CREDIT POLICIES IN SOUTHERN ITALY SOLID WASTE FIRMS

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ABSTRACT

The aim of the present work is to analyze how relations between financial choices and the capital structure of firms condition the business dynamics of the companies involved. The paper involves an analysis of the balance sheets for the three year period 2005-2007 of firms dealing with urban waste disposal in a region of Southern Italy. The results show how economic dynamics and current tariff policies have resulted in conditions of financial imbalance that, in more than one case, have led to financial bankruptcy. The massive credit given to insolvent public bodies has resulted in excessive risk exposure. The result is levels of debt that it is hard to imagine would be tolerated in companies working under normal market competition. This paper analyzes waste disposal companies dealing in a part of the country that has been defined as underutilized. This sample provides an interesting opportunity to study the policy implications of the crisis and failure of such companies.

JEL: M4

KEYWORDS: Public Utility, Capital Structure

INTRODUCTION

The expression "public service" has diverse definitions and interpretations. This is true especially at the scientific and academic levels because of the absence of any precise legal definition (Sorace, 2001). National legislation has never provided a definition of local public service, nor of public service in general, neither has it laid down a basis on which to build an exact description (Cattaneo, 1990). Indeed, it is this lack of a systematic frame of reference governing legislative measures that has made it impossible to arrive at a clear definition in the academic and theoretical field (Maggiora, 1986; Fresa, 1983). There is no theoretical consensus on how to define public service. Various and often conflicting criteria are used to identify services which can be labelled public.

One line of theory suggests it is necessary to make use of subjective criteria. From this standpoint, ervices offered by public subjects or all those carried out by Public Administration in general can be defined as public (Borgonovi, 1984). From another theoretical view, it is essential to link the determination of public service to objective data. What is considered necessary is not the quality of the subject that undertakes the activity but rather the nature of the service. Thus, it is irrelevant whether the service provider is public or private. There is no shortage of authoritative theoretical positions that claim that the two approaches, if applied rigidly, can be inadequate because the definition of public service implies consideration of various criteria including: subjective, objective, teleological, institutional and so on (Zucchetti, 2002). In fact, to be defined as a public service, the goods and activities produced must respond to basic and widespread needs of the local community and to realize social, economic and civic ends (Landolfi, 1999).

Regarding local public services, legislators have taken up a midway position between the objective and subjective conception, privileging a mixed notion of public services. Article 112, first section of the legal decree 267/2000 on the one hand focuses attention on the role of the local body whose job it is to manage service provision. It tries to give some content to public service, by claiming that it must have as its aim the production of goods and activities to fulfil social ends and to promote the economic and civic

development of local communities. This mixed notion adopted by the legislation does not pose any substantial limits to the activities of local government administrations in the Single Text formula. All activities to do with economic and social development are included except for those activities mentioned in the list of "functions".

Service allocation can be direct or indirect. In any event it must satisfy the needs of the local area under the control of the public service provider. In other words, the service is public as it is provided to the community and because of the fact that a public subject defines the characters which it assumes as obligations (Casetta, 1999).

A public service should consist of a certain type of economic activity whose aim is to satisfy needs so widely felt as to be considered belonging to the community. One can claim that public services have as an essential precondition the achievement of social ends (Picarelli, 1975). The service becomes public only if public institutions recognize it as such. Public services are addressed to the community to meet its public needs. The task of the Government is to make available the necessary means to satisfy these needs. There is a collective interest in ensuring progress in public service management to bring it in line with best international practices.

Public services provide a clear sign of the well-being of a country and characterize its ability to supply citizens with a quality of life considered acceptable, and the ability of companies to satisfactory compete on a global scale (Rassu and Saporito, 2009). Satisfactory levels of efficiency in the supply of general services by public administrations can contribute to the quality of public policies, to increase productivity, thereby allocating other services to the community and to general improvement in the local environment for both firms and citizens (Onida, 1967; Massei, 1992). Obviously low efficiency levels in the supply of local public services, especially related to productivity, act as a brake on territorial development. Indeed, inefficiency and backwardness in services carry a heavy burden for citizens and users alike. This cost weighs heavily both directly and indirectly on the local economy (Tretola, 2004).

Studies of demand levels, supply and the efficiency of certain collective services show, in line with *Istat* data, a marked backwardness in southern parts of the country compared to the north and center with regard to the quality of overall provision of local public services. In more dynamic parts of the country, legal reforms started in the 1990s aimed at liberalizing various sectors and introducing elements of competition, and favored a process of rationalization and reorganization of the industrial supply side base with significant gains in efficiency and a growing entrepreneurial ethos in certain subjects running the system (Severi, 1991; Montrone, 2006). In the south of the country, however, reforms were introduced more slowly and often resistance to the changes was much stronger. The system of supply, was also handicapped by a less developed demand. It remained fragmented and tied to public management models reluctant to any market opening.

