“Examining governance and performance of utility companies after mergers: a case from a municipal water company in Greece”

AUTHORS	Michail Pazarskis Stergios Galanis Maria Gkatziou Sofia Kourtesi

ARTICLE INFO	Michail Pazarskis, Stergios Galanis, Maria Gkatziou and Sofia Kourtesi (2022). Examining governance and performance of utility companies after mergers: a case from a municipal water company in Greece. *Public and Municipal Finance*, *11*(1), 90-100. doi:10.21511/pmf.11(1).2022.08
DOI	http://dx.doi.org/10.21511/pmf.11(1).2022.08
RELEASED ON	Monday, 31 October 2022
RECEIVED ON	Monday, 19 September 2022
ACCEPTED ON	Friday, 14 October 2022

JOURNAL	"Public and Municipal Finance"
ISSN PRINT	2222-1867
ISSN ONLINE	2222-1875
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
42	0	4

BUSINESS PERSPECTIVES

LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine

www.businessperspectives.org

Michail Pazarskis (Greece), **Stergios Galanis** (Greece),
Maria Gkatziou (Greece), **Sofia Kourtesi** (Greece)

EXAMINING GOVERNANCE AND PERFORMANCE OF UTILITY COMPANIES AFTER MERGERS: A CASE FROM A MUNICIPAL WATER COMPANY IN GREECE

Abstract

This study deals with the governance and performance of utility companies following mergers in local government organizations (LGOs). It is demonstrated by using the municipal water supply and sewerage company in city of Serres as a case study of how the reform initiative known as "Kallikratis" has impacted Greek municipal water and sewerage companies. As a result of the Kallikratis Program, the municipalities were merged, and new data were added to the map of local government in Greece. The methodological approach entails surveying the economic analysis of raw data using a number of financial ratios (financial statements of the municipal company). The study's findings demonstrate that the municipal company of Serres was able to plan the actions that resulted in an improvement of the majority of the examined ratios after merger events, despite the extra responsibilities and geographic areas that the Kallikratis Program added to the municipal companies and the reduction of the extraordinary subsidies as a result of the Greek debt crisis. Eleven of the fourteen ratios perform better than they did before the merger, while three of them actually perform worse (2011–2018). However, various and contradictory results about the evolution of these ratios are seen over the crisis era, as some of them initially show a partial improvement (in the midst of the economic crisis period), but then they gradually deteriorate by the end of the crisis.

Keywords governance, mergers, utility companies, LGOs, municipalities, financial statements, financial ratios, revenues

JEL Classification G34, M40

Received on: 19th of September, 2022
Accepted on: 14th of October, 2022
Published on: 31st of October, 2022

Michail Pazarskis, Ph.D., Associate Professor, Department of Economics, International Hellenic University, Terma Magnesias, Greece.

Stergios Galanis, Ph.D. Candidate, Department of Economics, International Hellenic University, Terma Magnesias, Greece. (Corresponding author)

Maria Gkatziou, Ph.D. Candidate, Department of Economics, International Hellenic University, Terma Magnesias, Greece.

Sofia Kourtesi, Ph.D., Adjunct Assistant Professor, Department of Economics, International Hellenic University, Terma Magnesias, Greece.

Conflict of interest statement:
Author(s) reported no conflict of interest

INTRODUCTION

According to the Greek Constitution, Local Government Organizations (LGOs) are responsible for managing and regulating all "local matters" with the aim of preserving, enhancing, and continuously raising the standard of living in local communities (Pazarskis et al., 2020). Article 102 (paragraph 1) of the Constitution states that LGOs (first and second degree) are responsible for administering local issues. As part of a bold initiative to restructure the decentralized administrative structure of the Greek State, Law 3852, titled "New Architecture of Self-Government and Decentralized Administration – Kallikratis Program," was passed in June 2010 (Government Gazette A′ 87/7-6-2010). It strengthened municipal self-governments and abolished prefectural self-governments. By merging Municipalities (first-degree LGOs), transferring new responsibilities from the defunct Prefectures to the newly established first-degree LGOs, and establishing Regions and Decentralized Administrations, the Kallikratis Program resulted in the creation of a new system of Local Self-Government and Decentralized Administration.

http://dx.doi.org/10.21511/pmf.11(1).2022.08

This reform's primary goal was the creation of (a) new Decentralized Administrations (from 13 Decentralized Regions and 54 Prefectures to 7 Decentralized Administrations and 13 elected Regions, which will now constitute second-level local government), and (b) new merged of larger Municipalities – First Degree Local Self-Government – reducing their total number to 325 from 1034 (together with the Communities), while also emphasizing them as "essential administrations where most administrative activities would be carried out, particularly those of public significance much closer to the citizen." The Kallikratis Program's execution of municipal mergers produced new information on the map of local government in Greece and has been the focus of intense discussion and controversy in recent years.

Furthermore, municipalities in Greece have long created and run municipal companies with a wide range of objectives (Pazarskis et al., 2021). Regarding the aforementioned, it would be particularly interesting to present a current impression through economic analysis and evaluation of mergers of municipal companies during the Kallikratis Program using the case study of a medium-sized municipal water and sewerage company, the Municipal Water and Sewerage Company of the Municipality of Serres (DEYAS). The Municipal Water Supply and Sewerage Company of Serres (DEYAS) was founded with the Presidential Decree (P.D.) 503/1991 published in the Government Gazette on November 29, 1991, in accordance with Law 1069/80 and after the Municipal Council of Serres' approval.

