

# **AMALGAMATION IMPACTS ON LOCAL GROWTH: ARE VOLUNTARY MUNICIPAL AMALGAMATIONS MORE EFFICIENT THAN COMPULSORY AMALGAMATIONS?<sup>1</sup>**

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## **Abstract.**

The purpose of this paper is to analyse amalgamation impacts on local population and income growth as well as whether voluntary amalgamations are more efficient compared to compulsory amalgamations. The empirical analysis is based on data for 1,005 Swedish municipalities for the period 1953-1959, i.e. a six-year period after the 1952 municipal reform. The reform was state imposed and 66 percent of the newly formed municipalities were amalgamated on a compulsory basis. The results show that amalgamations had a positive effect on population growth in small municipalities. The main finding in the paper is that municipalities formed on a voluntary basis had higher population growth compared to municipalities formed on a compulsory basis. One conclusion is that local opinions are important to consider when forming a new local government structure.

**Key Words:** Economic growth, population growth, local government amalgamation, heterogenous preferences

**JEL Codes:** H11, H73, H77, R11, R23, R50.

## **Résumé. Les impacts de la fusion municipale sur la croissance locale : est-ce que les fusions municipales volontaires plus efficace que les fusions imposées?**

Durant le XX<sup>e</sup> siècle, des réformes concernant la gouvernance locale ont été mises en œuvre dans plusieurs pays. Ce processus de restructuration des collectivités territoriales, à l'échelle régionale et locale, suscite de nombreux débats. Quand les réformes sont imposées par l'État, cela crée souvent un conflit entre les intérêts nationaux et les intérêts locaux. Le désir de réaliser des économies d'échelle et d'internaliser des externalités interjuridictionnelles vient souvent en opposition des arguments de démocratie locale. Malgré la mise en œuvre d'importantes réformes de gouvernance locale dans plusieurs pays, il existe relativement peu d'études qui utilisent des données couvrant des réformes à l'échelon national pour analyser les effets du regroupement sur l'économie locale. En outre, on observe souvent une forte résistance locale aux réformes à l'échelon national, mais à notre connaissance aucune étude empirique menée ne s'est attachée à analyser l'importance des préférences locales et des accords volontaires concernant les conséquences liées aux réformes des limites territoriales. L'objet de cet article est d'analyser les effets du regroupement sur la population locale et la croissance des revenus, et de savoir si les regroupements volontaires sont plus efficaces que les regroupements obligatoires. Celui-ci peut apporter une contribution appréciable en permettant de mieux faire connaître les conditions nécessaires à la réalisation de fusions de gouvernements locaux. Les réformes de gouvernance locale impliquent en général un objectif explicite de la taille d'une collectivité donnée. Par conséquent, l'efficacité dépend souvent de l'effet de taille des fusions de gouvernements locaux. Des

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facteurs comme l'affinité naturelle et l'hétérogénéité des préférences peuvent cependant se révéler importants pour la réussite de la réforme structurelle, mais ces facteurs sont rarement pris en compte lors de l'étude préalable. L'analyse empirique est basée sur des données concernant 1 005 communes suédoises et couvre la période 1953-1959, à savoir les six années qui ont suivi la réforme municipale de 1952. L'objectif principal de la réforme de 1952 en Suède était de regrouper les petites communes. Les communes ne devaient pas avoir moins de 2 000 habitants afin d'améliorer l'efficacité administrative et les services publics en exploitant les économies d'échelle. La réforme fut imposée par l'État et 66 % des communes nouvellement constituées ont fusionné sur la base d'un regroupement obligatoire. Les résultats montrent que les regroupements ont eu un effet positif sur la croissance de la population dans les petites communes. Le constat principal de l'article est que des communes regroupées sur une base volontaire présentent une croissance de population supérieure à celle des communes regroupées sur une base obligatoire. Il en ressort que la prise en compte des opinions locales est essentielle dès qu'il s'agit de créer une nouvelle structure de gouvernance locale.

