

THE PROFITABILITY OF WATER COMPANIES DURING TEN YEARS

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Abstract: *Water companies play a strategic role in the economy of each country and determine the sustainability of the related resources involved. It is therefore interesting to analyze the profitability of water companies, operating in particular during the sales phase, during a ten years period. The aim of this paper is to analyze the profitability of the aforementioned companies, to check how they have affected by the effects of the reforms of public services. To this end, data from the AIDA database relating to Italian companies in the sector were used. The profitability of these companies has been analyzed using the main profitability, ROA and ROE ratios. An analysis of the trends of these indices was carried out for the period 2008-2017 and an ANOVA one-way. In this way, it has been verified whether the reforms of public services have affected the profitability of water companies in Italy.*

Keywords: *Public services, Water, Profitability, Performance, Ratio.*

1. INTRODUCTION

This paper highlights the water business sector in Italy. In particular, the objective is to analyze the income dynamics of Italian water companies and considering the three different and different geographical areas of Italy. This income structure was highlighted for 10 years, from 2008 to 2017, during the reform processes of the water companies, as part of the overall transformation of public service companies.

The reform of public services in fact started in the 1990s at European level with different types of legislative interventions. These interventions have particularly characterized the sectors of industrial importance. With regard to these, the primary objective was to ensure the technical quality of the service and at the same time allow potentially access to all citizens, i.e. the so-called universal service. The interventions at European level are followed by the consequent measures at national level in order to guarantee one of the most important public services, the water one.

The first important intervention in the sector in Italy was the so-called Galli law, Law 36/94. The purpose of this law was both to ensure an adequate technical quality for the sector and to promote adequate investments that would ensure a real public service to citizens. In fact, until then there was a serious lack of access to water throughout the country and in particular in the South. Very serious deficiencies due mainly to infrastructural reasons.

This is why this law intervenes by placing the investments at the centre with changes to the tariff system. The latter is entrusted until 2011 to an administrative body, the Committee for the supervision of water resources. Since 2011 the competence in water tariffs has been entrusted to ARERA.

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Several studies have focused on the managerial characteristics of these companies. Few, however, are those who have paid attention to the aspects of the income and financial performance of these companies.

This paper has tried to understand the trends of two main profitability indexes of water companies during 10 years. The main reason is to verify whether the transformations taking place in public services and the consequent reform of water services have enabled positive results to be obtained in the various geographical areas of the country.

To this end, three main research questions have been asked:

- 1) Which were the trends in the profitability ratios analyzed in the various Italian geographical areas?
- 2) Are there differences in trends in different Italian areas?
- 3) Are any differences statistically significant?

With regard to the three research questions we hypothesize that the reform processes had positive effects on the profitability of the companies (H1); that there are differences in the results of companies belonging to different geographical areas of Italy, by virtue of the structural differences present in the country (H2); the previous differences between the different geographical areas are statistically significant (H3).

For this aim, the profitability structure is evaluated using two different ratios: ROA e ROE; the period analysed is the ten years from 2008 to 2017; an analysis of the different trends and ANOVA have been implemented.

In the further sections, some literature notes on water companies are drawn. The other paragraphs are the specific methodology, the different results, conclusions and the main implications.

2. LITERATURE REVIEW NOTES

Different authors have been interested in the issue of water companies and the effects of the reform on their general trend.

- [1] analyses the effects of the reform of water companies in China. The objective is to verify the performance of Chinese water companies with private equity investments over the period 1998-2006. 12 performance indicators are used. The results demonstrate improvements in output, in financial and income performance, in efficiency. The participation of the private sector therefore has positive effects on the performance of Chinese water companies.
- [2] verify the changes in profit and in its elements of 10 English and Welsh water companies. The analysis is carried out for the period 1991-2008 in which three reforms were carried out. The results demonstrate a negative change in profit over the entire period. The effects of scale and the price of the input have a decisive negative weight.
- [3] use a multifactor market model to understand the effects of changes in prices in agriculture and energy on the financial and income performance of water companies. To this end, a truck of listed companies is used. The results demonstrate a certain sensitivity of the stock prices of water companies to changes in agricultural and energy prices.
- [4] try to understand the link between privatization of water companies and their performance. The paper uses a sample of Spanish water companies. The results show that private

companies achieve better results in work management, while public companies appear less efficient in dealing with operating costs.