The reform process of local public services began in the final decade of the last century. The main driving force behind this process can be found in the municipal model crises, brought about by the unsustainably high cost of such services, the increase in the complexity of the public's needs and the related inadequacy of the bureaucratic structure in meeting those needs (Ammannati, 2008).

The need to reduce costs and streamline the structure connected to community pressure for the liberalization of certain sectors of public services resulted in a process of reform related to running the public services, shown by law n. 142 of 1990. This law represented the evolution of various regulations which had been introduced one after another over time. This law introduced new forms to manage public services providing an opening towards third parties and economic management open to an influx of capital from local sources. Later, there was a further move towards introducing a business structure for the management of local public services (Corso, 1997; Delli Santi and Santiapichi, 2000).

The structure of local public services underwent another change through the legal decree 269 of 2003, that converted into law n. 326 in the same year. The first significant element of this change was the distinction between local public services with economic importance and others. This substituted the old distinction between local public services with an industrial importance and others, hitherto used by the Italian legal system. Legal decree 269 underscores that network ownership belongs to the local bodies and stipulates that in running the network administrations can delegate service provision to suitable companies chosen through open tenders, to publicly listed companies who could take over to run the service, providing the public body providing the public money continues to exercise the same control as would be the case under direct management and that the new service provider cooperates in its activities with the controlling public body or bodies.

The discipline regulating the offloading of economically important services was completely overhauled. Strict conditions were stipulated for awarding private contracts, which had to meet standards of the sector in question as well as those fixed by EU norms as follows: 1) private companies are selected through an open public tendering system; 2) mixed private/public companies in which the private partner was selected through public tendering procedures; 3) companies financed by public money on the condition that the bodies controlling the public capital apply the same control and monitoring as would be the case with their own services, and the companies work closely and cooperate with controlling bodies.

Services of no economic importance, awarding control through a system of tendering to third parties was eliminated and the business model to run such companies was reformulated, substituting mixed companies with companies financed by public money. With the ruling n. 272 of 27th July 2004 the Constitutional Court declared illegitimate article 14, section 1, e) and section 2 of the legal decree n. 269 of 30th September 2003, which afterwards became law n. 236 on 24th November 2003, being in conflict with articles 117 and 118 of the Constitution. The Court decided for public services of economic relevance that the government intervention must limit itself to laying down the guiding principles, leaving the detail to the local public bodies concerned. With regard to public services of no economic importance, the court declared that government intervention was not legitimate since competition had no relevance.

After this judgment the Italian government intervened once again in the question of public services with the aim of encouraging the widest possible application of competition. They determined that awarding control to a mixed company through public procedures for the selection of the operative partner, the so-called "dual objective tender", is covered by ordinary modes of allocating tenders for the running of local public services, stipulating that the private partner be awarded a percentage of no less than 40%.

Significant innovations in public services have been introduced by the Bersani Decree, converted amendments into Law No. 248/2006. This decree was intended to curb the proliferation of regional or local companies, which had been included in market's related to areas other than those institutionally their local public services (Clarich, 2006; Longoni, 2006). Further amendments to the regulations were introduced by Finance Act 2008. This law introduced a model of triangulation negotiation between the operator and user control, aimed at achieving higher levels of quality of public services provided.

The much-troubled reform of local public services has took place in 2008 (for further details, see Lucarelli, 2008, and Bassi, 2008). In 2009 the law was further amended. The subject matter covered by the new art. 23-bis, Law 166/2009, included two modes of local public services: The award for employers or companies in any form consisted of identification through a public competitive procedure. Our reliance on joint venture companies and private public companies provided that the selection is carried out by the member using a public competitive procedure and should transfer to the private partner a share of at least 40 percent of the tasks

In the course of 2010 was also approved the DPR No 168 of 2010 amending the Regulations on local public services of economic interest. Lastly the government has recently approved the Decree Law No. 138/2011, currently under conversion, article 4 provides for the adjustment of the discipline of public services to local referendum and the law of the union the European Union. This decree applies to local public services of economic interest with the exception of water service, the service distribution of natural gas distribution services of electricity, the regional rail service and the operation of pharmacies.