The company's operations started in August 1992, and they are governed by the Internal Service Organization, the Operation and Management Regulation, and the relevant laws at the time. The Municipal Water Supply and Sewerage Company of Serres is a Legal Entity of Private Law with a Public Benefit Character. As is well known, the region's economic infrastructure relies more on the primary sector and less on the secondary and tertiary sectors. A significant component of this infrastructure is the Municipal Water Supply and Sewerage Company of Serres. There are about 110,000 people in DEYA Serres' customer base (38,500 connections), and the water supply and sewage pipes each have a length of 300 km.

The study examines utility company governance and performance in the wake of mergers among local government agencies (LGOs). Specifically, it examines the financial performance course of the aforementioned larger legal entity before and after the implementation of the Kallikratis Program and assesses the financial statements of the new municipal company following the merger and in connection to the prior situation. With the case study of DEYAS, the aim of this paper is to use numerical indicators, primarily in accordance with Article 6 of Ministerial Decision (M.D.) 74712/2010, to draw useful conclusions about the economic impact of the implementation of Law 3852/2010 Kallikratis on a medium-sized municipal enterprise for the Pre-Kallikratis 2010 and Post-Kallikratis 2011–2018 time periods. Through a financial analysis of the legal entity's financial statements, the work's primary goal is to look at the differences between the two time periods. Finally, the goal was to provide future researchers with assistance for their own analysis through a thorough presentation and interpretation of our findings in a field with few studies.

1. LITERATURE REVIEW

The issue of the ideal size of local government organizations (LGOs) has become more crucial as the role of local governments in the public sector has grown. Municipal mergers are clearly on many nations' political agendas. The growth of the service industry's economic size, the efficiency of the reformed departments and organization, administration, and the enhancement of the standard of public services are all arguments in favor of mergers.

The following is a collection of studies that have been done over time for municipal mergers; research on specialized situations following mergers of municipal water and sewerage utilities is obviously missing. The main justification for most of these reforms is that municipalities should take advantage of economies of scale when providing public services.

The process of "incorporating one or more municipal units into a new organization" is known as

a merger (or amalgamation) (Blesse & Baskaran, 2016). Related to this, Beeri et al. (2018) describe a merger as the elimination of some local government institutions in favor of the creation of other, larger ones. Depending on the relevant laws, this procedure may be either potential or required (Neves et al., 2022). A sort of administrative and structural reform of municipalities is the merger-consolidation of local authorities, which is the action or process of integrating functions and producing units into a single more effective or cohesive whole (Hanes, 2015).

One of these capabilities is a municipality's capacity for performance. What is seen is that municipalities that perform especially poorly choose to merge (Lajmi et al., 2021). However, mergers frequently happen to address the "weak areas" of a legal body when, as a result of their organizational structures, they can no longer effectively manage the work that has accumulated (Andrews & Boyne, 2009). Therefore, one of the primary factors contributing to merger procedures is inefficiency in municipal structures and operations (Norgaard, 1996). More particularly, local government mergers are occurring more frequently around the world, which has led to an increase in the number of advances in state local government that are being seen in this direction (Houcine et al., 2022).

Furthermore, municipal reform mergers are a strategy adopted in the majority of developed countries, according to Reingewertz (2012). The Difference-in-Differences methodology aimed to give empirical evidence on the fiscal effects of municipal mergers. This study examined Israel's 2003 annexation reform using substantial data from Israeli municipalities during the years 1999–2007. According to Reingewertz (2012)'s findings, mergers caused a 9% decrease in municipal spending. No evidence of a drop in the quality of services offered to inhabitants of the combined towns was discovered. The findings also demonstrated that municipal mergers brought about real economies of scale.

Prior to voluntary municipal mergers, the behavior of Finnish municipalities was examined by Saarimaa and Tukiainen (2015) using the free-rider dilemma. Due to the time it takes from the original decision to the actual merger, during which the municipalities retain their autonomy, the merger procedure generates a temporary joint concentration problem. Saarimaa and Tukiainen (2015) discovered that the strongest cause of a municipality's free-rider issue was an increase in the municipality's indebtedness and a fall in financial reserves using the Difference-in-Differences methodology.

According to Tyrefors Hinnerich (2009), the border changes were a major factor in the Western world's noticeable trend toward greater municipal governments in the twentieth century. Reforms to local government boundaries may boost the economy, but they may also increase costs as a result of political opportunism. In his study, Tyrefors Hinnerich (2009) uses a sample of municipalities for the mandatory reform that occurred in Sweden. Since taxpayers in the newly bigger local government body would share the cost, the reform encourages local government to accumulate debt prior to the merger.

Research by Blesse and Baskaran (2016) used a significant merger reform in the German federal state of Brandenburg to study the fiscal effects of municipal mergers. The number of municipalities was significantly decreased as a result of this reform, which was carried out between 2001 and 2003. Due to the fact that each merger was unique in a number of ways, Blesse and Baskaran (2016) were able to add to the body of knowledge by researching the effects of several merger types within the same institutional setting. They used the Difference-in-Differences approach on the group data from 1995 to 2010 at the post-merger municipality level, focusing primarily on the distinction between compulsory and voluntary mergers. After forced mergers, they discovered considerable drops in administrative costs. Finally, cost reductions were greater in mergers involving more persons, more municipalities, and municipal annexes.