- [5] analyze a sample of Portuguese water companies in order to assess the impact of environmental and quality factors on the performance of these companies. The results of the paper show that environmental factors such as private participation, economies of purpose and water sources have a positive effect on performance. Furthermore, the quality of the service provided when it has improved also has positive effects on the performance of the companies themselves.
- [6] verify the effects of regulation on the Tunisian water monopoly enterprise. The results show that performance-based regulation improves the efficiency and productivity of the Tunisian water industry.

As is evident, therefore, it has not sufficiently developed an analysis of the effects of the reforms in the water sector, using a perspective that mainly takes into account the financial performance of these companies.

For this reason, it was decided to investigate the performance of some financial indicators to verify if there were significant positive effects on the profitability situation of the companies, ([7] - [8] - [9] - [10] - [11]).

4. RESEARCH METHODOLOGY

Data collection and sample characteristics

To answer the research questions and verify the assumptions made, secondary data from the AIDA database have been used. It was decided to analyse the profitability of Italian water companies through two indices, ROA and ROE. A nine-year period from 2008 to 2017 has been identified to consider the effects of the implemented reforms.

The companies were classified according to the NACE code rev.2. In fact, these companies are those of „Collection, treatment and supply of water”, with NACE code rev. 2 - 36. The total number of companies in the period considered is 305.

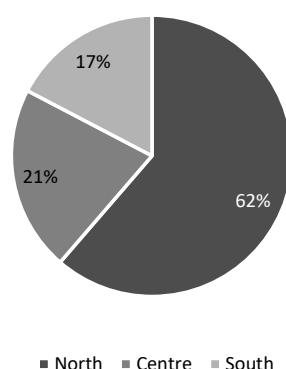


Fig. 1 – Source: our elaboration - geographic distribution of Italian water companies

This is the maximum number of companies available. Then it was decided to consider only the companies available for the indexes analysed for the 10 years. The sample is therefore made up of 150 companies.

Successively, different groups have been identified using as discriminating factor the geographical zone. About the first one three clusters have been found: northern, central and southern regions using the traditional division of Italian regions. The geographical division of the sample was the following: 62% in the Northern area, 21% in the Central area and 17% in the Southern ones (figure 1).

Used Method

First of all, a data trend analysis was done. It was carried out for the 2008-2017 period for each index and area. Subsequently the ANOVA was used to verify any differences or similarities in the values between the different geographical areas.

The null hypothesis states that all elements are equal to each other, while the alternative hypothesis specifies that there is at least one different value. In this paper, the independent variables used are the geographical areas, while the dependent variables are the indices. ANOVA one-way was also chosen, because it allows to verify if there are statistically significant differences, when two variables have been analyzed separately ([14]).

5. FINDINGS AND DISCUSSION

Analysis of trends and of variance

ROA (return on assets = operating profit / total assets) is an index that expresses the company's profitability on the total assets used. It indicates how much of the assets invested returns in terms of profitability by virtue of the activities carried out by the company. Investors analyse different profitability ratios to understand how much and if the company produces adequate profitability that can ensure its survival over time. In fact, it is the profitability that allows each company to continue operating. During the 10 years analysed the values are between 2.5 and 6.8 taking into account the geographical location as a distinctive element. The higher the value of this index, the more favourable is the condition of the company. Figure 2 highlights how the values recorded are fairly stable. Southern companies recorded a decreasing trend starting from 2008 and until 2011, probably also due to the economic crisis of the period. These companies have fairly stable values between 2012 and 2015 and then grow starting in 2016. The companies in the centre have stable values substantially for the entire period analysed. Companies in the north after a phase of relative stability up to 2013 recorded substantial growth. In fact, from a value of 2.5 in 2008 we reach a value of 5.026 in 2017. The profitability of the southern companies, as can be seen from the graph, is that higher than that recorded in the other two areas of Italy. It is therefore the best profitability despite a decrease over time.

