

CITY-COUNTY MERGERS IN SOUTH KOREA: ASSESSING EFFECTS ON PUBLIC EMPLOYMENT SIZE AND CITIZEN SATISFACTION

Hoyong JUNG

Hoyong JUNG

Assistant professor, Graduate School of Public
Administration and Korea Institute of Public Affairs,
Seoul National University, Seoul, South Korea
E-mail: ghdydwjd@snu.ac.kr

Abstract

Municipal mergers are a common administrative reform worldwide, but their effects on public employment size and citizen satisfaction remain poorly understood. This study investigates these effects by focusing on a city-county merger in South Korea after 2000. Using the synthetic control method and multivariate regression, we find that municipal mergers increase the number of public employees, primarily low-ranking officials, while negatively impacting citizen satisfaction. This suggests that the goal of enhancing administrative efficiency through local government consolidation does not yield positive outcomes for organizations' personnel or residents' welfare.

Keywords: city-county merger, public employment, citizen satisfaction, South Korea.

1. Introduction

The size of local government significantly influences its capacity to deliver public services and effectively represent its resident population. Scholars have engaged in extensive discussions regarding the optimal size of local governments (Dahl and Tufte, 1973; Dagger, 1981). A notable phenomenon in this context is the consolidation of local government entities, a prevalent occurrence observed globally (Tavares, 2018), wherein neighboring rural areas are absorbed into a larger city, as exemplified by instances like a city-county consolidation (Hansen, 2013). Typically, these mergers aim to enhance the competitive edge of local governments by improving administrative efficiency in matters of public finance and organizational management through economies of scale.

The academic literature on local government consolidation is extensive, encompassing economic, political, and administrative dimensions. These studies typically employ a range of indicators to evaluate the extent to which mergers achieve specific objectives, encompassing aspects like government expenditures and fiscal stability (Dollery, Brynes and Crase, 2007; Moisio and Uusitalo, 2013; Allers and Geertsema, 2016; Blom-Hansen *et al.*, 2016; Hirota and Yunoue, 2017), cost effectiveness and administrative efficiency (Hansen, 2015; Blesse and Baskaran, 2016; Miyazaki, 2018; Cobban, 2019; Hong and Park, 2019), voting patterns and political participation (Hyytinen, Saarimaa and Tukiainen, 2014; Saarimaa and Tukiainen, 2016; Koch and Rochat, 2017; Heinisch *et al.*, 2018; Lapointe, Saarimaa and Tukiainen, 2018; Bhatti and Hansen, 2019; Rodrigues and Tavares, 2020), democratic representation and electoral outcomes (Bawn and Rosenbluth, 2006; Saarimaa and Tukiainen, 2014; Horiuchi, Saito and Yamada, 2015; Jakobsen and Kjaer, 2016; Suzuki and Ha, 2018; Harjunen, Saarimaa and Tukiainen, 2021), residents' attitudes (Bjørnskov, Dreher and Fischer, 2007; Yamamura, 2011; Hansen, 2013; 2015; Hansen and Kjaer, 2020), and regional socio-demographic traits (Suzuki and Sakuwa, 2016). Although the results exhibit considerable heterogeneity across different contexts, specific recurring patterns are discernible (Tavares, 2018), such as cost reductions in general administration expenditures, changes in the quality of local services, and a decline in the representation of residents.

Remarkably, existing literature has demonstrated a notable absence in examining the implications of local government mergers on public employment size. One direct effect of local government mergers is evident in public employment. The size of government has both quantitative and qualitative meanings. Quantitative factors are visible and measurable, such as the size of public finances and organizations. Qualitative factors are relatively invisible and subjective, such as the power of government, the level of government regulation, and administrative efficiency. Previous studies have sought to account for both quantitative and qualitative factors, adopting measures such as the total size of government expenditure, the ratio of government expenditure to GDP, the ratio of tax burden to GDP, and the scale of government employment (Peltzman, 1980; Lowery and Berry, 1983; Schneider, 1986). Previous studies have primarily relied on fiscal indicators to measure the size of local governments, disregarding the critical variable of the number of public

officials employed in local governments. However, this variable holds critical importance as the rational management of government personnel, facilitated through an efficient service delivery system, is paramount to ensure productivity, efficacy, and adaptability within the local governance framework (Denhardt and Denhardt, 2000). The dynamic landscape in which local governments operate is subject to substantial ongoing internal and external social transformations. Rapid shifts stemming from an aging society, globalization, and the advent of information technology necessitate local governments to cater to a wide range of high-quality governmental services, meeting the diverse demands of residents. Consequently, assessing the effects of local government mergers on the number of public officials becomes a crucial criterion for evaluating the effectiveness and responsiveness of local governments.

Merely relying on the number of public personnel may prove inadequate when evaluating the effects of local government consolidation (Kelly and Swindell, 2002). An effective organization and adequate workforce are essential for local governments to meet administrative demands and perform their mandated responsibilities. However, it is important to recognize that larger staff numbers might not necessarily signify responsiveness to local demands; they could, instead, indicate inefficiencies in management. Therefore, adopting an auxiliary criterion to evaluate the impacts of local government mergers on residents' welfare becomes imperative. Citizen satisfaction emerges as a pertinent factor in this context, as it is closely linked to objective performance (Van Ryzin, 2004; 2006). By serving as a valuable source of information for the government (Poister and Henry, 1994), citizen satisfaction plays a decisive role in evaluating the competitiveness of local government (Osbourne and Gaebler, 1992).