In their study, Hirota and Yunoue (2017) sought to evaluate the widespread issue of fiscal debt concentrations in Japanese municipal mergers. They specifically looked into whether municipalities that were about to combine quickly raised their spending and debt. Municipal mergers existed in Japan because the likelihood of such mergers is influenced by local factors including population density, geographic region, and taxation.

http://dx.doi.org/10.21511/pmf.11(1).2022.08

Furthermore, there is a series of studies in the literature dealing with various issues related to the mergers of local government organizations (LGOs) such as growth of the local public sector (Nelson, 1992), operational efficiency (Dollery et al., 2007), effect on the municipal income growth patterns (Hanes & Wikstrom, 2008), common pool problem in politics (Jordahl & Liang, 2009), efficient amalgamations (Hanes & Wikstrom, 2010), feasible amalgamation (Dafflon, 2013), financial sustainability (Andrews, 2013), impact on local public expenditures (Moisio & Usitalo, 2013) local benefits (Weese, 2015), local government spending, taxation, and service provision (Allers et al., 2016), public service delivery, local finance, administrative staff, municipal autonomy and local democracy (Steiner & Kaiser, 2016), size and democracy (Zeedan, 2017), reduced expenditures (Roesel, 2017), superior performance in financial terms (Dollery & Ting, 2017), allocation of public services (Yamada, 2018), policy-based evidence-making in local government (Dollery, 2018; Turley et al., 2018), policy and welfare consequences (Di Liddo & Giuranno, 2019), common pool exploitation (Fritz & Feld, 2019), political representation (Voda & Svačinová, 2020), cost reductions and service delivery enhancement (Garlatti et al., 2020) and impact on the economy (Drew et al., 2021).

2. METHODS

Financial ratios are correlations between several variables that are typically represented as percentages. They are used to assess the actual position, effectiveness, or even overall health of an economic unit (Pazarskis et al., 2019).

Fourteen financial ratios, which are described and listed below in five categories, were used to analyze and process the financial statements of the various listed companies in the sample: (a) liquidity ratios, (b) profitability ratios, (c) activity ratios, (d) leverage ratios and (e) productivity ratios.

A municipal company's financial analysis includes an assessment of the components and accounting information that make up its overall picture. The review of the data in financial statements using both qualitative and quantitative methods is known as financial analysis. There are various steps involved in the analysis of financial data.

In more detail, the first stage entails calculating the relationships between the elements of the accounting statements, and the second stage involves comparing them. Financial ratios are one of the most popular and effective tools for financial analysis, and they are crucial for understanding how the financial information of companies in the public

Table 1. Financial ratios

Variables	Ratios	Ratio analysis	Desirable sign
Liquidity ratios			
Var01	Current ratio	current assets / current liabilities	+
Var02	Quick ratio	(current assets – inventories) / current liabilities	+
Profitability ratios			
Var03	Return on equity – ROE	Net income / equity	+
Var04	Net profit margin	Net income / sales	+
Activity ratios			
Var05	Inventories to sales	(Inventories / sales) × 365	–
Var06	Collection period	(Debtors / sales) × 365	–
Leverage ratios			
Var07	Loans to equity	(Long term loans + Short term loans) / equity	–
Var08	Subsidies to equity	Subsidies / equity	–
Var09	Debt ratio	Total debt / total assets	–
Var10	Investment financing ratio	Equity / net fixed assets	+
Productivity ratios			
Var11	Operating revenue per employee	Sales / number of employees	+
Var12	Asset turnover ratio	Sales / total assets	+
Var13	Fixed assets ratio	Sales / net fixed assets	+
Var14	Average salary of employees	Staff salaries / number of employees	–

and private sectors is interpreted (Brusca-Alijarde, 1997; Christiaens, 1999; Cohen, 2008; Godard, 2010; etc.). Therefore, this paper will implement the general form of financial analysis, namely:

- The measurement of the previous performance of the economic unit (calculation of ratios of the municipal enterprise for a year before the implementation of Kallikratis, i.e. for the year 2010).
- The measurement of the current state of the economic unit (calculation of municipal financial ratios for eight years after the implementation of Kallikratis, i.e. for the years 2011–2018).
- The statistical analysis of the previous with the newly formed situation, so that the impact of Kallikratis can be evaluated and the future possibilities of the economic unit (municipal enterprise) can be predicted. Our analysis includes comparison of means and median in the pre- and post-merger periods, and performance comparisons of time periods in the beginning (2010–2012), in the middle (2013–2015), and at the end of the economic crisis (2016–2018).

3. RESULTS

For the company under consideration, Table 2 shows the descriptive statistics for each financial ratio during the pre- and post-merger periods.

The total assets of DEYA Serres at the end of 2010 amounted to €42,073,130 compared to €42,474,539 in 2009, i.e. it was reduced by €401,408 or a percentage of 0.95%. The company's fixed assets amounted to €38,636,278 on 12-31-2010 compared to €39,532,748 in 2009, i.e. reduced by €896,470 or a percentage of 2.27%. The current assets of the company in the same period amounted to €3,413,492 in 2010 compared to €2,872,587 in 2009, i.e. it appears to increase by €477,176 or a percentage of 16.25%. The company's equity amounted to €34,321,508 in 2010 compared to €34,095,922 in 2009, i.e. it appears reduced by €225,585 or a percentage of 0.66%. The total liabilities in 2010 amounted to €6,655,397 compared to €7,196,703 in 2009, i.e. it appears reduced by €541,306 or a percentage of 7.52%.

