainly of case studies and studies using descriptive statistics.

There do exist a number of studies that follow more econometrically complex approaches, but the overall picture remains ambiguous. Some studies find that amalgamations lead to higher spending (Lüchinger and Stutzer 2002, studying amalgamations in Switzerland; Hansen 2011 doing the same for Denmark, and Moisio and Uusitalo 2013 for Finland), whereas others have found that spending falls after amalgamations (Reingewertz 2012, Israel; Blesse and Baskaran 2013, Germany).

Amalgamation effects are not expected to occur only after the amalgamation becomes a fact. Municipalities can also change spending behaviour in anticipation of the amalgamation itself, by creating debt or decreasing financial reserves (common pool effect). This effect has also been studied by a number of authors, and empirical evidence for its existence has indeed been reported for Sweden by Tyrefors Hinnerich (2009) and Jordahl and Liang (2009), for Denmark by Blom-Hansen (2010) and Hansen (2014) and for Finland by Saarimaa and Tukiainen (2013).

We add to the existing literature in several ways. With regard to econometrical issues, previous literature has used mainly cross-section data, or in one case static panel data. We are the first to use panel data in a dynamic setting, which seems to be the approach that best suits the extent to which municipal spending is determined by previous budgets and long term commitments.

The choice to study Dutch municipalities allows us to make a second improvement on existing research. The referenced studies have focussed on restructuring operations that followed a so-called big bang approach: within a short period of time of at most a couple of years (one year in some cases) many municipalities have been amalgamated at once, allowing only for comparison of the period before and after this operation. In the Netherlands, amalgamations occur almost every year, enabling us to isolate the amalgamation effects from other temporal effects and also to compare amalgamated municipalities with other municipalities that have been amalgamated in a later year.

In chapter 3 we present the results of our work. We find no evidence of any significant amalgamation effect on spending levels, be it positive or negative. These findings are consistent for other dependent variables that reflect municipal finances such as debt level, property tax revenues, employment and wages paid. These findings apply to both post-amalgamation and pre-amalgamation (common pool) effects.

One might argue that the fact that we found no significant amalgamation effects might be the result of counteracting effects for small and large municipalities that are averaged out by taking the joint effect on all municipalities simultaneously. To investigate this, we interact the amalgamation effect with population size. Chapter 4 presents the results of our extended analysis, indicating that our initial findings hold for all size ranges. We use the same method of interacting to see whether large differences in political preferences of amalgamating municipalities shortly before the amalgamation lead to an increase in spending, but find no evidence of that effect either.

Although changes in municipal spending levels are an indicator of local government efficiency, focussing on spending alone constitutes an approach that is too narrow. It is imperative that the analysis should not only focus on the input side of the municipal organization, its expenditures, but also look at the output side: the public services provided by making those expenditures. Only two studies are known to have done such a thing in the past (Reingewertz 2012; Blesse and Baskaran 2013). However, the output indicators used in these studies seem to have been rather arbitrary; selected because of availability of data, not out of conviction that they cover the full range of the multi-service jurisdictions that municipalities are. Alternatively, Rouse and Putterill (2005) focused on a specific area of public services (highway maintenance) and used data envelopment analysis (DEA) to test whether amalgamation in New Zealand increased efficiency there (it didn't). Bikker and Van

der Linde (2015) took a similar approach, using a stochastic cost frontier estimation on spending on local public administration[6] between 2005 and 2014 in the Netherlands. They find that for this function there are substantial unused economies of scale of around 20% for the average municipality. In chapter 4 we present our approach which is twofold and different from previous studies. We first examine whether the composition of expenditures is changed after amalgamation. If service levels would be affected, this would probably be visible in a shift from spending on activities that are less observable to inhabitants to activities that are more observable. Spending on administration does not benefit public service levels directly, but economies of size are highly likely to be found here, because the number of administrators and council members does not grow in proportion to population size. Several studies looked into these expenditures. Blom-Hansen et al. (2012) and Moisio and Uusitalo (2013) found evidence of lower expenditures on administration in amalgamated municipalities in Denmark and Finland, respectively. Our own study shows results in line with these findings, as we also see a decrease of spending on administration after amalgamation. However, this does not imply that there is a shift to spending on highly observable public services. When studying spending on culture and recreation, the budget category that mainly covers this type of spending, we observe no significant effects whatsoever.

As a second approach to including service levels in the analysis, we study amalgamation effects on house prices. Previous studies have shown that through capitalization a more efficient local government should increase the value of houses within the municipal border (Allers and Vermeulen 2016). However, we find no evidence of any effect on house prices.

All in all, the study on the effects of municipal amalgamation introduces several new approaches and uses a data set uniquely suitable for isolating these effects, but we find no robust evidence of the existence of any such effects on local government efficiency, either temporal or permanent.

The effects of intermunicipal cooperation on efficiency

The topicality of intermunicipal cooperation in the field of public administration is underlined by the existence of quite a few recent studies on the topic. A significant portion of those studies do not share our focus on the effects on spending and efficiency, but focus on what drives municipalities to engage in intergovernmental cooperation instead (e.g., in the German state Hesse (Blaeschke 2014), municipalities in France in the period 1995-2003 (Di Porto et al. 2013); cities in the United States in 2004 (Feiock et al. 2009) and 2007 (Hefetz and Warner 2011; LeRoux et al. 2010)).

Studies on the effects of intermunicipal cooperation are limited in their econometrical approach. Dollery et al. (2009) have drawn up a list of international studies on these effects,

[6] This local public administration is a broader spending category than the administration expenditures we use.

but find only survey studies or descriptive case studies . Bel and Warner (2015) survey the literature, and find just eight econometric studies on the effect of cooperation on public service costs or spending. All of these study solid waste services, one of them in combination with water, electricity and gas (Garrone et al. 2013). Most use spending on solid waste collection or waste disposal fees as dependent variable; some but not all control for differences in output and quality. Five conclude that cooperation reduces costs, where it is worth mentioning that four studies focus on waste collection and management in Spain (Bel and Costas 2006; Bel and Mur 2009; Zafra-Gómez et al. 2013; Bel et al. 2014) and one the same function in the Netherlands (Dijkgraaf and Gradus 2013). Two find rising costs (Sørensen (2007) in Norway and Garrone et al. (2013) in Italy) and one has insignificant results (Dijkgraaf and Gradus (2014) in the Netherlands). Not included in that survey but relevant in the context of our research are a Dutch study that finds no differences in efficiency between municipalities providing household solid waste services alone or in cooperation with other municipalities (Felsö et al. 2011) and an article by Frère et al. (2014) who find no effect of cooperation on total spending (not efficiency) of French municipalities.

Academics engaged in empirical studies on efficiency in this field have important issues to tackle (Geys and Moesen 2009). Firstly, to study efficiency it does not suffice to measure spending. To control for changes in public service levels, a measure of output has to be controlled for. However, variables measuring this output are hard to define, compare and quantify. Indicators that are available are usually at best crude proxies for the true level of public good provision. This is an explanation for the fact that a large portion of the literature focuses on waste disposal services, since for those services, data issues for output are less relevant. A second problem for empirical studies on local government efficiency is that often strong assumptions have to be made (e.g., regarding the cost function), or that they are prone to data errors (if data envelopment analysis is used).

For our study on the effects of intermunicipal cooperation, we take an entirely different approach. Instead of focussing on the full costs of providing a certain public service, we focus on the efficiency of an organizational activity that is relevant in a broad range of public services: the procurement of credit. With access to a unique dataset that holds information on a micro-level on the interest rates that Dutch intermunicipal organizations and municipalities paid for loans, we are able to determine to which extent differences are explained by characteristics of the loan in question. The credit risk for loans to these entities is in all cases zero, and since this dataset allows us to control for all relevant characteristics that could theoretically affect the interest rates, any significant difference in interest rates is bound to be the result of inefficiency.

Different theories predict different outcomes with regard to intermunicipal cooperation and (in)efficiency. Based on agency theory it can be argued that services delivered through intermunicipal cooperation are less closely monitored than those delivered by the municipality itself. This undermonitoring would lead to inefficiency. On the other hand,

public choice theory predicts that since the decision making process under intermunicipal cooperation is distanced from local politicians, this reduces their ability to let personal goals affect this process. Hence, intermunicipal cooperation leads to less political meddling and higher efficiency.

Our outcomes show that intermunicipal organizations do pay significantly higher interest rates than municipalities. This result is robust for all types of loans. The average effect of intermunicipal cooperation is a difference in paid interest rates of 4% (not percent point). Through some basic calculations, it can be shown that this amounts to extra interest of around € 10.000 - 15.000 euro per loan, which leads us to the conclusion that the effort put into negotiating for better rates is below efficient levels. This inefficiency can not be found for amalgamated municipalities. There are no significant differences between interest rates for municipalities that have amalgamated in the last 8 years and those that have not.

Further analysis of the inefficiency effect leads us to observe that it is not affected by the legal form of the intermunicipal cooperation, by the kind of public service that is delivered through cooperation, or by the number of municipalities that is involved in the cooperation. Hence, we can conclude that intermunicipal cooperation leads to inefficiency, regardless of any observable characteristics of this cooperation.

1.4 Reading guide

In this thesis, economical effects of both municipal amalgamations and intermunicipal cooperation will be discussed. In chapter 2 we will present the setup and the initial empirical study on the effects of municipal amalgamations. This chapter focusses on the effects both before and after amalgamation on a number of financial dependent variables. Chapter 3 is an extension to this initial study, and presents the results of various additional tests we have run to find out whether our initial findings on municipal expenditures are somehow the result of counteracting amalgamation effects that were averaged out. In this chapter, we also study whether there are effects on spending on certain public services or on the overall level of public services. Chapter 4 presents the outcomes of a study regarding inefficiency as a result of intermunicipal cooperation. Chapter 5 summarizes our findings and presents suggestions for future research on these topics.

Chapter 2 - The effects of amalgamation on local finances

This chapter is based on Allers and Geertsema (2016).

Policiymakers have several ways of changing the scale on which local public services are produced. They can contract out certain public services to private companies or engage in intermunicipal cooperation to produce public services at a supralocal level. Most rigorously, they can choose to amalgamate with one or more other municipalities, leading to a scaling up of production for all public services that were previously produced on a local level. As described in our introduction, there is an ongoing debate on the question whether this would reduce municipal spending and/or diminish efficiency, with theories predicting counteracting effects of scaling up and empirical research showing mixed results.

Our initial empirical analysis focuses on these amalgamations, and their effects on various aspects of local finances, such as levels of spending, debt and tax revenues. We start off with an exploration of local government in the Netherlands in general and an overview of the Dutch situation with regard to municipal amalgamations. Next, we present our basic analysis, which is set up to answer the question whether amalgamations have any effect on local finances, before or after amalgamations. We describe our econometric model and the variables used to measure the amalgamation effects. Next, we describe our identification strategy, followed by a detailed description of the data used. The first results are retrieved for our main dependent variable, which is total per capita expenditures. The chapter concludes with the results of regressions on alternative dependent variables, describing amalgamation effects on various aspects of local finances (spending on wages, debt levels and property tax revenues).

2.1 Institutional background

Municipalities in the Netherlands

In the Netherlands, there are three territorial layers of government: in addition to the national government, the country is divided into 12 provinces and into 418 municipalities (in 2011)[7]. All three layers cover the entire country. All provinces have more or less the same set of tasks and responsibilities and taxation options, as do all municipalities.

Municipalities provide a broad array of public services. Some of these are mandated by the central government, but municipalities are free to take up new tasks. There is no legal restriction on borrowing (Allers, forthcoming). About two thirds of Dutch municipalities' revenues consists of grants from the central government (Allers and Elhorst, 2005). Roughly one third of revenues consists of municipal levies and income from property and market activities. It must be noted that income from property is largely market driven and income from market activities cannot be spent freely because it is largely offset by the costs of these activities. Taxes and user fees account for approximately 15 percent of municipal revenues. Municipalities are allowed to impose a limited number of taxes only, but they can decide on tax rates freely.[8] The property tax is by far the most important local tax. Other local taxes are insubstantial or only raise significant revenues in a limited number of municipalities. Although matching grants exist, much of grant revenue is independent of local spending. Therefore, spending reductions may be used to cut taxes, which may be politically attractive: Allers and Elhorst (2005) show that Dutch municipal tax rates are influenced by political yardstick competition. Municipalities use accrual accounting, and local budgets must be balanced.

Municipal amalgamations in the Netherlands

The number of municipalities has been steadily declining for a long time. Figure 2.1 clearly illustrates this. We see that in the period 1997-2011, 2008 was the only year in which there was not a single amalgamation. As a result, Dutch municipalities had around 40,000 inhabitants on average in 2011, which makes them relatively large compared to those in other countries.

[7] For this thesis, I do not consider the Caribbean part of the Netherlands, where special municipalities were established as per 10th October 2010.

[8] In 2006 and 2007, property tax rates were capped at the municipality level.

Figure 2.1: Number of amalgamations and average municipal population size

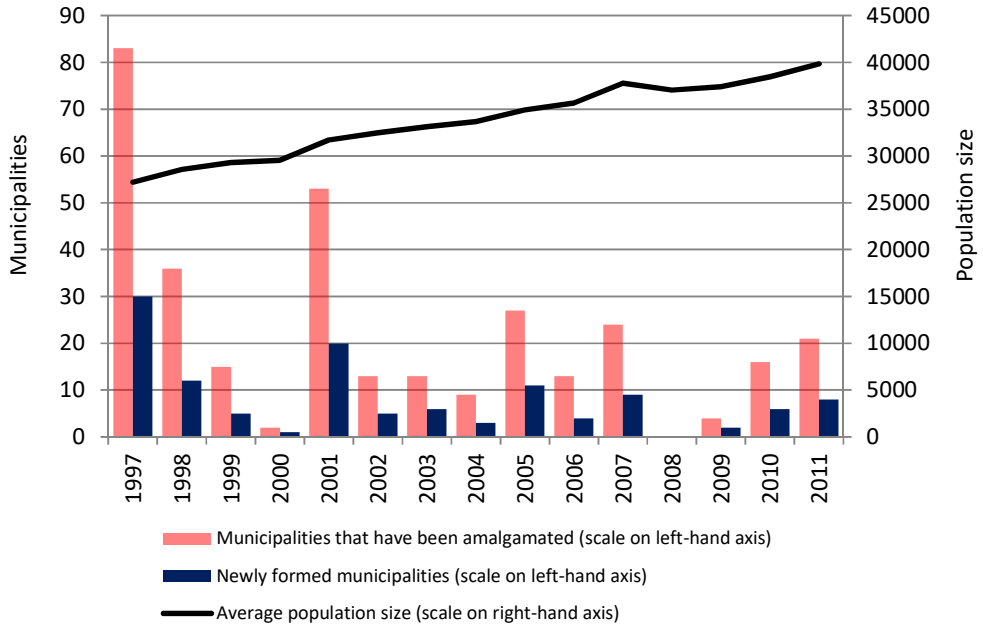
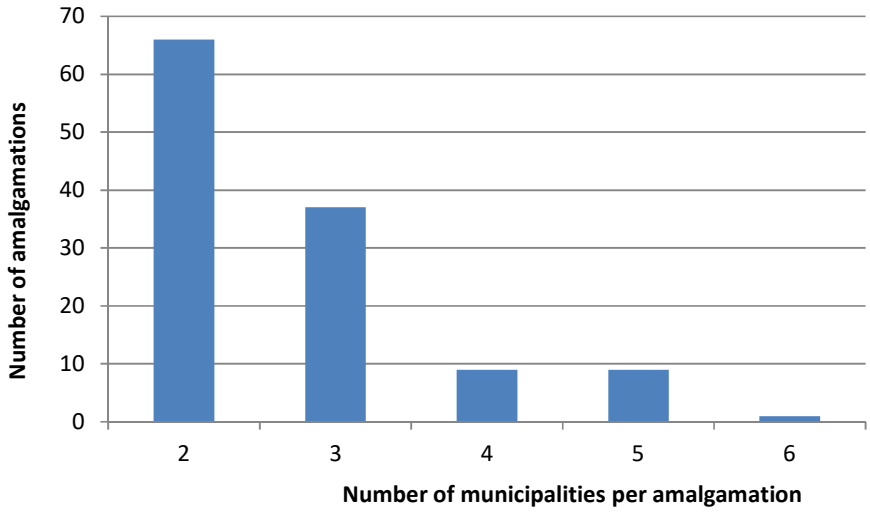


Figure 2.2: Number of municipalities per amalgamation, 1997-2011



In 1997-2011, the number of municipalities was reduced by 154 (figure 2.1). Often, two or three municipalities were merged, but the number of municipalities involved in an amalgamation ranges from two to six (figure 2.2). Most municipalities selected for amalgamation (234 out of 329) had between 5,000 and 20,000 inhabitants (figure 2.3). After amalgamation, population size is often in the range 20,000 – 50,000 (86 out of 122, figure 2.4).

Figure 2.3: Number of amalgamated municipalities by population size

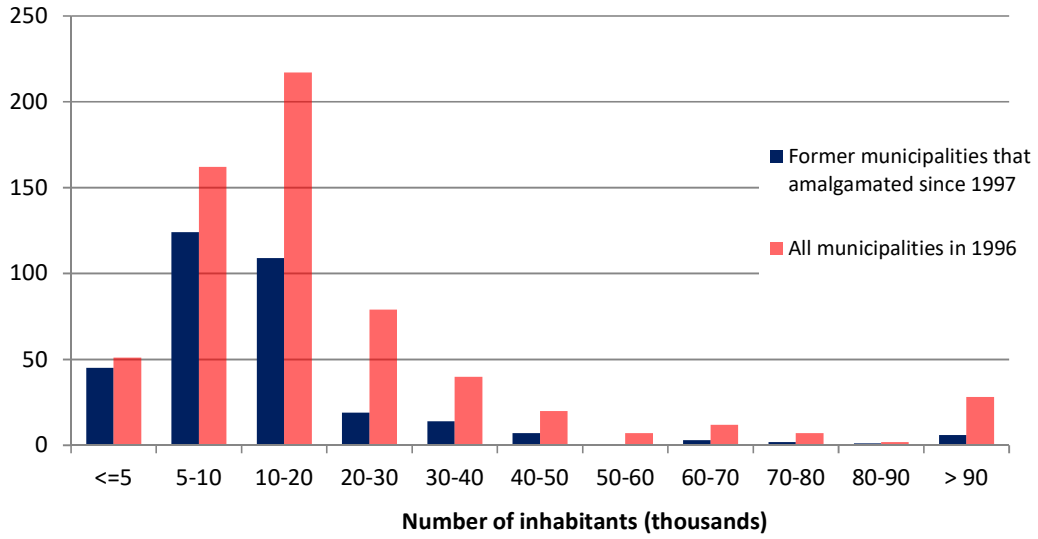
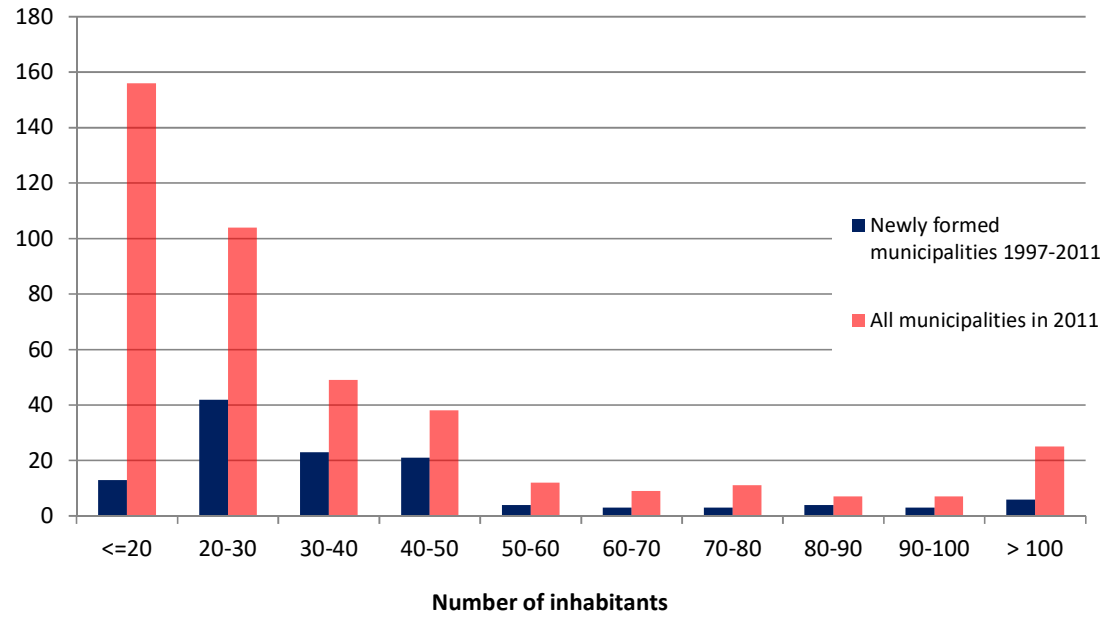


Figure 2.4: Number of newly formed municipalities by population size

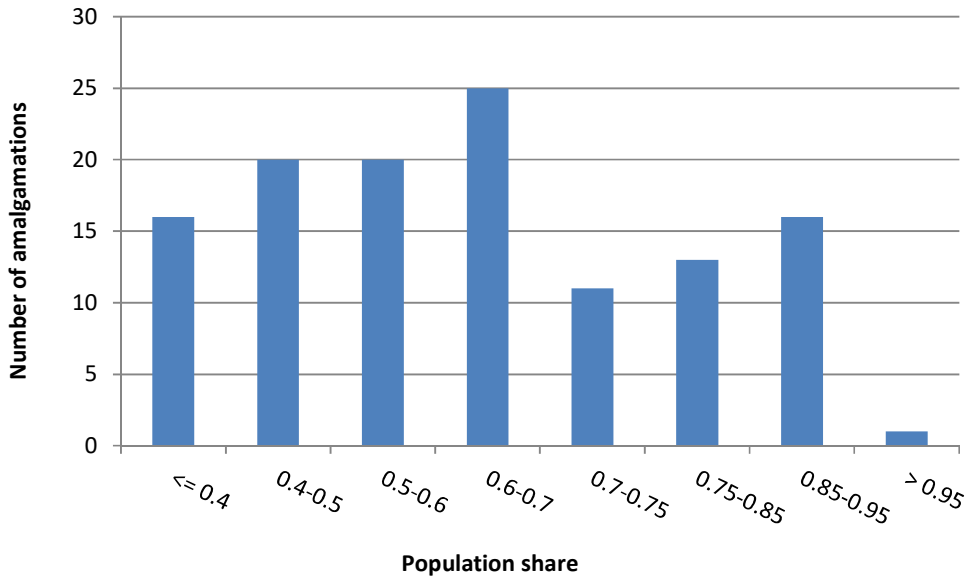


Roughly speaking, amalgamations come in two types. The first type involves municipalities which do not differ too much in size (a “merger of equals”). The second type of amalgamation is characterized by the absorption of a small municipality into a big neighbour. In the Netherlands, the first type, which we will denote simply by “amalgamations”, occurs far more often than the second, denoted as “annexations” (figure 2.5). It is not at all clear that both types have the same effects on local budgets. For one

thing, amalgamations require setting up new organizational structures, whereas annexations do not. Empirical studies should take this into account.

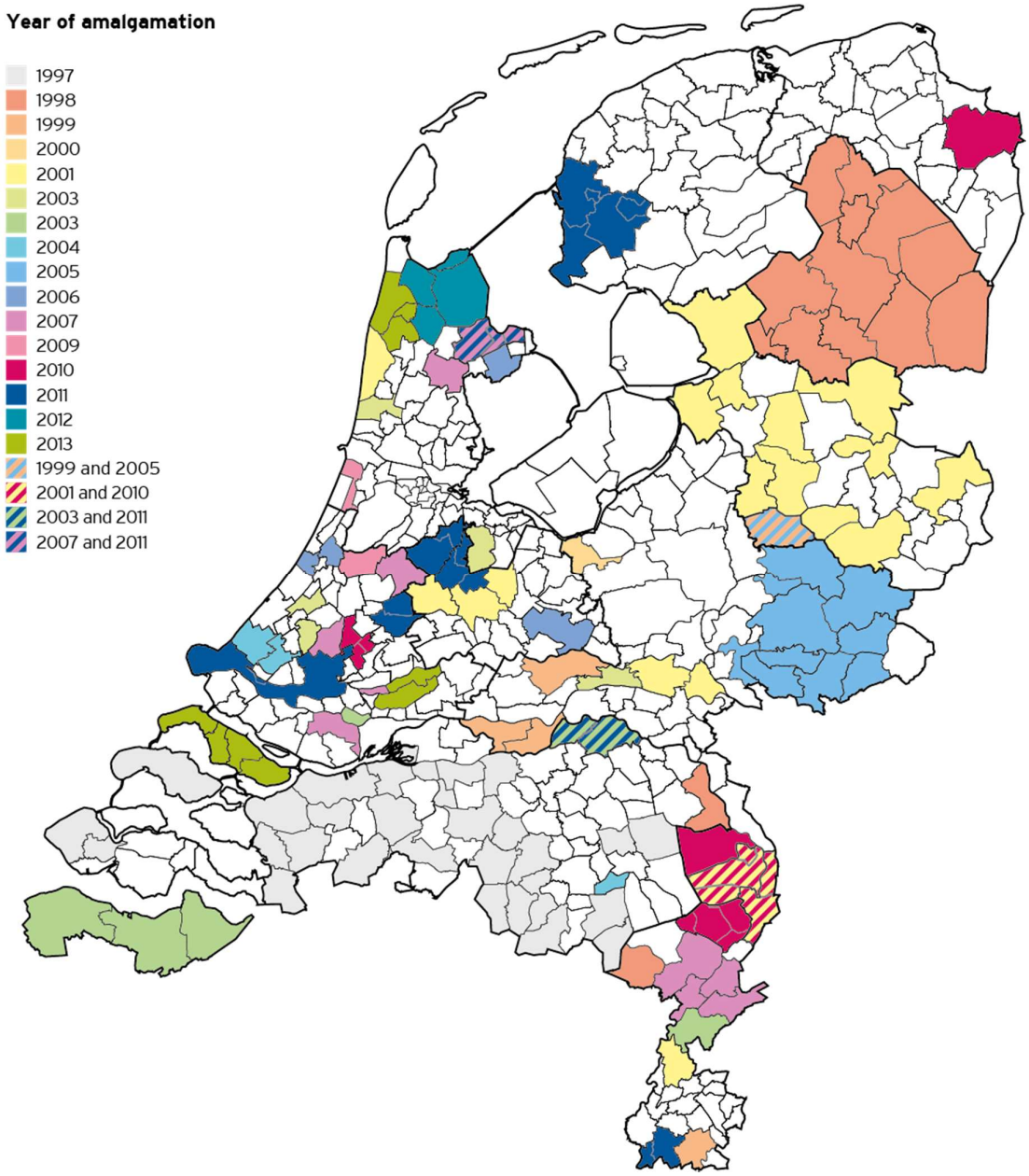
In policy debates in the Netherlands, the most important reason for amalgamation is that the scale of many municipalities is deemed too small for effective administration. The central government has decentralized many public tasks to local governments, a process of which the end is not yet in sight. Increasingly, small municipalities find it difficult to cope with this stream of new tasks. They lack the necessary manpower, or they become vulnerable because certain tasks can only be performed by one or two specialized officers. Amalgamations may ease such problems. Often, it is also assumed that scaling up local government will increase efficiency, because economies of scale can be exploited.