This paper represents the first empirical analysis investigating the effects of city-county consolidation on the size of public employment. Given the local government reform initiatives in South Korea, which have included city-county mergers since the 1990s, the aim has been to enhance the competitiveness of local governments (Park, 2013; Jung, 2023). Notably, the integration of the city of Cheongju-si and the county of Cheongwon-gun remains the sole case of urban and rural mergers in the 2000s. Employing the synthetic control method (SCM), this study analyzes how local government mergers affect the number of public officials. Additionally, the study investigates the effects of administrative consolidation on citizen satisfaction, seeking to identify any shifts in social welfare corresponding to the number of public officials and to draw policy conclusions.

The research reveals that a city-county merger leads to a notable increase in the size of public employment, primarily driven by a rise in lower-level public officials. A battery of robustness tests supports this key finding, which contrasts with the expectations fostered by the new public management (NPM) reform, which posits that consolidation would lead to reductions in the size of the government through economies of scale. Furthermore, our study identifies significant adverse effects on citizen satisfaction with the local government following the merger. This indicates a potential decline in administrative effectiveness due to the merger. In essence, our findings align with the excessive government

model, which posits that mergers lead to a rise in the number of government personnel to serve the private interests of bureaucrats, rather than being a response to residents' administrative demands. Consequently, such rent-seeking behaviors ultimately diminish the level of citizen satisfaction. Given South Korea's current challenges of a low birth rate, an aging population, and a declining total population in local areas, discussions surrounding the reorganization of local governments have resurfaced. The findings of our study suggest that it is crucial to simultaneously consider specific policy measures to promote efficient reform when contemplating future mergers of local governments. These measures should include minimizing rent-seeking behaviors and improving public service quality.

This study makes significant contributions to the existing body of literature. First, it represents the first empirical examination of the effects of a city-county merger on the size of public employment. Given that public officials constitute the primary agents delivering public services, understanding the impact of local government mergers on personnel organizations becomes a pivotal factor in evaluating the outcomes of government reforms. By presenting substantial evidence on this aspect, this study expands the scope of the literature, which has heretofore been predominantly confined to examining the effects of local government consolidation on fiscal, economic, and political dimensions. Second, the study establishes a causal link between the merger and the size of public employment by employing the SCM (Abadie, 2021). This approach facilitates the execution of a counterfactual experiment, enabling a more rigorous evaluation of the causal effects of local government mergers on personnel organization. Third, the investigation conducts a comparative analysis of citizen satisfaction levels in the treatment and comparable regions post-merger. This examination not only enriches our understanding of the link between outcomes and performance but also holds potential for guiding institutional reforms. Overall, this study offers a systematic and comprehensive examination of the impacts of local government consolidation on constituent communities, providing valuable policy implications.

The remainder of this paper is structured as follows. Section 2 presents the theoretical frameworks underpinning the analysis, while Section 3 delves into the institutional background. Section 4 discusses the research design employed in the study. Section 5 presents the findings of the estimation and subsequently discusses their implications. Lastly, Section 6 concludes the study.

2. Theoretical background

The theoretical predictions concerning the potential change in public employment size following a merger in local government reveal a diverse array of orientations. Three main, non-mutually exclusive theories are at play, drawing on diverse information and conceptualizations of key factors (Berry and Lowery, 1987). First, the number of public officials may decrease if the merger realizes administrative efficiency and enhances government competitiveness through economies of scale. This finds support in the NPM approach,

which influences the integration of local governments worldwide (Hood, 1991; Dunleavy and Hood, 1994; Steiner, 2000; Pollitt and Bouckaert, 2017; Lapuente and Van de Walle, 2020). NPM seeks to introduce market-oriented principles into government operations with the objective of reducing government inefficiencies. Within this framework, measures, such as prudent reductions of unnecessary or inefficient administrative entities and projects to save on labor costs, may be implemented to facilitate a transition from a larger to a smaller government. Consequently, the NPM approach interprets local government mergers as a means of achieving government efficiency through the streamlining and downsizing of government functions.

Second, another conceivable prediction pertains to expanding government staffing in response to heightened demands for public goods and services within the rapidly evolving administrative landscape, as posited by the responsive government model (Murrell, 1985; Mueller and Murrell, 1986). The rise in median voters' income in the constituency triggers an increase in the size of government to cater to amplified demands for government activities, such as welfare programs (Lowery and Berry, 1983; Mueller and Murrell, 1986; Brown and Jackson, 1990). Furthermore, the constituent population and area are the variables pertaining to administrative demand that exert the most significant and influential impact on the number of government personnel (Afonso and Furcer, 2010). The merger of local governments results in enlarged jurisdiction and a larger resident population, necessitating the establishment of additional administrative agencies and the recruitment of more public officials to respond effectively to residents' demands.

Third, the excessive government model proposes that the size of public employment may increase purely to maximize the utility of bureaucrats and politicians, irrespective of any actual increase in administrative demand (Murrell, 1985; Parkinson, 1957). This implies that irrespective of the relation of governmental reform to mergers, the number of public officials increases due to factors unrelated to the demand for government activities, driven instead by bureaucratic power, financial illusion, and rent-seeking behavior. The works of Parkinson (1957), Niskanen (1971), and Williamson (1986) stand as representative examples of the excessive government model. Parkinson's law refers to a posited constant increase in the number of public officials, regardless of the tasks and workload of the bureaucracy. Managers want to increase the number of their subordinates, and public officials do not want their competitors to increase. These incentives create unnecessary positions and tasks, and the number of public officials increases steadily (Parkinson, 1957; Breton and Wintrobe, 1982). Niskanen's budget maximization model argues that the government budget tends to increase to maximize bureaucrats' influence and opportunities. In this sense, surplus resources can be utilized to increase the workforce of the bureaucracy (Niskanen, 1971; Romer and Rosenthal, 1979). According to Williamson (1986), managers more interested in their own utility tend to invest more than the minimum cost to produce, and they operate their enterprises with an excess of personnel relative to the number of inputs. The excessive government perspective highlights the risk of potential

declines in government efficiency and residents' welfare as the bureaucracy expands and the government budget increases.