**Mots clé :** Croissance économique, croissance démographique, fusion municipale locale, préférences hétérogènes

**Codes JEL :** H11, H73, H77, R11, R23, R50

## **Introduction**

During the 20<sup>th</sup> century, local government reforms have been implemented in several nations. This restructuring process in the local and regional government sector is a highly debated issue. When reforms are state-imposed there is often a conflict between national and local interests. The desire to realise scale economies and internalise interjurisdictional externalities is often in opposition to local democracy arguments. In some cases, the reforms have been quite radical, meaning that the reforms have been state-imposed and very extensive, affecting a majority of the local governments. For example, starting with the first Swedish reform in 1952, all Scandinavian countries have implemented extensive reforms during the 1950s, 1960s, and the 1970s using the Swedish reform as an example.<sup>2</sup>

Although major local government reforms have been implemented in several nations, there are relatively few studies that utilise data covering nationwide reforms in order to analyse amalgamation impacts on the local economy. Two exceptions are Nelson (1992) and Hanes (2003) who study amalgamation impacts on local public expenditures in Sweden. Both studies suggest that amalgamations of larger municipalities might not be efficient.<sup>3</sup> A recent study by Hanes and Wikström (2008) concerns the impact of boundary reforms on population and income growth. A positive effect of amalgamations on population growth is found for amalgamation of small municipalities.

Strong local resistance to nationwide reforms is often observed, but there are no empirical studies to our knowledge that have analysed the importance of local preferences and voluntary agreements for the outcomes of boundary reforms. In this paper, we study

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<sup>2</sup> The 1952 reform in Sweden was also accompanied by other reforms in northern Europe, e.g. Germany and the U.K. See Gustafsson (1980) for a discussion of municipal reforms in Scandinavia. Meligrana (2004) gives an overview of boundary reforms and different practices, e.g. the case of Spain, Germany, and Canada. Dollery and Robatti (2008) also contains a thorough presentation of boundary reforms in different nations.

<sup>3</sup> Within the economic literature, several studies have addressed the question of municipal annexation and efficiency, foremost the effects on public spending (e.g. Liner, 1992, 1994; Mehay, 1981). Liner (2002) also studies annexation effects on taxes in U.S. municipalities, suggesting that there might be an optimal level of annexation.

the impact of a state imposed local government reform on local income and population growth. The paper builds on the work by Hanes and Wikström (2008) who studied the 1952 municipal reform in Sweden and subsequent income and population growth. The objective of the reform was to amalgamate small municipalities in order to improve administration efficiency and public services by exploiting scale economies. Hanes and Wikström found that amalgamations of small municipalities had a positive impact on subsequent population growth, which was one aim of the reform. The main purpose of the present paper is to analyse if voluntary amalgamations are more efficient compared to compulsory amalgamations. This is undertaken by comparing subsequent growth patterns between municipalities amalgamated on both voluntary and compulsory bases in the 1952 reform in Sweden. Local resistance to the reform was strong among municipalities. The reform reduced the number of municipalities from 2,498 to 1,037 and as much as 66% of the new municipalities had at least one municipal part that resisted the reform. However, municipalities were not able to stop an amalgamation with neighbouring municipalities.

In recent years, a growing amount of literature has focused on the formation of economic and political unions (e.g., Alesina and Spolaore, 1997; Bolton and Roland, 1997). Preference heterogeneity is a key variable in models describing the optimal government structure and the provision of public goods. According to the decentralization theorem proposed by Oates (1972), a decentralised local government structure is more likely to provide a mix of local public services that is consistent with the preferences of the inhabitants. The relationship between government structure and preference heterogeneity on the one hand and economic growth on the other hand is not thoroughly covered in the literature. The decentralisation theorem is foremost seen as a static link between the local government structure and efficiency; however, Oates (1993) argues that it is also reasonable to assume that a government structure that is sensitive to local needs will also enhance economic growth. More recent contributions focus more narrowly on different relationships between preference heterogeneity and economic growth; e.g. Woo (2005) presents a model where a polarized society causes volatile public spending which in turn may have a detrimental effect on economic growth.

Since the starting point for the present analysis is the restructuring of the local government sector, a central question is why should the structure of the local government sector, or degree of horizontal concentration, affect local growth patterns? One hypothesis is that amalgamations may enhance efficiency in the local public sector through realisation of scale economies and internalisation of inter-jurisdictional externalities. If public services serve as amenities affecting the value of residing in a particular region and as inputs to private firms, municipal amalgamations may enhance local income and population growth. Theories within economic geography can also contribute to explain amalgamation effects on growth patterns; e.g. central place theory (see Christaller, 1933) states that demand thresholds are important for business establishments. In this perspective, local government reform may enlarge local markets and higher demand thresholds may be reached.