In this context of reform, privatization and liberalization, it is interesting to analyze the companies dealing with municipal solid waste in southern Italy, an area of the country defined underutilized. The Italian case represents an interesting natural experiment because both privatisation of utilities and market liberalisation were launched at the same time - the 1990s - with the intervention of the regulator and other supervision mechanisms.

Specifically, this study aims to analyze how relations between the financial and capital structure affect the dynamics of firms in the regulated businesses. Researchers have long hypothesized there exists an important interaction between the pricing choices of regulators that set rates in regulated environments and the capital structure decisions of firms which operate in those markets. The general consensus that can be drawn from the theory is the existence of price regulation in the output market provides the regulated entity with incentives to utilize additional levels of debt to finance the operations of the firm. Literature on the subject is conspicuous and will be analyzed in the following section.

Data on regulated industries such as cable television, local telephone, electricity generation, and natural gas distribution, find considerable empirical evidence consistent the predictions from the theory - rate regulation creates an incentive for firms to increase their debt levels. For example, De Fraja and Stones (2004) have investigated the role of capital structure in a regulated firm. They have show that it affects the prices set by the regulator: the expected price is lower the higher the proportion of debt finance. Also, Cambini and Rondi (2006), with data from the four largest public utilities Italian companies - Eni, Enel, Autostrade and Telecom - conduct a descriptive analysis of the interrelation between leverage, price, profitability and investment rate. This article analyzes the relationship between the financial and capital structure in the solid waste management company in Southern Italy city.

The article is organized as follows. The next section gives the basic framework of the strategic regulation process. The empirical analysis section discusses the aim of the present research. The subsequent sections describes the data, the research method and the empirical results. The last section concludes the paper.

LITERATURE REVIEW

The process of privatization determined a new scenario for public utility companies, opening the field to competition both national and international (Marchetti, 1995; Bonelli, 2001; Clarich and Pisaneschi, 2000). The economic and financial crisis at the beginning of the new millennium showed up the extreme debt situation of these companies and sometimes an clear abuse of leverage for financing activities and acquisitions. The levels of debt of many of the regulated companies, also, were it would hardly have been tolerated by the banking system in normal market conditions.

The regulation has some implications. First, the regulation increases a monopolist's cost efficiency (Coco and De Vincenti, 2004). When the firm's cost-reducing effort depends on the output supplied, a binding pricecap, by compelling the monopolist to produce more, finally results in lower costs. There may be several reasons for which an unregulated monopolist or a firm regulated by non-binding caps may lower its cost-reducing effort below the socially optimal level. For example, insufficient market discipline could originate phenomena similar to those correlated with soft budget constraints create separation between management and property of the firm. When management maximises its discretionary budget with a

profit constraint. Coco and De Vincenti (2004) provides another, simpler, reason. Management builds on the so-called "Arrow effect": comparing the incentives to process innovation under a monopolistic and a competitive market structure, Arrow (1962) concluded that they are greater under competition because the marginal gain from innovation in terms of cost-reduction is positively correlated with output. Cabral and Riordan (1989) exploited this intuition in a natural monopoly regulation model to highlight the positive, but discontinuous relationship between the X parameter of the pricecap and the level of a one-shot effort exerted by the firm at the beginning of the regulatory period.

A regulated monopoly may be more cost-efficient than an unregulated one, so that regulation may not only improve allocative efficiency but also productive efficiency (Coco and De Vincenti, 2004). The behavior of regulated companies is subject to many variables that affect- often in an irreversible manner- their economic and financial stability. The classical circular relationship between debt, internal performance and company expected value is interrupted in regulated companies because the performance rate is decided by the regulator and the capital structure by the company. The performance of a regulated company depends on the way in which prices for services offered by the company are controlled. In general the price is set in such a way that the expected earnings equal the company's expected earning needs (Cavallo & Coco, 2002).

The capital structure of regulated firms is a key determinant of regulated rates. Under traditional cost-of-service regulation and some forms of price–cap regulation, commissions set regulated rates so as to ensure firms a "fair" rate of return on equity (see e.g., Bonbright, Danielson, and Kamerschen, 1998; Phillips, 1988; and Spulber, 1989). Consequently, regulated firms have an incentive to choose their capital structure in anticipation of its effect on their rates. Given the size and political sensitivity of the regulated sector and the fact that stocks of regulated firms are widely held, it is clear that an understanding of strategic interaction between firm capital structure and the rate setting process is needed.

Spiegel and Spulber (1997) examine two key aspects of financing strategies of regulated firms. First, due to the limited commitment ability of regulators, a regulated firm may have an incentive to become leveraged. Debt may deter regulators from lowering rates because they seek to minimize the likelihood that the firm will go bankrupt and incur a deadweight loss. Second, asymmetries in the information that regulators, investors, and the regulated firm possess about the firm's costs significantly complicate the leverage effect. Recognizing the information conveyed by its capital structure fundamentally alters the financing incentives of the regulated firm.