The impact of a local government merger on the size of public employment represents a reform outcome. To comprehensively evaluate the welfare effects on residents, it is imperative to move beyond merely considering the reform's immediate outcome. For example, an increase in the number of public officials following the merger cannot be deemed negative if it corresponds to an improvement in government performance, such as the enhanced quality of public services. In such cases, even though the reform may not have succeeded in reducing government size, the positive impact on government services warrants consideration. A vital gauge of government performance lies in citizen satisfaction, which serves as a representative indicator. By measuring citizen satisfaction, one can effectively gauge the impact of administrative reform from the perspective of residents, who are the ultimate consumers of public goods and services. This metric offers valuable insights that aid in elucidating changes in social welfare (Helliwell and Huang, 2008; Hansen, 2013, 2015).

According to the existing literature, citizen satisfaction is affected by various factors, including the political distance between governments and individuals, the geographical characteristics of jurisdictions, access to public services, and socio-demographic heterogeneity within the region (Lovrich and Taylor, 1976; Stipak, 1979; Fitzgerald and Durant, 1980; Brown and Coulter, 1983; Hero and Durand, 1985; DeHoog, Lowery and Lyons, 1990). This highlights the significance of the role played by public service delivery channels of local governments in shaping citizen satisfaction. Given that the merger of local governments represents a momentous event for residents and may lead to a significant change in their interaction with the government, it is reasonable to infer that the consolidation of local governments can affect citizen satisfaction by altering the quality of public service offered (Van Ryzin, 2004; 2006; 2007).

Two competing theories offer divergent perspectives on the relationship between government size and citizen satisfaction (Mouritzen, 1989). The reform theory posits that a larger jurisdiction size positively influences citizen satisfaction by facilitating more efficient public service delivery through realizing economies of scale, facilitated by a larger demographic base. On the other hand, the political economy theory postulates that a huge government size negatively affects citizen satisfaction, as such entities struggle to accommodate heterogeneous preferences and fail to achieve economies of scale in labor-intensive public services.

Given these competing theoretical viewpoints, examining the impacts of city-county mergers on public employment size and citizen satisfaction yields different predictions. Consequently, an empirical investigation within the context of the study becomes essential to discern the effects of the reform.

3. Institutional background

In South Korea, the local government structure comprises provincial- and municipal-level entities. As of 2022, the country was home to 17 provincial-level governments (teukbyeolsi, gwangyeoksi, teukbyeol-jachisi, teukbyeol-jachido, and do) and 226 municipal-level governments (si, gun, and gu).

The types of mergers in South Korea can be diverse, with several possible configurations. For example, small municipalities may be integrated into large ones or multiple smaller municipalities might consolidate to form a single larger municipality. Of particular focus in this study is the city-county merger, which involves the integration of urban (si) and rural (gun) areas at the municipal level.

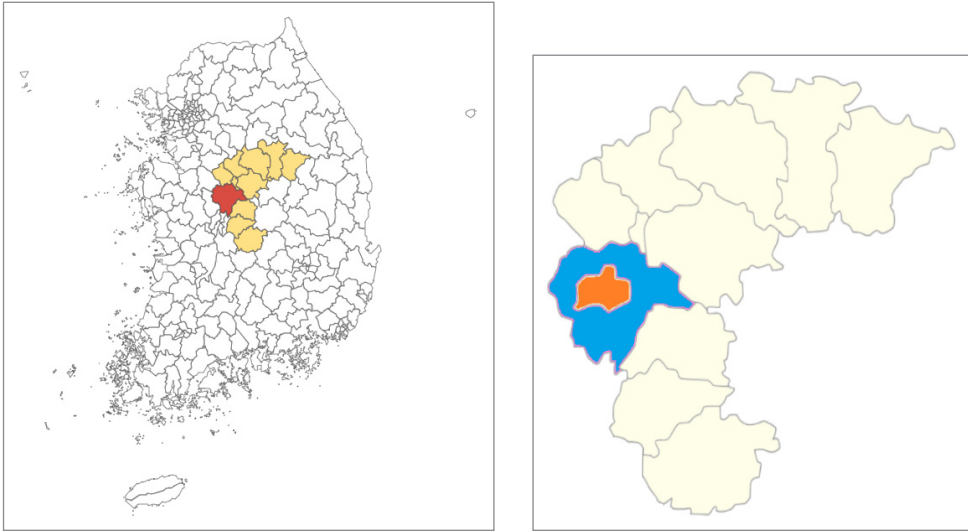
The initiation of municipal mergers in Korea can be traced back to the 1990s, driven by two primary factors. First, the need to increase competitiveness in rural areas arose following the liberalization of global trade. Second, calls for internal reform within local governments have been growing stronger. While cities and counties were administratively separate, the presence of county offices within city boundaries and overlapping residential areas between cities and counties led to inconveniences and inefficiencies, necessitating administrative reorganization. For example, the city-county mergers in 1995 included the following cases: Namyangju-si, Chuncheon-si, Wonju-si, Gangneung-si, Samcheok-si, Chungju-si, Jecheon-si, Gongju-si, Boryeong-si, Asan-si, Seosan-si, Gunsan-si, Jeongeup-si, Namwon-si, Gimje-si, Suncheon-si, Naju-si, Gwangyang-si, Pohang-si, Gyeongju-si, Gimcheon-si, Gumi-si, Yeongcheon-si, Sangju-si, Gyeongsan-si, Gyeongsan-si, Changwon-si, Masan-si, Jinju-si, Tongyeong-si, Miryang-si, Geoje-si, Ulsan-si, Pyeongtaek-si, Cheonan-si, Iksan-si, Sacheon-si, and Gimhae-si.