There have been to date some recent studies on boundary reforms and local growth; for example Meligrana (2007) who studied municipal annexation in British Columbia, Canada, during 1971-2001 and found no effect of annexation on population growth or economic development. The paper by Hanes and Wikström (2008) studied the 1952 reform in Sweden and subsequent income and population growth for the period 1953-1959. The nationwide reform in Sweden was implemented in connection to a rapid growth of the

public sector, especially at the local level as a consequence of fiscal decentralisation. The large number of small municipalities was not seen as a sustainable horizontal structure, considering the expansion of the local public services.<sup>4</sup> Hanes and Wikström found no evidence that amalgamations affected average income growth. However, the results indicated that municipal amalgamations had a positive effect on population growth in small municipalities. One interpretation is that amalgamations were able to slow down depopulation in small municipalities, which was one aim of the reform. Furthermore, they found that the composition of the newly formed municipalities affected subsequent growth. An unequal distribution of pre-reform population levels was found to have a positive effect on growth, i.e. there is an advantage to being of different size prior to amalgamation. One explanation is that a new municipality with a natural centre might be in better position to take advantage of the amalgamation, e.g. through realisation of scale economies. On the other hand, heterogeneity with respect to income levels, which may indicate preference heterogeneity, was found to be detrimental for subsequent growth.

Related literature has contributed numerous studies regarding the relationship between fiscal decentralisation and economic growth. Fiscal decentralisation is generally measured as the size of local tax revenues and expenditures relative to the national tax revenues and expenditures, i.e. it is a measure of how much decision making is decentralised to local governments.<sup>5</sup> In a cross-country study, Davoodi and Zou (1998) find a negative relationship between decentralisation and economic growth in developing countries. However, they did not find any effect in developed countries. Zhang and Zou (1998) also find a negative relationship between fiscal decentralisation and economic growth in their study of income growth in China. Xie et al (1999) used county data for the U.S. in order to analyse decentralisation effects on economic growth. They find that further decentralisation may have a negative effect on economic growth in the U.S. The results seem reasonable for developing countries; the central state has a fundamental responsibility in co-ordinating and providing basic functions such as property rights and infra-structure. As pointed out by Oates (1993), the relationship between decentralisation and economic growth is ambiguous - does fiscal decentralisation enhance economic growth, or is it economic growth that constitutes a necessary criterion for decentralisation? Other studies have found a positive relationship between decentralisation and growth in developed countries, e.g. Akai and Sakata (2002), Thiessen (2003) and Stansel (2005).

In the empirical analysis below we estimate models similar to those in Hanes and Wikström (2008) and extend their analysis by also including information on whether municipalities were amalgamated on a voluntary or compulsory basis. To our knowledge, this is the first empirical study to address the issue of local opinions and the outcome of local government mergers. This may be an important contribution since it may increase the knowledge of the conditions for achieving efficient local government mergers. Local government reforms are often concerned with an explicit aim of a given government size (see e.g. Gustafsson, 1980). Thus, efficiency is often concerned with the size effect of local government mergers. However, factors such as natural affinity and preference

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<sup>4</sup> Public spending by municipalities was five times higher (in real terms) in 1950 compared to 1915 (see e.g. Wängmar, 2003).

<sup>5</sup> These kinds of measures may not be easily interpreted, e.g. they do not reveal the structure of intergovernmental grants.

heterogeneity may be important for the outcome of the structural reform but these factors are seldom observed by the researcher.

The paper is organised as follows. In the next section we present the framework and methodology for the analysis. Following this, the results are presented whilst the final section concludes.

## **Data and Methodology**

The empirical analysis in this paper follows Hanes and Wikström (2008). Information describing whether or not municipalities were amalgamated on a voluntary basis in the 1952 reform is added to the basic model. The empirical models are estimated using data during the period 1953-1959 for a cross-section of 1,005 municipalities.

### **Framework and empirical model**

The first question to address is whether or not amalgamations of municipalities can help to maintain the local population and tax base. This question necessitates an empirical framework that simultaneously can handle population growth and the growth of average income. In the empirical growth literature, one can find different approaches for modelling population movements. Glaeser et al (1995) includes the migration rate directly in the growth equation (in lagged form in order to avoid endogeneity). Another approach is to use instrumental techniques to avoid endogeneity, see e.g. Barro and Sala-i-Martin (1995). In this paper we estimate separate equations for income growth and population growth since one purpose of the paper is to relate the municipal reform to population movements.