Next year's financial reports indicated that the total assets of DEYA Serres at the end of 2011 amounted to €43,713,196 compared to €42,073,130 in 2010, i.e. it was increased by €1,640,065 or a percentage of 3.90%. The company's fixed assets amounted to €39,195,972 on 12-31-2011 compared to €38,636,278 in 2010, i.e. an increase of €559,693 or a percentage of 1.45%. The company's current assets in the same period amounted to €4,511,121 in 2011 compared to €3,413,492 in 2010, i.e. it appears increased by €1,097,629 or a percentage of 32.16%. The company's equity amounted to €36,622,872 in 2011 compared to €34,321,508 in 2010, i.e. it appears increased by €2,301,364 or a percentage of 6.71%. The total liabilities in 2011 amounted to €6,161,073 compared to €6,655,397 in 2010, i.e. it appears reduced by €494,323 or a percentage of 7.43%.

Table 2. Descriptive statistics

Variables	Minimum	Q1	Q3	Maximum	IQR	stdev	skewness	kurtosis
Var01	1.360	2.250	3.350	3.680	4.340	1.430	0.982	−0.401
Var02	1.280	2.170	3.260	3.590	4.190	1.420	0.966	−0.429
Var03	0.001	0.005	0.011	0.024	0.034	0.019	0.012	0.571
Var04	0.009	0.034	0.057	0.177	0.242	0.143	0.078	0.628
Var05	8.680	9.840	10.110	11.380	14.160	1.540	1.552	1.205
Var06	110.6	188.5	215.6	343.7	404.8	155.1	99.644	0.122
Var07	0.099	0.113	0.121	0.132	0.188	0.020	0.027	1.258
Var08	0.396	0.432	0.443	0.557	1.051	0.126	0.246	1.459
Var09	0.090	0.101	0.104	0.117	0.158	0.016	0.021	1.223
Var10	0.975	1.006	1.022	1.063	106.420	0.057	34.857	2.828
Var11	65646.1	73007.1	75682.1	76960.7	96452.7	3953.6	9935.9	1.042
Var12	0.107	0.118	0.120	0.130	0.165	0.013	0.020	1.171
Var13	0.128	0.139	0.143	0.154	0.188	0.016	0.021	1.175
Var14	26684.8	33695.7	35430.1	36402.7	40526.7	2706.9	3760.3	−1.027

http://dx.doi.org/10.21511/pmf.11(1).2022.08

Furthermore, the total assets of DEYA Serres at the end of 2012 amounted to €59,462,310 compared to €43,713,196 in 2011, i.e. it was increased by €15,640,065 or a percentage of 36.03%. The company's fixed assets amounted to €53,903,098 on 12-31-2012 compared to €39,195,972 in 2011, i.e. an increase of €14,707,126 or a percentage of 37.52%. The company's current assets in the same period amounted to €5,552,027 in 2012 compared to €4,511,121 in 2011, i.e. it appears to increase by €1,040,906 or a percentage of 23.07%. The company's equity amounted to €53,116,616 in 2012 compared to €36,622,872 in 2011, i.e. it appears increased by €16,493,743 or a percentage of 45.04%. The total liabilities in 2012 amounted to €5,344,394 compared to €6,161,073 in 2011, i.e. it appears reduced by €816,678 or a percentage of 13.26%.

In addition to the above, the total assets of DEYA Serres at the end of 2013 amounted to €61,555,948 compared to €59,462,310 in 2012, i.e. it was increased by €2,093,637 or a percentage of 3.52%. The company's fixed assets amounted to €54,194,039 on 12-31-2013 compared to €53,903,098 in 2012, i.e. an increase of €290,941 or a percentage of 0.54%. The company's current assets in the same period amounted to €7,353,986 in 2013 compared to €5,552,027 in 2012, i.e. it appears to increase by €1,801,958 or a percentage of 32.46%.

To continue with the reports at the end of 2014, total assets of DEYA Serres amounted to €55,298,233 compared to €61,555,948 in 2013, i.e. it was reduced by €6,257,715 or a percentage of 10.17% and is due to the main factor in the valuation of the inventory that was completed. The company's fixed assets amounted to €46,386,613 on 12-31-2014 compared to €54,194,039 in 2013, i.e. reduced by €7,807,426 or a percentage of 14.41%. The company's current assets in the same period amounted to €8,905,525 in 2014 compared to €7,353,986 in 2013, i.e. it appears to increase by €1,551,539 or a percentage of 21.1%. The company's equity amounted to €47,437,707 in 2014 compared to €54,458,885 in 2013, i.e. it appears reduced by €7,021,177 or a percentage of 12.89%. The total liabilities in 2014 amounted to €6,451,959 compared to €6,226,267 in 2013, i.e. it appears increased by €225,692 or 3.62%. The company's equity amounted to €54,458,885 in 2013 compared to €53,116,616 in 2012, i.e. it appears increased by €1,342,268 or a percentage of 2.53%. The total liabilities in 2013 amounted to €6,226,267 compared to €5,344,394 in 2012, i.e. it appears increased by €881,872 or by 16.50%.