Thus, city-county mergers were implemented to address disparities in areas of daily life and administrative units, optimize administrative efficiency, and achieve balanced development between urban and rural areas. As a result of these reforms, the number of cities and counties (si, gun, and gu) decreased from about 260 to 220.

Figure 1 depicts the geographical locations of Cheongju-si (urban) and Cheongwon-gun (rural). Prior to the merger, these two entities operated as separate and independent local governments, even though Cheongwon-gun was geographically surrounding Cheongju-si and its administrative office was situated within the boundaries of Cheongju-si. Unlike other regions, the merger of Cheongju-si and Cheongwon-gun into one administrative unit did not take place during the 1990s, mainly due to opposition from the residents of Cheongwon-gun. It took nearly two decades of deliberations and compromises before the city-county merger was finally approved through a referendum in 2012. Subsequently, the enactment of the Act on Special Cases concerning Establishment and Support in Cheongju-si, Chungcheongbuk-do, in 2013 laid the legal groundwork for financial and organizational reform, which was officially implemented in 2014. Remarkably, since 2000, the merger of Cheongju-si and Cheongwon-gun has been the sole instance of urban-rural integration at the municipal level among local governments.

Panel A. South Korea and Chungcheongbuk-do

Panel B. Chungcheongbuk-do and Cheongju-si

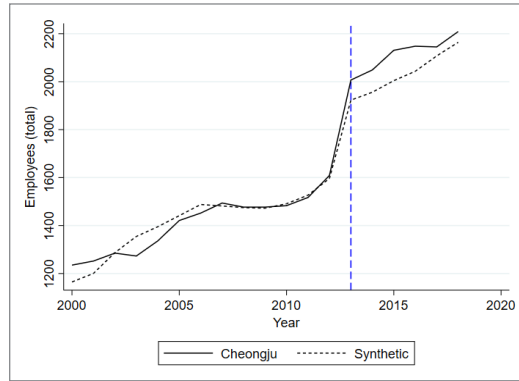


Note: Panel A exhibits the entire map of South Korea. Chungcheongbuk-do, one of the 17 provincial-level local governments, is marked in yellow. Cheongju-si (after the merger of Cheongju-si and Cheongwon-gun), a municipal-level local government, is marked in orange. Panel B shows the map of Chungcheongbuk-do. The orange region is Cheongju-si before the merger, and the blue region is Cheongwon-gun.

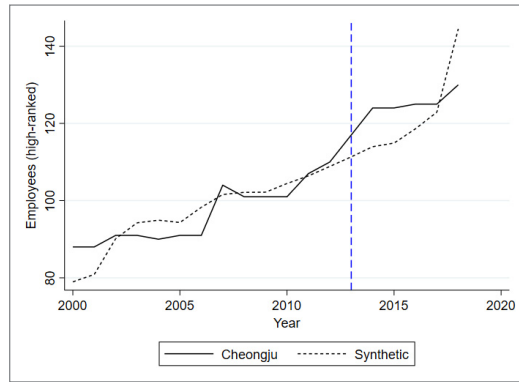
Figure 1: City-county consolidation: Case of Cheongju-si

The Local Autonomy Act contains provisions concerning the number of local government personnel. Specifically, Article 112, paragraphs (1) and (2), constitute the legal framework for establishing administrative organizations and recruiting local public officials. These provisions are prescribed by municipal ordinances within the respective local governments in accordance with the standards set forth by presidential decree. In line with these general principles, the size of public officials in Korean local governments is primarily determined through a system where local governments manage the personnel quota, subject to approval by the central government. A notable shift has occurred since the 2000s, moving towards granting local governments more autonomy and reducing reliance on a control-oriented management system. Additionally, in response to an escalating demand for welfare services, efforts have been directed toward increasing the overall size of local government officials (Park and Choi, 2013; Jeong and Lee, 2016; Ra, 2018). Since the 2000s, the rigidity of the personnel quota has gradually eased, with the introduction of the total labor cost system and the standard labor cost system.