Following Hanes and Wikström (2008), we specify the following reduced form of equation system for income growth ( $y$ ) and population growth ( $n$ ):

$$y=f(Y, N, z, a) \quad (1)$$

$$n=g(Y, N, z, a) \quad (2)$$

where  $Y$  is the initial income level and  $N$  is the initial population level. Initial characteristics affecting the growth rates are included in  $z$ , whilst  $a$  represents a vector of variables describing the municipalities that were integrated. Following previous empirical research on regional economic growth (e.g. Glaeser et al, 1995; Aronsson et al, 2001), the growth rates are conditional on initial differences between regions. In the empirical analysis, we include variables describing local economic life and labour supply. We also include demographic and geographic characteristics as well as local public sector characteristics (variable definitions are presented in Table A1 in the Appendix).

The following variables are included in  $z$ : local public per capita expenditures, per capita state grants, share of population aged 0-15, share of population aged 65 and above, share of population employed in the agriculture sector, share of population employed in the industry sector, share of employed population aged 16-65, the share of the employed with the workplace outside the municipality, dummy variables for cities and boroughs, and dummy variables for counties. The vector  $a$  contains two variables describing the amalgamation; the first is a dummy variable for amalgamation indicating whether or not

the municipality is a newly formed municipality; the second is an interaction variable indicating whether or not the municipality was formed on a voluntary basis. Voluntary amalgamations are defined as newly formed municipalities where none of the amalgamated municipalities rejected the amalgamation decision from the national government.

### **Preference heterogeneity and voluntary amalgamations in the 1952 reform**

The implementation of the 1952 reform was motivated by the rapid increase of small municipalities and the growth of the public sector that was combined with a fiscal decentralisation. Official reports prior to the 1952 reform stated that no municipalities should have less than 2,000 inhabitants and that the local tax base should exceed a critical level. These criteria were set in order to ensure that the local tax base should be large enough to handle the expansion of local government services. The county administrations were responsible for working out the new municipal structure. Several factors had impact on the new municipal structure, such as, intergovernmental co-operation prior to the reform, historical and cultural factors such as parishes and hundreds, geographical circumstances such as distance, as well as topography and factors related to the economic geography of the municipality. Official reports (SOU, 1945: pp. 236) also pointed out that the natural affinity between municipalities should be considered when forming the new local government structure.

This paper is based on the municipal statements concerning the final amalgamation decision that was presented by the national government in 1951 and that was implemented in 1952. The main hypothesis to be tested in this paper is whether differences in local preferences among amalgamated municipalities affected subsequent growth patterns. We argue that this can be achieved by comparing amalgamation effects between municipalities amalgamated on a voluntary and compulsory basis. As was mentioned earlier, local resistance to the reform was strong. The 1952 reform affected 2,045 municipalities where 795 municipalities objected to the amalgamation plan (Wångmar, 2003). In this paper, we have defined an amalgamation as compulsory if at least one of the municipalities in the new constellation resisted the amalgamation decision. As much as 66% of the newly formed municipalities had at least one part that resisted the amalgamation. It is important to note that although municipalities had an opportunity to comment on the amalgamation decision, they did not have a veto.

Our hypothesis is that local resistance to a state imposed local government reform indicates that the national government has neglected some aspects relevant to the local government, or considered them to be irrelevant. One might argue that other factors such as geographical circumstances may determine whether or not municipalities resist the amalgamation proposal. However, as mentioned above, in the final amalgamation proposal the national government considered geographical circumstances that restricted potential mergers<sup>6</sup>; thus, we assume that municipal resistance is foremost a consequence of heterogeneous preferences among governments and not geographical circumstances. Besides population size, factors such as number of municipalities in the new constellation, political composition in local parliament, and old common boundaries such as parishes are also correlated with resistance to the amalgamation plan (Wångmar, 2003).

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<sup>6</sup> See SOU (1945:39).