The overall assets of DEYA Serres at the end of 2015 amounted to €57,263,151 compared to €55,298,233 in 2014, i.e. it was increased by €1,694,918 or a percentage of 3.55% and is due mainly to the integration of new projects calculated by DEYA in 2015. The company's current assets in the same period amounted to €8,937,274 in 2015 compared to €8,981,581 in 2014, i.e. it appears reduced by €44,307 or a percentage of 0.49%. The company's net worth amounted to €20,858,663 in 2015 compared to €21,252,777 in 2014, i.e. it appears reduced by €394,113 or a percentage of 1.85%. The total short-term liabilities in 2015 amounted to €2,669,233 compared to €2,302,152 in 2014, i.e. it appears increased by €367,080 or 15.95%.

At the end of 2016, the assets of DEYA Serres amounted to €57,592,969 compared to €57,263,151 in 2015, i.e. it was increased by €1,694,918 or a percentage of 3.55% and is mainly due to the integration of new projects calculated by DEYA in 2015. The company's current assets in the same period amounted to €9,128,334 in 2016 compared to €8,937,274 in 2015, i.e. an increase of 38.05%. The total of short-term liabilities in 2016 amounted to €3,359,117 compared to €2,669,233 in 2015, i.e. it appears increased by €689,884 or 25.85%.

Last but not least, the whole assets of DEYA Serres at the end of 2017 amounted to €60,218,820 compared to €61,235,160 in 2016, i.e. it was reduced by €1,016,339 or a percentage of 1.66%. The current assets of the company in the same period amounted to €5,730,227 in 2017 compared to €7,683,778 in 2016, i.e. it appears reduced by €1,953,550 or in a percentage of 25.42%. The net worth of the company amounted to €29,212,575 in 2017 compared to €28,917,164 in 2016, i.e. it appears increased by €295.411 or at a rate of 1.02%. Total long-term liabilities in 2017 amounted to €3,134,370 compared to €3,537,945 in 2016, i.e. it appears re-

duced by €403,574 or a percentage of 11.41%. The total of short-term liabilities in 2017 amounted to €1,637,560 compared to €1,704,011 in 2016. i.e. it appears reduced by €66,451 or a percentage of 3.90%.

To conclude, the total assets of DEYA Serres at the end of 2018 amounted to €60,496,963 compared to €60,218,820 in 2017, i.e. it increased by 278,142 or by 0.04%. The company's current assets in the same period amounted to €6,476,066 in 2017 compared to €5,730,227 in 2017, i.e. it appears to increase by €745,838 or a percentage of 13.02%. The company's net worth amounted to €30,070,850 in 2018 compared to €29,212,575 in 2017, i.e. it appears increased by €858,274 or a percentage of 2.29%. The total long-term liabilities in 2018 amounted to €2,983,362 compared to €3,134,370 in 2017, i.e. it appears reduced by 151,008 or a percentage of 4.82%. The total short-term liabilities in 2018 amounted to €1,493,467 compared to €1,637,560 in 2017, i.e. it appears reduced by €144,092 or a percentage of 8.80%.

Regarding the examined fourteen ratios (Var01-Var14), several changes are observed in the pre- and post-merger period (see Table 3). Of the fourteen ratios, eleven ratios (current ratio; quick ratio; return on equity; net profit margin; inventories to sales; loans to equity; subsidies to equity; debt ratio; investment financing ratio; operating revenue per employee; average salary of employees) present a better performance, while three of them (collection period; asset turnover ratio; fixed assets ratio) deteriorates in the post-merger period (2011–2018). Similar results are presented with the mean examination, as well as the median.

To compare the data for different time intervals, the time frame period of the sample is divided into three sub-periods:

a) beginning of the crisis period (2010–2012);
b) middle of the crisis period (2013–2015); and
c) end of the crisis period (2016–2018).

Then, the mean is extracted from each of the examined fourteen ratios (Var01-Var14) for these sub-periods. The results are presented in Table 4. In the examined ratios several ratios are presenting a better performance diachronically (loans to equity; subsidies to equity; debt ratio; operating revenue per employee), while some others show a partial worsening in their performance and in the sum of the three-time periods present mixed and contradictory results, as they do not follow the desirable sign of the ratios (current ratio; quick ratio; return on equity; net profit margin; inventories to sales; collection period; investment financing ratio; asset turnover ratio; fixed assets ratio; average salary of employees).

Table 3. Comparison of financial ratios in the pre- and post-merger period

Variables	Financial ratios	Mean in the premerger period (2010)	Mean in the post-merger period (2011–18)	Median in the premerger period (2010)	Median in the post-merger period (2011–18)
Var01	Current ratio	1.360	3.2	1.360	3.425
Var02	Quick ratio	1.280	3.1025	1.280	3.315
Var03	Return on equity	0.011	0.0153	0.011	0.01205
Var04	Net profit margin	0.057	0.1051	0.057	0.0848
Var05	Inventories to sales	11.380	10.62	11.380	10.025
Var06	Collection period	110.6	274.12	110.6	264.42
Var07	Loans to equity	0.188	0.12281	0.188	0.11785
Var08	Subsidies to equity	1.051	0.52495	1.051	0.43845
Var09	Debt ratio	0.158	0.1085	0.158	0.1032
Var10	Investment financing ratio	0.933	14.196	0.933	1.0224
Var11	Operating revenue per employee	65,646.1	79,218.8	65,646.1	76,170.3
Var12	Asset turnover ratio	0.164	0.1255	0.164	0.1198
Var13	Fixed assets ratio	0.182	0.14604	0.182	0.1428
Var14	Average salary of employees	40,526.7	34,567.4	40,526.7	35,403.7