In the last thirty years, a large literature has emerged that studies optimal rate regulation under asymmetric information (e.g., Baron and Myerson, 1982; Laffont and Tirole, 1986; Lewis and Sappington, 1988; and Spulber, 1989), these models assume that regulators can precommit to optimal regulatory mechanisms and apply the principal agent framework to derive incentive schedules.

Regulated firms make large investments in infrastructure and generally finance them with a mix of debt and equity. Spiegel and Spulber (1997) show that in such cases, firm capital structure is uncorrelated with their expected values, reflecting the pooling of diverse firm types. This results suggests that countervailing incentives should be taken into account in future empirical studies of capital structure and cost of capital of regulated firms. Moreover, this result can explain why Miller and Modigliani (1966), in their classic study of the electric utility industry, found "no evidence of sizeable leverage or dividend effect on firm value of the kind assumed in much of the traditional finance literature. This empirical result supports the Modigliani and Miller irrelevance theorem (1958). However, it conflicts with later financial signaling models in which capital structure conveys the firm's private information about its value. The countervailing incentives identified in Spiegel and Spulber (1997) can serve to reconcile these two approaches to the case of regulated industries.

The effects of countervailing incentives on the capital structure of firms have been studied by Gertner, Gibbons, and Scharfstein (1989). They examine a model in which a firm uses its capital structure to signal private information to both the product and capital markets. In their model the firm competes in an oligopolistic product market.

A leverage effect is identified by Taggart (1981) although not in a strategic setting. This effect has been observed empirically by Taggart (1985) and by Dasgupta and Nanda (1993). The effects of regulatory opportunism in a full-information setting were considered by Spiegel and Spulber (1994) and Spiegel (1994) in the context of capital structure and by Spiegel (1997) in the context of the choice of technology. Lewis and Sappington (1995) examine optimal incentive regulation under asymmetric information when the firm obtains investment funds from the capital market.

Capital structure plays an important role in rate regulation due to the interaction between the investment and financial decision of a regulated firm and the pricing choices of regulators. First, regulatory commissions set rates that depend on the firm's level of investment and capital structure, thus reflecting not only ratepayer interest, but also those of investors. The capital market, in turn, values the equity and debt of the regulated firm on the basis of its investment and capital structure, as well as on present and future regulatory policies. Second, the regulated firm makes its investment and financial decisions in anticipation of regulatory policies and the capital market's reactions.

Spiegel and Spulber explain these interactions and examine their implications for the regulatory process. Specifically, Spiegel and Spulber (1994, 1997) and Spiegel (1992) have developed models that examine the strategic interaction between capital structure, regulated price, and investment. Spiegel and Spulber (1994) study the strategic interaction between interaction between the firm's capital structure and the rate-setting process, finding that rate regulation induces firms to become leveraged. They show that by issuing debt, a regulated firm can induce the regulator to increase the regulated price in attempt to reduce the probability that the firm becomes financially distressed. Moreover, it show that this price increase as a positive effect on the firm's incentive to invest and on its choices of technology.

The regulatory process is modelled has a three-stage game in which the payers are the firm, outside investors, and consumers. At the beginning of the game, the firm is all-equity and has no liquid assets. In stage 1, the firm chooses how much to invest in enhancing the quality of its output, and it issues a mix of debt and equity to outsiders to finance this investment. The market value of this securities is determined in a competitive capital market in stage 2. Finally, in stage 3, the regulated price is determined in a rate-setting process.

The sequential structure of the model reflects two important features of rate regulation. First, the sequential structure of the model reflect the fact that "the selection of the class and the amount of securities to be issued for utility purposes ordinarily is a management function in the first instance" (Tuner 1969). Second, it reflects the inability of regulators t commit to particular rates before the firm makes irreversible investment decisions. The absence of regulatory commitment to rates is also explored by Banks (1992) in the context of regulatory auditing and by Besanko and Spulber (1992) in the context of the choices of investment.