ROE (return on equity = net profit / equity) expresses the overall profitability of the company, taking into consideration the partial results of all the different managements in which it is possible to distinguish the unitary management of the company. As previously seen for ROA, even if the ROE assumes the highest possible values, the greater the profitability of the company. In this case, therefore, the company is in good health and is in a position to endure over time. During the analysed period the ROE trend assumes positive values above 2.

This implies a capacity of the company to produce income from the activity carried out. Except in 2013 in which the ROE value is close to zero for companies in the south of Italy, in all years

and geographical areas the values recorded are between 2 and 10. Southern companies have a high profitability, but more variable than in the centre and north. In fact, the ROE values are more stable in the other two areas of Italy, particularly for companies in the north. However, there has been substantial growth since 2011 in all three areas. This occurs in conjunction with the regulatory change in the procedures for defining water tariffs for end users. In fact, as previously stated, starting from 2011 the methods for determining tariffs are the responsibility of the Regulatory Authority for Energy and Gas (AEEG) ([14] – [15]), from 2018 called Regulatory Authority, Energy, Networks, Environment (ARERA).

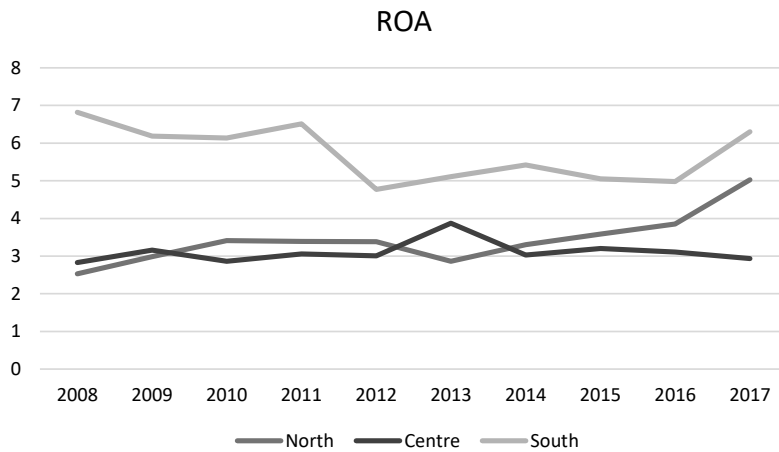


Figure 2: Trend of *ROA* according to geographic localization

Thus, the profitability of the companies analysed appears substantially increasing in the years following the various reforms that have characterized the water sector, as part of the more general process of reforming public service companies. This is particularly evident for ROE. The ROA certainly appears to be conditioned in its values by the processes of further investments in infrastructure and their increasing weight. Therefore, hypothesis H1 is substantially verified. Moreover, the values of both indices appear quite different in the different geographical areas in the case of ROE, while there is a certain similarity between the north and the centre in the case of ROA. It can therefore be said that substantially there is a difference in the results of water companies in different areas of Italy. The H2 hypothesis is therefore not verified. Thus, the results in terms of profitability of the reforms carried out in the water sector were generally positive, but with different effects in the various Italian geographical areas.

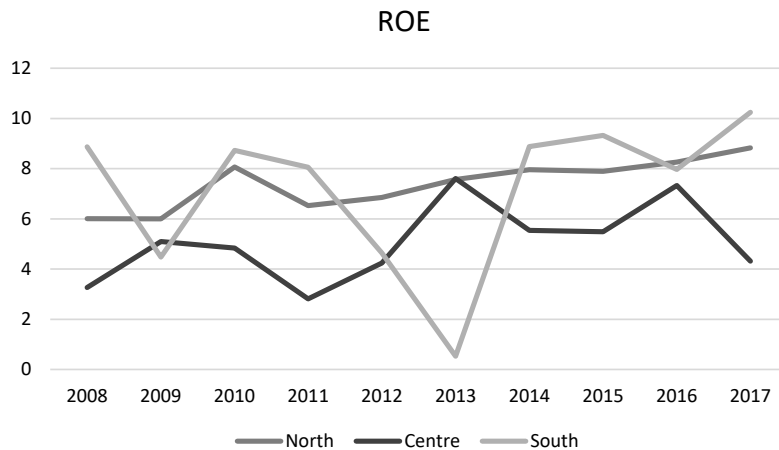


Figure 3: Trend of *ROE* following the geographical area

Analysis of variance

The results of ROA are showed in the Table 1. They have been calculated using the geographical zone as an independent variable. It can be seen that a statistically significant difference between groups is highlighted. In fact, $(F(2,27) = 56.21, p = 2,3661255297293E-10)$ and $F > F_{crit}$ with a p value less than 0.05.