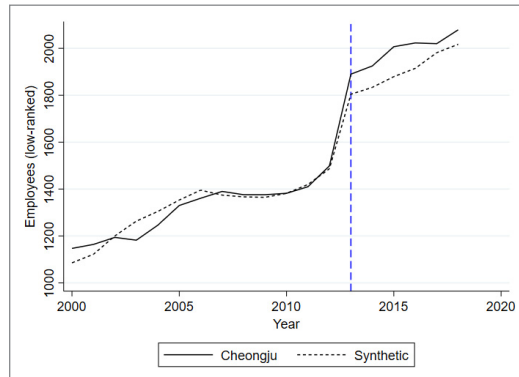
Panel A. Total employment



Panel B. High-ranked employment

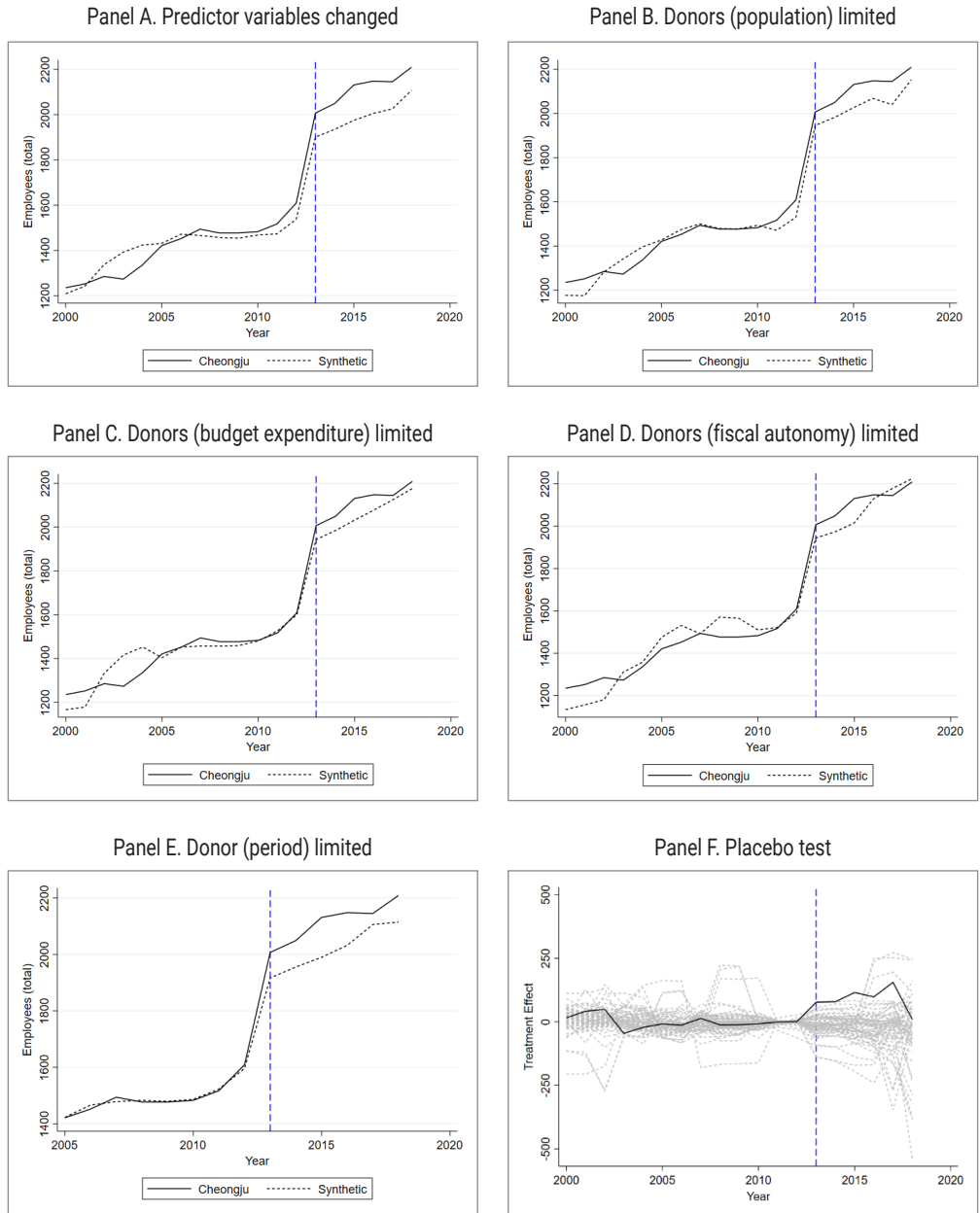


Panel C. Low-ranked employment



Note: Korean public officials are given authority on a nine-grade system. High-ranking officials are in grades 1-5, which include deputy directors and the above. Low-ranked officials are in grades 6-9.

Figure 2: Effects on public employment size: Basic results



Note: Figure 3 shows a battery of robustness tests. In Panel A, we change the predictor variables and perform the estimation. From Panel B to Panel D, we restrict the donor pool to regions with the top 50% of the population, budget expenditure, and fiscal autonomy ratio. In Panel E, we limit the analysis period to after 2005. In Panel F, the solid black line shows the treatment effect of Cheongju-si, and the grey dotted line shows the treatment effect of other regions in the donor pool.

Figure 3. Effects on public employment size: Robustness checks

4. Research design

4.1. Effects on public employment size

To empirically identify the impact of city-county consolidation on public employment size, we employ the SCM, a widely used approach to estimate the causal effects of policy treatment (Abadie, 2021).

Using a simple mathematical representation, consider a local district $i \in \{1, 2, \dots, n\}$, with $\{1\}$ as the treated unit and $\{2, \dots, n\}$ constituting the donor pool that constructs the synthetic control unit. The period under consideration spans $t \in \{1, \dots, T_o, \dots, T\}$, where the event occurs at $\{T_o\}$, and the post-intervention period is $\{T_o, \dots, T\}$. The variable Y_{it} represents the outcome variable, with Y_{it}^T denoting the dependent variable of the treated units and Y_{it}^N representing the corresponding variable of the untreated unit. The treatment effect, thus, is $\beta_{1t} = Y_{1t}^T - Y_{1t}^N$ for $t \in \{T_o, \dots, T\}$.