Figure 2.5: Population share of largest amalgamation partner, 1997-2011



The final decision to amalgamate municipalities is made by the national parliament, usually in the year preceding the amalgamation, which normally is effected on the first day of a calendar year. Of course, several years of debate and preparations precede any amalgamation. Amalgamations may happen at the request of the municipalities concerned, but they can also forced upon those municipalities. In many cases, it is hard to say to what extent an amalgamation is voluntary or mandatory. Provinces play an important role here, initializing and coordinating amalgamations. Some provinces are more active in this respect than others. This is one of the reasons why amalgamated municipalities are not spread out evenly across the country (see figure 2.6).

Figure 2.6: Municipalities formed after amalgamations, 1997-2013



2.2 Basic analysis

Since we have budgetary data on 418 municipalities for a period up to 12 years, we have an opportunity to study amalgamation effects using a panel data model into which we can introduce a number of amalgamation dummies. We first explain our choice of the type of panel data model.

We start our analysis with a fixed effects model:

$$y_{it} = X_{it}\beta + \alpha_t I_n + \eta_i + \gamma_i t + \epsilon_{it} \quad (1)$$

where y_{it} is the dependent variable, X_{it} is the vector of (strictly exogenous) explanatory variables, α_t is a time scalar and I_n is a Column vector of ones, η_i is an unobserved individual effect, *t* is a linear time trend that is allowed a municipality-specific effect and ϵ_{it} is an unobserved white noise disturbance. The subscript *i* denotes municipalities (*i* = 1…*n*), the subscript *t* denotes years.

Previous econometric studies of amalgamations rely on static models. In the related literature on political business cycles, however, dynamic models are common (e.g. Brender and Drazen, 2005; Alt and Lassen, 2006). This is motivated by the nature of the dependent variable, being local expenditures. While these are partly discretionary and as such can be changed from year to year, spending in many categories changes only gradually. First, because national regulations and popular expectations often oblige municipalities to deliver certain services, as a result of which part of total spending is pre-committed (Allers and Elhorst, 2011). Secondly, spending decisions involve rather complex trade-offs between political priorities. The previous year's budget often serves as a point of reference, and only limited changes are made every year (Bennett, 1984). Moreover, the apparatus of government is largely fixed in the short term. Hence, budgetary decision-making is likely to be incremental (Wildavsky, 1964). Therefore, we do not limit our analysis to static models but use dynamic models as well, including a one year lag of the dependent variable.

In our dataset, the time dimension (T=11)[9] is rather limited. Using dummy variables (LSDV) to estimate individual effects in a dynamic model then results in biased estimates. Various estimation methods have been proposed to cope with this problem, either using instrumental estimators (e.g., Generalize Method of Moments, GMM) or using a direct bias correction. The most commonly used estimator in situations like these has become system GMM (Blundell and Bond, 1998), which relies heavily on a large N in the data panels (preferably approaching infinity). However, Judson and Owen (1999) and Behr (2003) run Monte Carlo simulations to compare estimation methods that have been developed for cases with limited T and small or moderate N, and both conclude that the estimators using

[9] We have expenditure data for 2002-2013. Because we include a lagged dependent variable, we lose one year in our regressions.

direct bias correction are superior even for panels with N = 100. The latter does find that GMM and especially system GMM is a better alternative for panels with N = 1,000.

Bias corrected LSDV estimators have since been used as a robustness check by several authors (e.g., Eicher and Schreiber, 2010; Brick et al., 2012) and as the estimator of choice by others who have data panels with small N (e.g., Potrafke, 2012; Aidt and Mooney, 2014). Since the number of municipalities in our preferred data panel (N = 135) is close to 100, we also use the corrected LSDV method (Kiviet, 1995; 1999), in Bruno's (2005) implementation to deal with the fact that our panel is unbalanced.[10] The method is based on a standard dynamic panel data model:

$$y_{it} = \gamma y_{i,t-1} + X_{it}\beta + \alpha_t I_n + \eta_i + \epsilon_{it} \quad (2)$$

The dependent variables and the control variables are expressed in logs.[11] That is because we expect amalgamation to have a proportional effect on spending, if at all, and not a constant effect.

In order to study the effects of amalgamations, we first extend models (1) and (2) to include a number of amalgamation dummies. This is the standard approach in the literature. Because we expect short term effects to differ from long term effects, and pre-amalgamation effects from post-amalgamation effects, we use four different amalgamation dummies:

A_{pre} for the period of three years to one year before amalgamation. Although the definitive decision to amalgamate is typically made in the year before amalgamation, plans and preparations are being made in earlier years, quite possibly incurring some reorganization costs. If any common pool effects were to exist, these would be observable in the coefficient for this dummy.

$A_{0\text{-}3}$ for the period of the amalgamation year itself to three years after amalgamation. In this four year period the lion's share of transition costs is expected to be made. To help municipalities finance these costs, the allocation formula of the general grant[12] awards a temporarily higher grant for amalgamated municipalities (in the first four years only).

[10] The system GMM estimator of Blundell and Bond (1998) is used as the initial estimator. Using the Arellano-Bond (1991) instead yields nearly identical results. Standard errors are approximated by a bootstrap algorithm with fifty repetitions. Since no information on the goodness of fit of the CLSDV model is available, we have rerun all regressions as a regular LSDV test with fixed effects (including a lagged dependent variable), and provide the R^2 of these estimations. Although these values give no accurate measure of the goodness of fit of the CLSDV model, they do give a good indication of the relative goodness of fit of the various CLSDV regressions. However, they are not comparable with the R^2 values given for the static regressions.

[11] One exception is made for ideology of the coalition, since this variable can take a value of zero.

[12] The general grant is the main component of the municipality fund, which is used for transferring funds from the central government to municipalities.

$A_{4\text{-}10}$ for the long term period of four to ten years after amalgamation. Although no siginificant transaction costs are expected in this period, some temporal amalgamation effects might still work through in this period (due to e.g., employment contracts being served out to avoid lay-off costs). The long term economies of scale-effects are expected to become prevalent in this period.

A_{11+} for the period of eleven or more years after amalgamation. Temporal amalgamation effects are expected to be negligible. Note that this dummy will only be take a value of one for municipalities that have amalgamated before 2003.

Amalgamations normally take effect on the 1st of January of a certain year and that year is marked as the amalgamation year where the dummy $A_{0\text{-}3}$ takes the value of 1 for the first time.

2.3 Identification strategy

We use difference-in-difference estimation, comparing changes in spending of amalgamated municipalities (the treatment group) with those of a control group of municipalities that were not amalgamated. Difference-in-difference estimation has been applied to study the effects of amalgamations before by Lüchinger and Stutzer (2002), Tyrefors Hinnerich (2009), Jordahl and Liang (2010), Reingewertz (2012) and Blesse and Baskaran (2013). Like these authors, we exploit the fact that some municipalities were amalgamated and others were not. Moreover, the staggered nature of the Dutch amalgamations allows us to also utilize the fact that amalgamations took place in different years, as opposed to the big bang approach (with a large number of amalgamations at the same time) mostly used in other countries.

An important assumption in difference-in-difference estimation is that the error term is uncorrelated with the treatment status. Obviously, selection for amalgamation is not random. To control for the forces that drive selection, an instrumental variables approach may sometimes be used. This would require an instrument that influences selection for amalgamation, but not budgetary outcomes. It is unlikely that such an instrument exists. We take an alternative approach: including all relevant variables affecting selection in the budgetary regressions as controls. Although one can never be sure that all relevant variables have been included, many of these are likely to be relatively time-invariant, like, e.g., location within a certain province. Including municipal and year fixed effects takes care of these. We control for time-variant variables affecting selection by including municipality-specific time trends and a number of control variables.

Despite these measures, selection bias might still be present. If some municipalities are badly managed, with deteriorating public services or rising tax rates, citizens might revolt and press for amalgamation. If, after amalgamation, such municipalities perform as well as not-amalgamated municipalities (which were performing satisfactorily), this improvement might not be found in our results. A second important assumption is therefore that the

treatment group and the control group consist of municipalities with similar budgetary trends. Both groups should consist of comparable municipalities. We have three different control groups at our disposal. We can take all municipalities that were not amalgamated, or that were amalgamated but in a different year. This control group is not entirely satisfactory, as amalgamated municipalities have different characteristics from non-amalgamated municipalities. A second option is to use municipalities that were amalgamated, but in a different year. This control group resembles the treatment group well. Our preferred control group, following Reingewertz (2012), is created by adding to the second control group 34 municipalities that were set to amalgamate, but have, for political reasons, been left intact. This control group is denoted as "amalgamated or almost amalgamated" and used in our basic setup throughout this and the next chapter.

2.4 Data

We have spending data for 2002-2013. We rebuilt the dataset in such a way that all amalgamations are retroactively applied to the data. Thus, we organize our data as if all amalgamations had been implemented by 2002. We have information on amalgamations in 1997-2013. We drop five municipalities that were amalgamated twice in this period from our dataset, along with the fourteen that amalgamated in 2012 and 2013. Amalgamated municipalities that had a dominant partner (a municipality more than 85% of the post-amalgamation population size), are marked as annexations and excluded as well. This results in spending data for 388 municipalities, of which 101 were created through amalgamation, 34 were selected for amalgamation but left intact ("almost amalgamated") and 252 were not amalgamated. Figure 2.7 shows the geographical distribution of these groups.

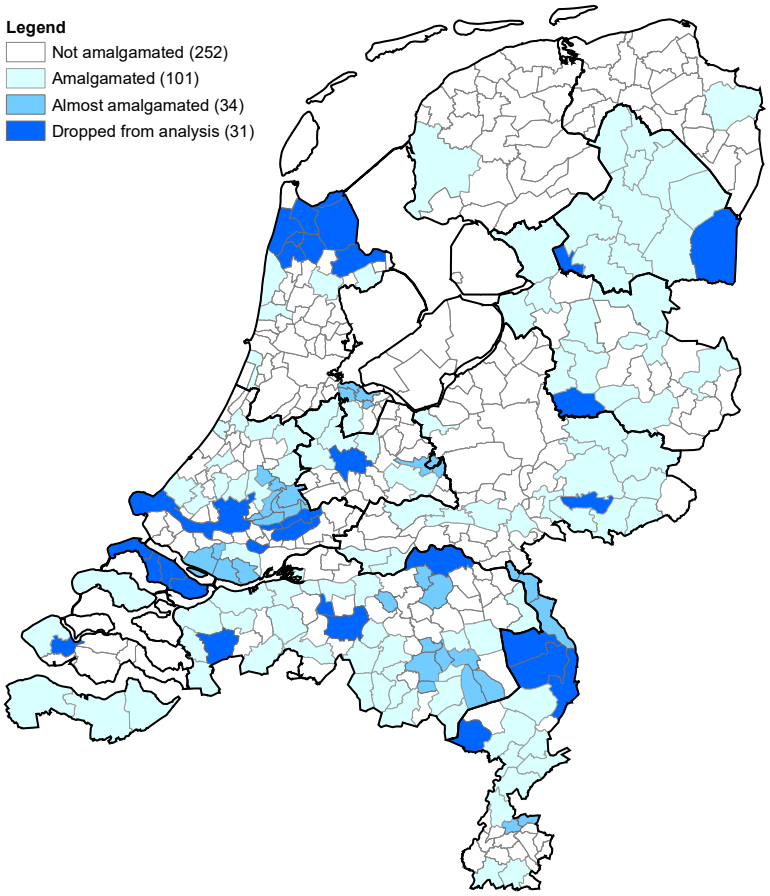
The main dependent budgetary variable is total per capita expenditures. We exclude expenditures on land purchases and land development from total expenditures. In some cases, these form a considerable part of total expenditures (on average 9 percent, with extremes up to 75 percent), but they are highly volatile due to their incidental nature, and they are not relevant for our study. Spending data is provided by Statistics Netherlands. Unfortunately, data is missing for some municipalities in some years. As a result, we have an unbalanced panel. Amounts are expressed in euros of 2013 using the consumer price index.

The matrix X_{it} consists of several control variables. As described above, central government grants constitute a large part of total municipal income. We include per capita amounts of the general, non-earmarked equalization grant. Data on earmarked intergovernmental grants are only available from 2010 onward. However, the correlation between the general grant and the total of other intergovernmental grants is very high (Allers and Van Gelder, 2013). Thus, the general grant seems to be an adequate proxy for the total size of central government grants.[13] As this is an equalization grant, allocated through a formula containing

[13] The allocation formula of the general grant awards a temporarily higher grant for amalgamated municipalities (in the first four years only). This is meant to help them finance the transition costs which follow

more than 50 demographic, physical and other local characteristics outside the control of the local government, this variable indirectly controls for a great number of variables that might influence both spending and selection for amalgamation.

Figure 2.7 Geographical distribution of the different control groups



To discover what variables determine the probability that municipalities were amalgamated in the period studied, we ran a logistic regression on data for 2000. The dependent variable was a dummy that took the value one if the municipality was to be amalgamated in 2001-2011. Not surprisingly, smaller municipalities turn out to be more likely to amalgamate.

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amalgamation. Inclusion of control variables that are affected by the treatment should normally be avoided. That is because indirect effects of the treatment working through such controls may load on these controls, downwardly biasing the estimates of the treatment effect. In this case, amalgamation temporarily raises the grant, as a result of which spending is likely to go up. By including the general grant we control for this indirect effect. We chose to include the grant variable because our analysis extends well beyond the four-year period for which this might be problematic. Grants are the most important source of municipal revenue. Changes in grants not due to amalgamations should therefore be controlled for. As a robustness test, we will check whether excluding this variable changes our results.

Table 2.1: Determinants of amalgamation

Population in 2000	-9.57e-05***
	(-5.469)
General grant per capita in 2000	-0.000659
	(-0.419)
Houses per capita in 2000	-0.683
	(-0.269)
Density in 2000	0.974**
	(2.489)
Observations	473

Dependent variable: probability that municipality is amalgamated in 2001-2011.
z-statistics in parentheses. Significance: *** p<0.01, ** p<0.05, * p<0.1.
Province dummies and constant included but not reported.

Density, measured as the average number of addresses per square kilometer, also affects the likelihood of amalgamation. Table 2.1 presents the results of this regression. In order to avoid selection bias, both population size and density are included as control variables. Population was included for a different reason as well: spending may not grow proportionately to population size. Just like amalgamation, autonomous population growth results in larger municipalities which may lead to economies of scale. Although not included in table 2.1, province dummies also have significant effects on the probability of being selected for amalgamation, but these are superfluous as we include municipal fixed effects.[14]

A fourth control variable is the political ideology of the municipal government. For each municipality, we divide the council seats held by the coalition parties into left-wing, right-wing and other parties. We have chosen this as our main indicator instead of the ideology of the entire council (including opposition parties), since local policy will mainly be determined by the coalition parties. Even though opposition parties might have some influence, important issues that significantly impact

[14] In the period under study, provincial boundaries have not changed.

Table 2.2: Mean values of control variables and dependent variables for different groups of municipalities (2002-2013)

	All municipalities	Not amalgamated	Amalgamated	Amalgamated or almost amalgamated		
	Mean	Mean	Mean	Mean	Min	Max
Total expenditures per capita[a]	1,967 (10)	2,024 (13)	1,798 (11)	1,787 (10)	741	3,448
Expenditures on administration per capita[a]	120 (1.0)	127 (1.3)	102 (1.0)	106 (0.9)	25	306
Property tax revenues per capita[a]	184 (1.0)	186 (1.2)	175 (1.7)	177 (1.4)	47	540
Average house price[b]	256,867 (864)	259,402 (1,033)	249,709 (1,535)	257,173 (1,338)	118,368	510,552
General grant per capita[c]	826 (2.7)	842 (3.5)	783 (3.1)	777 (2.8)	372	1,370
Population[a]	36,829 (722)	37,149 (957)	35,923 (560)	33,138 (602)	4,005	218,456
Density[c]	0.94 (0.01)	1.02 (0.01)	0.73 (0.01)	0.76 (0.01)	0.19	2.80
Ideology of coalition (left)[d]	0.43 (0.003)	0.44 (0.003)	0.39 (0.005)	0.38 (0.004)	0	0.91
Concentration of power in municipal council[d]	0.21 (0.0007)	0.21 (0.0008)	0.22 (0.0014)	0.21 (0.001)	0.11	0.42
Share of coalition in municipal council[d]	0.63 (0.001)	0.62 (0.002)	0.64 (0.003)	0.63 (0.002)	0.27	0.97
Number of observations[e]	3681-5417	2744-4004	937-1413	1265-1889		
Number of municipalities	387	286	101	135		

Standard errors within parentheses. Amounts are expressed in euros of 2013.

[a] Source: Statistics Netherlands (CBS)
[b] Source: Estimated (hedonic regression) using data from Dutch Association of Realtors (NVM)
[c] Source: Ministry of the Interior and Kingdom Relations
[d] Source: Statistics Netherlands (CBS) and Associations of Netherlands Municipalities (VNG)
[e] Some variables are not available for the entire period

local government budgets will be discussed during coalition negotiations. Hence, opposition influence on local spending is negligible. We measure ideology as the share of left-wing parties on a scale from 0 to 1.[15] In accordance with partisan theory (for Dutch evidence, see Allers et al. 2001), we expect government expenditures to increase when left wing parties are in charge and vice versa.

[15] This is done by counting the number of seats for left wing parties, adding one half of the seats of parties of "neutral" ideology (e.g. local parties without a clear ideological disposition) and dividing the sum by the total number of coalition seats. The national parties PvdA (social democrats), Groen Links (the green left), SP (socialist party), D66 (left wing liberals) and CU (social christians) are counted as left wing parties, whereas VVD (conservative liberals), CDA (christian democrats) and SGP (orthodox christians) are counted as right wing parties. Local parties that have a clear right or left wing signature are treated accordingly.

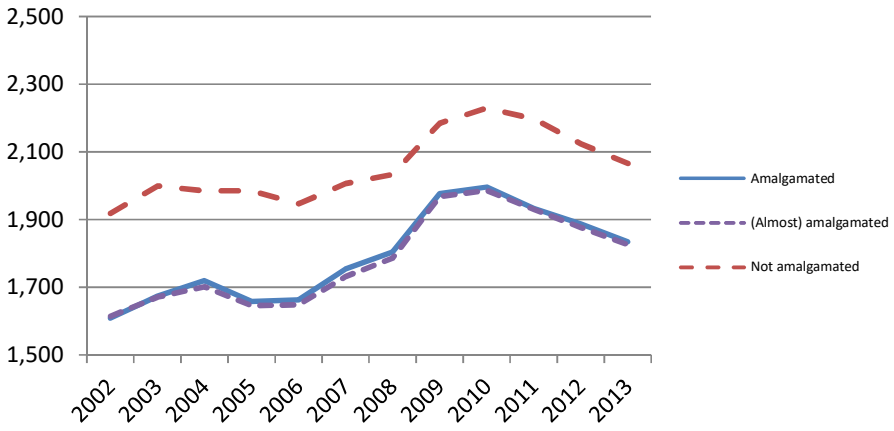
Two more political variables are included to control for differences in the political power to influence spending: the political concentration of the municipal council (Herfindahl index) and the share of council seats taken by the parties that form the ruling coalition. Amalgamations are sometimes accompanied by local elections, depending on whether they take place in or near national election years.[16] In order to control for possible political budget cycle effects we include three election dummies: for the election year itself as well as for the year before elections and the year thereafter. Table 2.2 compares dependent variables and control variables for different control groups.

2.5 Results

Graphical analysis

Figure 2.8 presents the course of total per capita expenditures for three control groups. Differences between amalgamated municipalities on the one hand and amalgamated or almost amalgamated municipalities on the other hand are so small they are hardly visible. Non-amalgamated municipalities show the same pattern, but at a higher level.

Figure 2.8: Total per capita spending (euros of 2013) for different groups of municipalities



[16] Normally, local elections take place every four years in all municipalities.

Table 2.3: Regressions of total per capita spending, static and dynamic panel models

Control group	Amalgamated or almost amalgamated				
Model	Static	Static	Static	Dynamic	Dynamic
Regression number	1	2	3	4	5
A_{pre}	-0.01	-0.03	-0.04*	-0.03*	-0.03*
	(-0.25)	(-1.65)	(-1.86)	(-1.85)	(-1.84)
A_{0-3}	0.01	0.01	-0.03	-0.01	0.00
	(0.30)	(0.27)	(-0.99)	(-0.45)	(0.11)
A_{4-10}	0.08***	0.04	-0.02	0.01	0.00
	(2.92)	(1.16)	(-0.58)	(0.24)	(0.12)
A_{11+}	0.11***	0.04	-0.01	0.00	0.00
	(3.40)	(1.10)	(-0.29)	(0.09)	(0.03)
Lagged dependent				0.45***	0.47***
				(13.41)	(12.72)
General grant	0.46***	0.19	-0.09	0.29***	0.03
	(10.07)	(1.53)	(-1.04)	(11.08)	(0.28)
Population	-1.07***	-1.11***	-1.25***	-0.30*	-0.42***
	(-4.84)	(-4.76)	(-4.00)	(-1.93)	(-2.73)
Density	1.01***	0.74***	0.30	0.18	0.36**
	(6.94)	(3.31)	(1.28)	(1.50)	(2.46)
Ideology (left)	0.04	0.01	0.02	0.05***	0.01
	(1.43)	(0.40)	(0.86)	(3.06)	(0.52)
Concentration	0.03	0.03	-0.03	0.02	0.00
in council	(1.13)	(1.06)	(-1.00)	(0.98)	(0.14)
Coalition power	-0.02	-0.02	0.01	0.00	-0.00
in council	(-0.69)	(-0.66)	(0.52)	(0.31)	(-0.27)
Pre-election year	0.03***	0.01	0.02	0.03***	-0.00
	(4.87)	(0.81)	(1.24)	(3.85)	(-0.06)
Election year	-0.03***	0.06**	0.06**	-0.02**	0.03
	(-3.48)	(2.59)	(2.61)	(-2.18)	(0.90)
Post-election year	-0.03***	0.02	0.02*	-0.02***	0.01
	(-4.16)	(1.64)	(1.96)	(-2.93)	(0.31)
Year effects	No	Yes	Yes	No	Yes
Municipal fixed effects	Yes	Yes	Yes	Yes	Yes
Municipal time trends	No	No	Yes	No	No
Observations	1,541	1,541	1,541	1,339	1,339
Municipalities	135	135	135	135	135
R^2 (within)	0.45	0.52	0.74		
Pseudo-R^2				0.62	0.67

T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs. * denotes significance at the 10% confidence level, ** significance at the 5% confidence level, and *** significance at the 1% confidence level.

Econometric analysis

Table 2.3 reports regression results of total expenditures, using as a control group municipalities that were amalgamated in a different year, or that had been selected for amalgamation but were left intact.[17] Different control groups will be introduced in table 2.5.

All regressions include fixed effects at the municipal level, to control for unobserved time-invariant local characteristics. The first three columns in table 2.3 present regressions of the basic static panel model of total spending. In the first regression we include only amalgamation dummies, a constant, and control variables. This renders insignificant amalgamation effects before and shortly after amalgamation, but the medium and long term effects are highly significant. This significance disappears after adding year dummies (column 2) that control for nationwide temporal effects, like law changes or national budget cuts that affect the local playing field. Adding municipality-specific linear time trends (column 3) does not have much impact, although one (negative) pre-amalgamation effect now borders on significance. Theoretically, we would expect a pre-amalgamation effect to be positive. For the periods after amalgamation, amalgamation effects are insignificant. Earlier studies using static models found lower spending (Reingewertz, 2012; Blesse and Baskaran, 2013) or higher spending (Lüchinger and Stutzer 2002; Hansen, 2011; Moisio and Uusitalo, 2013) after amalgamation.

Columns (4) and (5) in table 2.3 present the results of the dynamic regression model. Per capita municipal spending is positively affected by density and negatively by population size, as expected, and the lagged dependent is highly significant. However, whether year dummies are included or not, all post-amalgamation coefficients are close to zero and far from significant. We do see that the pre-amalgamation effect still borders on significance, but it does not have the expected sign.

Tests

Table 2.3 suggests that amalgamation does not affect total local government spending. We now put this result to a number of tests.

First, we test for differences in spending between municipalities that are later amalgamated and other municipalities. As explained, such differences might point to selection bias as amalgamation might be more likely in badly-run municipalities. We have run regressions with dummies measuring the amalgamation effect 4 to 10 years before, 1 to 3 years before and 0 to 3 after amalgamation. The results are presented in table 2.4. Control variables are included in the regressions but coefficients are no longer reported. We see that there is no significant effect on total per capita spending.

[17] The dependent variables and the control variables are expressed in logs. As a result, the coefficients of continuous variables can be interpreted as elasticities. Before interpreting the coefficient of a dummy variable, one must take the exponent. For example, if the coefficient of a dummy is 0.20, then, when the dummy takes the value 1, the dependent variable is 22 percent larger than otherwise (e^0.2=1.22).