Table 1 – ROA – ANOVA (one-way) using as an independent variable of the geographic area

Source of variance	<i>SQ</i>	<i>gdl</i>	<i>MQ</i>	<i>F</i>	<i>p</i>	<i>F crit</i>
Among groups	40,86087991	2	20,43043995	56,22170627	2,37E-10	3,354130829
Within groups	9,811546382	27	0,363390607			
Total	50,67242629	29				

Significance level $p > 0,05$

The null hypothesis must be rejected and the alternative ones must be accepted. Thus, there is a statistically significant difference between the values recorded in the period under investigation in the three different Italian geographical areas.

ANOVA (one-way) of the ROE with the geographical variable as an independent variable confirms that there is a statistically significant difference between the different geographical areas. In fact, $F(2,27) = 4.02853, p = 0,029444275)$ and $F > F_{crit}$ with a p value less than 0.05.

Table 2: ROE – Analysis of variance (www.researchgate.net) with the geographic area as an independent variable

Source of variance	<i>SQ</i>	<i>gdl</i>	<i>MQ</i>	<i>F</i>	<i>p</i>	<i>F crit</i>
Between groups	33,39117827	2	16,69558914	4,028353032	0,029444275	3,354131
Within groups	111,9020362	27	4,144519858			
Total	145,2932144	29				

Significance level $p > 0,05$

Also, in the case of the ROE the null hypothesis must be rejected and the alternative hypotheses must be considered. Therefore, for both profitability ratios analysed, ROA and ROE, there is a statistically significant difference in the values analysed.

6. CONCLUSION AND IMPLICATIONS

Since the 1990s, the water business sector has undergone a profound transformation due to the genial reform processes that have involved all public services. The need to combine resource savings with the guarantee of universal access to this service has led to numerous and varied legislative interventions.

In this sense, the interventions in favour of the growth of investments, but also of the technical quality of the service have increased ([16] - [14] – [15]).

In this general framework, the present work of analysing two profitability indices over ten years (2008-2017) shows a positive influence of the reform processes with some features.

The ROA does not appear to be particularly affected by the reform processes in the three geographical areas. In fact, the index maintains a fairly stable trend during the period analysed. However, there is a significant variation in companies in the southern regions. This indicates that there has been a greater incidence of investment processes in this area.

However, high values of this index in all areas of the country indicate a good return on the investments made. Naturally, this is also the result of an increase in tariffs towards end users.

The ROE also assumes significantly positive values in all three areas of Italy. The results appear more stable in the north, while very variable in the centre and south. Therefore, in the case of this index that measures the overall profitability of the company, there is no stability over time similar to that recorded for the ROA. This implies a greater incidence of management different from the characteristic one on the net final result of the company.

However, the common element is that overall profitability is still positive, but with obvious differences between the different geographical areas.

These differences are also confirmed by the ANOVA (one-way) which detects a statistically significant difference in the values of both indices between the three different Italian geographical areas.

The present study provides a significant contribution, because it carries out an analysis on almost all the population of Italian water companies, and does not use only one sample. Furthermore, attention is focused on two important profitability ratios. Among them, the ROA indicates the profitability of the investments, the latter element on which the recent legislative interventions have focused. The present work also has limitations deriving also from the use of only two profitability indices. In fact, it constitutes an exploratory study. Furthermore, only the companies of which all the values for the indexes analysed in the time frame under investigation are available, are considered. The study therefore does not take into account the informational limits, but also the aggregation processes that have characterized the sector. Future research lines will be aimed at taking into account more financial and income indices. Furthermore, comparisons with other European countries are interesting. In this sense, it is also useful to verify the influence of cultural variables on the performance of companies in different countries.

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