## **Municipal amalgamations as an evaluation problem**

Hanes and Wikström (2008) point out that the nature of amalgamations as an evaluation problem raises some methodological questions. One concerns the construction of comparison groups. There are at least two comparison groups that can be constructed. The first one consists of municipalities with equal characteristics before the reform, a pre-reform comparison group. A second comparison group consists of municipalities with equal characteristics after the reform, a post-reform comparison group. The hypotheses are that amalgamated municipalities in the pre-reform comparison group are supposed to "take off" compared to non-amalgamated municipalities; likewise, amalgamated municipalities in the post-reform comparison group are supposed to "catch up" non-amalgamated municipalities.

The empirical analysis in this paper is based on the pre-reform comparison group. The municipalities are divided into two sub-samples. The sub-samples are constructed with respect to average population size in 1951, i.e. using population size and municipal borders in 1951 for the municipalities amalgamated into the new unit. The first sub-sample contains municipalities with an average population size of less than 2,000 inhabitants in 1951. It is important to note that the correspondence between the amalgamated and non-amalgamated municipalities is not perfect, i.e. although the mean size is less than 2,000 inhabitants we find municipalities with more than 2,000 inhabitants in 1951 among the newly formed municipalities. One approach is to restrict the sample and reject municipalities with municipal parts larger than 2,000 inhabitants in 1951; the shortcoming with this approach is that few municipalities remain in the sub-sample. However, restricting the sample and rejecting newly formed municipalities with municipal parts larger than 2,000 inhabitants in 1951 does not affect any qualitative result in the empirical analysis. According to the reform policy (SOU, 1945:39), non-amalgamated municipalities in this sub-sample are too small. Thus, one might expect these municipalities to be worse off compared to amalgamated municipalities.

The second sub-sample contains municipalities with an average size of 2,000-3,500 inhabitants in 1951. In the second sub-sample we find newly formed municipalities with municipal parts in 1951 smaller than 2,000 inhabitants. If the sub-samples are restricted in a way that only amalgamations of large municipalities are analysed, i.e. rejecting newly formed municipalities with municipal parts smaller than 2,000 inhabitants in 1951, too few observations remain in order to make a thorough analysis. Hanes and Wikström (2008) include a third sub-sample in their analysis that consists of municipalities with an average size of 3,501-7,000 inhabitants. However, very few amalgamations in this sample are compulsory which makes the sample less interesting in the present analysis.

## **Results**

Out of 1,037 municipalities, data were collected for 1,005 municipalities for the years 1953 and 1959. Data were also collected for 2,498 municipalities for 1951. Municipalities that were affected by further amalgamations between 1953 and 1959 are excluded from the analysis. A small number of municipalities are excluded due to missing data. Data were collected from statistical yearbooks (*Årsbok för Sveriges kommuner and Kommunernas finanser*). Data concerning amalgamations and municipal borders after the reform were

collected from Thunborg (1950).<sup>7</sup> The estimation results for two pre-reform comparison groups are presented in Table 1. In order to save space, we have only presented the main parameters of interest in Table 1.<sup>8</sup> The first sample consists of municipalities with an average population size less than 2,000 in 1951. In the second sample, the average population size is 2,001-3,500 in 1951.<sup>9</sup>

**TABLE 1 OLS Estimation Results for Sub-Groups, Dependent Variables Are: i) Average Income Growth; ii) Population Growth, t-Values within Parentheses**

	Average population in 1951	
	0-2,000	2,001-3,500
i) Income growth		
Amalgamation 1952	0.0052 (0.47)	-0.00004 (-0.01)
Voluntary amalgamation	0.0021 (0.34)	0.013 (0.84)
F	18.15	8.27
Adj. R <sup>2</sup>	0.56	0.54
ii) Population growth		
Amalgamation 1952	0.022 (2.16)	0.0076 (0.64)
Voluntary amalgamation	0.011 (1.95)	-0.0047 (-0.28)
F	11.28	9.04
Adj. R <sup>2</sup>	0.43	0.56
Nr.obs.	505	225

Note: t-values corrected for heteroscedasticity within parenthesis.

Earlier studies on local and regional income growth in Sweden present evidence that supports the hypothesis of conditional convergence, i.e. initial income levels have a negative impact on subsequent income growth (see Persson, 1997; Aronsson et al, 2001; Lundberg, 2003). Although not presented in the table, our results also support the convergence hypothesis; the initial income level (in 1953) has a negative and significant impact on income growth. As can be seen from Table 1, municipal amalgamations do not seem to affect income growth. However, amalgamations of small municipalities have a positive effect on population growth. One interpretation is that amalgamations were able to slow down depopulation in small municipalities; thus, the results indicate that the 1952 reform to some extent fulfilled its aims.