Table 2.4: Regression for long term pre-amalgamation effects

Control group	Amalgamated or almost amalgamated
Dependent variable	Total expenditures
Model	Dynamic
Regression number	6
$A_{pre\ (4-10)}$	-0.00
	(-0.15)
$A_{pre\ (1-3)}$	-0.03
	(-1.29)
A_{0-3}	-0.00
	(-0.06)
Lagged dependent	0.70***
	(16.90)
Control variables	Yes
Year effects	Yes
Municipality fixed effects	Yes
Municipality time trends	No
Observations	1,339
Municipalities	135
Pseudo-R^2	0.67

T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs. Significance: *** p<0.01, ** p<0.05, * p<0.1.

Next, we repeat the analyses in table 2.3 in three different ways: including annexations (amalgamations with a dominant partner, chapter 1); using dummies A_{4-8} and A_{9+} instead of A_{4-10} and A_{11+}, respectively; using the ideology of the entire local council, instead of only those parties that form the ruling coalition, and excluding the general grant as a control variable (since this grant is higher during the four-year period following amalgamation). In table 2.5 it can be seen that none of these alternative specifcations change our results significantly.

Table 2.5: Various robustness tests

	Annexations included		A_{4-8} and A_{9+} instead of A_{4-10} and A_{11+}.		Without general grant as a control variable	
Model	Static	Dynamic	Static	Dynamic	Static	Dynamic
	7	8	9	10	11	12
A_{pre}	-0.04**	-0.03*	-0.04*	-0.03*	-0.04**	-0.03*
	(-2.09)	(-1.93)	(-1.80)	(-1.86)	(-2.00)	(-1.82)
A_{0-3}	-0.02	-0.00	-0.03	0.00	-0.04	0.01
	(-0.82)	(-0.08)	(-0.89)	(0.08)	(-1.17)	(0.24)
A_{4-10}	-0.01	-0.00	-0.02	0.00	-0.02	0.00
	(-0.43)	(-0.05)	(-0.43)	(0.10)	(-0.59)	(0.16)
A_{11+}	-0.00	-0.00	-0.01	-0.00	-0.01	-0.00
	(-0.12)	(-0.10)	(-0.17)	(-0.03)	(-0.33)	(-0.02)
Lagged dependent		0.70***		0.70***		0.71***
		(20.37)		(17.25)		(17.06)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Municipality time trends	Yes	No	Yes	No	Yes	No
Observations	1,681	1,463	1,541	1,339	1,541	1,339
Municipalities	147	147	135	135	135	135
R^2 (within)	0.73		0.74		0.73	
Pseudo-R^2		0.66		0.67		0.67

T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs. Significance: *** p<0.01, ** p<0.05, * p<0.1.

In table 2.6, we present regression results for different control groups. Columns (13) and (16) in table 2.6 match columns (3) and (5) in table 2.3. In columns (14) and (17) we remove the almost amalgamated municipalities from the control group, leaving only the municipalities that have indeed been amalgamated. In columns (15) and (18) we include all municipalities, except for those municipalities that have been dropped from the dataset altogether (see above). We see here that the pre-amalgamation effect is insignificant for the other control groups, implying that it is not robust.

Table 2.6: Regressions of total per capita spending: alternative control groups

Model	Static	Static	Static	Dynamic	Dynamic	Dynamic
Control group	Amalgamated or almost amalgamated	Amalgamated	All	Amalgamated or almost amalgamated	Amalgamated	All
Regression number	13	14	15	16	17	18
A_{pre}	-0.04*	-0.05**	-0.03	-0.03*	-0.02	-0.02
	(-1.86)	(-2.19)	(-1.54)	(-1.84)	(-1.43)	(-1.33)
A_{0-3}	-0.03	-0.04	-0.02	0.00	0.01	0.01
	(-0.99)	(-1.36)	(-0.80)	(0.11)	(0.62)	(0.26)
A_{4-10}	-0.02	-0.03	-0.00	0.00	0.02	0.01
	(-0.58)	(-0.82)	(-0.09)	(0.12)	(0.77)	(0.43)
A_{11+}	-0.01	-0.02	0.01	0.00	0.03	0.01
	(-0.29)	(-0.40)	(0.28)	(0.03)	(0.91)	(0.43)
Lagged dependent				0.70***	0.69***	0.75***
				(17.19)	(12.40)	(44.50)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Municipal fixed eff.	Yes	Yes	Yes	Yes	Yes	Yes
Municipal time trends	Yes	Yes	Yes	No	No	No
Observations	1,541	1,144	4,492	1,339	985	3,983
Municipalities	135	101	387	135	101	387
R^2	0.74	0.73	0.70			
Pseudo-R^2 (within)				0.67	0.68	0.63

T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs. * denotes significance at the 10% confidence level, ** significance at the 5% confidence level, and *** significance at the 1% confidence level.

Robustness tests: alternative econometric models

As a further robustness test, we use two alternative models. The first embodies an instrumental variable approach. Here, instead of A_{pre}, A_{0-3}, A_{4-10}, and A_{11+}, we use average population per jurisdiction as dependent variable of interest. Before amalgamation this variable is calculated as the population of the amalgamated municipality divided by the number of amalgamating jurisdictions. After amalgamation, it is equal to the population. We instrument this variable on a simple dummy (Amalgamated), which takes the value of one in the years after a municipality has been amalgamated. At the moment of amalgamation, average population increases (e.g., it doubles when two municipalities amalgamate). This approach reflects that it is increase in size through amalgamation, not amalgamation as such, that is expected to yield economies of scale.

Table 2.7 presents results of this approach. As we see in first stage regression results, the coefficient for the dummy variable Amalgamated is highly significant. The Kleibergen-Paap F-statistic indicates that our instrument is strong. A possible amalgamation effect should now be observable in the coefficient of average population per jurisdiction. However, this is not the case (Column 19).

Table 2.7: Regressions of total per capita spending: instrumental variable approach

Control group	Amalgamated or almost amalgamated	
	IV estimate	1st stage regression
Regression number	19	20
General grant	-0.11	0.08
	(-1.41)	(0.99)
Density	0.15	0.32
	(0.69)	(1.53)
Ideology (left)	0.02	-0.04
	(0.92)	(-1.55)
Concentration in council	-0.03	-0.02
	(-1.01)	(-0.76)
Coalition power in council	0.01	-0.02
	(0.50)	(-1.64)
Pre-election year	0.02	0.02
	(1.10)	(1.02)
Election year	0.06***	0.01
	(2.75)	(0.22)
Post-election year	0.03**	0.00
	(2.54)	(0.09)
Average population per jurisdiction	0.01	
	(0.53)	
Amalgamated		0.96***
		(14.94)
Year effects	Yes	Yes
Municipal fixed effects	Yes	Yes
Municipal time trends	Yes	Yes
Observations	1,541	1,541
Municipalities	135	135
R^2	0.03	0.966
Kleibergen-Paap F	223.4	

T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs. * denotes significance at the 10% confidence level, ** significance at the 5% confidence level, and *** significance at the 1% confidence level.

As a second robustness test, we employ a dynamic model which is extended to include spatial interaction effects.[18] Allers and Elhorst (2011) found evidence of expenditure mimicking among Dutch local governments. Failure to include this could lead to omitted variable bias. Elhorst (2010) compares a number of different dynamic panel models with spatial interaction effects, and specifically evaluates their performance for panels with a small time dimension (T=5). He finds that the bias-corrected LSDV (BCLSDV) method from Yu, De Jong and Lee (2008) roughly decimates the bias that is found when using a standard LSDV method. This bias is even less if the time dimension is larger than 5, as in our case. Therefore we will use this model, for which the econometric specification is:

[18] Different spatial interaction models exist. A spatial lag model is chosen here because we know from Allers and Elhorst (2011) that we should expect direct spatial interactions between Dutch municipalities.

$$y_{it} = \gamma y_{i,t-1} + X_{it}\beta + \lambda W_i y_{it} + \rho W_i y_{it-1} + \alpha_t I_n + \eta_i + \epsilon_{it} \quad (3)$$

W_i is an *n* x *n* spatial weights matrix which is non-stochastic and generates the spatial dependence among cross sectional units y_{it}. As each row sums to one, $W_i y_{it}$ is the average of y_{it} in neighboring municipalities. Spatial interaction is included both for the dependent variable in the present year *t* and in the previous year *t-1*. As with the dynamic non-spatial model, we extend model (3) to include a number of amalgamations dummies, which are defined above.

We run the spatial dynamic model for the entire sample. Thus, the control group consists of municipalities that were not amalgamated, or that were amalgamated in a different year. Reducing the sample to limit the control group would result in too many geographical gaps to make spatial analysis useful. Many municipalities would have no or few neighbours included in the analysis. Table 2.8 presents the results. No indicator for goodness of fit is available for the spatial estimator. Column (21) matches column (18) in table 2.6. Column (22) shows the results of the same model, but for a balanced panel. These results can be compared with those of the model including a spatial lag in Column (23), which can only be estimated for balanced panels. The coefficient for the spatial lag is significantly positive. Per capita spending increases with 1 percent when the average level of per capita spending in neighbouring municipalities increases with 10 percent. However, the introduction of this effect into the model does not affect our results with regard to the amalgamation effects. These remain insignificant. We take this as evidence that the absence of any robust effect of amalgamation in the dynamic models in tables 2.3 and 2.6 does not result from omitting spatial interaction from the model.

Table 2.8: Regressions of total per capita spending with spatial lag; dynamic panel data model

Control group	All	All	All
Balanced panel	No	Yes	Yes
Regression number	21	22	23
A_{pre}	-0.02	-0.01	-0.01
	(-1.33)	(-0.34)	(0.18)
A_{0-3}	0.01	-0.01	-0.02
	(0.26)	(-0.16)	(0.49)
A_{4-10}	0.01	0.00	-0.00
	(0.43)	(0.12)	(0.02)
A_{11+}	0.01	-0.01	-0.01
	(0.43)	(-0.14)	(0.29)
Lagged dependent	0.75***	0.82***	0.75***
	(44.50)	(45.44)	(45.79)
Spatial lag			0.10***
			(4.61)
Spatial lag on lagged dependent			0.01
			(0.31)
Control variables	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Municipal fixed effects	Yes	Yes	Yes
Observations	3,983	2,704	2,704
Municipalities	387	246	246
Pseudo-R^2 (within)	0.63	0.62	

T-values between parentheses. Variables are expressed in logs. * denotes significance at the 10 percent confidence level, ** significance at the 5 percent confidence level, and *** significance at the 1 percent confidence level.

2.6 Amalgamation effects for other aspects of local finance

So far, we have focussed on total per capita spending as the variable of interest and found no significant amalgamation effects. In this section, we will use different dependent variables to get a more complete view of the effects of amalgamation on local finances. By studying the effects on employee numbers and wages, municipal debt levels and tax revenues, we might observe that despite total expenditures being unaffected, amalgamation effects still do occur in specific areas of local public finances. Alternatively, we might find that the absence of an amalgamation effect is consistent regardless of the angle from which we approach these finances.

Employment and wage costs

After amalgamation and the merging of two or more municipal organizations, it is not expected that employment by the newly formed organization is reduced immediately or in the short run. Many employment contracts for civil servants are of indefinite duration, which makes terminating those contracts expensive. This decreases the incentive to immediately reduce the workforce to the size that would be fully efficient in the long run, given the new situation. In addition, mayor wage levels are standardized and are higher for larger municipalities. This in itself does not lead to higher wage costs since there is only one mayor after amalgamation, but since the mayor wage level functions as a wage ceiling for other functions in the municipal organization, this has an indirect upward effect on wage levels in general. Moreover, amalgamation is likely to lead to a harmonization of the salary structures of all municipalities. Now if for example two civil servants in the same function in different municipalities get a different salary, chances are the lower paid one gets a raise and not that the higher paid gets a wage cut. Concurrently, non-monetary employee benefits could be upgraded to the highest pre-amalgamation standard as well. These two effects could then even lead to a temporary increase of wage costs that could undo the effect of efficiency gains even in the medium run.

Table 2.9: Regressions of fulltime employees per capita, static and dynamic panel models

Model	Static	Static	Static	Dynamic	Dynamic	Dynamic
Control group	Amalgamated or almost amalgamated	Amalgamated	All	Amalgamated or almost amalgamated	Amalgamated	All
Regression number	24	25	26	27	28	29
A_{pre}	-0.01	-0.01	-0.03*	-0.00	-0.01	-0.00
	(-0.53)	(-0.44)	(-1.83)	(-0.08)	(-0.35)	(-0.02)
A_{0-3}	0.00	0.00	-0.03	0.01	-0.01	0.03
	(0.13)	(0.12)	(-0.78)	(0.37)	(-0.23)	(0.90)
A_{4-10}	0.02	0.02	-0.01	-0.00	-0.03	0.03
	(0.50)	(0.44)	(-0.15)	(-0.10)	(-0.55)	(0.95)
A_{11+}	-0.03	-0.04	-0.04	-0.03	-0.07	0.01
	(-0.43)	(-0.57)	(-0.62)	(-0.97)	(-1.08)	(0.21)
Lagged dependent				0.85***	0.88***	1.04***
				(31.22)	(33.82)	(147.96)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Municipal fixed eff.	Yes	Yes	Yes	Yes	Yes	Yes
Municipal time trends	Yes	Yes	Yes	No	No	No
Observations	1,485	1,111	4,257	1,350	1,010	3,870
Municipalities	135	101	387	135	101	387
R^2	0.32	0.32	0.57			
Pseudo-R^2 (within)				0.12	0.11	0.48

T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs. * denotes significance at the 10% confidence level, ** significance at the 5% confidence level, and *** significance at the 1% confidence level.

To study these effects, we use data from the *ABP* pension fund for employees in the government and education sectors. Participation in this fund is mandatory for all civil servants, meaning that this data set gives us a complete picture of the number of employees and the wage budget per municipality.[19]

Table 2.9 shows the resuls with both static and dynamic models for the three control groups for the number of full time employees (FTE). We see that there is no significant and robust amalgamation effect whatsoever. This means that as far as the size of the workforce is concerned, there is no sign of a significant reduction even in the long run. However, if wages have gone up, this might still be observable in wage budgets. In table 2.10, the results of the same regressions with the wage budgets per capita as dependent variable are given. Yet again, we see no significant effect of amalgamations.

Table 2.10: Regressions of paid wages per capita: alternative control groups

Model	Static	Static	Static	Dynamic	Dynamic	Dynamic
Control group	Amalgamated or almost amalgamated	Amalgamated	All	Amalgamated or almost amalgamated	Amalgamated	All
Regression number	30	31	32	33	34	35
A_{pre}	-0.01	-0.01	-0.03**	-0.00	-0.01	-0.00
	(-0.86)	(-0.82)	(-2.09)	(-0.09)	(-0.35)	(-0.02)
A_{0-3}	0.01	0.00	-0.02	0.01	-0.00	0.03
	(0.17)	(0.13)	(-0.67)	(0.50)	(-0.12)	(1.02)
A_{4-10}	0.03	0.03	0.00	-0.00	-0.03	0.03
	(0.62)	(0.53)	(0.00)	(-0.08)	(-0.52)	(0.90)
A_{11+}	-0.01	-0.02	-0.02	-0.03	-0.06	0.01
	(-0.26)	(-0.42)	(-0.43)	(-0.95)	(-1.04)	(0.17)
Lagged dependent				0.84***	0.87***	1.04***
				(29.71)	(31.60)	(144.75)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Municipal fixed eff.	Yes	Yes	Yes	Yes	Yes	Yes
Municipal time trends	Yes	Yes	Yes	No	No	No
Observations	1,485	1,111	4,255	1,350	1,010	3,868
Municipalities	135	101	387	135	101	387
R^2	0.44	0.41	0.58			
Pseudo-R^2 (within)				0.23	0.20	0.48

T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs. * denotes significance at the 10% confidence level, ** significance at the 5% confidence level, and *** significance at the 1% confidence level.

[19] Data provided by the Ministry of the Interior and Kingdom Relations.

Level of debt

So far, we have focussed on the spending side of government finances. No significant robust amalgamation effect has been found in that area. Theory suggests other approaches as well. The common-pool hypothesis predicts that amalgamating municipalities might not (only) induce increased spending, but might also increase debt size in the years preceding amalgamation. Also, changes in ambition and efficiency might be reflected in debt levels after amalgamation. In order to test these hypotheses, we introduce a new dependent variable debt per capita. Data for this variable was retrieved from Statistics Netherlands, using municipal balances for the period 2005-2011, from which we have taken the sum of fixed and current liabilities.

Table 2.11 shows that the results are in line with the overall results seen so far. Neither before, nor after amalgamation, can any effect from amalgamation be observed. We find no evidence for the common pool hypothesis.

Table 2.11: Regressions of debt per capita: alternative control groups

Model	Static	Static	Static	Dynamic	Dynamic	Dynamic
Control group	Amalgamated or almost amalgamated	Amalgamated	All	Amalgamated or almost amalgamated	Amalgamated	All
Regression number	36	37	38	39	40	41
A_{pre}	-0.06	-0.03	-0.07	-0.08	-0.05	-0.03
	(-0.58)	(-0.38)	(-0.64)	(-0.71)	(-0.56)	(-0.27)
A_{0-3}	-0.08	-0.04	-0.10	-0.09	-0.04	-0.06
	(-0.63)	(-0.29)	(-0.74)	(-0.60)	(-0.41)	(-0.52)
A_{4-10}	-0.15	-0.10	-0.17	-0.20	-0.12	-0.13
	(-0.97)	(-0.67)	(-1.04)	(-1.33)	(-1.01)	(-0.89)
A_{11+}	-0.09	-0.07	-0.13	-0.21	-0.08	-0.09
	(-0.58)	(-0.45)	(-0.76)	(-1.21)	(-0.58)	(-0.61)
Lagged dependent				0.50***	0.77***	0.71***
				(12.19)	(19.95)	(23.63)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Municipal fixed eff.	Yes	Yes	Yes	Yes	Yes	Yes
Municipal time trends	Yes	Yes	Yes	No	No	No
Observations	904	676	2,629	758	567	2,216
Municipalities	135	101	387	135	101	387
R^2	0.50	0.63	0.61			
Pseudo-R^2 (within)				0.15	0.30	0.27

T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs. * denotes significance at the 10% confidence level, ** significance at the 5% confidence level, and *** significance at the 1% confidence level.

Tax rates and tax revenues

The final category of dependent variables that we have taken an interest in, lies on the revenue side of the municipal budget. As noted before, taxation possibilities for municipalities in the Netherlands are limited, since roughly two thirds of municipal income consist of grants from central government. The size of the grant for an municipality is based on factors that lie outside of the sphere of influence of the municipalities.

About 15% of municipal income comes from taxes and user fees and the size of that source of income is determined by the local government. Therefore, It is interesting to focus on this aspect of local finances since a change in behavior due to increased efficiency might be more easily observable in variables that are largely determined by the municipalities themselves.

Local government is free to decide which taxes will be imposed and what user fees are charged, but this freedom of choice is limited to a selection of potential taxes and levies that has been determined on a national level. Many taxes are levied in a limited number of municipalities (e.g., dog tax, tourist tax, commuter tax) and have been introduced in some municipalities and abolished in others during our research period. As a result, they are not suitable for our analysis of amalgamation effects.

Two user fees and one tax have been consistently levied in all municipalities in our research period and form a significant source of income for municipalities. Sewer charges and waste disposal charges are both user fees that are linked directly to specific public services. The total revenues from these fees are not allowed to exceed the associated costs. Hence, the freedom in setting the rates for these user fees is limited for municipalities that aim for full cost coverage for these public services. The municipal property tax rate can be set freely by individual municipalities[20], with separate rates for residential and non-residential buildings. Local governments can spend the revenues of this tax at their own discretion.

The data is available from COELO, and is taken for the period 2002-2013 to correspond with the period used to analyze expenditures. Since property tax is the only significant tax that is set freely by municipalities, our dependent variable focusses on this. We select total property tax revenue per capita, which also takes into account property tax revenues levied from non-households.

Table 2.12 shows that property tax revenues appear unaffected by amalgamation. Hence, our initial conclusions that amalgamations do not affect public finances are reaffirmed when studying different aspects of municipal finances.

[20] In 2006 and 2007, property tax rates were capped at the municipality level. Furthermore, a national norm ('macronorm') for the total nationwide growth of property tax revenues is in place, although as of yet no immediate measures have been taken when this norm was violated in 2012 and 2013.

Table 2.12: Regressions of property tax revenues per capita: alternative control groups

Model	Static	Static	Static	Dynamic	Dynamic	Dynamic
Control group	Amalgamated or almost amalgamated	Amalgamated	All	Amalgamated or almost amalgamated	Amalgamated	All
Regression number	42	43	44	45	46	47
A_{pre}	0.01	-0.01	0.01	-0.01	-0.00	0.00
	(0.16)	(-0.17)	(0.21)	(-0.24)	(-0.03)	(0.06)
A_{0-3}	0.04	0.01	0.04	-0.00	0.02	-0.00
	(0.63)	(0.23)	(0.52)	(-0.05)	(0.36)	(-0.02)
A_{4-10}	0.07	0.05	0.07	0.00	0.03	0.01
	(1.07)	(0.66)	(0.96)	(0.06)	(0.54)	(0.21)
A_{11+}	0.07	0.05	0.08	-0.00	0.04	0.01
	(1.12)	(0.73)	(1.04)	(-0.02)	(0.62)	(0.21)
Lagged dependent				0.79***	0.94***	0.59***
				(13.99)	(11.06)	(22.19)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Municipal fixed eff.	Yes	Yes	Yes	Yes	Yes	Yes
Municipal time trends	Yes	Yes	Yes	No	No	No
Observations	1,265	937	3,681	1,062	778	3,151
Municipalities	135	101	387	135	101	387
R^2	0.86	0.86	0.82			
Pseudo-R^2 (within)				0.79	0.80	0.71

T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs. * denotes significance at the 10% confidence level, ** significance at the 5% confidence level, and *** significance at the 1% confidence level.

Robustness test: IV estimation

When we use the number of FTE's, wage budget, debt and property tax revenues per capita in an IV estimation similar to table 2.7, we see that the absence of significant amalgamation effects is robust to this change of methodolgy. The results of these analyses are presented in tables 2.13 and 2.14.

Table 2.13: Regressions of FTEs and wage sum per capita: instrumental variable approach

Control group	Amalgamated or almost amalgamated			
Dependent variable (per capita)	FTEs		Wage sum	
Model	IV estimate	1st stage regression	IV estimate	1st stage regression
Regression number	48	49	50	51
Average population per jurisdiction	0.01		0.02	
	(0.40)		(0.66)	
Amalgamated		0.95***		0.95***
		(15.77)		(15.77)
Year effects	Yes	Yes	Yes	Yes
Municipal fixed effects	Yes	Yes	Yes	Yes
Municipal time trends	Yes	Yes	Yes	Yes
Observations	1,485	1,485	1,485	1,485
Municipalities	135	135	135	135
R^2	0.00	0.961	0.00	0.961
Kleibergen-Paap F	248.9		248.9	

T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs. Significance: *** p<0.01, ** p<0.05, * p<0.1.

Table 2.14: Regressions of debt and property tax revenues per capita: instrumental variable approach

Control group	Amalgamated or almost amalgamated			
Dependent variable (per capita)	Debt		Property tax revenues	
Model	IV estimate	1st stage regression	IV estimate	1st stage regression
Regression number	52	53	54	55
Average population per jurisdiction	0.01		0.01	
	(0.24)		(0.30)	
Amalgamated		0.99***		0.95***
		(11.56)		(16.44)
Year effects	Yes	Yes	Yes	Yes
Municipal fixed effects	Yes	Yes	Yes	Yes
Municipal time trends	Yes	Yes	Yes	Yes
Observations	904	904	1,265	1,265
Municipalities	135	135	135	135
R^2	0.03	0.960	0.02	0.971
Kleibergen-Paap F	133.8		270.4	

T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs. Significance: *** p<0.01, ** p<0.05, * p<0.1.

2.7 Conclusion

In this chapter we consider the effects of municipal amalgamation on several aspects of municipal finances. We first focus on total spending per capita, a variable that gives a good impression of financial developments in general. With dynamic data panel analysis and several dummy variables measuring amalgamation effects in different time periods before and after amalgamation, we find that there is no robust significant amalgamation effect. Even though we do find a pre-amalgamation effect that borders on insignificance, this result does not hold when we use alternative control groups or alternative econometrical approaches (instrument variables approach or a dynamic panel including spatial lag).

Analyses using dependent variables that cover different aspects of municipal finances confirm these findings. We have studied spending on personnel by using per capita variables measuring the number of FTE's employed and the wage sum paid by municipalities but no amalgamation effects is found there either. The same can be said of the level of debt and the revenues of the most important local tax (property tax). For none of these variables, amalgamation effects are observed.

These findings do not settle the debate in the literature with regard to post-amalgamation effects, with authors previously having presented evidence of both higher and lower spending after amalgamations. The fact that budget cuts for municipalities in the Netherlands in the near future are based on expectations of lowered spending after amalgamations, raises doubts about the reasoning behind these budget cuts.

The absence of any evidence of a robust common pool effect (or pre-amalgamation effect) does not seem to be in line with several publications that do indeed find such an effect (most recently Hansen (2014) in Sweden and Saarimaa and Tukiainen (2013) in Finland). This could be due to institutional differences between the studied countries with regard to budget rules for municipalities.

The findings in general do leave room for extended research on the topic, which will be presented in the next chapter.

Chapter 3 - An extended analysis of amalgamation effects

This chapter is based on Allers and Geertsema (2016).

In the previous chapter, we have seen that no robust effect of amalgamation on total spending is found. Similar results were found when using the number of employees (FTE), wage sum, debt level and property tax revenues per capita. The first part of this chapter shifts the focus back to our main variable of interest, total spending per capita.

The results with this dependent variable were unaffected by the chosen control group or regression model, and held for all time periods around amalgamation, be it shortly before, shortly after or even in the medium or long term after amalgamation. In this chapter, we will delve further into these findings too see if they are truly representing the absence of an amalgamation effect, or if they are the result of the decision to study the effect on all municipalities within the control groups. By differentiating between different types of amalgamated municipalities we might observe different effects.