http://dx.doi.org/10.21511/pmf.11(1).2022.08

Table 4. Comparison of financial ratios in the economic crisis periods

Variables	Financial ratios	Mean from the beginning of the crisis period (2010–2012)	Mean from the middle of the crisis period (2013–2015)	Mean from the end of the crisis period (2016–2018)
Var01	Current ratio	1.777	3.690	3.520
Var02	Quick ratio	1.697	3.600	3.403
Var03	Return on equity	0.023	0.012	0.009
Var04	Net profit margin	0.138	0.095	0.066
Var05	Inventories to sales	10.443	10.927	10.743
Var06	Collection period	147.78	353.88	266.18
Var07	Loans to equity	0.150	0.125	0.115
Var08	Subsidies to equity	0.834	0.492	0.424
Var09	Debt ratio	0.130	0.111	0.101
Var10	Investment financing ratio	0.974	1.053	1.022
Var11	Operating revenue per employee	71,445.1	72,820.7	88,866.5
Var12	Asset turnover ratio	0.150	0.115	0.125
Var13	Fixed assets ratio	0.168	0.136	0.142
Var14	Average salary of employees	38,701.9	31,936.9	35,049.9

4. DISCUSSION

Results show that three of the fourteen ratios actually perform worse than they did before the merger, while eleven of the fourteen ratios actually perform better (2011–2018). Although several of these ratios first indicate a partial recovery (during the economic crisis period), they progressively worse by the end of the crisis, resulting in a variety of contradicting outcomes about the evolution of these ratios over the crisis era. Compared with other studies, D'Alauro (2020) insists that growing mergers among public utilities brought on by competition may favor in Italy a decrease in public control and a rise in fair value accounting. Moreover, according to Iroanya and Njingolo (2017), mergers and acquisitions are one strategy to turn underperforming municipal-owned entities into productive and successful businesses. Furthermore, in contrast to shareholder value maximization and long-term strategic objectives, Florio et al. (2018) found that rescue of financially distressed enterprises is a considerably less frequent deal rationale when State-Owned Enterprises are engaged in a merger or an acquisition. In the context of municipal mergers, researchers noted that, in addition to the scaling of the local government body's economic dynamics, which is the fundamental motive behind their conceptualization and implementation, mergers have negative effects on other areas of the municipal action range (Alqudah et al., 2019). Nevertheless, many studies (Allers & Geertsema, 2016; Blom-Hansen et al., 2016; Roesel, 2017; Hansen et al., 2014) did not notice a change in the economic transactions of municipalities, whereas one study supports a positive impact and another study supports a negative impact on the economic sector, respectively (Reingewertz, 2012; Drew et al., 2021). This diversity in the studies' origins may indicate a probable relationship between the location, culture, and temperament of the population and the effectiveness of the mergers.

CONCLUSION

Examining utility company governance and performance following mergers among local government agencies is the focus of the current study (LGOs). With the municipal water supply company in Serres as a case study, the current study's specific objective is to investigate and assess how the Kallikratis program has affected Greek municipal water and sewerage companies. As a result, this study looks at the Kallikratis Program's effects on the finances of the Municipality of Serres' medium-sized municipal water and sewerage company one year before and eight years after the law's passage. Moreover, an effort is made to evaluate the implementation using the financial statements of the municipal organization that are based on the double-entry system. The study's findings demonstrated that the municipal

company of Serres was able to plan the actions that resulted in an improvement of the majority of the examined ratios after merger events, despite the additional responsibilities and geographic areas that the Kallikratis Program added to the municipal companies and the reduction of the extraordinary subsidies, primarily as a result of the Greek debt crisis. According to the research, the majority of the ratios for a municipal water supply and sewerage company in Greece under investigation demonstrate enhanced performance following merger events. However, during the crisis phase, various and conflicting results of the evolution of these ratios over the studied period are noticed, as some of them exhibit a partial improvement at the midst of the crisis but then a partial deterioration at the end of the crisis. Future studies may focus on how other municipal water supply and sewerage corporations in Greece or other EU member states perform in this area of public utilities. The impact of the freshly established post-covid era and the world energy crisis could also be investigated. Although for a long time, these consequences have not been accurately reflected as an economic impact on the financial statements of any company operating in this sector.

AUTHOR CONTRIBUTIONS

Conceptualization: Stergios Galanis.
Data curation: Stergios Galanis, Maria Gkatziou.
Formal analysis: Michail Pazarskis, Sofia Kourtesi.
Investigation: Maria Gkatziou.
Methodology: Stergios Galanis.
Project administration: Michail Pazarskis, Sofia Kourtesi.
Resources: Maria Gkatziou.
Supervision: Michail Pazarskis, Sofia Kourtesi.
Validation: Michail Pazarskis.
Writing – original draft: Maria Gkatziou.
Writing – review & editing: Stergios Galanis, Sofia Kourtesi.