The issue lies in the fact that Y_{1t}^N is not an observed variable. The SCM resolves the issue by predicting the counterfactual Y_{1t}^N from the donor pool $i \in \{2, \dots, n\}$. The SCM constructs a weighted combination of the units in the donor pool to create a synthetic control unit that resembles the actual treated unit. This is achieved by calculating the minimum distance between the treated and synthetic control units based on the observed outcome variable and the pre-intervention traits. The disparity of traits between the treated unit and the synthetic control unit can be represented as $X_1 - X_S W$ in a vector notation, where W denotes each unit's vector of weights. W^* is the vector of optimal weights that minimizes $\|X_1 - X_S W\|$, and the treated unit's counterfactual Y_{1t}^N can be obtained from the dynamic path of W^* .

In this study, Cheongju-si serves as the treated unit, while the remaining regions constitute the donor pool that constructs the synthetic control unit. To ensure homogeneity among the local governments in the donor pool, a total of 67 municipal-level urban governments (si) are considered. It includes all city local governments (si) in South Korea except for Changwon-si, Masan-si, and Jinhae-si. These three cities amalgamated into Changwon-si in 2010. The case of Changwon-si differs from that of Cheongju-si in that it is a city-city merger and not an urban-rural integration. Changwon-si and Masan-si already experienced the city-county consolidation in 1995. The analysis period spans from 2000 to 2018, with the post-treatment period defined as 2013 and later.

Table 1 presents the descriptive statistics of the variables used in the study, with data collected from Statistics Korea and the Ministry of Economy and Finance. To construct a synthetic control unit that closely resembles Cheongju-si from the donor pool, we use various socioeconomic traits encompassing fiscal characteristics (budget expenditure, local tax revenue, national subsidy, and fiscal autonomy ratio), demographic characteristics (total population and senior population ratio), political characteristics (voting rate and leader's party affiliation), and economic characteristics (employment and business status). During the analysis period, the number of public officials was approximately 900, with high-ranking public officials constituting around 6% of the total. Korean public officials

have a total of nine-grade systems. High-ranked officials have grades 1–5, which include deputy directors and above. Low-ranked officials have grades 6–9. The deputy mayor in a local government body is generally in grade 4.

Table 1: Descriptive statistics

Variable	Mean	S.D.	Min.	Max.
Total employment	909.702	466.960	287.000	3110.000
High-ranked employment	62.124	30.492	22.000	283.000
Low-ranked employment	847.578	437.810	259.000	2928.000
Budget expenditure	12.929	0.588	11.091	14.521
Local tax revenue	11.313	0.940	9.225	13.739
National subsidy	11.276	0.805	7.359	13.094
Fiscal autonomy ratio	52.076	25.777	8.047	145.501
Total population	12.321	0.743	10.711	14.000
Senior population ratio	0.122	0.052	0.039	0.296
Voting rate	51.768	10.179	23.200	84.440
Conservative party	0.493	0.500	0.000	1.000
Employment (total)	0.244	0.074	0.095	0.496
Employment (manufacture)	0.076	0.060	0.005	0.289
Employment (construction)	0.017	0.010	0.004	0.062
Employment (wholesale and retail)	0.030	0.011	0.014	0.109
Employment (accommodation and food)	0.024	0.007	0.009	0.068
Business (total)	0.030	0.006	0.017	0.055
Business (manufacture)	0.004	0.004	0.001	0.024
Business (construction)	0.002	0.001	0.000	0.006
Business (wholesale and retail)	0.006	0.002	0.003	0.018
Business (accommodation and food)	0.006	0.001	0.003	0.014

Note: Budget expenditure, local tax revenue, national subsidy, and total population are the logged values. The fiscal autonomy ratio is the total autonomous revenue divided by the total budget expenditure. The senior population is 65 and older. The conservative party is equal to 1 when the executive head's affiliated party is the first conservative party during the analysis period. Employment variables are the number of employees per population. Business variables are the number of registered companies per population.

4.2. Effects on citizen satisfaction

The Center for Survey Research at Seoul National University conducted a survey in 2015 to gauge citizen satisfaction. The survey samples consisted of residents from cities identified and weighted in the SCM estimation. We include Cheongju-si as the treated unit and Gangneung-si, Gimhae-si, Yangsan-si, Jinju-si, Pohang-si, Yeosu-si, and Jeonju-si as the controlled units. While Suwon-si and Yongin-si are included and weighed in the SCM estimation, they are not considered in the estimation because the data provided by

the Center for Survey Research at Seoul National University does not include data from these two cities.

This allows for the setting up of comparable characteristics in the treated and controlled cities, thereby mitigating the confounding effects arising from heterogeneous demographic traits. After excluding non-responsive cases, the dataset comprised a total of 1,717 valid samples.

To investigate the impact of the city-county merger on citizens' satisfaction, the study employs a multivariate regression model as follows:

$$Y_{ij} = \alpha + \beta Treat_j + \gamma X_{ij} + \epsilon_{ii}$$

Here i denotes the surveyed individual, and j represents the municipal-level local government. The analysis period is confined to the year 2015. Y_i is the dependent variable that reflects citizen satisfaction. Three categories of citizen satisfaction were considered: satisfaction with the local government, satisfaction with the local government based on the level of taxation, and satisfaction with overall life. They are measured on a 10-point scale, ranging from 1 (lowest) to 10 (highest). $Treat_j$ takes a value of 1 if the local unit j is Cheongju-si and 0 otherwise. X_{ij} represents the covariates, which include various individual and regional control variables that may affect satisfaction levels. These control variables include provincial-level local government, municipal-level local government, gender, age group, occupation, educational background, household income, and marital status. The error term is denoted by ϵ_i and standard errors are clustered at the level of the local unit to accommodate heteroscedasticity.