As a second extension, we study whether amalgamation affects spending on different public services as opposed to aggregate spending. We focus on public services that could theoretically be expected to be affected by an amalgamation. This approach might produce some information on the level of public services that is offered by amalgamated municipalities. Finally, we continue our analysis of public service levels by studying amalgamation effects on house prices. Theories on capitalization of efficiency gains predict that these gains should be reflected in higher house prices. An absence of an effect of amalgamation of house prices would therefore indicate that there is no amalgamation effect on efficience either.

3.1 Does amalgamation affect total spending of certain types of municipalities?

The effect of population size

As described in chapter 1, compared to those in other countries, Dutch municipalities are large. Perhaps economies of scale only exist in small municipalities.[21] Moreover, the amalgamation effect might differ for municipalities with different characteristics, and this effect might even work in opposite directions for different amalgamations. Since our analysis so far concerns the aggregate effect, i.e., for all amalgamations, the results might reflect both positive and negative effects that cancel out. Therefore, we now test whether the amalgamation effect for small municipalities, where economies of scale are more likely, differs from that for large municipalities.

To this end, we introduce four interaction dummies corresponding with our four amalgamation dummies. These interaction dummies measure the influence of the population size on the size of the amalgamation effect in a certain period. The results for the dynamic model and the static model with municipality trends are presented in columns (1) and (2) of table 3.1. None of the amalgamation dummies and none of the interaction variables have significant coefficients. The relevant effect, however, is the combined effect of both amalgamation and population, and cannot be read from the table directly. Instead, the amalgamation effect and its confidence intervals for the relevant range of population sizes are best presented in a graph. Figure 3.1 presents the combined effect of the amalgamation dummies and the interaction with population in the dynamic model.[22] The marginal effect is drawn as a solid line, while the 95 percent confidence interval lies between the dashed lines. If there is a certain population range for which the confidence interval lies above or below the x-axis, this can be interpreted as a significant amalgamation effect at the 5 percent confidence level. Also, if it is possible to draw a horizontal line that lies within the confidence interval, this can be interpreted as an absence of a significant interaction effect. The vertical bars represent the number of municipalities observed in that population range, where we use intervals of 1,000. The amalgamation effects turn out not to vary with population size, and the slope of the marginal effect line is nearly horizontal. Thus, we find no indication of (dis)economies of scale for small (large) municipalities. Also, we see that the post-amalgamation effects are insignificant for the entire population range. Results for other control groups are similar, as well as outcomes for the static model with municipality trends.

[21] Hanes (2014) found that a negative amalgamation effect on spending in Sweden exists only for municipalities below a certain critical size.

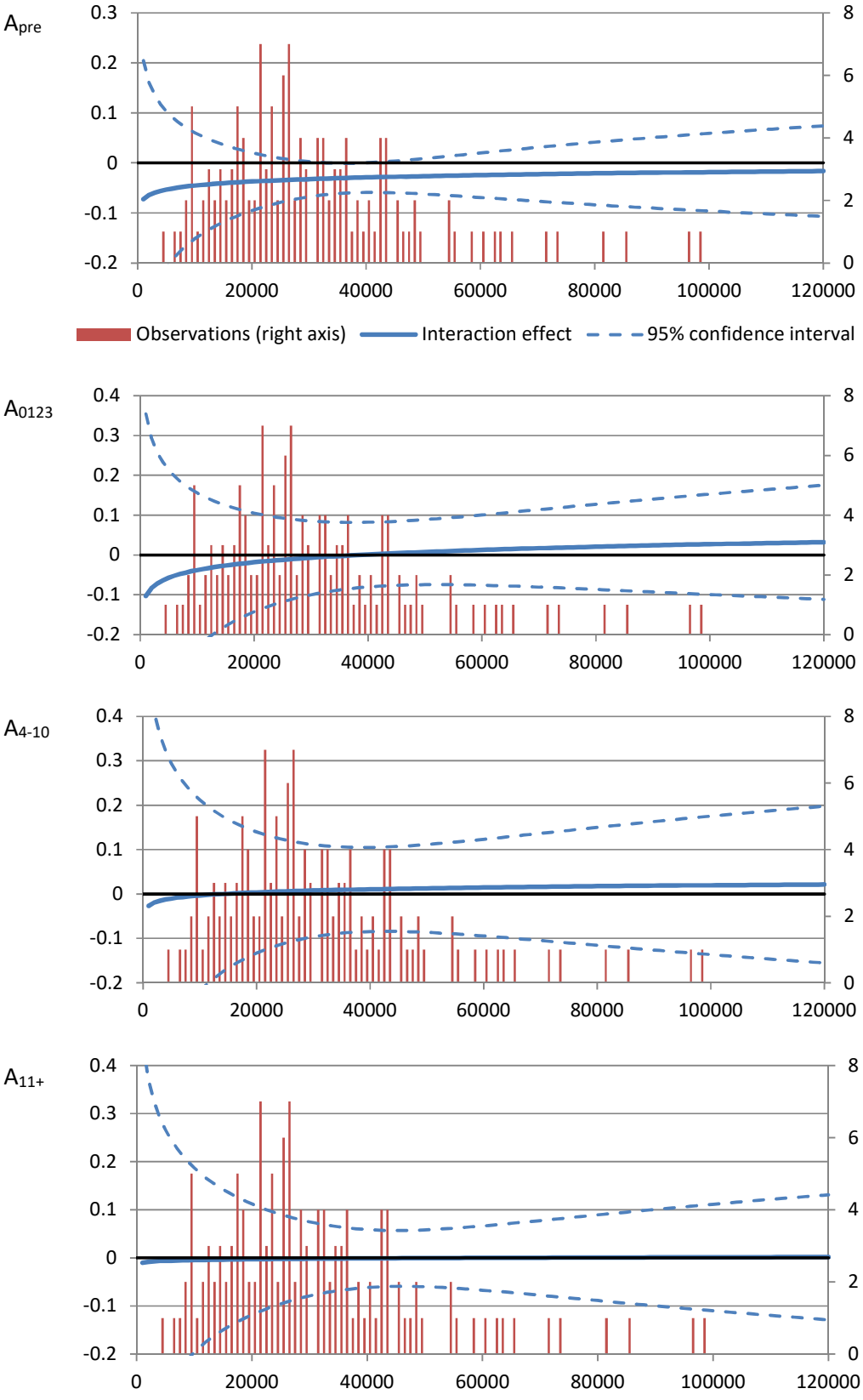
[22] The marginal effect of amalgamation on per capita spending is calculated as $\beta_1 + \beta_2 \text{Population}$, where β_1 is the coefficient of the amalgamation dummy A_x and β_2 the coefficient of the interaction term Population*A_x. The standard error is given by $\sqrt{\text{var}(\beta_1) + \text{Population}^2\text{var}(\beta_2) + 2\text{Population cov}(\beta_1\beta_2)}$. See, e.g., Brambor et al. (2006).

Table 3.1: Regression of total per capita spending; static and dynamic panel with interaction terms

Interaction variable	Population before amalg.		Difference in ideology	
Model	Static	Dynamic	Static	Dynamic
Regression number	1	2	3	4
A_{pre}	-0.60	-0.15	-0.03	-0.03*
	(-1.34)	(-0.38)	(-1.27)	(-1.82)
A_{0-3}	-0.61	-0.33	0.01	-0.00
	(-0.94)	(-0.55)	(0.18)	(-0.06)
A_{4-10}	-0.68	-0.11	0.02	0.00
	(-0.94)	(-0.16)	(0.47)	(0.01)
A_{11+}	-0.67	-0.03	0.03	0.00
	(-0.91)	(-0.04)	(0.57)	(0.02)
Interaction with A_{pre}	0.05	0.01	-0.09	0.03
	(1.29)	(0.30)	(-1.51)	(0.39)
Interaction with A_{0-3}	0.06	0.03	-0.19	0.02
	(0.91)	(0.57)	(-1.55)	(0.10)
Interaction with A_{4-10}	0.06	0.01	-0.23	0.00
	(0.92)	(0.17)	(-1.46)	(0.02)
Interaction with A_{11+}	0.06	0.00	-0.22	-0.01
	(0.91)	(0.04)	(-1.29)	(-0.04)
Population before amalg.	0.05	0.01		
	(1.29)	(0.30)		
Difference in ideology			-0.09	0.03
			(-1.51)	(0.39)
Lagged dependent		0.70***		0.70***
		(16.78)		(16.68)
Control variables	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Municipal fixed effects	Yes	Yes	Yes	Yes
Municipal time trends	Yes	No	Yes	No
Observations	1,541	1,339	1,541	1,339
Municipalities	135	135	135	135
R^2 (within)	0.74		0.74	
Pseudo-R^2 (within)		0.67		0.52

Control group: amalgamated or almost amalgamated. T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs, except for the political difference variables. * denotes significance at the 10% confidence level, ** significance at the 5% confidence level, and *** significance at the 1% confidence level.

Figure 3.1: Marginal effect of amalgamation on total municipal spending, conditional on population, for all four measured time periods around amalgamation



We do see that the pre-amalgamation effect bordering on being significant found in chapter 2 manifests itself in the first panel. For a very small range (approximately 35,000 to 38,000 after amalgamation) the effect is significant and negative. However, when using different control groups (as in table 2.8) the effect is insignificant for the entire range, so as with the basic analysis, we find that this result is found not to be robust. [23]

The effect of preference heterogeneity

The amalgamation of a number of municipalities is not merely a matter of removing internal borders and merging the administrative organization. In addition to the territorial and organizational changes, multiple local administrations with potentially different political preferences will have to form one new administration and set one uniform policy for all local issues. This change potentially affects public spending through an increase of local ambitions. When different ambition levels for a certain public service exist, it is more likely that the highest service level will become the new standard for the entire municipality than that service levels will be lowered for certain functions. This effect can work through in every single public service, e.g. the maintenance of roads in the former district A might be raised to the level of district B, while simultaneously public sports facilities in district B will be improved to the level of district A. (Park 2013).

It is interesting to see whether the absence of an amalgamation effect is the result of a combination of this effect, with possible efficiency gains compensating for this increased ambition. For municipalities with heterogeneous preferences, efficiency gains are then used to increase service levels, resulting in unchanged public spending. Homogeneous preferences would not lead to increased ambitions, allowing those municipalities to use increased efficiency to reduce public spending. To test whether preference heterogeneity affects amalgamation effects, we again use interaction variables. As an indicator for preference heterogeneity, various measures are available.

1. Our variable measuring the political ideology of the parties governing the amalgamated jurisdictions is an objective measure. To measure heterogeneity, we can calculate the difference between the highest and the lowest value of ideology among jurisdictions in the year before they amalgamate.
2. The same calculation can be done using the ideology of the entire municipal council. This includes the parties that are not in the coalition.
3. Both measures of ideology pay very little attention to the exact composition of the coalition or the entire council respectively. For example, a coalition existing of one neutral party has the same ideology as a coalition of a right-wing party and an equally large left-wing party. We construct another variable that addresses this problem. To do this, for an amalgamation of two municipalities, we take the difference between the number of seats each party has in both municipalities, and take the sum of those

[23] See figure 4A in the appendix for graphical results.

differences. Again, for more than three amalgamating municipalities, we take the difference between the maximum and the minimum number of seats in any council in the year before amalgamation.

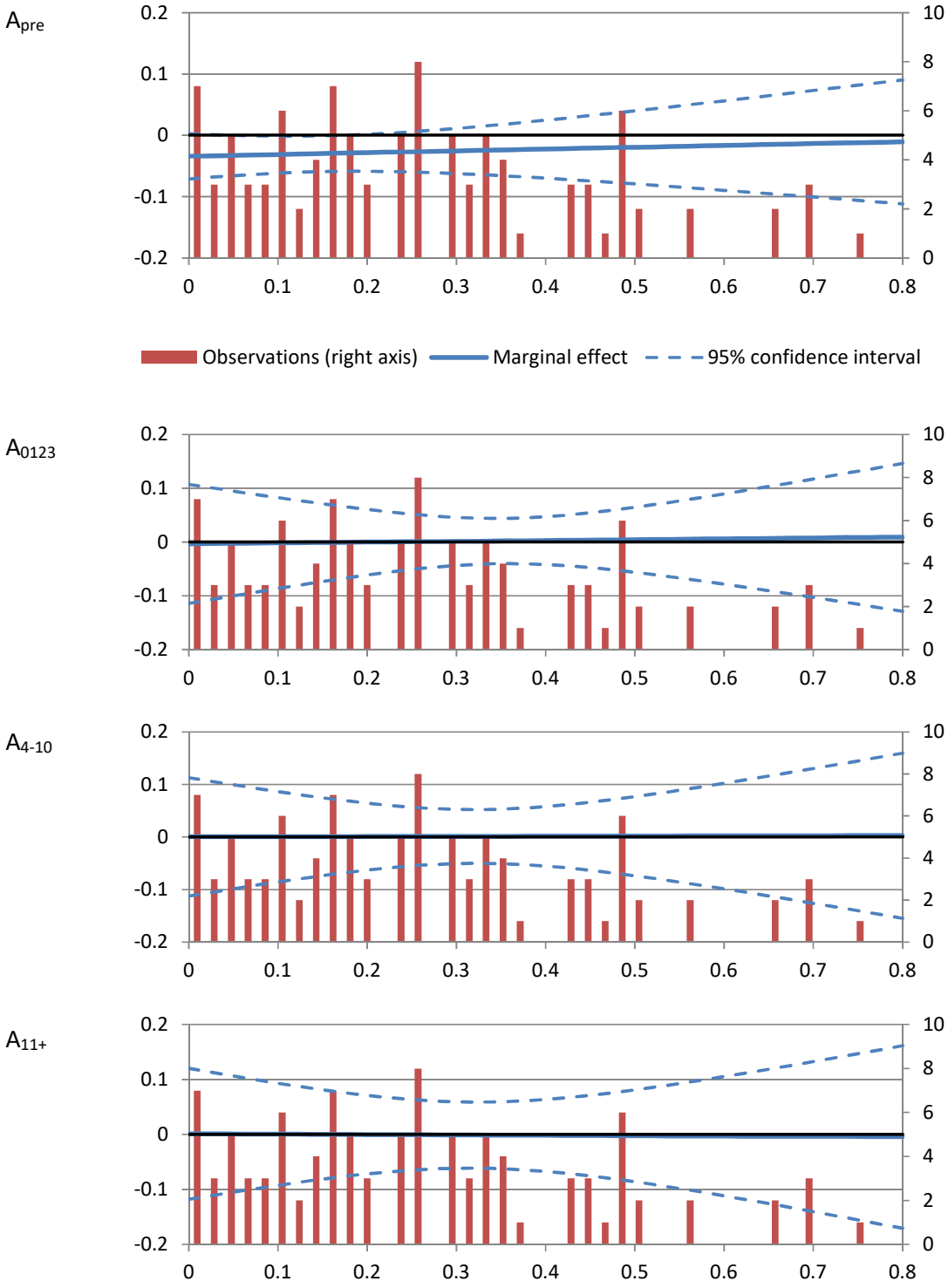
4. This third measure may overestimate actual differences, because it ignores the fact that different political parties sharing the same ideology are more interchangeable in terms of preferences than two parties of different ideologies. To address this, we construct a variable by first grouping the political parties based on ideology (left-wing, right-wing and neutral), and then calculating the sum of seat differences for these groups instead of for the individual parties.

We have run regressions with all four measures for preference heterogeneity, but since the results are virtually identical regardless of the measure chosen, we focus on the results using the first one, the differences in political ideology of the parties governing the amalgamating jurisdictions. These are given in columns (3) and (4) of table 3.1, and a graphical presentation is given in figure 3.2. As with population, we see a small range for difference of ideology (0,06 to 0,16) for which the pre-amalgamation effect is significantly negative. However, this result is not robust for changes in the control group.[24]

[24] See figure 3B in the appendix for graphical results

Figure 3.2: Marginal effect of amalgamation on total municipal spending, conditional on preference heterogeneity

Preference heterogeneity (for ideology of the coalition) on the horizontal axis, marginal effect on the left hand axis, number of observations on the right hand axis



The effect of the number of amalgamating municipalities

A last possible factor influencing the amalgamation effect is the number of amalgamating municipalities. The larger this number is, the larger the potential savings can be from removing redundant components from multiple municipal organizations. As we saw in figure 2.2, most amalgamations concern two or three jurisdictions. The number of observations for amalgamations of four or more municipalities is very small. Hence, a model with interaction variables which measure the marginal effect conditional on the number of amalgamating municipalities is not suitable. Consequently, we test only whether the effect of amalgamating two jurisdictions differs from the effect of amalgamating three jurisdictions.

To do this, we run regressions in which the original amalgamation dummies have been split in two sets. One set (starting with Mun2) takes the value of 1 in the appropriate period only when two jurisdictions are amalgamated, the other (starting with Mun3) takes the value of 1 when three jurisdictions are amalgamated. Table 3.2 presents regression outcomes. Amalgamations of more than three municipalities are omitted. Lower and upper limits are given for the 95% confidence intervals. We find that there are no significant differences in amalgamation effects for any period or model.

Table 3.2: Amalgamation effect for amalgamations with two and three municipalities

Control group	Amalgamated and almost amalgamated					
Model	Static	Confidence interval		Dynamic	Confidence interval	
		Lower	Upper		Lower	Upper
Regression number	5			6		
Mun2 * A_{pre}	-0.07**	-0.14	-0.00	-0.06	-0.14	0.02
	(-2.02)			(-1.46)		
Mun2 * A_{0-3}	-0.08*	-0.17	0.01	-0.03	-0.14	0.09
	(-1.83)			(-0.44)		
Mun2 * A_{4-10}	-0.08	-0.18	0.02	-0.03	-0.14	0.08
	(-1.49)			(-0.54)		
Mun2 * A_{11+}	-0.07	-0.17	0.04	-0.04	-0.16	0.08
	(-1.22)			(-0.63)		
Mun3 * A_{pre}	-0.03	-0.07	0.01	-0.02	-0.07	0.03
	(-1.45)			(-0.76)		
Mun3 * A_{0-3}	-0.00	-0.11	0.11	0.03	-0.04	0.09
	(-0.00)			(0.76)		
Mun3 * A_{4-10}	0.02	-0.10	0.15	0.03	-0.05	0.11
	(0.34)			(0.77)		
Mun3 * A_{11+}	0.04	-0.09	0.18	0.02	-0.06	0.10
	(0.60)			(0.54)		
Lagged dependent				0.69***	0.61	0.77
				(16.95)		
Municipality time trends	Yes			No		
Observations/municipalities	1,345/ 118			1,167/ 118		
R^2 (within) resp. Pseudo-R^2	0.75			0.68		

Control variables, year effects and municipality fixed effects included. T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs. * denotes significance at the 10% confidence level, ** significance at the 5% confidence level, and *** significance at the 1% confidence level.

Hence, there is no evidence suggesting that our failure to find a significant amalgamation effect on total spending is the result of averaging out counteracting effects for small and large, or homogeneous and heterogeneous, jurisdictions. The number of amalgamating jurisdictions does not affect the amalgamation effect either.

3.2 Changes in service levels

Finally, it is conceivable that economies of scale do occur, but that they are not used to reduce spending but to increase public service levels. In that case, the amalgamation effect will not be observable in the total level of municipal spending, but should be observable in the composition thereof, or in the appreciation of local public services. We investigate this possibility by analyzing this composition, and the effect of amalgamation on house prices.

Composition of spending

The spending category where we would most expect economies of scale is administration. Spending on administration of Dutch municipalities includes remunerations for mayor, aldermen and members of the municipal council, and spending on staff and administrative support of these administrators and politicians. Amalgamations reduce the number of aldermen, council members and mayors. We do indeed find a significantly negative

Table 3.3: Regressions of share of spending categories in total spending (control group: amalgamated or almost amalgamated)

Dependent variable	Share of administration		Share of culture & recreation	
Model	Static	Dynamic	Static	Dynamic
Regression number	7	8	9	10
A_{pre}	0.01	-0.01	0.02	0.02
	(0.21)	(-0.19)	(0.82)	(0.52)
A_{0-3}	-0.22**	-0.12	0.07*	0.03
	(-2.09)	(-1.63)	(1.69)	(0.83)
A_{4-10}	-0.24**	-0.14*	0.06	0.02
	(-2.17)	(-1.76)	(1.12)	(0.55)
A_{11+}	-0.27**	-0.18**	0.05	0.03
	(-2.30)	(-2.18)	(0.96)	(0.51)
Lagged dependent		0.68***		0.60***
		(16.48)		(16.95)
Control variables	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Municipal fixed effects	Yes	Yes	Yes	Yes
Municipal time trends	Yes	No	Yes	No
Observations	1,515	1,311	1,514	1,309
Municipalities	135	135	135	135
Pseudo-R^2 (within)		0.41		0.27
R^2	0.50		0.40	

T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs. * denotes significance at the 10% confidence level, ** significance at the 5% confidence level, and *** significance at the 1% confidence level.

amalgamation effect on long run spending on administration in both the static and the dynamic model (table 3.3). This points to economies of scale in this specific area. Any savings on administration might have been used on different spending categories, perhaps raising public service levels. However, as the share of administration outlays in total spending is small, it cannot be ruled out a priori that savings on administration have been used to reduce total spending, but that the effect is too small to be picked up by our regressions.

If efficiency gains have been used to improve public services, one would expect higher spending levels in policy fields where spending is largely discretionary and aimed at providing services to the public. In the Netherlands, spending on many municipal tasks is driven by national guidelines or economic developments (e.g., welfare). In contrast, spending on culture & recreation is characterized by a large degree of freedom for local politicians. Moreover, this category consists of outlays for services that benefit citizens directly. Columns (9) and (10) of table 3.3 present regressions with the share of spending on culture & recreation as dependent variable. In the dynamic model, we find no significant effect of amalgamations on this share. In the static setting with municipality trends, we do find a positive effect immediately after amalgamation, that borders on significance. There is no long term effect, though. If there were any efficiency gains from amalgamation, these should not disappear over time, which leads us to the conclusion that even the results for the static model are no indication of efficiency gains.

Capitalization of changes in service levels

Instead of focussing on individual spending categories, it is also possible to investigate whether amalgamation might raise the overall level of public services. If amalgamated municipalities improve service levels, this should make them more attractive to live in, ceteris paribus. Housing supply in the Netherlands is inelastic (Vermeulen and Rouwendal 2007). If a municipality becomes more attractive, local demand for housing will increase, resulting in rising house prices (Oates 1969; Brueckner 1979). Recent empirical studies in England and the Netherlands indicate that intergovernmental grants are fully capitalized into house prices with a lag of about two years (Hilber et al. 2011; Allers and Vermeulen 2013). We would expect the same to happen with funds that become available as a result of economies of scale. Thus, changes in quality-adjusted average house prices per municipality and per year seem a better indicator for changes in service levels that variables like birth rate that have been used in some previous amalgamation studies.[25]

We first ran a hedonic regression based on a panel data set which, for 1.7 million transactions in 1995-2013, contains sale prices and dates along with a rich set of house characteristics (number of rooms, floors, kitchens, bathrooms; year of construction,

[25] Hedonic price analysis has been used by many authors to measure the value of local public services. For examples see Zheng, Sun and Wang (2014) and the references provided therein.

proximity of busy roads, garden orientation, etc.).[26] The regression results were used to estimate the average house price per municipality and per year, keeping every other variable constant. The result is a price reflecting the value of a location in a particular municipality in a particular year. We next take this average house price as the dependent variable in a regression with amalgamation dummies, fixed effects, year effects and individual municipality trends on the right hand side. We have dropped municipalities if less than 20 transactions took place every year.

Table 3.4 shows that amalgamations do not raise house prices significantly. If anything, there is some weakly significant evidence of temporary negative amalgamation effects. Thus, we find no evidence supporting the improved public services hypothesis.

Table 3.4: Regressions of average house price

Control group	Amalgamated or almost amalgamated			
Dependent variable	Average house price			
Model	Static	Dynamic	IV	1st stage regression
Regression number	19	20	21	22
A_{pre}	-0.01*	-0.00		
	(-1.68)	(-0.29)		
A_{0-3}	-0.02*	0.01		
	(-1.82)	(0.99)		
A_{4-10}	-0.02*	0.02		
	(-1.67)	(1.19)		
A_{11+}	-0.01	0.02		
	(-0.88)	(1.13)		
Lagged dependent		1.45***		
		(83.12)		
Average population per jurisdiction			-0.00	
			(-0.88)	
Amalgamated				0.95***
				(16.39)
Control variables	No	No	No	No
Year effects	Yes	Yes	Yes	Yes
Municipal fixed effects	Yes	Yes	Yes	Yes
Municipal time trends	Yes	No	Yes	Yes
Observations	1,464	1,340	1,464	1,464
Municipalities	122	122	122	122
Pseudo-R^2 (within)		0.92		
R^2 (within)	0.94			0.96
Kleibergen-Paap F			269	

T-values between parentheses, based on robust standard errors clustered by municipality. Variables are expressed in logs. * denotes significance at the 10% confidence level, ** significance at the 5% confidence level, and *** significance at the 1% confidence level.

[26] Data have been kindly made available by the Dutch Association of Realtors (*Nederlandse Vereniging van Makelaars o.g. en vastgoeddeskundigen, NVM*). For regression results see Table 3C in the Appendix.

3.3 Conclusion

This chapter presented a more extensive analysis of amalgamation effects on the main dependent variable measuring local finances, being total expenditures. The conclusion that there are no robust amalgamation effects whatsoever, based on our initial analyses as presented in chapter 2, might raise several questions with regard to the interpretation of those results.

One objection might be that we have taken all municipalities and differentiated them only based on the question whether or not they had (almost) been amalgamated. This produces aggregate results that do not take into account characteristics that might influence the direction and extent of potential amalgamation effects. However, in this chapter we found that the initial findings where not a result of counteracting effects cancelling each other out. We have differentiated municipalities using interaction variables based on population size and ideological heterogeneity and the results of chapter 2 have proven to be robust.