REFERENCES

1. Allers, M. A., & Geertsema, J. B. (2016). The Effects of Local Government Amalgamation on Public Spending, Taxation, and Service Levels: Evidence from 15 Years of Municipal Consolidation. *Journal of Regional Science, 56*(4), 659-682. https://doi.org/10.1111/jors.12268
2. Alqudah, H. M., Amran, N. A., & Hassan, H. (2019). Factors affecting the internal auditors' effectiveness in the Jordanian public sector: The moderating effect of task complexity. *EuroMed Journal of Business, 14*(3), 251-273. https://doi.org/10.1108/EMJB-03-2019-0049
3. Andrews, R. (2013). Local government amalgamation and financial sustainability: the case of England and Wales. *Public Finance and Management, 13*(2), 124-141. Retrieved from https://spaef.org/article/1438/Local-government-amalgamation-and-financial-sustainability:-the-case-of-England-and-Wales
4. Andrews, R., & Boyne, G. A. (2009). Size, structure and administrative overheads: An empirical analysis of English local authorities. *Urban Studies, 46*(4), 739-759. https://doi.org/10.1177/0042098009102127
5. Blesse, S., & Baskaran, T. (2016). Do municipal mergers reduce costs? Evidence from a German federal state. *Regional Science and Urban Economics, 59*(1), 54-74. https://doi.org/10.1016/j.regsciurbeco.2016.04.003
6. Blom-Hansen, J., Houlberg, K., Serritzlew, S., & Treisman, D. (2016). Jurisdiction Size and Local Government Policy Expenditure: Assessing the Effect of Municipal Amalgamation. *Journal of American Political Science Review, 110*(4), 812-831. https://doi.org/10.1111/1475-6765.12394
7. Brusca-Alijarde, M. I. (1997). The Usefulness of Financial Reporting in Spanish Local Governments. *Financial Accountability and Management, 13*(1), 17-34. https://doi.org/10.1111/1468-0408.00024
8. Christiaens, J. (1999). Financial Accounting Reform in Flemish Municipalities: An Empirical Investigation. *Financial Accountability and Management, 15*(1), 21-40. https://doi.org/10.1111/1468-0408.00072
9. Cohen, S. (2008). Identifying the Moderator Factors of Financial Performance in Greek Municipalities. *Financial Accountability and Management, 24*(3), 265-293. https://doi.org/10.1111/j.1468-0408.2008.00453.x

http://dx.doi.org/10.21511/pmf.11(1).2022.08

10. D'Alauro, G. (2020). Italian Utilities and Public Control: Evidence of Merger Effects. *International Journal of Public Administration, 43*(7), 573-586. https://doi.org/10.1080/01900692.2019.1644517

11. Dafflon, B. (2013). Voluntary amalgamation of local governments: the Swiss debate in the European context. In S. Lago-Penas & J. Martinez-Vazquez (Eds.), *The Challenge of Local Government Size Theoretical Perspectives, International Experience and Policy Reform* (pp. 189-220). https://doi.org/10.4337/9781782544302.00012

12. Di Liddo, G., & Giuranno, M. G. (2019). The political economy of municipal consortia and municipal mergers. *Economia Politica, 37*(1), 105-135. https://doi.org/10.1007/s40888-019-00169-1

13. Dollery, B. (2018). Policy-Based Evidence Making in Local Government: The New South Wales' Municipal Merger Program, 2011 to 2017. *Economic Papers: A Journal of Applied Economics and Policy, 37*(4), 363-373. https://doi.org/10.1111/1759-3441.12231

14. Dollery, B., & Ting, S. K. (2017). Counting the cost: An analysis of the post-merger performance of the Clarence Valley Council in New South Wales. *Economic Analysis and Policy, 56,* 72-78. https://doi.org/10.1016/j.eap.2017.08.008

15. Dollery, B., Byrnes, J., & Crase, L. (2007). Is Bigger Better? Local Government Amalgamation and the South Australian Rising to the Challenge Inquiry. *Economic Analysis and Policy, 37*(1), 1-14. https://doi.org/10.1016/s0313-5926(07)50001-9

16. Drew, J., Mcquestin, D., & Dollery, B. (2021). Did amalgamation make local government more fit for the future? *Australian Journal of Public Administration, 81*(2), 383-398. https://doi.org/10.1111/1467-8500.12530

17. Florio, M., Ferraris, M., & Vandone, D. (2018). State-Owned Enterprises: Rationales for Merges and Acquisitions. *CIRIEC, 2018*(01), 1-34. http://dx.doi.org/10.2139/ssrn.3202219

18. Fritz, B., & Feld, L. P. (2019). Common pool effects and local public debt in amalgamated municipalities. *Public Choice, 183*(1-2), 69-99. https://doi.org/10.1007/s11127-019-00688-2

19. Garlatti, A., Fedele, P., & Iacuzzi, S. (2020). Can amalgamations deliver? Barriers to local government mergers from an historical institutionalist perspective. *Public Money & Management, 42*(6), 420-430. https://doi.org/10.1080/09540962.2020.1800216

20. Godard, A. (2010). Contemporary Public Sector Accounting Research – An International Comparison of Journal Papers. *The British Accounting Review, 42*(2), 75-87. https://doi.org/10.1016/j.bar.2010.02.006

21. Hanes, N. (2015). Amalgamation impacts on local public expenditures in Sweden. *Journal of Local Government Studies, 41*(1), 63-77. https://doi.org/10.1080/03003930.2013.869496

22. Hanes, N., & Wikstrom, M. (2008). Does the local government structure affect population and income growth? an empirical analysis of the 1952 municipal reform in Sweden. *Journal of Regional Studies, 42*(4), 593-604. https://doi.org/10.1080/00343400701281311

23. Hanes, N., & Wikstrom, M. (2010). Amalgamation impacts on local growth: are voluntary municipal amalgamations more efficient than compulsory amalgamations? *Canadian Journal of Regional Science, 33*(1), 57-70. Retrieved from https://idjs.ca/images/rcsr/archives/V33N1-HANES-WIKSTROM.pdf