<sup>7</sup> Data on voluntary and compulsory amalgamations were provided by Erik Wångmar. These data were collected from archives in the municipalities and county administrations.

<sup>8</sup> The complete estimation results can be obtained from the authors upon request.

<sup>9</sup> Descriptive statistics for municipalities affected/not affected by the reform are presented in Table A2 in the Appendix.



As pointed out by Hanes and Wikström (2008), one might argue that non-amalgamated municipalities with less than 2,000 inhabitants have different characteristics and it is difficult to compare this group with the amalgamated municipalities. For example, some of the municipalities did not amalgamate due to geographical conditions, e.g. municipalities in sparsely populated areas and islands. Thus, the amalgamation effect that we observe may be attributed to such conditions and not the amalgamation itself. Hanes and Wikström argue that the results are not sensitive to geographical factors, they “test” this methodological problem by changing the sample e.g. by excluding municipalities that constitute an island and municipalities with large land areas located in the periphery. The positive effect of amalgamation is also present when the three major city areas (counties) are excluded from the sample.

As can be seen in Table 1, the positive impact of amalgamations on population growth is larger for municipalities amalgamating on a voluntary basis.<sup>10</sup> The result is in line with our expectations; voluntary amalgamations should be more efficient compared to compulsory amalgamations. The difference between voluntary and compulsory amalgamations is sizeable; the impact of amalgamations on population growth is approximately one third larger in municipalities amalgamated on a voluntary basis. One conclusion is that it is important to consider local opinions when implementing a local government reform. Note that we have not answered what factors determine the municipal decision to amalgamate on a voluntary basis and how these factors may affect growth patterns, e.g. preferences for amalgamations may be affected by expectations about the future, whilst municipalities in prosperous regions may have a more positive attitude and amalgamate on a voluntary basis. From the descriptive statistics, it is not possible to identify any differences between voluntary and compulsory amalgamations (comparisons within the sub-samples), e.g. voluntary or compulsory amalgamations are not concentrated to any specific region (county).<sup>11</sup> One pattern that can be found is that several voluntary amalgamations consisted of relatively large municipalities and small surrounding rural municipalities. However, the positive effect of amalgamations is found in the sample with small municipalities. The positive effect is also present when the major urban regions are excluded from the sample. Thus, the positive amalgamation effect that is found in the sub-sample with small municipalities is not due to positive net migration patterns in urban areas, nor amalgamations where large municipalities are involved.

## **Discussion**

This paper analyses amalgamation effects on local income and population growth. The hypothesis that is tested is whether voluntary amalgamations are more efficient compared to compulsory amalgamations, i.e. if amalgamation impacts on local growth are higher in municipalities amalgamating on a voluntary basis compared to compulsory amalgamations. The empirical analysis is based on the data and model presented by Hanes and Wikström (2008). In this paper, their data are complemented with information describing to what extent municipalities are amalgamating on a compulsory or voluntary basis; 66% of the newly formed municipalities were amalgamated on a compulsory basis. Hanes and Wikström (2008) found that municipal amalgamations had a positive effect on

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<sup>10</sup> In the sample with small municipalities, 32% of the amalgamations were voluntary.

<sup>11</sup> Complete descriptive statistics can be obtained from the author upon request.

population growth when small municipalities were amalgamated, i.e. amalgamations of small municipalities may have slowed down depopulation, which was one aim of the reform. No effect on income growth was found. The results in this paper indicate that the positive growth effect in amalgamated municipalities was larger when municipalities amalgamated on a voluntary basis. The amalgamation effect on population growth was one third larger in voluntary amalgamations compared to compulsory amalgamations. One implication is that factors such as natural affinity and local preferences may be important to consider when implementing local government reforms.