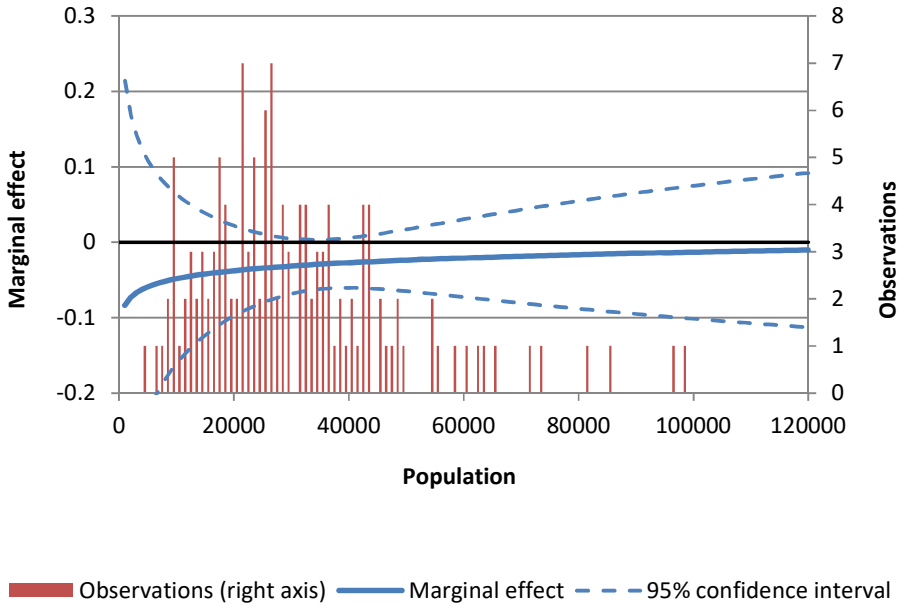
A second objection might be that focussing on total spending provides an incomplete picture of the effects of amalgamation, and that efficiency, measuring both output (public service delivery) and input (municipal budgets), gives a much more inclusive insight in these effects. Total output of a municipality is extremely hard to measure, but we have taken two alternative approaches to shed some light on this topic. We have focused on spending on culture and recreation, a spending category which is highly observable to voters and which we might expect to grow when increased efficiency of the municipality on the whole would set free funds. However, we have found no amalgamation effect there. The second approach entails the use of changes in house prices within the municipality, with the idea that increased efficency would make a municipality more attractive to live in, putting upward pressure on these prices. Again, we have found no amalgamation effect using this approach either.

This leads us to conclude that the absence of amalgamation effects is not only highly robust and applicable to municipalities with different characteristics, but also to the efficiency of municipal public service delivery.

Appendix 3

Figure 3A: Marginal pre-amalgamation effect of amalgamation on total municipal spending, conditional on population, for the alternative control groups of amalgamated municipalities and all municipalities

Amalgamated municipalities



All municipalities

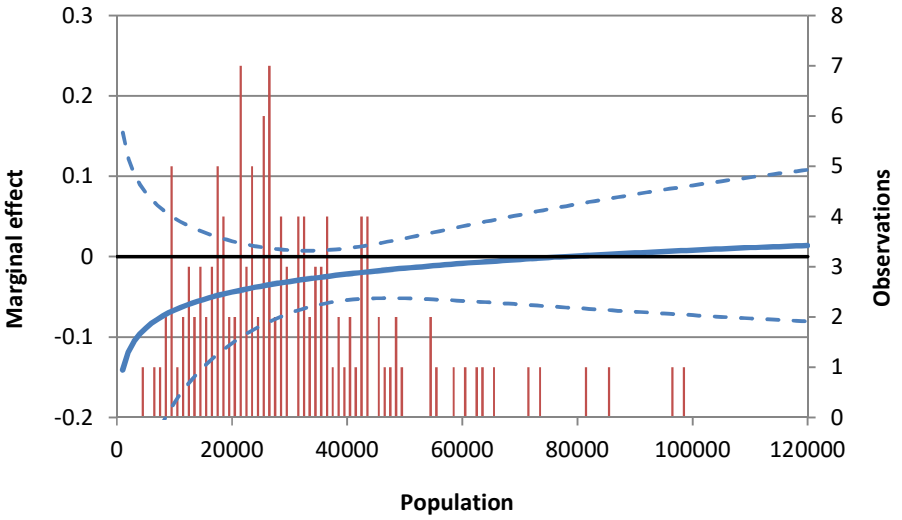
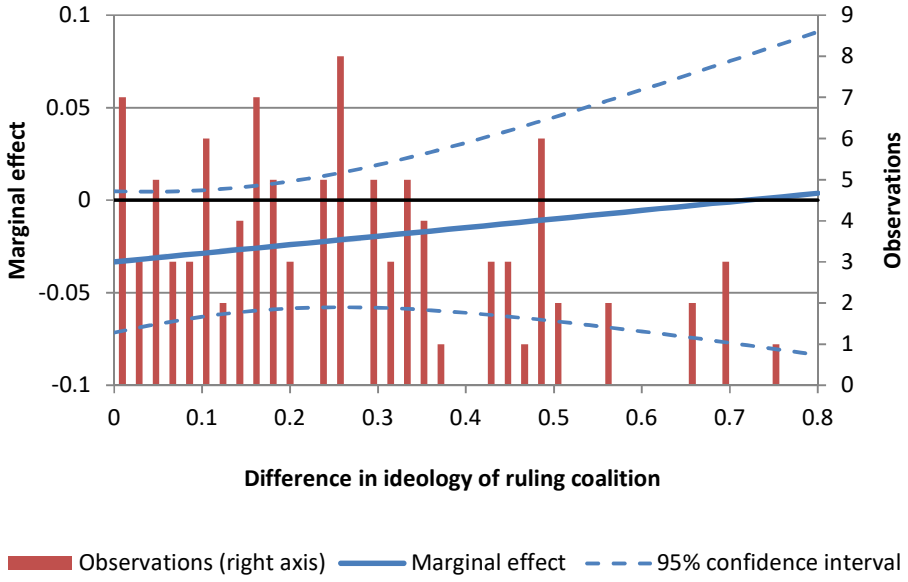


Figure 3B: Marginal pre-amalgamation effect of amalgamation on total municipal spending, conditional on difference in ideology, for the alternative control groups of amalgamated municipalities and all municipalities

Amalgamated municipalities



All municipalities

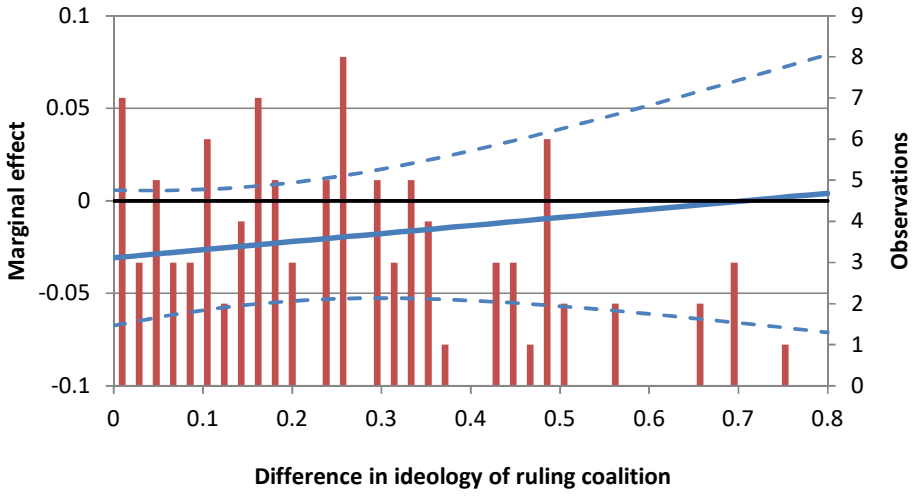


Table 3C: Hedonic regression of house prices

The average house price per municipality per year is obtained by regressing the log of the transaction price in 2013 euros on dwelling characteristics and municipality/year-specific fixed effects. Dwelling characteristics are differentiated for single family units and apartments whenever relevant. For robustness, we exclude municipalities where less than 20 houses were sold in any single year. Using 50 as a cut-off point does not change the results much. The price index is constructed from the fixed effects.

Lot area (log)	0.153***		
	(109.6)	4 bathrooms (house)	0.139***
Living area (log)	0.156***		(21.09)
	(49.32)	2 bathrooms (apartment)	0.0463***
Living area (log))	0.714***		(11.83)
	(59.44)	3 bathrooms (apartment)	0.181***
Log volume (house)	0.346***		(27.30)
	(103.1)	Open porch	-0.0706***
Log volume (apartment)	0.0381***		(-6.226)
	(6.685)	Elevator	0.0341***
2 rooms (house)	-0.0294***		(14.38)
	(-4.469)	Basement	0.0198***
3 rooms (house)	-0.0204***		(9.300)
	(-3.726)	Semi-detached house	0.0280***
4 rooms (house)	-0.00365		(17.80)
	(-0.674)	Townhouse (end of block)	0.00846***
5 rooms (house)	0.00806		(12.41)
	(1.488)	Duplex house	0.0669***
6 rooms (house)	0.0271***		(45.74)
	(5.003)	Detached house	0.124***
7 rooms (house)	0.0629***		(61.17)
	(10.73)	Simple house	-0.0551***
2 rooms (apartment)	0.0281***		(-31.44)
	(5.168)	Canal house	0.241***
3 rooms (apartment)	0.0299***		(25.62)
	(4.447)	Manor house	0.111***
4 rooms (apartment)	-0.0209***		(55.50)
	(-2.578)	Farm house	-0.0304***
5 rooms (apartment)	-0.000931		(-9.636)
	(-0.143)	Bungalow	0.137***
6 rooms (apartment)	0.0354***		(77.21)
	(4.496)	Villa	0.199***
7 rooms (apartment)	0.0555***		(94.80)
	(5.338)	Country house	0.160***
2 balconies (house)	0.0596***		(58.93)
	(46.87)	Downstairs apartment	-0.0964**
3 balconies (house)	0.0970***		(-2.571)
	(10.23)	Upstairs apartment	-0.179***
2 dormers (house)	0.0237***		(-4.631)
	(34.06)	Maisonnette	-0.208***
3 dormers (house)	0.0349***		(-5.432)
	(14.65)	Porch flat	-0.165***
Roof terrace (house)	0.0264***		(-4.245)
	(24.59)	Flat with walkway access	-0.173***
Roof terrace (apartment)	0.0443***		(-4.624)
	(20.41)	Care flat	-0.0969***
Scullery (apartment)	0.0926***		(-2.623)
	(36.18)	Built between 1906-1930	-0.0609***
2 bathrooms (house)	0.0184***		(-20.60)
	(13.57)	Built between 1931-1944	-0.0578***
3 bathrooms (house)	0.0769***		(-11.07)

Built between 1945-1959	-0.0831***
	(-20.90)
Built between 1960-1970	-0.119***
	(-24.99)
Built between 1971-1980	-0.0895***
	(-19.09)
Built between 1981-1990	-0.0398***
	(-8.767)
Built between 1991-2000	0.0171***
	(3.601)
Built after 2001	0.0431***
	(7.009)
Low quality apartment	-0.0514***
	(-15.08)
High quality apartment	0.107***
	(34.87)
Interior maintenance state good	0.0674***
	(66.37)
Interior maintenance state excellent	0.114***
	(66.64)
Interior maintenance state bad	-0.0369***
	(-17.36)
Exterior maintenance state good	0.0480***
	(40.53)
Exterior maintenance state excellent	0.0580***
	(33.85)
Exterior maintenance state bad	-0.0530***
	(-20.88)
2 types of isolation	0.0174***
	(26.30)
3 types of isolation	0.0152***
	(16.89)
4 types of isolation	0.0112***
	(9.292)
5 or more types of isolation	0.0153***
	(12.93)
Monument	0.105***
	(24.19)
Garden at North	-0.0150***
	(-15.51)
Garden at Northeast	-0.0121***
	(-9.997)
Garden at East	-0.0149***
	(-15.91)
Garden at Southeast	-0.00535***
	(-4.510)
Garden at South	-0.00367***
	(-4.062)
Garden at Southwest	-0.000430
	(-0.399)
Garden at West	-0.00783***
	(-8.325)
Garden at Northwest	-0.00857***
	(-7.109)
Garden to be laid out	0.00118
	(0.424)
Garden in neglected state	0.0456***
	(26.70)
Garden in normal state	0.0815***
	(45.99)
Garden in fine state	0.0690***
	(38.79)
Parking space present	0.0266***
	(25.09)
Carport (no garage) present	0.0522***
	(46.70)
Garage (no carport) present	0.0693***
	(95.00)
Carport and garage present	0.0746***
	(57.02)
Garage for multiple cars present	0.0671***
	(52.33)
Indoor parking space	-0.0181***
	(-15.96)
Situated downtown	0.0588***
	(43.03)
Situated near busy road	-0.0287***
	(-20.46)
Situated near forest	0.0578***
	(22.17)
Situated near water	0.0544***
	(34.29)
Situated near park	0.0165***
	(12.36)
Situated with free view	0.00612***
	(8.352)
Sold in February	0.00526***
	(7.725)
Sold in March	0.0111***
	(15.39)
Sold in April	0.0168***
	(21.67)
Sold in May	0.0222***
	(26.99)
Sold in June	0.0248***
	(26.81)
Sold in July	-0.0137***
	(-14.36)
Sold in August	-0.0112***
	(-12.21)
Sold in September	-0.00658***
	(-7.690)
Sold in October	-0.00526***
	(-6.850)
Sold in November	-0.00272***
	(-3.973)
Sold in December	-0.00220***
	(-3.162)
Constant	8.521***
	(498.6)
N	1,779,126
R-squared	0.876

Robust t-statistics in parentheses

*** p < 0.01, ** p < 0.05, * p < 0.1

Chapter 4 - The effect of intermunicipal cooperation on efficiency

This chapter is based on Allers et al. (2015).

Up to this point, our empirical research has focused on the effects of municipal amalgamation. There are other ways local government can increase the scale on which public services are produced: they can choose to cooperate with other governments or choose to contract out to or partner up with the private sector. Contracting out requires a competitive market, which does not exist for many services for which local government is responsible. Where it has been applied, results have often been disappointing (Bel et al. 2010). The same goes for public-private partnership (Andrews and Entwistle 2010). Therefore, this chapter focuses on intermunicipal cooperation and its effects on efficiency.

Paragraph 4.1 provides an overview of empirical research on intermunicipal cooperation. Next, we will give an insight of the institutional background relevant to this topic. Since general background information on municipalities in the Netherlands has already been given in paragraph 2.1, we will focus on intermunicipal cooperation and borrowing by and lending to local governments here. Paragraph 4.3 presents the method and data used. Paragraph 4.4 offers the results of our basic analysis while paragraph 4.5 elaborates and presents results of further analysis of the characteristics of intermunicipal cooperation and their effects on the results presented.

4.1 Empirical research on intermunicipal cooperation

Although intermunicipal cooperation is a wide-spread phenomenon (Hulst and Van Montfort 2012), it has not been extensively studied.

Empirical studies of the effects of cooperation or amalgamation often focus on spending levels. Higher spending does not necessarily point to increased inefficiency, however. It may

simply reflect rising public service levels. Unfortunately, efficiency of municipalities is hard to measure, because output is often ill-defined, heterogeneous and hard to quantify. Empirical studies in this field suffer from two fundamental problems (Geys and Moesen 2009). They have to make do with the scarce output indicators available, which usually are at best crude proxies for the true level of public good provision. Moreover, they rely on strong assumptions (e.g., regarding the cost function), or they are vulnerable to data errors (if data envelopment analysis is used to measure efficiency). Because all previous econometric papers on the effects of intermunicipal cooperation (reviewed in Bel and Warner 2015) focus on a service for which output is easy to quantify (waste), the first problem does not necessarily apply to them. Indeed, output and quality are controlled for in some of these studies (e.g., Bel and Costas 2006 and Zafra-Gómez et al. 2013).

Our approach is completely different. Whereas previous studies on the effects of intermunicipal cooperation on costs cover *all* costs of providing a *single* service, we focus on a *single* cost in a *broad range* of public services. We exploit a unique micro-level dataset on the price both municipalities and intermunicipal organizations pay for a standard commodity: credit. We compare interest rates on loans to Dutch intermunicipal organizations, amalgamated municipalities, and municipalities that were not amalgamated. The credit risk for these loans is identical (i.e., zero). Our rich dataset allows us to control for loan characteristics that influence interest rates. Consequently, any differences we find point ceteris paribus to differences in efficiency, without having to rely on strong assumptions inherent in the approaches chosen by previous studies.

4.2 Institutional background

Intermunicipal cooperation

Intermunicipal cooperation is an important phenomenon in the Netherlands. Municipalities often cooperate to perform specific tasks, ranging from waste collection to administering social welfare benefits. To this end, many intermunicipal organizations have been created. Cooperation is often aimed at reaping economies of size. Other reasons to cooperate are that some municipalities are simply too small to perform every task independently, or that the catchment area of a public service exceeds the municipality's boundaries.

Intermunicipal organizations may take different forms (Hulst and Van Montfort 2007). There are no limitations with respect to the number of cooperative arrangements, and municipalities are free to choose different partners for each (except for some cases where cooperation is mandatory). The Joint Provisions Act (*Wet gemeenschappelijke regelingen*) enables municipalities to create public bodies, which are separate administrative entities that may employ staff, own assets, borrow money, etcetera. A public body is governed by a general board containing members of municipal councils or aldermen from the participating municipalities. The general board can delegate its authority to an executive board. It is the general board, not the councils of the participating municipalities, that adopts the public

body's budget. Municipal councils may express their views on the proposed budget, but the public body's board decides.

Municipalities may also create public companies under private law. The management of public companies enjoys almost complete autonomy vis-à-vis local government (Hulst and Van Montfort 2007). The advisory and the executive boards may (partly) consist of representatives of the participating jurisdictions, but they must act in the interest of the company and are not accountable to the municipal councils.

Apart from these two main forms, several other types exist, e.g., foundations and informal clubs of government officials in charge of specific public services. The exact number of intermunicipal organizations is not known; no central register exists. However, every municipality participates in several, if not scores, of cooperative arrangements.

Local government borrowing

There are no legal limits to the amounts municipalities or intermunicipal organizations can borrow (Allers 2015). Although Dutch municipalities are legally obliged to present balanced budgets, this does not rule out deficit financing. Because municipalities use accrual accounting, expenditures to acquire assets do not burden the budget in the year of acquisition for the full amount, but are spread out over the economic life of the assets, in the form of interest and depreciation, in a way similar to that in business accounting. Thus, a municipality may borrow while at the same time presenting a balanced budget.

There is no default risk associated with loans to municipalities. Dutch municipalities never go bankrupt (Allers forthcoming), and neither do intermunicipal public bodies. Article 12 of the Financial Relations Act (*Financiële verhoudingswet*) stipulates that a municipality may apply for a supplementary grant if revenues are significantly and structurally insufficient to cover necessary outlays, while local tax rates are sufficiently high. This explicit bailout guarantee enables Dutch municipalities to borrow cheaply. According to Article 2.8 of the *Regeling solvabiliteitseisen kredietrisico en grote posities Wft 2010* ("Rules on solvability requirements, credit risk and large positions"), the credit risk associated with loans to municipalities and intermunicipal public bodies is on par with loans to the central government. Such loans are not subject to solvency requirements, i.e., the bank is not required to hold additional capital if it holds more of these loans.

Unlike public bodies, public companies sometimes go bankrupt, although this happens rarely. Some of the loans to such companies are guaranteed by local governments. Those loans are not subject to solvency requirements as credit risk is zero. If necessary, the bank will contact the municipality acting as a guarantor and receive its money back. Non-guaranteed debt of public companies does carry credit risk, and is excluded from this study.

Loans must be approved by the municipality's board of aldermen or the general board of the intermunicipal organization, or by a civil servant mandated by the relevant board. A

representative of the municipality or the intermunicipal organization contacts the client desk of one or more financial institutions, sets out the specifics of the requested loan, and is offered an interest rate. After selecting the best offer, the loan is quickly arranged.

Lending to local government

Two Dutch banks specialize in loans to local governments, BNG Bank and NWB bank. Both enjoy triple-A ratings.[27] Apart from these banks, of which shares are held by the central government and subnational governments, municipalities and intermunicipal organizations may borrow from commercial banks. As bank loans are easily available, local governments do not normally issue bonds. Credit ratings of individual municipalities are not available.

In 2012, the most recent year for which this figure is available, subnational public bodies (mostly, but not exclusively, intermunicipal bodies) had a combined debt of 3.6 billion euro.[28] Countrywide data on debt of other intermunicipal organizations is not available. In the same year, intermunicipal organizations owed BNG Bank 3.5 billion euro and NWB Bank 0.5 billion euro.[29] Intermunicipal public bodies account for 1 billion (BNG) and 0.2 billion (NWB) of these totals. Outstanding debt of municipalities totaled 46 billion euro in 2012.[30] Of this, 27 billion euro was owed to BNG Bank and 7 billion euro to NWB Bank.[31]

We interviewed representatives of BNG Bank on the way interest rates are set.[32] To make long term loans, BNG Bank borrows money on the international capital market. The proceeds of the bond issues, paying a fixed interest rate, are swapped to Euribor (European inter-bank offered rates) immediately to mitigate interest risk. Short term funding is obtained through the money market. Short term lending rates are based on Euribor rates, long term lending rates are based on swap rates. Before the start of every business day, the bank builds a so called pricing yield curve by first connecting the funding interest rates for different maturities, and then adding surcharges for profit and cost (which may depend on principal and maturity), a liquidity premium (if applicable) [33] and a surcharge for cost of capital (“usage of balance sheet”).

The pricing yield curve gives a norm price on which the actual interest rate of a loan is based. Actual interest rates usually differ from this norm price; they are a result of negotiations between lender and borrower. E.g., lower rates may be offered to attract extra business on days with ample supply, or when the interest rate on the international market has gone down during the day, after the pricing yield curve has been fixed. Borrowers who are aware

[27] In 2013, one of the three major credit rating agencies downgraded the rating of the Kingdom of the Netherlands to AA+. As a result, the rating of these banks was downgraded as well by this agency.
[28] Source: Statistics Netherlands.
[29] Sources: internal data BNG Bank; NWB (2013).
[30] Source: Statistics Netherlands. This includes debts to non-banks (e.g., unpaid bills).
[31] Sources: internal data BNG Bank; NWB (2013).
[32] We interviewed a member of the Board of Directors and persons working at the client desk of the bank.
[33] A liquidity premium was introduced during the financial crisis of 2008, when international credit market liquidity was low.

of the latter are likely to secure better deals than borrowers who do not spend time to collect market information.

Sometimes long term loans have a forward start. This means that the borrowed money is not made available on the day the loan is arranged (and the interest rate set), but at a later date. Interest rates on loans with a forward start are usually higher, because pricing is based on immediately borrowing by the bank on the capital market, until maturity, and lending to a third party against a usually lower rate for the period until the loan starts. The resulting loss in the first period has to be compensated by a premium on the interest rate during the second period, leading to a higher interest rate. A forward start can be attractive because it gives the borrower certainty about the interest to be paid, even though the loan has not actually started yet, or because the borrower anticipates rising interest rates. It may also be convenient for intermunicipal organizations where loans have to be approved by a board that does not meet very often. It that case, the board may also give permission to borrow money on certain conditions at a later moment.

4.3 Theory and hypotheses

Risk and interest rate

Suppose that a bank can choose between two options. This first is a risk-free investment earning a return of $R^* = 1 + r^*$. The second option is a loan to a borrower i who will default with probability P_i, at interest rate r_i. In case of default, the bank recoups a proportion τ of the loan, but this is accompanied by extra costs T, such as judicial or procedural costs. Assume T is fixed, i.e., independent of L, the size of the loan. If borrower i does not default, the bank lends L and gets back LR_i, so the return of investment is R_i. In case of default, the bank receives $\tau LR_i - T$, so the return is $\frac{\tau LR_i - T}{L}$.

Risk neutrality implies that the loan should have the same expected return as the risk-free investment:

$$R^* = (1 - P_i)R_i + P_i\left(\tau R_i - \frac{T}{L}\right) \quad (1)$$

Solving for R_i gives:

$$R_i = \frac{R^* + P_i\frac{T}{L}}{1-(1-\tau)P_i} \quad (2)$$

For Dutch municipalities and public bodies, which never default, P_i is zero and the required rate of return equals the risk-free rate of return:

$$R_i^{municipality} = R_i^{public\ body} = R^* \quad (3)$$

For public companies, default risk is positive, but credit risk is zero, as their debt is guaranteed by default-free municipalities.[34] This means that τ, the proportion of the return that the lender recoups in case of default, equals 1. However, some effort might be needed (and thus costs T be made) in case of financial distress for the borrower, despite the official legal mechanisms in place for such situations. Thus, for public companies, equation (2) simplifies into:

$$R_i^{public\ company} = R^* + P_i \frac{T}{L} \quad (4)$$

The above implies that there is no theoretical reason for banks to require different interest rates for loans to municipalities and to public bodies (equation 3). Loans to public companies may carry more interest if enforcing loan guarantees in case of default is costly (equation 4). However, interest rates are not determined solely by the rate of return the bank requires; they are the result of negotiations between lender and borrower. The outcomes of these negotiations are the result of the effort put in by both parties, where the effort put in by the borrower is expected to be determined by the extent to which efficiency is monitored.

The role of monitoring

The decision to outsource tasks to private firms complicates the decision making process. Agency theory describes how monitoring, sanctions and awards are needed to align the agent's objectives with those of the principal (e.g., Fama and Jensen 1983). This carries transaction costs with it. Stewardship theory suggests that such costs are lower when tasks are carried out by other governmental organizations, as objectives are likely to be more aligned in that case (Van Slyke 2007). However, it seems that monitoring in such cases is less productive, because of the difficulty to induce service-providing governments to react to the contracting government's evaluation of the services provided, due to weak sanctioning power (Marvel and Marvel 2008).

Corporate governance theory suggests that, in the case of intermunicipal cooperation, there is an additional problem: dispersed ownership (Sørensen 2007). Public services provided through intermunicipal cooperation are financed from a common pool; hence, the costs are shared with other municipalities. Consequently, when a municipality decides on the amount of effort (cost) that should be put into monitoring an intermunicipal organization, it will take into account that any gains from making that effort will only partly benefit the municipality itself, since they will be shared with all other participants. This is likely to result in a level of monitoring that is lower than that for the operations of the municipality itself. According to corporate governance theory, this incentive for undermonitoring will lead to inefficient service provision. It allows functionaries of intermunicipal organizations to engage in, e.g., budget-maximizing behavior (Niskanen 1971).