24. Hansen, S. W., Houlberg, K., & Pedersen, L. H. (2014). Do municipal mergers improve fiscal outcomes? *Scandinavian Political Studies, 37*(2), 196-214. https://doi.org/10.1111/1467-9477.12020

25. Hirota, H., & Yunoue, H. (2017). Evaluation of the fiscal effect on municipal mergers: Quasi-experimental evidence from Japanese municipal data. *Regional Science and Urban Economics, 66*(1), 132-149. https://doi.org/10.1016/j.regsciurbeco.2017.05.010

26. Iroanya, R. O., & Njingolo, B. (2017). Mergers and acquisitions (M&A) of municipal owned entities (MOEs) in South Africa: the case of Johannesburg City Parks and Zoo. *Journal of Public Administration*, *52*(1), 89-106. Retrieved from https://hdl.handle.net/10520/EJC-990be88bf

27. Jordahl, H., & Liang, C.-Y. (2009). Merged municipalities, higher debt: on free-riding and the common pool problem in politics. *Public Choice, 143*(1-2), 157-172. https://doi.org/10.1007/s11127-009-9495-y

28. Moisio, A., & Usitalo, R. (2013). The impact of municipal mergers on local public expenditures in Finland. *Public Finance and Management, 13*(3), 148-166. Retrieved from https://spaef.org/article/1440/The%20impact%20of%20municipal%20mergers%20on%20local%20public%20expenditures%20in%20Finland

29. Nelson, M. A. (1992). Municipal amalgamation and the growth of the local public sector in Sweden. *Journal of Regional Science, 32*(1), 39-53. https://doi.org/10.1111/j.1467-9787.1992.tb00167.x

30. Pazarskis, M., Goumas, S., Koutoupis, A., & Konstantinidis, K. (2019). Do municipal mergers work? Evidence from municipalities in Greece. *Journal of Governance and Regulation, 8*(2), 61-67. https://doi.org/10.22495/jgr_v8_i2_p8

31. Pazarskis, M., Koutoupis, A., Kyriakou, M., & Galanis, S. (2021). Corporate governance & internal audit at Greek municipal enterprises in the COVID-19 era. In S. Hundal, A. Kostyuk, & D. Govorun (Eds.), *Corporate governance: A search for emerging trends in the pandemic times* (pp. 119-125). https://doi.org/10.22495/cgsetpt21

32. Pazarskis, M., Mitsopoulos, K., Ioannidis, G., & Galanis S. (2020). Administrative state audit at Local Government Organizations in Greece. *Actual Problems of Economics, 224*(2),

68-91. Retrieved from https://eco-science.net/wp-content/uploads/2020/03/2.20._topic_Pazarskis-Michail-Mitsopoulos-Konstantinos-Ioannidis-George-Galanis-Stergios.pdf

33. Reingewertz, Y. (2012). Do municipal amalgamations work? Evidence from municipalities in Israel. *Journal of Urban Economics, 72*(2-3), 240-251. https://doi.org/10.1016/j.jue.2012.06.001

34. Roesel, F. (2017). Do mergers of large local governments reduce expenditures? – Evidence from Germany using the synthetic control method. *European Journal of Political Economy, 50,* 22-36. https://doi.org/10.1016/j.ejpoleco.2017.10.002

35. Saarimaa, T., & Tukiainen, J. (2015). Common pool problems in voluntary municipal mergers. *European Journal of Political Economy, 38*(1), 140-152. https://doi.org/10.1016/j.ejpoleco.2015.02.006

36. Steiner, R., & Kaiser, C. (2016). Effects of amalgamations: evidence from Swiss municipalities. *Public Management Review, 19*(2), 232-252. https://doi.org/10.1080/14719037.2016.1153704

37. Turley, G., McDonagh, J., McNena, S., & Grzedzinski, A. (2018). Optimum Territorial Reforms in Local Government: An Empirical Analysis of Scale Economies in Ireland. *The Economic and Social Review, 49*(4), 463-488. Retrieved from https://www.esr.ie/article/view/1034/205

38. Tyrefors Hinnerich, B. (2009). Do merging local governments free ride on their counterparts when facing boundary reform? *Journal of Public Economics, 93*(5-6), 721-728. https://doi.org/10.1016/j.jpubeco.2009.01.003

39. Voda, P., & Svačinová, P. (2020). To Be Central or Peripheral? What Matters for Political Representation in Amalgamated Municipalities? *Journal of Urban Affairs Review, 56*(4), 1206-1236. https://doi.org/10.1177/1078087418824671

40. Weese, E. (2015). Political mergers as coalition formation: An analysis of the Heisei municipal amalgamations. *Quantitative Economics, 6*(2), 257-307. https://doi.org/10.3982/qe442

41. Yamada, K. (2018). From a Majority to a Minority: How Municipal Mergers in Japan Changed the Distribution of Political Powers and the Allocation of Public Services Within a Merged Municipality. *Journal of Urban Affairs Review, 54*(3), 560-592. https://doi.org/10.1177/1078087416669603

42. Zeedan, R. (2017). Bigger but not always better: Size and democracy in Israeli amalgamated local governments. *Journal of Urban Affairs, 39*(5), 711-728. https://doi.org/10.1080/07352166.2016.1262701

http://dx.doi.org/10.21511/pmf.11(1).2022.08