We could have performed a difference-in-difference estimation here if the surveys were conducted before and after the merger. Unfortunately, the surveys are only available after the merger. Thus, we adopt multivariate regression analysis. We can capture the impacts of city-county mergers by comparing the treated and controlled units since the surveyed year is 2015, which is two years after the merger.

5. Results and discussion

5.1. Results

Table 2 presents the covariance balance between the treated unit and the synthetic control unit, with about six to nine cities serving as the weighted units to construct the synthetic control unit. Figure 2 illustrates the impacts of city-county mergers on public employment size, with Panel A specifically focusing on total employment. Before the merger, the trends in the number of public officials in the treated and synthetic control units exhibited similarities. However, following the merger (depicted as a blue dotted line) there was a significant increase in the size of personnel in Cheongju-si.

The analysis further divides the case into high-ranked (grades 1–5) and low-ranked (grades 6–9) public officials. Inferring the effects of mergers on high-ranking officials (Panel B) proves challenging as the pre-merger trends of the two units do not match well.

Nevertheless, a rise in public officials after the merger is primarily attributable to an increase in lower-ranked public employment size (Panel C). Based on these findings, it can be inferred that the increase in public employment size subsequent to the merger predominantly results from heightened demands for public services on the policy front.

Table 2: Effects on public employment size: Covariance balance between treated and synthetic unit

Predictor variables	Total		High-ranked		Low-ranked	
	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic
Weighted units	Cheongju	Gangneung Suwon Yongin Gimhae Yangsan Jinju Pohang Yeosu Jeonju	Cheongju	Gangneung Suwon Yongin Gimhae Pohang Jeonju	Cheongju	Suwon Yongin Gimhae Yangsan Jinju Pohang Yeosu Jeonju
Public employment (1)	1408.538	1413.355	96.462	96.720	1312.077	1316.762
Public employment (2)	1379.667	1365.649	93.333	92.570	1286.333	1273.483
Public employment (3)	1609.000	1596.359	110.000	108.848	1499.000	1486.737
Public employment (4)	1517.000	1526.880	107.000	106.413	1410.000	1419.726
Budget expenditure	13.566	13.403	13.566	13.411	13.566	13.410
Local tax revenue	12.380	12.348	12.380	12.358	12.380	12.361
National subsidy	11.898	11.534	11.898	11.517	11.898	11.534
Fiscal autonomy ratio	66.848	71.695	66.848	72.434	66.848	71.569
Total population	13.547	13.325	13.547	13.337	13.547	13.334
Senior population ratio	0.081	0.075	0.081	0.075	0.081	0.075
Voting rate	50.450	57.698	50.450	57.845	50.450	57.779
Conservative party	0.615	0.648	0.615	0.617	0.615	0.672
Employment (total)	0.237	0.233	0.237	0.232	0.237	0.233
Employment (manufacture)	0.073	0.063	0.073	0.064	0.073	0.063
Employment (construction)	0.019	0.017	0.019	0.016	0.019	0.017
Employment (wholesale and retail)	0.031	0.030	0.031	0.030	0.031	0.030
Employment (accommodation and food)	0.022	0.023	0.022	0.023	0.022	0.023
Business (total)	0.027	0.027	0.027	0.027	0.027	0.027
Business (manufacture)	0.003	0.003	0.003	0.003	0.003	0.003
Business (construction)	0.002	0.001	0.002	0.001	0.002	0.001
Business (wholesale and retail)	0.006	0.006	0.006	0.006	0.006	0.006
Business (accommodation and food)	0.006	0.006	0.006	0.006	0.006	0.006

Note: Public employment (1) is the average value of total public employment between 2000 and 2012. Public employment (2) is the 5-year average value of total public employment between 2000 and 2012. Public employment (3) is the value of total public employment as of 2012. Public employment (4) is the value of total public employment as of 2011.

Table 3 and Figure 3 show a battery of robustness tests to support the validity of the primary findings. Table 3 corroborates the primary finding using an alternative model specification. Difference-in-difference estimation confirms that public employment size increases following the merger (column 1), with the effects being particularly pronounced in the case of low-ranked public officials (column 3).

Figure 3 shows the consistency of the results from Figure 2 across various alterations to the SCM estimation. Panel A changes predictor variables to ensure that findings are not sensitive to the selection of variables. Given that Cheongju-si is a relatively large city in the Korean context, Panels B to D limit the donor pool to local governments with the top 50% of the population, budget expenditure, and financial autonomy ratio, respectively. Panel E is the result of limiting the period to after 2005. Remarkably, in all these cases, we consistently observe an increase in the number of public officials after the merger. Panel F depicts a placebo test, assuming that local governments other than those of Cheongju-si have undergone a merger. The black solid line represents the treatment effect for Cheongju-si, while the gray dotted line represents the treatment effect for other regions. The results show that the true treatment effect is around zero in the pre-treatment period but becomes greater than zero right after the merger (particularly right after a few years), supporting the primary findings.