[34] We abstract from operational risk, which includes, e.g., the possibility that contractual stipulations prove unenforceable or have been incorrectly documented.

However, the public choice literature provides a different perspective, with a different outcome. According to this literature, citizens are unable to effectively oversee their elected representatives. This allows politicians to collect rent: they can divert public resources to further their own goals, e.g., to improve their chances to be reelected. Decision making in intermunicipal organizations is at a greater distance from politicians than decision making in municipalities. As a result, it is more difficult for politicians to exploit the organization's resources as transaction costs are higher (Sørensen 2007).

Thus, theoretically, intermunicipal cooperation may result in less efficiency because of reduced monitoring (agency theory), and to greater efficiency because of less political meddling (public choice). The net effect is uncertain. However, in the case we study, borrowing money, political meddling seems to be less relevant. It is hard to see how politicians could benefit from intermunicipal organizations paying unnecessarily high interest rates. We hypothesize that intermunicipal cooperation reduces monitoring effort and therefore leads to higher interest costs:

> Hypothesis 1: intermunicipal organizations pay higher interest rates than municipalities.

Amalgamation, which is an alternative to cooperation, might also affect monitoring effort. It is conceivable that recently amalgamated municipalities are not able to monitor their borrowing activities as well as municipalities that did not amalgamate. Amalgamation is an arduous process that may have severe disruptive effects on managerial behavior and organizational outcomes, e.g., because of poor staff morale, loss of managerial expertise due to increased turnover, and work overload (Andrews and Boyne 2012). On the other hand, amalgamation might have a beneficial effect on efficiency. Existing organizations usually have well established ways of doing things, which may have become outdated. Amalgamation forces organizations to reconsider procedures and operations, possibly resulting in the adoption of more efficient practices (Hansen et al. 2014). Again, the net effect is uncertain. We hypothesize that the first, efficiency-reducing, effect dominates, but that it is smaller than for cooperation:

> Hypothesis 2a: in the first few years after amalgamation, municipalities pay higher interest rates than not (recently) amalgamated municipalities.
>
> Hypothesis 2b: interest rates paid by recently amalgamated municipalities are lower than those paid by intermunicipal organizations.

We expect that the extent to which intermunicipal organizations pay higher interest rates than municipalities depends on two crucial characteristics of such organizations. The first is legal form. Because public bodies are default-free and public companies are not, different risk-free rates of return apply (see equation 3 and 4, respectively). For public companies, costs *T* might be involved in case of default (equation 4). Thus, we expect public companies to pay higher interest rates than public bodies:

> Hypothesis 3: interest rates paid by public companies are higher than those paid by public bodies.

The second characteristic of intermunicipal organizations that may affect the interest rate is the number of cooperating municipalities. Several papers argue that inefficiency due to common pool effects increases with the number of participants, a phenomenon called the "law of 1/n" (Weingast 1979; Weingast et al. 1981; Primo and Snyder 2008). Originally, this law is based on models where (i) individual legislators care mainly about the public projects that flow into their own districts (or benefit their inhabitants), (ii) funding of public projects is fixed and not connected to individual projects and (iii) all projects proposed are passed. Although empirical findings supporting this hypothesis are presented by several authors (e.g., Baqir 2002; Bradbury and Stephenson 2003), others have raised questions.

Primo and Snyder (2008) argue that the effect of the number of participants depends on factors like the degree of publicness of the goods provided. They also give examples of cases where a "reverse law of 1/n" may hold. This is in line with Tornell and Lane (1999), who propose a non-monotonic relationship between the number of competing powerful groups in an economy and the growth rate of the efficient sector: a shift from $n = 1$ to $n = 2$ reduces efficiency, while, starting at $n \geq 2$, a further increase reduces power concentration and improves outcomes. Tornell and Lane (1999) model a situation where each participant has an outside option. This means that, for the most efficient organization as well as for others, participating must be at least as attractive as leaving. As n goes up, inefficiency must be curbed to satisfy that condition. As municipalities are free to join or leave intermunicipal organizations, this model is relevant here.

The public choice literature provides another reason to expect a "reverse law of 1/n" to apply. As describe above, according to this literature, decision making in intermunicipal organizations may be more efficient because it is further removed from politicians than decision making in municipalities. As the number of participants grows, it gets more difficult for politicians from one participating unit to exploit the organization's resources, as transaction costs are higher. This suggests a "reverse law of 1/n".

Thus, theoretically, a higher number of cooperating municipalities may result in lower efficiency because of reduced monitoring, and to higher efficiency because exit should remain unattractive and because of less political meddling. The net effect is uncertain. Leaving an intermunicipal organization and setting up an operation on one's own will probably be unattractive in many cases, especially where service provision is capital-intensive. Therefore, we hypothesize that the first effects dominates.

> Hypothesis 4: the interest rate paid by intermunicipal organizations is higher if the number of participating municipalities is higher (i.e. the "law of 1/n" holds).

4.4 Method and data

Our units of observation are individual loans. We have data on four types of loans with fixed interest rates made by BNG Bank, which is the market leader in this field:

1) Short term loans (up to one year) where payment of principal and interest is due at maturity.
2) Long term loans where amortization and interest is paid in equal installments (Annuity).
3) Long term loan where the principal is paid back in equal installments (Linear).
4) Long term loans where the principal is paid back at maturity (Bullet).

Purchase or sale of loans, refinancing, restructuring, consolidation of loans and loans with no fixed interest rate or standard amortization schedules are left out of our selection. We select loans to municipalities and public bodies, which both never default in the Netherlands, and loans to public companies which are guaranteed by municipalities. So, all loans in our sample are officially free of credit risk.

Interest rates vary a lot over time and over amortization schemes. In order to compare interest rates of different loans, we relate them to reference interest rates that apply to the same dates and amortization schedules. Our dependent variable is the interest rate differential (IRD), defined as the relative difference between the actual interest rate r_j on loan j and the reference interest rate r_{ref}: $IRD_j = \frac{r_j - r_{ref}}{r_{ref}}$. We apply a relative measure because different loan types have different interest rates, and because interest fluctuates considerably over time. The IRD may be interpreted as follows: if, e.g., intermunicipal organizations have an average IRD that is 0.05 higher than that of municipalities, then, other things being equal, they spend 5 percent more on interest payments.[35]

We use the interest rate indicated by BNG Bank's pricing yield curve as the reference interest rate. Although the bank keeps records of pricing yield curves for many years back, these data are not available for all possible maturities. For long term loans, reference rates based on the bank's pricing yield curve are available for the most common maturities only: both 5 and 10 years for bullet loans, 5, 10, 15, 20 and 25 years for loans with linear

[35] More precisely, if the IRD of intermunicipal organizations exceeds the IRD of municipalities by x, the former pay $x\frac{r_{ref}}{r_{municip}}$ as much in interest. That is because $IRD^{interm} = IRD^{municip}$+x implies $\frac{r_{interm} - r_{ref}}{r_{ref}} = \frac{r_{municip} - r_{ref}}{r_{ref}} + x$. Rewriting yields $\frac{r_{interm} - r_{municip}}{r_{municip}} = x\frac{r_{ref}}{r_{municip}}$. As the average value of $\frac{r_{ref}}{r_{municip}}$ in our sample is 1.02, this factor will usually be negligible. Thus, if we find a difference in IRD of 0.05, that implies that 5.1 percent more is paid on interest ($0.05 \times 1.02 \times 100\%$).

amortization and 10, 15, 20 and 25 years for loans with annuity amortization.[36] We select loans for which reference rates are available, and exclude loans with less common maturities from our basic analysis. In our sensitivity analysis, we will check whether this affects the results.

For each loan, BNG Bank creates a paper file and a record in its computer system. We were allowed to use data from the latter, for 1997–2013. For short term loans, however, data is available for 2006-2013 only, because the bank's (computerized) administration does not allow going further back in time. For each loan, we have data on the identity of the borrower and on the loan characteristics that influence interest rates. These include date of contract, amortization schedule, principal borrowed, maturity and forward start (number of days between setting the contract and the effective start of the loan).

At this point, we have to decide whether or not to control for such loan characteristics in our regressions. It could be argued that borrowers should choose loan characteristics which minimize interest payments, under the restriction that enough funds are available at the moments these are needed. Controlling for loan characteristics would then eliminate inefficiencies resulting from poor treasury management. For municipalities, loans are not usually linked to specific investments. Rather, the municipality's treasurer reviews the entire capital needs of his or her organization and borrows accordingly. Loan characteristics such as amortization schedule, principal borrowed, maturity and forward start can then be chosen to minimize interest payments. Intermunicipal organizations, however, usually borrow money for specific projects. Thus, their choice with respect to such characteristics is more limited. For that reason, we decide to control for loan characteristics. In that way, we compare interest paid on equivalent loans. In our regressions, we use principal, maturity and forward start as controls, and run separate regressions for different amortization schedules. In order to allow for non-linearity, the square of these variables is also included. Furthermore, we include year dummies to control for nationwide factors influencing IRDs.

Data taken from the bank's administration are combined with data collected through a survey of intermunicipal organizations. We collected data on the number of participating municipalities, on the field of activity and on their legal form. Not all of these variables are constant over time; especially the number of partners may vary as municipalities join, leave or amalgamate. For some organizations, we were unable to collect all data for all relevant years. It proved especially difficult to gather data for the earlier years of our research period. We define number of partners as equal to 1 in case of loans to municipalities and equal to the number of participating municipalities for loans to intermunicipal organizations.

For all municipalities, we collected data on amalgamations. We construct two dummy variables: one indicating whether a municipality has been amalgamated in the year of the loan or up to 3 years before, and one indicating whether it has been amalgamated 4-8 years

[36] For 5 year loans with linear amortization, reference interest rates are available from July 16, 1999 onward.

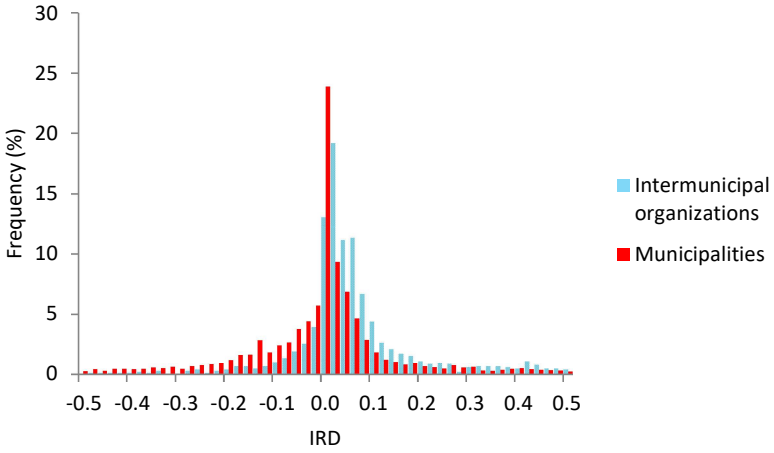
before the loan was made. This way it is possible to discriminate between short run and long term effects of amalgamation.

Figure 4.1 shows the frequency distribution of IRDs for municipalities and for intermunicipal organizations. Although most observations are in the range [-0.1, 0.1], the distribution exhibits long tails on both sides. That might be problematic, e.g., in case these long tails result from data errors, especially if systematic differences exist between municipalities and municipal organizations. To investigate this, we accessed the paper files of the ten loans with highest IRDs and the ten loans with lowest IRDs, both for short term loans and for long term loans, and both for municipalities and for intermunicipal organizations, i.e., 80 loans in total. Table 4.1 summarizes the results. For long term loans, a forward start is the most common reason for an extremely high IRD (six out of ten cases, for both municipalities and intermunicipal organizations). In two cases, this coincided with a price guarantee, where intermunicipal organizations pay extra to secure the right to borrow at a certain IRD in a certain period. A small loan size may also result in a high IRD, as the administrative costs of making a loan are fixed.

Table 4.1: Explanations for IRD outliers

	Municipality	Intermunicipal organization
	Long term loans	
High IRD		
Forward start	6	6
Small loan	0	4
Price guarantee	0	2
Mistake (too high interest rate offered & accepted)	1	0
Data error	3	0
Low IRD		
Low rate offered because of market conditions	10	9
Data error	0	1
	Short term loans	
High IRD		
Small loan	9	0
Price guarantee	0	9
Data error	1	1
Low IRD		
Large loan	10	6
Mistake (too low interest rate offered)	0	2
Strong bargaining position borrower	0	2

Figure 4.1: Frequency distribution of IRDs for municipalities and for intermunicipal organizations (percentages)



One high IRD was the result of a mistake made by the client desk of the bank, and three outliers proved to be data errors (in the computerized data we use). For long term loans, the reason for very low IRDs is, apart from one data error, that the bank sometimes offers interest rates below the reference rate given by the pricing yield curve, e.g., when market rates drop during the day (the pricing curve is fixed before business starts, early in the morning).

For short term loans, small loan size and price guarantee explain most of the very high IRDs; there was one data error. Very low IRDs are caused by large loan sizes, mistakes made by the bank's client desk, and, in two cases, a borrower with a strong bargaining position. In these cases, the representative from the intermunicipal organization which took up the loan had recently negotiated cheap, large loans for a municipality, and demanded the same low IRD, which the bank accepted.

The only systematic difference between municipalities and municipal organizations we find among these outliers is that the latter sometimes pay a premium in order to get a price guarantee. This is not observed in our dataset, so we cannot control for it in our regressions. In most cases, outliers are related to forward start and loan size, which we do control for. However, the number of data errors is rather high among outliers. In order to avoid results being driven by outliers, we exclude observations where the absolute value of IRD exceeds 0.25 from our main analysis. In our sensitivity analysis, we will check whether our results are robust for dropping or changing this threshold.

Table 4.2 presents descriptive statistics. Our dataset contains 11,307 observations, of which 10,313 are loans to 433 different municipalities, and 994 are loans to 113 different intermunicipal organizations. In those 113 intermunicipal organizations, 389 different municipalities participate, ranging from very small to very large. Table 4A in the Appendix to

Table 4.2: Summary statistics

	N	mean	st.dev.	min	max
Entire sample					
Interest rate	11,307	2.095	1.924	0.050	6.820
Principal (million euro)	11,307	7.663	12.25	0.091	278.495
Maturity (years)	11,307	5.977	8.413	0	25
Forward start (days)	11,307	25.34	129.4	0	2,193
Number of partners	11,307	1.543	2.399	1	35
IRD	11,307	-0.012	0.084	-0.250	0.250
Intermunicipal organizations					
Interest rate	994	1.684	1.561	0.090	5.620
Principal (million euro)	994	4.911	8.273	0.010	66.086
Maturity (years)	994	3.782	6.502	0	25
Forward start (days)	994	15.59	74.20	0	923
Number of partners	994	7.178	5.539	2	35
IRD	994	0.027	0.072	-0.248	0.250

This table describes the observations used in regressions reported in tables 4.3-4.5, i.e., excluding observations with an absolute value of IRD exceeding 0.25 and excluding observations with uncommon maturities.

this chapter offers a detailed breakdown of the dataset by loan type and borrower characteristics.

4.5 Comparing interest paid by intermunicipal organizations, amalgamated municipalities and not-amalgamated municipalities

In this section, we test whether there exist significant differences between IRDs of intermunicipal organizations and municipalities (hypothesis 1), municipalities which are amalgamated and municipalities which are not (hypothesis 2a), and intermunicipal organizations and amalgamated municipalities (hypothesis 2b). In the next section, we examine whether intermunicipal organizations' characteristics affect IRDs.

It is obvious from figure 4.1 that IRDs are often higher for intermunicipal organizations. However, this may be due to differences in loan characteristics or timing. To test whether the type of organization really matters, we conduct a number of regression analyses. Reported standard errors are robust for heteroscedasticity and for correlation between observations for identical organizations.

Basic results

Table 4.3 shows regressions of IRDs on a dummy that takes the value of one if the loan was made to an intermunicipal organization, and on a number of control variables. The first column includes all loans in our dataset. Columns (2)-(5) concern specific types of loans. In many cases, the control variables are highly significant, especially for long term loans which are more heterogeneous than short term loans. Overall, the variables included in the regression explain differences in IRDs quite well.

Table 4.3: Regressions of IRD: basic analysis

Loan type	All loans	Short term	Annuity	Linear	Bullet
Regression number	1	2	3	4	5
Intermunicipal organization	0.0430***	0.0476***	0.0450***	0.0271***	0.0437***
	(0.00405)	(0.00537)	(0.00999)	(0.00330)	(0.00842)
Principal (million euro)	-0.000838**	-0.000897*	-0.000917	-0.000603***	-0.000602**
	(0.000399)	(0.000505)	(0.000795)	(0.000155)	(0.000243)
Principal squared	3.33e-06	3.49e-06	2.73e-05	6.22e-06***	3.46e-06
	(3.03e-06)	(3.38e-06)	(2.25e-05)	(2.06e-06)	(3.70e-06)
Maturity (years)	-0.00170***	-0.00607	-0.00850***	0.00194***	
	(0.000542)	(0.0134)	(0.00299)	(0.000661)	
Maturity squared	5.10e-05***	0.00365	0.000238***	-5.61e-05***	4.58e-05
	(1.68e-05)	(0.00842)	(8.45e-05)	(1.89e-05)	(4.30e-05)
Forward start (days)	0.000210***	0.00158	0.000215***	0.000195***	0.000339***
	(1.41e-05)	(0.00142)	(1.37e-05)	(1.40e-05)	(4.45e-05)
Forward start squared	-6.14e-08***	-4.38e-05	-7.03e-08***	-4.62e-08***	-2.07e-07***
	(1.01e-08)	(6.08e-05)	(9.50e-09)	(8.10e-09)	(4.90e-08)
Observations	11,307	6,822	309	3,676	500
R-squared	0.206	0.160	0.709	0.695	0.674

Robust clustered standard errors in parentheses. Year dummies included. * denotes significance at the 10% confidence level, ** significance at the 5% confidence level, and *** significance at the 1% confidence level.

It is time to the central question of this chapter: do intermunicipal organizations pay higher interest rates than municipalities? The answer is surprisingly straightforward. The coefficients of the intermunicipal organization dummy are positive and highly significant for all loan types. On average, the IRD for intermunicipal organizations is 0.027 (linear amortization) to 0.048 (short term loans) higher than it is for municipalities. Intermunicipal organizations pay 3-5 percent more interest on equivalent loans. This confirms hypothesis 1.

Thus, presumably, intermunicipal organizations could pay less interest, but no doubt this would require more effort (collecting market information; negotiating). Would that be cost effective? A rough calculation can put this issue into perspective. For intermunicipal organizations in our sample, average loan size is 4.9 million euro and the average interest rate is 1.7 percent (table 4.2). Thus, yearly interest paid on the average loan amounts to 83,000 euro. Paying 3-5 percent more in interest means paying 2,500 – 4,000 euro more annually. Over 3.8 years (average maturity, table 4.2) that amounts to 10,000-15,000 euro per loan. Assuming wage costs of 100,000 euro (rather generous) and 228 working days per year (the Dutch average), 10,000 euro buys 23 days of staff. Thus, spending an extra couple of hours or even days in order to secure a lower interest rate would be a rewarding investment indeed. This suggests that intermunicipal organizations borrow inefficiently.

Table 4.4 reports estimates of similar regressions as those underlying table 4.3, but with two amalgamation dummy variables added (coefficients of control variables are not reported).

Table 4.4: Regressions of IRD on cooperation and amalgamation

Loan type	All loans	Short term	Annuity	Linear	Bullet
Regression number	6	7	8	9	10
Intermunicipal organization	0.0424***	0.0464***	0.0468***	0.0272***	0.0437***
	(0.00419)	(0.00564)	(0.00930)	(0.00331)	(0.00842)
Amalgamated 0-3 years before	-0.00334	-0.0119	0.0140	0.00129	8.50e-05
	(0.00593)	(0.00993)	(0.0105)	(0.00122)	(0.00411)
Amalgamated 4-8 years before	-0.00461	-0.00757	0.000540	-0.000200	0.000217
	(0.00485)	(0.00790)	(0.00442)	(0.00145)	(0.00355)
Observations	11,307	6,822	309	3,676	500
R-squared	0.206	0.161	0.713	0.695	0.674

Robust clustered standard errors in parentheses. Control variables (see table 5.3) and year dummies included. * denotes significance at the 10% confidence level, ** significance at the 5% confidence level, and *** significance at the 1% confidence level.

The coefficient of none of these is significant for any of the loan types. Municipal amalgamation does not affect IRDs, neither in the short run nor in the long run. Thus, hypothesis 2a, which states that amalgamation temporarily leads to higher interest rates, is rejected. Moreover, this confirms hypothesis 2b, that amalgamated municipalities have lower IRDs than intermunicipal organizations.

Sensitivity analysis

We test the robustness of the findings in three ways. First, we re-run the regressions including uncommon maturities for which no reference interest rates are available, using interpolated values for reference interest rates. Secondly, we drop municipalities that do not participate in at least one of the intermunicipal organizations we study from the analysis. Finally, we allow previously excluded observations with an IRD above 0.25 or below -0.25 in our regressions, and apply different thresholds.

Because reference interest rates for long term loans are only available for the most common maturities, we excluded observations with other maturities from the analysis. This may have affected our conclusions. In order to check for this potential disturbance, we now include all maturities. To find the reference interest rates for non-common maturities, we linearly interpolate the reference rates available. E.g., we find the reference rate for a 12 year loan by interpolating the rate for a 10 year loan and that of a 15 year loan. For relatively short terms, we interpolate between the 1 year Euribor rate and the lowest available swap reference rate. For long term loans, over 10 years for bullet loans and over 25 years for other long term loans, we use the reference rate for 10 years and 25 years, respectively. Table 4B in the Appendix presents the results of regressions similar to those in table 4.4, but including observations with non-standard maturities. Columns 2 of both tables are identical, because reference rates are available for all short term loans. The R-squared values are somewhat lower in table 4B, which is not surprising as our method of interpolating and extrapolating reference interest rates is rather crude (yield curves not normally being linear).

The coefficients of the intermunicipal organization dummy are hardly affected, though. Now, we do find a significant short-term effect of amalgamation, but only at the 10 percent confidence level, and only for bullet loans. We conclude that our basic results are not affected by the exclusion of loans with non-standard maturities.

It might be argued that the decision to cooperate may not be independent of a municipality's efficiency. E.g., efficient municipalities could be less likely to cooperate because they already enjoy low costs, or are more likely to cooperate because they are more attractive partners. In that case, we would be comparing intermunicipal organizations, which comprise relatively (in)efficient municipalities, with a group of both inefficient and efficient municipalities. However, the intermunicipal organizations included in our database have participants from 389 different municipalities, while the total number of municipalities was 572 in 1997 and 408 in 2013. Thus, the majority of municipalities participates in the intermunicipal organizations studied. Still, as a robustness check, we dropped municipalities that do not participate in at least one of the intermunicipal organizations covered in our analysis and ran the regressions in table 4.4 again. The results are virtually identical (see table 4C in the Appendix).

In order to prevent outliers from influencing our results, we excluded observations with an IRD exceeding 0.25 or under -0.25 from our regressions. We now test whether our conclusions change by including these observations, or by setting a lower threshold. Table 4D in appendix 4 shows results of regressions similar to those in table 4.3, reporting only the coefficients of the intermunicipal organization dummy and the number of observations. Column (1) presents coefficients from regressions where observations with extreme IRDs are not excluded. Column (2) presents coefficients from the main analysis as reported in table 4.3, excluding IRDs above 0.25 or below -0.25. We see that including extreme observations strongly increases the coefficient for short term loans, while the coefficients for the other loan types are hardly affected. In columns (3)–(5), we exclude observations with an absolute IRD above 0.15, 0.10 and 0.05, respectively. Obviously, the coefficients are downwardly affected, but they stay positive and highly significant in all cases. Thus, our results are not driven by IRDs of a specific magnitude.

4.6 Effect of intermunicipal organizations' characteristics on IRDs

Having established that intermunicipal organizations pay higher interest rates than municipalities, and that municipal amalgamation does not affect interest rates, we now turn to possible relevant characteristics of intermunicipal organizations. Table 4.5 presents regression results for intermunicipal organizations only. Thus, municipalities are excluded from these regressions. As extra control variables we add dummies representing the fields in which these organizations are active. That is because in some fields, a particular legal form or number of participants is more prevalent than in others. The control variables concerning individual loan characteristics (as shown in table 4.3) are included as well, but we do not report their coefficients.

Table 4.5: Regressions of IRD of intermunicipal organizations

Loan type	All loans	Short term	Annuity	Linear	Bullet
Regression number	11	12	13	14	15
Legal form: public body	0.00214	0.00263		0.00655	
	(0.0120)	(0.0140)		(0.0125)	
Inverse of number of partners (1/n)	-0.0295	-0.0152	-0.484	-0.0118	-0.0863
	(0.0383)	(0.0586)	(3.585)	(0.0259)	(0.0545)
Field: welfare provision	-0.0226	-0.0172	0.190	-0.0509***	
	(0.0190)	(0.0211)	(1.849)	(0.0128)	
Field: work provision for disabled	-0.00734	0.00449	-0.328	-0.0365***	-0.0427**
	(0.00978)	(0.0102)	(0.383)	(0.0103)	(0.0155)
Field: environmental services	0.00806	0.0241**	0.0350	-0.0223*	-0.0194
	(0.0107)	(0.0102)	(0.435)	(0.0129)	(0.0246)
Field: public health	-0.00559	-0.0145		-0.0166	0.00632
	(0.0131)	(0.0240)		(0.0151)	(0.0415)
Field: public safety	-0.00975	-0.00673	-0.286	-0.0399***	-0.0579***
	(0.0147)	(0.0217)	(0.558)	(0.0117)	(0.0152)
Field: business development	0.0123	0.0138			-0.00455
	(0.0187)	(0.0202)			(0.0130)
Observations	889	631	25	197	36
R-squared	0.095	0.081	0.959	0.386	0.970

Robust clustered standard errors in parentheses. Controls and year dummies included. Observations where legal form is missing are excluded. * denotes significance at the 10% confidence level, ** significance at the 5% confidence level, and *** significance at the 1% confidence level.