Since the analysis is based on data from the 1950s, an important question is whether results in this paper are interesting beyond this historical example. A first observation is that the Swedish reform in 1952 was followed by boundary reforms in other nations, using the Swedish reform as an example. Some of these reforms were also implemented in nations with similar structure of the public sector, e.g. the Scandinavian countries. The results are also consistent with the policy documents prior to the second municipal reform in Sweden that was implemented in 1965 and finalised in 1973. The national government stated that municipalities should amalgamate on a voluntary basis, partly because compulsory amalgamations were considered to be less efficient. However, in 1969 the reform became compulsory when the national government stated that too few amalgamations had been implemented. In later years, some municipalities in Sweden have split up; some of the disagreements between municipalities that caused the split ups originate from the previous municipal reforms. This highlights the difficulties of amalgamating municipalities with heterogeneous preferences. Today, the question of further municipal amalgamations, and even consolidation of county councils, is highly debatable in Sweden. The arguments are much the same as in the preceding reforms; sparsely populated areas suffer from depopulation and furthermore, the lack of population and tax base makes it difficult to fulfil welfare commitments. In this context, there is a need for more research on the determinants of voluntary amalgamations, or cooperative arrangements in the local and regional public sector, and also their impacts on regional development.

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**Appendix**

**TABLE A1 Variable definitions**

Variable	Definition
Income ( $Y_{i,t}$ )	Average work income level in municipality $i$ at time $t$ . Measured as total taxable income divided by the number of inhabitants.
Income growth ( $y_{i,t}$ )	Average work income growth in municipality between 1953 and 1959, measured as $\ln(Y_{i,59}/Y_{i,53})$
Population ( $N_{i,t}$ )	Population size (thousands) in municipality $i$ at time $t$ .
Population Growth ( $n_{i,t}$ )	Population growth in municipality $i$ between 1953 and 1959, measured as $\ln(N_{i,59}/N_{i,53})$
Local exp.	Per capita operating costs in municipality $i$ in 1953.
State grants	Per capita state grants in municipality $i$ in 1953.
Area	Land area (thousands of hectare) in municipality $i$ .
Age 0-15	Share of population aged 0-15 in municipality $i$ in 1953.
Age 65-	Share of population aged 65 and above in municipality $i$ in 1953.
Agriculture	Share of population employed in the agricultural sector in municipality $i$ in 1950.
Industry	Share of population employed in traditional industries in municipality $i$ in 1950.
Employment	Share of employed population aged 15-65 in 1950.
Commuting	The share of the employed with the work place outside the municipality.
City	Dummy variable for cities
Borough	Dummy variable for boroughs
Amalgamation	The variable takes the value one if the municipality is a newly formed municipality in the 1952 reform, zero otherwise.
Voluntary	The variable takes the value one if the municipality was amalgamated on a voluntary basis and zero if at least one municipality in the newly formed municipality rejected the amalgamation decision.

Note: Variables are measured in SEK 1949 and deflated with CPI. Source: Statistics Sweden (Årsbok för Sveriges kommuner, Kommunernas finanser).

**TABLE A2 Descriptive statistics for municipalities affected/not affected by the municipal reform in 1952**

Variable	Mean	Std dev	Min	Max
Inc. growth	0.32/0.28	0.10/0.11	-0.09/-0.10	0.69/0.94
Income	1,864.8/2,104.3	293.1/444.5	1,097.2/988.2	2,876.3/4,809.1
Local exp.	194.6/270.0	60.8/113.0	87.7/27.1	621.6/1,093.4
State grants	72.3/82.1	14.0/30.5	6.6/4.9	140.6/250.9
Pop. Growth	-0.036/0.028	0.07/0.11	-0.17/-0.15	0.55/0.77
Population	4,595.5/9,378.7	5,817.6/165,270.3	1,026/288	87,451/761,787
Age 0-15	0.24/0.24	0.018/0.034	0.18/0.17	0.29/0.41
Age 65-	0.12/0.10	0.019/0.028	0.06/0.04	0.19/0.20
Agriculture	0.48/0.30	0.16/0.23	0.015/0.006	0.77/0.79
Industry	0.30/0.39	0.12/0.18	0.095/0.06	0.73/0.77
Empl. Rate	0.65/0.65	0.04/0.06	0.38/0.43	0.80/1.09
Commuting	0.097/0.10	0.085/0.134	0.0005/0.0003	0.47/0.68
Area	26.8/56.5	33.8/165.3	2.2/0.2	308.4/1,814.3
Nr.obs.=	553/452			

Note: Figures are measured in SEK 1949. Initial variables refer to 1953 except the variables Age 0-15, Age 65-, Agriculture, Industry, Empl. rate, and Commuting (1950). Source: Statistics Sweden (Årsbok för Sveriges kommuner, Kommunernas finanser).