Table 3: Effects on public employment size: Difference-in-difference model

	(1)	(2)	(3)
Variable	Total	High-ranked	Low-ranked
Treat x Period	372.099** (33.049)	18.645** (1.784)	353.454** (31.622)
Treat	257.233 (266.238)	3.140 (17.716)	254.094 (249.181)
Period	38.059 (261.195)	-10.897 (14.448)	48.956 (248.073)
Covariates	Y	Y	Y
Region FE	Y	Y	Y
Year FE	Y	Y	Y
R ²	0.944	0.929	0.943
N	1,245	1,245	1,245

Clustered standard errors in parentheses:

*** p < 0.001, ** p < 0.01, and * p < 0.05.

Table 4 presents the estimation result pertaining to citizen satisfaction. Notably, residents in Cheongju-si exhibit lower satisfaction with their local government (column 1). The coefficient value of about -0.210 indicates that satisfaction with the local government is about 3% lower compared to that of other regions. Importantly, this decline in citizen satisfaction cannot be accounted for by changes in observed individual and regional characteristics, as an array of variables have been controlled for.

Furthermore, the consistency of this evidence is observed across two alternative measures. The coefficient of citizen satisfaction with the local government, as it pertains to the level of taxation, stands at about -0.331 and is statistically significant (column 2). Conversely, the coefficient for citizen satisfaction with overall life does not demonstrate statistical significance (column 3). These contrasting results underscore the impact of integration, indicating that the merger has a more pronounced effect on reducing residents' satisfaction with the local government compared to other factors.

Table 4: Effects on citizen satisfaction

Variable	(1)	(2)	(3)
	Satisfaction with local government	Satisfaction with local government reflecting the tax	Satisfaction with overall life
Treat	-0.210*** (0.034)	-0.331*** (0.030)	-0.031 (0.030)
Provincial dummy	Y	Y	Y
Municipal dummy	Y	Y	Y
Covariates	Y	Y	Y
Mean of Dependent	7.198	5.681	6.902
R ²	0.037	0.068	0.060
N	1,717	1,717	1,717

Clustered standard errors in parentheses, *** $p < 0.001$, ** $p < 0.01$, and * $p < 0.05$.

Note: Local samples are limited to regions where the weights in the SCM are greater than 0 among donor pools. They include Gangneung-si, Gimhae-si, Yangsan-si, Jinju-si, Pohang-si, Yeosu-si, and Jeonju-si. While Suwon-si and Yongin-si are weighted greater than 0 in the SCM, they are not considered in the estimation as the survey in 2015 did not include residents from these two regions.

5.2. Discussion

In South Korea, city-county mergers have been carried out under the NPM paradigm, which seeks to promote and develop smaller governments. The integration process is tied to broader governmental objectives such as restructuring government entities, privatizing public enterprises, enhancing administrative competition, and reforming the personnel system. However, concerning public employment size, the research findings suggest that the pursuit of smaller government through these mergers has not been successful, and the intended goals of the reform have largely remained unattained (Kim and Han, 2015).

It is essential to acknowledge that evaluating the outcomes of such a reform solely based on the number of public officials entails limitations. Given that the ultimate objective of local government mergers is to improve the quality of residents' lives, the size of public personnel alone might not provide a comprehensive basis for drawing definitive conclusions about welfare outcomes. Nevertheless, our second estimation indicates that citizen satisfaction in the consolidated region is lower than in other areas. This finding raises further concerns regarding the overall effectiveness of the mergers in achieving the desired improvement in residents' welfare.

Despite the simultaneous increase in public employment size, the decline in citizen satisfaction with the local government indicates that the city-county merger has not effectively accomplished its intended objective of improving government competitiveness and social welfare. These results align with the theoretical predictions put forth by the excessive government model, which holds that the reform may be susceptible to exploitation by the bureaucracy's rent-seeking behavior. In this context, the bureaucracy may leverage the merger to bolster its authority by expanding personnel organizations, irrespective of actual public service demands.

In light of a declining birth rate, an aging population, and population decline in Korea, there is a renewed emphasis on reorganizing local government. Drawing insights from the merger of Cheongju-si and Cheongwon-gun, we observe inefficiencies associated with increasing the size of public officials, coupled with a lack of positive effects on resident satisfaction. Therefore, the government ought to contemplate innovative approaches to achieve the actual goal of future mergers with local governments.

6. Conclusions

The discourse surrounding the optimal size of local government is a nuanced pursuit, aiming to strike a balance wherein the government can effectively cater to both responsiveness and productivity. The ultimate objective is to enhance residents' welfare by actively addressing administrative demands while achieving administrative efficiency through judicious fiscal and personnel management.

Through an empirical investigation of city-county consolidation in South Korea, this study uncovers certain administrative costs pertaining to public employment size and citizen satisfaction. Specifically, the total number of public employees and the count of lower-ranked officials experience an increase post-merger, while citizen satisfaction, subjectively evaluated by the residents, witnesses a decline. The findings indicate that city-county integration does not necessarily translate into improving administrative quality through increasing manpower. Consequently, there is a need to carefully consider the potential risk of the quality of public service not necessarily being closely tethered to the size of local government during any forthcoming reform or administrative reorganization initiatives.

Based on our findings, we draw policy implications: it is imperative to examine potential side effects on organizational management, such as scrutinizing whether consolidation might have inadvertently been exploited to expand bureaucratic interests. Additionally, securing ample resident support beforehand for the reform is essential. By doing so, local government consolidation can achieve its purpose of enhancing administrative efficiency, fostering local government competitiveness, stimulating growth, and improving resident welfare.

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