First, we consider legal form. Because public companies can (and sometimes do) go bankrupt and public bodies cannot, lenders might want to charge the former higher interest rates in order to cover costs associated with enforcing loan guarantees (equation 4). One might even argue that our result that intermunicipal organizations pay higher interest rates may be driven partly by this reason. In that case, we would expect public companies to pay higher interest rates than public bodies (hypothesis 3). In table 4.5 we test whether the legal form of intermunicipal organizations affects the IRD. Our dataset does not contain any annuity or bullet loans to public companies (see table 4A in the Appendix), which explains the blanks in those columns. For the other loan types, the coefficients of the dummy variable public body are far from significant. That implies that there is no difference in interest rates compared with public companies. Thus, we find no evidence supporting hypothesis 3. That is not entirely surprising. Defaults of public companies are exceptional in the Netherlands. Moreover, when interviewing officials of BNG Bank, we were informed that the costs of retrieving a loan in such a case are negligible, as the municipalities that guaranteed the loan involved pay up swiftly.

Next we consider the number of participants (n) which, in our dataset, can be as high as 35 (table 4.2). In order to directly test the "law of 1/n", we include 1/n in the regressions. For none of the loan types we find a significant coefficient (table 4.5). If we enter n, rather than 1/n, into the regressions, the coefficient for linear loans is significant at the 10 percent confidence level; for other loan types, the coefficients are again insignificant (not shown in table 4.5). Thus, hypothesis 4 is not supported. Intermunicipal organizations pay higher interest rates, but this is not linked to the number of cooperating partners.

The coefficients of the control variables representing fields of activity do not point to consistently higher interest rates paid by organizations active in specific fields, although some coefficients are significant for one or two loan types. Note that, for some combinations of field of activity and loan type, we have few or even no observations (see table 4A in the Appendix).

4.7 Conclusions

This chapter presents our study on the effects of intermunicipal cooperation on efficiency. Theory predicts different, counteracting, effects that may occur when the production of a public service gets assigned to an intermunicipal organization. Whereas agency theory predicts that bureaucracy might increase and misalignment of interests could decreasedd efficiency, public choice theory foresees a reduction of political meddling when public service production is not under the direct influence of local politicians, which improves efficiency. We have used a novel approach to measure efficiency, by comparing interest rates paid for identical loans by both municipalities and intermunicipal organizations.

We find that interest rates paid by intermunicipal organizations are significantly higher than those paid by municipalities. All possible explanatory variables for this difference are controlled for in our analysis. This leads us to conclude that the observed differences can only be the result of a difference in negotiation effort. Apparently, intermunicipal organizations are less inclined to put an efficient amount of effort in negotiations about interest rates. This points towards less efficiency oriented operations within intermunicipal organizations, an outcome that can be theoretically explained by the fact that the latter organizations are less closely monitored than in-house operations. There is no reason to believe that the process of finding loans at the most favorable terms would be an exception to other processes with regard to the degree that efficiency is pursued. Thus, these results suggest that less priority is being given to effiency optimization by intermunicipal organizations in general. The findings are thus in line with agency theory as described above.

Appendix 4

Table 4A: Number of observations by amortization schedule

This table describes the observations used in regressions reported in tables 5.3-5.5, i.e., excluding observations with an absolute value of IRD exceeding 0.25 and excluding observations with uncommon maturities.

	All loans	Short term	Annuity	Linear	Bullet
Intermunicipal organization	994	698	28	231	37
Municipality, amalgamated 0-3 years before	640	289	23	309	19
Municipality, amalgamated 4-8 years before	915	530	19	326	40
Municipality, not recently amalgamated	8,758	5,305	239	2,810	404
Total	11,307	6,822	309	3,676	500
	Intermunicipal organizations: field of activity				
Welfare provision	41	36	2	3	0
Work provision for disabled	529	404	3	116	6
Environmental services	70	37	5	27	1
Public health	43	19	0	21	3
Public safety	98	29	16	47	6
Business development	120	115	0	0	5
Other	93	58	2	17	16
Total	994	698	28	231	37
	Intermunicipal organizations: legal form				
Public body	799	553	25	185	36
Public company	90	78	0	12	0
Unknown	105	67	3	34	1
Total	994	698	28	231	37

Table 4B: Regressions of IRD with observations with interpolated reference interest rates included

	(1) All loans	(2) Short term	(3) Annuity	(4) Linear	(5) Bullet
Intermunicipal organization	0.0421***	0.0464***	0.0417***	0.0294***	0.0511***
	(0.00378)	(0.00564)	(0.00869)	(0.00306)	(0.00652)
Amalgamated 0-3 years before	-0.00132	-0.0119	0.0147	0.00110	0.0185*
	(0.00520)	(0.00993)	(0.0109)	(0.00148)	(0.00943)
Amalgamated 4-8 years before	-0.00258	-0.00757	0.00390	-0.000668	0.0161
	(0.00469)	(0.00790)	(0.00496)	(0.00162)	(0.00991)
Observations	12,643	6,822	448	4,121	1,252
R-squared	0.206	0.161	0.585	0.648	0.453

Robust clustered standard errors in parentheses. Controls and year dummies included. *** p<0.01, ** p<0.05, * p<0.1

Table 4C: Regressions of IRDs with only municipalities that participate in intermunicipal organizations included in regressions

	(1) All loans	(2) Short term	(3) Annuity	(4) Linear	(5) Bullet
Intermunicipal organization	0.0398***	0.0438***	0.0500***	0.0267***	0.0441***
	(0.00468)	(0.00636)	(0.00952)	(0.00329)	(0.00914)
Amalgamated 0-3 years before	0.000734	-0.00620	0.0210	0.00162	-0.000906
	(0.00719)	(0.0110)	(0.0129)	(0.00138)	(0.00587)
Amalgamated 4-8 years before	-0.00399	-0.00632	0.000377	0.000474	0.00519
	(0.00564)	(0.00848)	(0.00536)	(0.00190)	(0.00389)
Observations	8,715	5,405	235	2,737	338
R-squared	0.208	0.168	0.748	0.689	0.664

Robust clustered standard errors in parentheses. Controls and year dummies included. *** p<0.01, ** p<0.05, * p<0.1

Table 4D: Regressions of IRD with observations with absolute value of IRD above threshold dropped

	(1) No threshold	(2) IRD<=0.25	(3) IRD <=0.15	(4) IRD <=0.1	(5) IRD <=0.05
		All loans			
Intermunicipal organization	0.120***	0.0430***	0.0310***	0.0205***	0.0102***
	(0.0360)	(0.00405)	(0.00265)	(0.00193)	(0.00106)
Observations	14,222	11,307	9,962	8,859	6,819
		Short term loans			
Intermunicipal organization	0.156***	0.0476***	0.0319***	0.0187***	0.00624***
	(0.0449)	(0.00537)	(0.00339)	(0.00248)	(0.00125)
Observations	9,695	6,822	5,569	4,593	3,035
		Annuity			
Intermunicipal organization	0.0445***	0.0450***	0.0369***	0.0378***	0.0216***
	(0.0100)	(0.00999)	(0.00984)	(0.00868)	(0.00480)
Observations	312	309	292	267	229
		Linear			
Intermunicipal organization	0.0296***	0.0271***	0.0270***	0.0224***	0.0158***
	(0.00438)	(0.00330)	(0.00322)	(0.00264)	(0.00164)
Observations	3,704	3,676	3,615	3,528	3,155
		Bullet			
Intermunicipal organization	0.0426***	0.0437***	0.0402***	0.0304***	0.0216***
	(0.00898)	(0.00842)	(0.00728)	(0.00396)	(0.00367)
Observations	511	500	486	471	400

Robust clustered standard errors in parentheses. Controls and year dummies included. *** p<0.01, ** p<0.05, * p<0.1

Chapter 5 - Conclusion

The potential efficiency gains of scaling up the production and provision of local public services are of great interest to both scientists and policy makers. The theory in this field describes many possible effects of scaling up, both positive and negative, for both productive and allocative efficiency, but overall theory remains ambiguous on the question which effects prevail for various jurisdiction sizes. This dissertation presents empirical studies that shed some light on two of the instruments for scaling up: municipal amalgamation and intermunicipal cooperation. In this final chapter the main findings of this work are presented, along with the implications of these findings for policy makers. In addition, several avenues for further research are discussed.

5.1 Municipal amalgamations

The most rigorous instrument for increasing local jurisdiction size is municipal amalgamation (also consolidation or merger), which combines multiple municipalities into one. This instrument has been applied by many governments in recent and less recent history, in many cases in the form of a single so-called 'big bang' procedure, meaning that a substantial part of all municipalities are amalgamated according to a nationally coordinated plan. Strikingly, these amalgamations do not appear to have led municipalities in relatively similar countries (like Western European countries) to converge to a certain specific size range.

This, of course, is in line with the theoretical ambiguity on effects of scale and size. Some theories predict that productive efficiency increases with size, mainly caused by less than proportional growth of fixed costs and increased opportunities for specialization and to a lesser degree by increased bargaining power and improved accountability mechanisms. On the other hand, larger jurisdictions are prone to bureaucracy, due to higher coordination and communication costs. Indirectly, the fact that if jurisdictions are larger also means that there

are less jurisdictions, leads to reduced competition between municipalities to outperform each other (so-called yardstick competition) and thus to less productive efficiency.

For allocative efficiency also, theory proposes counteracting effects of scale increase. Larger jurisdictions lead to a reduction in potential interjurisdictional externalities, enabling better policy decisions based on all relevant effects, improving allocative efficiency. On the other hand, larger jurisdictions allow for less possibilities for inhabitants to change local policy through voting. As a second disadvantage, we see that multiple smaller jurisdictions are better able to match inhabitants' preferences in different local policies than one jurisdiction setting a single local policy. The fact that if jurisdictions are larger there are less jurisdictions, implies that scaling up leads to a decrease in variation of local policies. Assuming a large variation in inhabitants' preferences, this reduces the match between preferences and policy, lowering allocative efficiency.

Empirical research on the effects of municipal amalgamation has led to mixed conclusions so far. Some studies have found that spending increases after amalgamation (in Switzerland, Denmark and Finland) whereas other studies have led authors to conclude that spending is reduced (in Israel and Germany). Spending can also be affected if politicians are keen on depleting reserves or incurring debt shortly before financial assets are combined by the amalgamation. This so-called common pool effect has also been found in some studies (from Denmark, Sweden and Finland).

In chapters 2 and 3 we presented our research on the effects of municipal amalgamations. This research adds to the existing literature in terms of data used and methodology. The literature has so far focused on a limited number of individual cases, or on the effects of a big bang amalgamation operation (meaning a number of coordinated, simultaneous amalgamations). We study amalgamations in the Netherlands for an extended period of time, during which a small number of municipalities have been amalgamated (almost) every year. This unique panel data set allows for optimal isolation of the amalgamation effect from other temporal effects that would influence spending in all municipalities, amalgamated or not. We introduce the use of dynamic panel data analysis in this field and apply various robustness tests among which the inclusion of spatial effects.

We have found no robust evidence of any effect of amalgamations on per capita spending, before or after amalgamation. These findings are unaffected when we include annexations (amalgamations with a dominant partner) or use alternative sets of amalgamation dummies and control variables. As a robustness test, we have also used different research setups based on an instrumental variable approach and a spatial dynamic panel setup, and again the findings have proven to be robust. Studying other variables such as the number of employees, total wages of civil servants and debt per capita confirm the outcome that municipal finances as a whole are unaffected by amalgamation. We have not found an effect on property tax revenue per capita either.

In chapter 3 we presented an extended analysis of these findings by investigating a number of possible explanations for the apparent absence of an amalgamation effect. Firstly, it is conceivable that our findings are caused by the fact that all municipalities have been studied as one group. If there are different, counteracting amalgamation effects for municipalities with different characteristics, this might not have been observed if these effects cancel each other out. To study this possibility, we repeated our analyses on spending per capita, but differentiated the effect using interaction variables. First, we interacted the amalgamation dummies with the population size after amalgamation, based on the hypothesis that for smaller municipalities economies of size should be more likely than diseconomies of size, whereas for larger municipalities the reverse should be expected. However, this differentiation rendered no different results than the original analysis. Our second differentiation was based on the degree to which the average ideology of amalgamating municipalities' councils differs. Theoretically, amalgamating municipalities with heterogeneous preferences are expected to increase spending more than amalgamating municipalities with homogeneous preferences. However, the results of an analysis differentiating on variables measuring this heterogeneity did not support this hypothesis.

The second extension deals with the possible critique that spending per capita does not per se measure efficiency of a municipality. It is conceivable that economies of size do occur, but that amalgamated municipalities decide to improve public service levels instead of decreasing spending. This possibility has been looked into using two different approaches. First, we have studied categories of spending instead of aggregate spending, and focussed on the spending category that is most likely to show efficiency gains (administration) and the spending category that is most relevant with regard to providing services highly observable to the public (culture and recreation). Although we did observe a decrease of spending on administration after an amalgamation, spending on culture and recreation remains unaffected. The second approach focusses on house prize developments, based on the mechanism of capitalization which implicates that if public services in a municipality are improved without local taxes being raised, the houses in that municipality will increase in value. However, we did not observe any significant changes in house prices after amalgamations. This has led us to conclude that there is no evidence of any efficiency gains being directed towards improvement of local public services.

Overall, with the exception of an effect on spending on administration (which is apparently too small to have any significant effect on total spending), we have found no evidence of a significant, robust amalgamation effect on local public finances or public services.

Policy implications

In the introduction of this thesis, we highlighted the ambition of the Dutch Rutte II administration to stimulate municipal amalgamation and to reduce the size of grants from national to local government, based on assumptions about efficiency gains from increasing average size of municipalities. Financial gains have not been the only motive for the

administration to engage in stimulating amalgamations. Instead, the decentralization of tasks in the social domain and the need for improvement of the administrative capacity of municipalities are declared to be the main motive for these policies. However, substantial efficiency gains have been factored in and budgeted for the medium to long run.

We have found no empirical evidence in support of the assumed efficiency gains. Hence, we conclude that it is unwise for governments to steer towards municipal amalgamations for financial motives. If and when amalgamations are deemed desirable for other reasons, efficiency gains should not be taken as a given and financial projections should be made with appropriate caution. We have studied amalgamations that were decided on enjoying substantial local public support, either based on a bottom up approach or at least taking into account local preferences by consulting local administrations. This implies that our conclusions are even more relevant for policies that put external pressure from higher level governments on local governments, leading to amalgamations that would not take place without that pressure. Municipalities involved in these kinds of amalgamations are less likely to make the most of their situation than most of the municipalities we studied, making chances for efficiency gains even smaller.

5.2 Intermunicipal cooperation

The discussion on what is an optimal size or size range for municipalities encompasses more than questions of administrative size alone. In the Netherlands and in most other countries, municipalities can choose to cooperate with other municipalities for the production and/or delivery of public services. This means that, for those public services that are produced through intermunicipal cooperation, the administrative scale is not equal to the operational scale. For these public services, a municipal amalgamation is bound to have smaller (or no) consequences for the operational scale. Symmetrically, the operational scale of certain public services can be changed radically without any amalgamation coming into play when intermunicipal cooperation is initiated.

Intermunicipal cooperation introduces other aspects into the discussion as well. It allows municipalities to increase operational scale, reaping some of the benefits of economies of size that are more predictable for specific public services than for the local public services as a whole. Meanwhile, administrative scale remains unaffected, enabling a better reflection of local preferences in local government policy. A strong argument against intermunicipal cooperation is the introduction of an extra intermunicipal administration layer, which increases the distance between local government and public service production. According to agency theory, this might increase bureaucracy and inefficiency. Public choice theory instead suggests that the increased distance reduces political meddling which improves efficiency.

Chapter 4 discusses our empirical research in this specific area of (in)efficiency caused by an increased distance between local government and the production of public services in the context of intermunicipal cooperation. We have taken a novel approach for this study.

Instead of focussing on a single public service and analysing efficiency effects by means of conventional methods for efficiency analysis, we focussed on the procurement of an resource that is needed for the production of a broad range of public services, namely credit. Using a micro-level dataset of loans to municipalities and intermunicipal organizations, we have been able to control for all variables that might affect negotiated interest rates for loans, leaving us with differences that can only be contributed to the negotiation effort put in by the borrowing party.

We have found evidence that intermunicipal organizations pay higher interest rates for identical loans than municipalities do. This cannot be explained by differences in creditworthiness, as all loans in our dataset are risk free. These findings are robust for all types of loans that data is available for. The interest rates paid by intermunicipal organizations are 4% higher on average than those paid by municipalities. Newly amalgamated municipalities, however, do not pay higher interest rates than municipalities that have not been amalgamated in the recent past.

Further analysis shows that the observed differences are not affected by the legal form of the intermunicipal organization (public body or public company), nor by the public service that is produced by the intermunicipal organization or by the number of municipalities that take part in the cooperation.

Some crude calculations show that the amount of money that could be saved per loan by an intermunicipal organization would warrant more effort to be put into negotiations. The fact that this effort has not been made has led us to conclude that the existence of an extra administrative layer leads to inefficiency in the case of intermunicipal cooperation. This conclusion is in line with agency theory, which predicts that extra organizational layers among other things may reduce the level of monitoring by the principal which allows for suboptimal effort of the agent to optimize efficiency.

Policy implications

There is no reason to believe that our findings with regard to inefficiency caused by reduced monitoring should be limited only to the task of procuring credit. On the contrary, now that the hypothesis on inefficiency is supported by robust empirical evidence in this area, we would expect that reduced monitoring leads to inefficient behaviour in other parts of intermunicipal organizations as well. With our study, we have found support for a hypothesis that is the foundation of an important argument against intermunicipal cooperation: local politicians are bound to have less influence on the efficient delivery of public services if they decide to assign the task concerned to an intermunicipal organization. This does not mean that intermunicipal cooperation is undesirable in all cases. The arguments in favour of intermunicipal cooperation might be convincing enough to warrant such a decision. But it does underline that this efficiency effect is real and should not be underestimated or neglected by policymakers.

5.3 Avenues for further research

Our research on municipal amalgamations and intermunicipal cooperation has added to the existing literature in a number of ways. We have used unique datasets that have allowed us to take steps in new directions and analyse effects using new approaches. However, as with all scientific research, we have found a number of avenues for further research which we have not been able to cover in the present work but could greatly help in finding more answers to the questions we have delved into.

We have differentiated municipal amalgamations based on the population size after amalgamation and based on the differences in ideology of council and coalition before amalgamation. This is only a selection of possible criteria based on which amalgamations can show different effects on budgetary outcomes and efficiency. It is conceivable, for instance, that amalgamations are more likely to render efficiency gains when they are initiated fully voluntarily, and there is no external pressure whatsoever. Correspondingly, local public support for an amalgamation might be a factor of influence, not only ex post in terms of acceptance of policy changes and the valuation of public services, but also in terms of ex ante enthusiasm and support for approaching the preparations and the amalgamation process itself in a serious manner. Thirdly, the number of simultaneous amalgamations in the region or nation and the possibly associated guidance from higher level governments in the amalgamation process might positively affect outcomes in terms of efficiency. These criteria are worth exploring for a more detailed analysis of amalgamation effects.

We have touched upon the issue of municipal efficiency and the way in which this is affected by amalgamation, using an approach of measuring capitalization of efficiency effects (or the lack thereof). Efficiency analysis is typically done using methods such as data envelopment analysis (DEA) or stochastic frontier analysis (SFA). The extent to which these methods are reliable and applicable depends heavily on the availability and quality of output indicators. For specific municipal tasks (e.g., waste disposal) these methods have been used thanks to the availability of this type of data. However, to measure municipal output as a whole and to produce reliable indicators that are comparable both over (a longer period of) time and between different municipalities has proven to be hard if not impossible. As an alternative approach, it would be interesting to see if data on credit procurement by municipalities is available on a microlevel for other countries(as it was to us for the research presented in chapter 4). If so, a comparison or combination with existing research on efficiency in waste management could provide a good opportunity for gaining insight in this topic. Also, to find out if our results found with interest rate differences can be translated to efficiency differences for the organizations in question, perhaps case studies aimed at obtaining a more complete view of the organizations involved could be fruitful.

In our study on municipal amalgamation, we have mainly studied the effects on total spending of an increase of the administrative scale and with that a simultaneous increase of the operational scale for most public services (those that are not delivered at a supralocal

level). Although we have studied some specific categories of spending too, we have not yet delved into effects on specific categories of spending of increasing scale for specific tasks by means of intermunicipal cooperation. Ideally, this extension of the literature would combine effects of scaling up for several or all categories of spending, paying attention to possible synergy effects of intermunicipal organizations for different public services that share one or more municipalities.

Hence, there are still many studies to be done with regard to the topic of optimal scale and size for local governments. With this thesis, I trust that we have taken the literature one small step further in the direction of a more definitive answer to the question what this optimal size might be (and under what conditions), but many steps still remain.

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Samenvatting

Inleiding

Een van de belangrijkte vraagstukken binnen het vakgebied van openbare financiën gaat over de optimale omvang van lagere overheden. Voor een groot aantal overheidstaken geldt dat de nationale overheid te groot is om deze op een efficiënte manier uit te voeren. Het ligt dan ook voor de hand dat de nationale overheid een aantal taken selecteert om door lagere overheden uit te laten voeren. Maar daar houdt de beleidsvrijheid van de overheid niet op: ook herstructurering van lagere overheden (zowel van bovenaf als van onderop) kan grote veranderingen in de schaal waarop taken worden uitgevoerd tot gevolg hebben. Dit proefschrift bestudeert de gevolgen van verschillende vormen van dergelijke herstructurering.

Aanleiding: lokale overheid in de praktijk

Er zijn twee ontwikkelingen die aanleiding hebben gegeven tot de onderzoeken die ten grondslag liggen aan dit proefschrift. Ten eerste is er de constatering dat er grote verschillen zijn in de omvang van lokale overheden in verschillende landen. Zo hebben gemeenten in Tsjechië en Frankrijk gemiddeld minder dan 2.000 inwoners, terwijl die omvang in het Verenigd Koninkrijk rond 140.000 ligt. Het zou te makkelijk zijn om daarmee te concluderen dat er blijkbaar geen consensus over de optimale omvang van lokale overheden bestaat; deze verschillen kunnen immers ook in belangrijke mate bepaald zijn door historische ontwikkelingen in plaats van door recent beleid. We zien echter ook bij herindelingsoperaties in West-Europa in het verleden dat de resulterende gemeenten grote verschillen kennen in omvang. Het feit dat dus zelfs wanneer overheden vrij zijn om te bepalen hoe groot gemeenten ongeveer worden, zij niet ongeveer dezelfde omvang

nastreven, is een duidelijk indicatie van het feit dat er nog veel onduidelijkheid is over de optimale omvang van gemeenten.

De tweede ontwikkeling die aanleiding geeft tot onderzoek naar herindeling en samenwerking betreft het beleid in Nederland ten aanzien van schaalvergroting. In Nederland zijn gemeentelijke herindelingen altijd aan de orde van de dag geweest. Geleidelijk aan is het aantal gemeenten tussen 1900 en 2015 door herindelingen afgenomen van 1.121 naar 393. Sinds 2002 is formeel vastgelegd dat brede publieke steun een belangrijke factor moet zijn bij beslissingen over het doorgaan van een gemeentelijke herindeling, waarmee het initiatief voor herindelingen kwam te liggen bij de betrokken gemeenten (of bij provincies die daarbij verplicht waren de wensen van de gemeenten zoveel mogelijk mee te nemen).

Aan dat uitgangspunt kwam met het aantreden van het kabinet Rutte II een einde. In het regeerakkoord werden de ambities uitgesproken om door middel van decentralisaties het takenpakket van gemeenten te vergroten en tegelijkertijd de bestuurskracht van gemeenten te vergroten door aan te sturen op vergaande schaalvergroting. Uiteindelijk zouden gemeenten minimaal 100.000 inwoners moeten hebben, terwijl gemeenten in 2012 gemiddeld ongeveer 40.000 inwoners hadden. Het aantal herindelingen per jaar zou daarvoor grofweg moeten worden verdubbeld, zo nodig op aangeven van de provincies. Omdat het kabinet ervan overtuigd was dat de gemeenten efficiënter zouden worden bij een grotere omvang, werd op lange termijn een structurele korting op het gemeentefonds van 1 miljard euro per jaar ingecalculeerd, wat neer zou komen op een reductie van ongeveer 6%.

Blijkbaar wordt door nationale overheden (in elk geval door de Nederlandse) soms aangestuurd op schaalvergroting door herindeling op basis van verwachte efficiencywinst, terwijl het internationale beeld niet wijst op een consensus over de meest efficiënte omvang van gemeenten. Daarmee is het belang van een verdergaand debat over dit onderwerp geschets, waarbij economisch onderzoek zowel in theoretisch als in empirisch opzicht een belangrijke rol kan spelen.

De theorie over de optimale omvang van gemeenten

Theoretisch gezien is de optimale omvang van gemeenten die omvang waarbij de efficiency van die gemeenten optimaal is, zodat er sprake van een nutsmaximalisatie. Van die efficiency worden in de theorie twee typen onderscheiden: productieve en allocatieve efficiency.

Productieve efficiency

Bij productieve efficiency gaat het om de vraag hoe een bepaalde productie-eenheid (in dit geval: een gemeente) gegeven een bepaalde input (o.a. het gemeentelijke budget) optimaal kan produceren (diensten kan leveren), of hoe een bepaalde productie tegen zo laag mogelijke input geleverd kan worden. De omvang van een gemeente kan dit type efficiency op een aantal manieren beïnvloeden, zowel positief als negatief.

Ten eerste kunnen ambtenaren in grotere gemeentelijke organisaties meer expertise opbouwen, omdat zij in de regel een kleiner takenpakket zullen hebben. Deze mogelijkheid tot specialisatie verhoogt de individuele efficiency en daarmee die van de organisatie als geheel. Een tweede efficiencyvoordeel ligt in het feit dat niet alle gemeentelijke kosten naar rato meegroeien met de omvang van een gemeente. Zo zal het gemeentehuis van een gemeente met 100.000 inwoners niet twee maal zo groot zijn als in een gemeente met 50.000 inwoners, en ook het aantal raadsleden per inwoner is kleiner bij grotere gemeenten. Grotere gemeenten hebben een betere onderhandelingspositie bij inkoop van goederen en diensten en kunnen daardoor efficienter werken. Het vierde effect heeft te maken met toevallige gebeurtenissen waar politici geen invloed op hebben maar die wel een wezenlijke invloed op herverkiezing van politici kunnen hebben. Dergelijke gebeurtenissen ondermijnen verantwoordingsmechanismen in het lokaal bestuur. De kans hierop is naar verwachting kleiner in grotere gemeenten, waardoor die ook op dit punt efficiencyvoordeel hebben.

Productieve efficiency kan ook negatief beïnvloed worden door de omvang van de gemeente. Ten eerste kunnen de kosten om informatie binnen een organisatie over te brengen naar rato of zelfs exponentieel groeien met de omvang van die organisatie. Daarnaast kunnen bij grotere organisaties de coördinatie- en communicatiekosten naar verhouding hoger zijn. Bij grotere gemeenten zullen meer schakels in een organisatie betrokken zijn bij het vertalen van wensen van de inwoners naar gemeentelijke dienstverlening, terwijl bij elke schakel ruis kan ontstaan bij deze vertaling. Daarbij kunnen ook de persoonlijke voorkeuren van ambtenaren een rol gaan spelen: er zijn theoriën die voorspellen dat deze een belang hebben om hun eigen budget (of dat van hun organisatie-eenheid) te maximaliseren. Hoe meer ambtenaren betrokken zijn, hoe sterker dit effect negatieve invloed op de efficiency kan uitoefenen.

Wanneer binnen een land de gemeenten gemiddeld groter zijn, betekent dat ook dat er minder gemeenten zijn. Ook dit is van invloed op de efficiency van gemeenten. Kiezers kunnen namelijk de prestaties van hun gemeente beoordelen door middel van vergelijking met andere gemeenten. Wanneer er minder gemeenten zijn, zullen er ook minder vergelijkbare gemeenten zijn, waardoor de kiezer minder goed kan beoordelen hoe goed zijn eigen gemeente functioneert. Hierdoor vermindert de controle van de kiezer op het lokaal bestuur, dat minder geprikkeld zal zijn om efficiency na te streven. Deze verminderde maatstafconcurrentie en daarmee gepaard gaande verminderde efficiency is een indirect gevolg van het groter maken van gemeenten binnen een bepaald gebied.

Allocatieve efficiency

In de context van gemeenten spreken we over maximale allocatieve efficiency wanneer de samenstelling en kwaliteit van de publieke dienstverlening precies overeenkomt met de wensen van het publiek. Ook hierop kan de omvang van gemeenten van positieve of negatieve invloed zijn.

Het voornaamste argument in dit opzicht tegen grotere gemeenten is dat het in deze gemeenten relatief moeilijk is om als kiezer de voorkeur door te laten klinken in het lokale beleid. In grotere gemeenten is het voor bestuurders makkelijker om een informatievoorsprong te verkrijgen, waardoor het voor inwoners moeilijker is om erachter te komen wanneer bestuurders niet optimaal hun wensen vertalen naar beleid. Zelfs als er een aantal inwoners is dat wel voldoende toegang tot informatie heeft om het presteren van bestuurders op waarde te schatten, zal dit aantal naar verwachting in grotere gemeentes relatief klein zijn ten opzichte van het totale electoraat. In grotere gemeentes worden bestuurders dus minder goed gecorrigeerd wanneer zij hun taak als vertaler van wensen van de kiezer naar publieke dienstverlening niet goed vervullen.

Ook het Oates decentralisatie theorema is in dit opzicht relevant. Dit theorema stelt dat taken zo ver mogelijk gedecentraliseerd moeten worden, zolang de opbrengsten opwegen tegen de kosten. De kosten zijn hierbij tweeledig: ten eerste wijst Oates op het wegvallen van schaalvoordelen ten aanzien van productieve efficiency, ten tweede zijn externaliteiten groter bij vergaande decentralisaties (daarover later meer). De opbrengsten spelen ten aanzien van allocatieve efficiency: decentralisatie van taken naar lokaal niveau creëert de mogelijkheid om meer variatie aan te brengen in publieke dienstverlening, ervan uitgaande dat in verschillende gemeenten ook verschillende wensen spelen. Hoe groter echter de gemeenten, hoe minder die mogelijkheid optimaal benut kan worden. Daarmee is de omvang van een gemeente dus van negatieve invloed op allocatieve efficiency. Bij grotere gemeenten valt er minder te kiezen voor de burger: de kans zal kleiner zijn dat hij naar een gemeente zou kunnen verhuizen waar de publieke dienstverlening dicht bij zijn voorkeuren ligt wanneer er keus is uit minder gemeenten.

Een belangrijk voordeel van grotere gemeenten is de verkleining van zogenaamde overloopeffecten. Vaak moeten lokale politici beslissingen maken die ook gevolgen kunnen hebben op het welzijn buiten hun eigen gemeente, zowel positief als negatief. Deze gevolgen zullen niet of nauwelijks worden meegenomen door politici: de inwoners van hun buurgemeenten kunnen hen immers nauwelijks belonen of afstraffen voor de genomen beslissen. Hierdoor worden deze effecten buiten de eigen jurisdictie (externaliteiten) onvoldoende meegenomen waardoor het nut in het totale gebied waar de gevolgen neerslaan zijn niet gemaximaliseerd wordt. Dit fenomeen wordt echter zwakker wanneer de gemeenten groter worden en daarmee de externaliteiten kleiner. De allocatieve efficiency wordt dus in dit opzicht groter met de gemeenteomvang.

Aanvullende theoretische complicaties

Al met al kan dus worden gesteld dat de gemeentegrootte zowel ten aanzien van productieve efficiency als ten aanzien van allocatieve efficiency positieve en negatieve theoretische effecten kan hebben. Het is vanuit de theorie niet mogelijk om te beredeneren welke effecten sterker zijn voor gemeenten van een bepaalde omvang. Het is wel duidelijk dat schaalvoordelen vooral van toepassing zijn bij kleine gemeenten, terwijl schaalnadelen

een prominentere rol spelen bij grote gemeenten. Hier volgt de conclusie uit dat er in theorie een optimale omvang voor gemeenten zou kunnen bestaan: op dit punt zouden de schaalnadelen de overhand krijgen boven de schaalvoordelen en zou het niet meer lonen een grotere omvang te hebben.

Ook daarbij kunnen vraagtekens worden gezet. Een lokale overheid levert immers meerdere diensten en kent meerdere productieprocessen die elk een eigen optimale schaal hebben. Om de optimale schaal van een gemeente te berekenen moet worden bekeken of en hoe die verschillende optimale schalen gecombineerd kunnen worden. Ook hiervoor geeft de theorie geen uitsluitsel.

Een volgende complicatie betreft het feit dat gemeentelijke organisaties er niet aan gehouden hun productieprocessen op gemeentelijke schaal uit te voeren. Ze kunnen ervoor kiezen om met andere gemeenten samen te werken bij het leveren van bepaalde diensten, of om bepaalde diensten uit te besteden aan bedrijven die daarmee op grotere schaal kunnen opereren. Het feit dat verschillende diensten op verschillende schaalgroottes kunnen worden uitgevoerd en dat deze schalen niet overeen hoeven te komen met de omvang van de gemeente zelf, is van invloed op de vraag hoe groot die gemeente dan zou moeten zijn. Datzelfde geldt voor de mogelijke invloed die samenwerkingspartners en leveranciers op het lokale bestuur kunnen uitoefenen (wordt beleid geüniformeerd?) en de effecten van extra schakels in de keten wanneer een derde partij namens een gemeente diensten verleent aan de bevolking op allocatieve efficiency.

Effecten van herindelingen op het lokaal bestuur

Tot nu toe hebben we het gehad over de optimale omvang van gemeenten. Dat is van groot belang bij het behandelen van het onderwerp gemeentelijke herindeling, omdat het belangrijkste gevolg van zo'n herindeling is dat de omvang van de betrokken gemeenten aanzienlijk toeneemt. Maar er is ook een aantal effecten van herindeling die niet zozeer met de verandering in omvang te maken hebben, maar wel invloed kunnen hebben op het lokaal bestuur.

Er zijn twee nadelige effecten die op korte termijn relevant zijn denkbaar. Allereerst is het zogenaamde 'common pool'-effect van belang. Dit houdt in dat lokale besturen bij een aanstaande herindeling geneigd zullen zijn om voor dat het zover is nog bestaande reserves snel uit te geven aan zaken die vooral de eigen gemeente baten, voordat alles in de gezamenlijke pot terecht komt. Dergelijke uitgaven zouden zelfs gefinancierd kunnen worden door leningen aan te gaan, die na de herindeling door de nieuwe gemeente zal moeten worden afgelost. Een tweede effect betreft de ambtelijke reorganisatie: onzekerheid onder het personeel kan leiden tot focus op de eigen carrière, uitdiensttreding en een verslechterde werksfeer, terwijl strategische beslissingen mogelijk worden uitgesteld tot na de herindeling.

De reorganisatie kan ook een positief, structureel effect hebben. Doordat organisaties samengevoegd worden ontstaan kansen om de huidige, mogelijk ingesleten werkwijzen door te lichten, van elkaar te leren en eventueel geheel nieuwe, efficiente processen op te zetten.

De noodzaak van empirisch onderzoek en de rol van dit proefschrift

Samengevat zien we dat in de praktijk het gevoerde beleid op gemeentelijke schaal internationaal geen uitsluitsel geeft over wat hierin optimaal is. Toch zien we regelmatig herstructureringsoperaties die een schaalvergroting beogen, waarbij vaak – ook in Nederland – financiële prikkels een rol spelen op basis van de aanname dat daarbij efficiencywinst te behalen valt. Theoretisch is er voor die aanname geen basis te vinden: ten aanzien van zowel productieve als allocatieve efficiency kunnen positieve én negatieve effecten optreden, die door een aantal complicerende factoren slecht voorspelbaar zijn op basis van theorie alleen. Empirisch onderzoek is nodig om meer inzicht in dit onderwerp te krijgen.

Dit proefschrift presenteert de resultaten van twee empirische onderzoeken over twee instrumenten die gebruikt worden om de schaal van gemeentelijke dienstverlening te vergroten: gemeentelijke herindeling en intergemeentelijke samenwerking. Het derde instrument, uitbesteding van overheidsdiensten, valt buiten de scope van het proefschrift.

De economische effecten van gemeentelijke herindeling

Het meest rigoureuze instrument dat beleidsmakers hebben om schaal en omvang van gemeenten te beïnvloeden is de gemeentelijke herindeling. Door samenvoeging van meerdere gemeenten neemt de omvang van de betrokken gemeenten plotsklaps enorm toe. In veel landen is dit instrument de laatste tientallen jaren ingezet, waarbij vaak is gekozen voor een zogenaamde ‘big bang’-benadering, waarbij een groot aantal gemeentelijke herindelingen tegelijk plaatsvindt op aangeven van een centrale overheid. Zoals gezegd zijn er verschillende effecten van schaal op efficiency van gemeentes en is de algehele conclusie uit de theorie dat niet valt te voorspellen wanneer welke effecten optreden en hoe sterk die ten opzichte van elkaar zijn.

Het is dan ook geen verrassing dat de uitkomsten van empirisch onderzoek naar dit onderwerp uiteenlopende conclusies opleveren. Uit een aantal onderzoeken blijkt dat de gemeentelijke uitgaven na een herindeling stijgen (in Zwitserland, Denemarken en Finland), terwijl andere onderzoeken het tegendeel uitwijzen (in Israël en Duitsland). Ook voor het zogenaamde ‘common pool’-effect is door een aantal onderzoekers bewijs gevonden (in Denemarken, Zweden en Finland).

De hoofdstukken 2 en 3 presenteren ons onderzoek over dit onderwerp. Het onderzoek biedt toegevoegde waarde ten opzichte van de bestaande literatuur op het gebied van zowel de gebruikte data als ingezette methodologie. Waar onderzoekers onderzoeken tot nog toe ofwel een beperkt aantal losse gevallen bestudeerden of onderzoek deden naar een ‘big bang’-herindelingsoperatie, bestuderen wij herindelingen in Nederland gedurende een

langere periode, waarbij in bijna elk jaar een aantal gemeenten (bijna) heringedeeld werd. Deze unieke dataset stelt ons in staat om het effect van herindelingen op een optimale wijze te isoleren van andere tijdelijke factoren die van invloed kunnen zijn op lokale overheidsfinanciën. Daarbij introduceren we in dit onderzoeksgebied een dynamische panel data analyse en gebruiken we een aantal robuustheidstesten waarbij we onder andere ruimtelijke effecten meenemen.

De uitkomst van dit onderzoek is dat er geen robuust bewijs te vinden is voor het bestaan van herindelingseffecten, noch voor noch na herindeling. Deze bevindingen houden stand wanneer we herindelingen met een dominante herindelingspartner meenemen, of alternatieve herindelingsdummy's of controlevariabelen gebruiken. Ook wanneer we een andere onderzoeksopzet kiezen op basis van instrumentele variabelen of een ruimtelijk dynamisch panel model, blijven de bevindingen overeind. Een significant herindelingseffect blijft niet alleen uit bij gemeentelijke uitgaven, maar ook bij gemeentelijke schuld, betaalde lonen, het aantal ambtenaren in de organisatie en bij ozb-inkomsten.

In hoofdstuk 3 presenteren we een uitgebreidere analyse van deze bevindingen waarbij we een aantal mogelijke verklaringen voor het ontbreken van een herindelingseffect onderzoeken. Zo is het denkbaar dat het niet vinden van een herindelingseffect het gevolg is van het feit dat we alle gemeenten als een groep hebben bestudeerd. Het kan zijn dat er voor verschillende subgroepen verschillende herindelingseffecten bestaan die in tegengestelde richting werken waardoor ze tegen elkaar wegvallen bij een analyse van alle gemeente samen. Zo is de verwachting dat bij kleine gemeenten schaalvoordelen zwaarder wegen dan schaalnadelen, terwijl dat bij grote gemeenten andersom is. De resultaten van nieuwe analyses, waarbij we de herindelingsdummy laten interacteren met de bevolking van de gemeente, wijzen echter niet op significant bewijs voor deze verwachting. Een tweede hypothese is dat bij gemeenten die samengaan en grote politieke verschillen kennen, de toename in uitgaven om alle partijen tevreden te stellen groter zal zijn dan eventuele efficiencyvoordelen waarmee uitgaven per saldo zouden groeien. Bij meer gelijkgestemde gemeenten zouden de efficiencyvoordelen juist overheersen. Ook voor deze hypothese vinden we echter geen bewijs in aanvullende analyses.

De tweede uitbreiding van de basisstudie in hoofdstuk 2 gaat in op de mogelijke kritiek dat de belangrijkste afhankelijke variabele in deze studie niet een goede maat is voor de efficiency van een gemeente. Het is immers denkbaar dat er wel degelijk schaalvoordelen optreden, maar dat deze niet zichtbaar zijn in de gemeentelijke uitgaven omdat de nieuwe gemeente de efficiencywinst inzet om de publieke dienstverlening te verbeteren. Dit scenario hebben we op twee manieren onderzocht. Ten eerste hebben we bekeken of er wellicht herindelingseffecten zijn te vinden in uitgaven waar specifiek efficiencyvoordelen te verwachten zijn (bestuurslasten) en in uitgaven waarvan de resultaten in relatief sterke mate zichtbaar zijn voor de inwoners van de gemeente (cultuur en recreatie). We vinden wel een afname in de eerste categore uitgaven, maar geen effect bij de tweede categorie. Als

tweede benadering kijken we naar de ontwikkeling in huizenprijzen binnen herindelingsgemeenten. Op basis van het mechanisme kapitalisatie, dat impliceert dat gemeenten die efficienter zijn ook aantrekkelijker zijn om in te wonen, zou een herindeling met efficiencywinst moeten leiden tot hogere huizenprijzen. Ook bij bestudering van deze variabele zien we echter geen herindelingseffect, waarmee we concluderen dat er geen bewijs is voor het idee dat efficiencyvoordelen worden ingezet voor verbetering van de gemeentelijke dienstverlening.

Over het geheel bezien vinden we dus, afgezien van een klein neerwaarts effect op uitgaven aan bestuurslasten dat dermate klein is dat het verwatert bij analyse van de totale uitgaven, geen significant, robuust bewijs voor het bestaan van een herindelingseffect, noch bij uitgaven, noch bij dienstverlening van gemeenten.

Gevolgen voor het beleid

We hebben gezien dat het kabinet Rutte II heeft ingezet op het stimuleren van gemeentelijke herindelingen. Dit beleid is niet alleen ingegeven door de verwachting dat dit financiëel voordelig zou zijn. Als voornaamste reden is opgegeven dat de ambitie is ontstaan om de bestuurskracht van gemeenten te vergroten, ook met het oog op het verzwaarde takenpakket na de decentralisaties in het sociale domein. Toch zijn er ook substantiële efficiencywinst ingecalculeerd én begroot voor de (middel)lange termijn.

Wij vinden echter geen empirisch bewijs wat de verwachtingen ten aanzien van deze efficiencywinsten kan ondersteunen. We concluderen daarmee dat het af te raden is om aan te sturen op herindelingen om financiële redenen. Het kan zo zijn dat herindelingen wenselijk zijn om andere redenen, maar men kan daarbij niet zonder meer van efficiencywinst uitgaan. De herindelingen die wij hebben bestudeerd konden in de regel op brede publieke steun rekenen, ofwel omdat ze het resultaat waren van een bottom up-proces, ofwel omdat er sterk rekening werd gehouden met de voorkeuren van het lokale bestuur. Dit betekent dat onze conclusies nog relevanter zijn voor beleid waarbij druk van bovenaf wordt uitgeoefend om herindelingen te bewerkstelligen. Gemeenten die hierbij betrokken zijn zullen immers minder gemotiveerd zijn het maximale resultaat uit hun herindeling te halen, wat de kansen op efficiencywinst verder verkleint.

Intergemeentelijke samenwerking

Zoals gezegd kan intergemeentelijke samenwerking een belangrijke rol spelen bij de discussie over de optimale omvang van een gemeente (of de bandbreedte daarvoor). Immers, wanneer bepaalde overheidsdienstverlening niet op het niveau van de gemeente is geregeld, maar op het niveau van een samenwerkingsverband of een groep gemeenten, dan heeft een herindeling minder grote (of geen) gevolgen voor de efficiency op dat gebied. Evenzo kan de operationele schaal van bepaalde publieke diensten ingrijpend veranderen zonder dat een herindeling hierin een rol speelt.

Doordat gemeentebesturen de optie hebben om bepaalde publieke taken op intergemeentelijk niveau uit te laten voeren, bestaat de mogelijkheid om specifiek schaalvoordelen te halen op een gedeelte van het takenpakket, zonder de bestuurlijke schaal te vergroten en de afstand tussen bestuur en bewoners aan te tasten voor de lokale overheid als geheel. Toch kan voor de intergemeentelijk geregelde taken door het introduceren van een extra bestuurslaag wel sprake zijn van verminderde grip van het lokale bestuur op deze processen. Volgens de *agency theroy* kan dit leiden tot meer bureaucratie en inefficiency. Aan de andere kant suggereert de *public choice theory* juist dat deze extra bestuurslaag ervoor zorgt dat er minder politieke belangen in de sturing kunnen worden gemengd, wat de efficiency juist ten goede zou komen.

In hoofstuk 4 bespreken we ons empirisch onderzoek naar de effecten van intergemeentelijke samenwerking op efficiency als gevolg van deze vergrote afstand tussen publieke dienstverlening en lokaal bestuur. Hiervoor maken we gebruik van een innovatieve methode. Normaal gesproken wordt gekeken naar een bepaalde overheidsdienst (bijvoorbeeld afvalverwerking) en worden conventionele efficiency-analyse-methoden hierop toegepast. Wij hebben onze focus gelegd op de inkoop van een input die gebruikt wordt bij de productie van een breed scala aan overheidsdiensten: krediet. We maken gebruik van een dataset van losse leningen aan gemeenten en intergemeentelijke organisaties, waarin alle eigenschappen die de hoogte van de toegepaste rente zouden kunnen beïnvloeden zijn opgenomen. Daarmee kunnen we het effect van de inzet op onderhandelingen door de lener isoleren: als een hogere rente wordt betaald voor een identieke lening, dan moet dat het gevolg zijn van een kleinere inspanning door de lener om een goede rente te onderhandelen.

Op basis van deze methode vinden we dat intergemeentelijke organisaties hogere rentes betalen dan gemeenten voor verder identieke leningen. Dit verschil kan niet verklaard worden verschillen in kredietwaardigheid, aangezien leningen in beide gevallen volledig zonder risico zijn. Dit verschil zien we bij alle typen leningen in onze dataset. Tegelijkertijd zien we dit effect juist niet bij net heringedeelde gemeenten: zij lenen tegen gelijke rentetarieven als langer bestaande gemeenten. Deze uitkomsten worden niet beïnvloed door het soort organisatie (openbaar lichaam of overheidsbedrijf) of de overheidstaak die door de intergemeentelijke organisatie wordt uitgevoerd.

Gemiddeld betalen intergemeentelijke organisaties 4 procent meer aan rentekosten voor identieke leningen dan gemeenten. Op basis van een aantal simpele berekeningen valt snel te achterhalen dat het voor deze organisaties zeker zou lonen om meer inspanning te leveren bij onderhandelingen om een goede rente. Het feit dat dit niet gebeurt doet ons concluderen dat het bestaan van een extra bestuurslaag tot inefficiency leidt. Deze conclusie is daarmee in lijn met de *agency theory* die voorspelt dat er ruimte ontstaat voor inefficiency door verminderd toezicht vanuit het lokaal bestuur.

Gevolgen voor het beleid

Er is geen reden om ervan uit te gaan dat onze conclusies over de inkoop van kredit niet toepasbaar zouden zijn op het functioneren van intergemeentelijke samenwerkingsverbanden in bredere zin. Ons onderzoek ondersteunt de hypothese die aan de basis staat van een belangrijk argument tegen intergemeentelijke samenwerking: lokale politici zullen naar verwachting minder kunnen sturen op de efficiënte levering van publieke diensten wanneer ze de uitvoering ervan beleggen bij een intergemeentelijke organisatie. Dit betekent niet automatisch dat intergemeentelijke samenwerking onder geen beding een goede keuze is: er kunnen andere argumenten zijn om hier wel toe over te gaan. Maar het potentiële efficiencyverlies is ontegenzeggelijk een reëel risico dat niet onderschat of genegeerd kan worden door beleidsmakers.

Mogelijk vervolgonderzoek

Ons onderzoek is op een aantal manieren van toegevoegde waarde geweest voor de bestaande literatuur. We hebben gebruik gemaakt van unieke datasets waarmee we in staat zijn gesteld om nieuwe benaderingen te kiezen bij de analyse van effecten van herindeling en samenwerking. Er is echter, zoals altijd bij wetenschappelijk onderzoek, ook nog een aantal mogelijkheden om deze onderwerpen nader te bestuderen.

We hebben bij het bestuderen van herindelingen onderscheid gemaakt tussen grote en kleine gemeenten, en tussen gemeenten met grote en kleine ideologische verschillen. Dat is maar een selectie uit de mogelijke factoren die van invloed kunnen zijn op het ontstaan van herindelingseffecten. Zo zou onderscheid gemaakt kunnen worden op basis van de mate waarin een herindeling is opgelegd door een hogere overheid. Volledig vrijwillig herindelende gemeenten zullen meer gemotiveerd zijn om het maximale uit een herindeling te halen dan gemeenten die daartoe gedwongen zijn. Ook de steun bij de bevolking kan van invloed zijn, niet alleen bij de waardering voor dienstverlening door de overheid na de herindeling, maar ook bij de voorbereidingen op een aanstaande herindeling. Ten derde zou nog gekeken kunnen worden naar gelijktijdige herindelingen in de regio en mogelijk daarmee gepaard gaande begeleiding vanuit hogere overheidslagen. Het is aanbevelenswaardig om deze factoren nader te bekijken om meer inzicht te krijgen in het bestaan van mogelijke herindelingseffecten.

We hebben het onderwerp gemeentelijke efficiency bij herindelingen onderzocht door te kijken naar de mogelijke kapitalisatie van efficiency effecten en de ontwikkeling van huizenprijzen. Het is gebruikelijk dat bij bestudering van efficiency gebruik wordt gemaakt van *data envelopment analysis* of *stochastic frontier analysis.* De toepasbaarheid en bruikbaarheid van deze methoden valt of staat bij de beschikbaarheid en kwaliteit van gegevens over de output van gemeenten. Voor een aantal publieke taken (zoals afvalverwerking) zijn dergelijke gegevens beschikbaar en zijn deze methoden dan ook gebruikt bij studies in meerdere landen. Voor de output van gemeenten als geheel, over het gehele scala aan overheidstaken, zijn de gegevens echter ontoereikend gebleken. Het is wel

het onderzoeken waard om te kijken of er in het buitenland vergelijkbare datasets van leningen zijn zoals de onze, om vervolgens vergelijkbare analyses uit te voeren met deze data. De uitkomsten van deze studies en die over specifieke taken zoals afvalverwerking kunnen dan naast elkaar gelegd worden om meer inzicht in dit onderwerp te verkrijgen. Ook zou het de moeite kunnen lonen om onze bevindingen op het gebied van inefficiency bij intergemeentelijke organisaties te toetsen door middel van casestudy's die een meer compleet beeld kunnen verschaffen.

Ons onderzoek naar gemeentelijke herindelingen is voornamelijk gericht geweest op de gevolgen voor totale gemeentelijke uitgaven van een toename van zowel de bestuurlijke schaal als de operationele schaal waarop de uitvoering van meeste (niet elders belegde) overheidstaken geschiedt. We hebben nog niet gekeken naar de effecten van de opschaling van bepaalde taken (door intergemeentelijke samenwerking) op bepaalde uitgavencategorieën van gemeenten. Idealiter zou men dan ook kunnen kijken naar synergie-effecten wanneer meerdere taken tegelijk bij samenwerkingsverbanden worden belegd.

Kortom, er is nog veel onderzoekswerk te verrichten over het onderwerp van de optimale schaal en omvang van gemeenten. Ik vertrouw erop dat we met dit proefschrift een nieuwe, kleine stap hebben gezet in de richting van een definitief antwoord op de vraag wat die optimale omvang zou kunnen zijn (en onder welke omstandigheden), maar er zijn nog veel (en grote) stappen nodig.