This structure reflects the dynamic nature of the regulatory process in which regulators can observe the investment and capital structure decisions of firms as well as the capital market equilibrium. The framework recognizes the greater flexibility of regulated rates in comparison with the capital investment and capital structure commitment of the regulated firms. This implies limited commitment by regulators. Howe (1982) finds that in many states (e.g., Michigan, Oklahoma, Kansas, Delaware) courts restrict the scope of state commissions' inquiry in security issue proceedings by directing the commissions to inquire only whether the proposed projects are within the range of the utility's corporate activity, and not whether

they are "reasonable" or "necessary". Today, rate regulation of public utilities in electricity, natural gas, telecommunications, cable TV, water services, and other industries is practiced by state regulatory commissions as well as federal regulatory agencies. Given the significance of this sector, it is useful to understand the interaction between rate regulation, capital structure, and investment.

A number of studies suggest that rate regulation creates an incentive for regulated firms to increase their debt levels. Others show that debt has a positive effect on regulated prices and on the allowed rate of return on equity. Bradley, Jarrel and Kim (1984), in a study of 25 industries over the period 1962-1981, find that regulated firms such as telephone, electric and gas utilities, and airlines are consistently among the most highly levered firms. Hyman, Toole and Avellis (1987) compare the Bell Regional holding companies (BHCs), as a proxy for the telephone industry, to 104 industry groups and find that these companies remain highly leveraged even when risk is taken into account. Taggart (1985) studies state electricity and natural gas regulation in the period 1912-1922, and concludes that the establishment of regulation increases the utility's debt-equity ratio. Taggart attributes this in part to reduction in the firm's risk due to regulation, but cannot reject a "price influence" effect of debt on regulatory decisions. Besley and Bolton (1990), in a survey of 27 regulatory agencies and 65 utilities, find that approximately 60% of the regulators and utilities surveyed believe that an increase in debt relative to equity increases regulated prices. Hagerman and Ratchford (1978) show that, for a sample of 79 electric utilities in 33 states, the allowed rate-of-return on equity is increasing in the debt-equity ratio. Dasgupta and Nanda (1991, 1993), in a cross-section of U.S. electric utilities for the years 1980-1983, show that increased debt is taken on to cope with a regulatory environment that is harsher to stakeholder. They find support for the view that debt precommitment can raise rates by causing the regulator avoid bankruptcy costs.

Dasgupta and Nanda (1991,1993) address debt precommitment under more restrictive demand assumptions with a fixed investment level. The Averch-Johnson effect and capital structure issues are discussed by Meyer (1976) and Sherman (1977). Greenwald (1984) address the issue of rate base measurement in an interesting dynamic setting. Taggart (1981) identifies a "price-influence effect" of debt due to price increased by regulators seeking to reduce the risk of bankruptcy.

Capital structure theories have focused on tax considerations, agency cost, asymmetric information, and corporate control as the forces driving capital structure. See Myers (1984) for a discussion of tax-based theories, and Harris and Raviv (1991) for an extensive survey of theories based on agency costs, asymmetric information, and corporate control. Also, the implications of symmetric information for the capital structure of regulated firms are examined in Spiegel and Spulber (1997), Lewis and Sappington (1992), Myers and Majluf (1984), Sappington and Stiglitz (1987), Stiglitz and Weiss (1981); and the interaction between agency costs, risk management and capital structure is analyzed by Leland (1998). Although these theories may also provide an explanation for the capital structure of regulated firms, they are not entirely satisfactory because none of them addresses the important interrelations between a regulated firm's capital structure, its investment, and regulated rates (Spiegel and Spulberg, 1994).

Most of the models on the interaction between price regulation, capital structure and investments levels of regulated companies have been produced by Spiegel and Spulber. They have found evidence of company underinvestment about the best socially desirable level (Spiegel and Spulber, 1994). This is due to the opportunistic behavior of the regulator reacting to company investment by lowering the regulated price. It is clear that the regulator allows the company to take on debts only if the debt increases the level of investment *ex ante*, so the benefits derived are enough high to overcome the likely costs of insolvency.

Spiegel and Spulberg (1994) have showed that in equilibrium the firm issues a positive amount of debt as a consequence of regulation. The regulator responds to this debt level by raising the regulated price to reduce the probability that the firm will become bankrupt. Nevertheless, in equilibrium the firm becomes bankrupt with a positive probability because the regulator does not increase the regulated price the point

where the firm is completely immune to bankruptcy. Because debt has a positive effect on the regulated price, it mitigates regulatory opportunism. This suggests that regulators permit debt financing as a means of making implicit binding commitments. However, despite the positive effect of debt on the regulated price, underinvestment persist in equilibrium, reflecting the lack of regulatory commitment to specific prices.

The consequences of limited regulatory commitment are examined by Banks (1992) in the context of regulatory auditing, and by Besanko and Spulber (1992) in a model of investment. This article goes beyond those studies by focusing on the crucial financial issues. The use of debt as a commitment device was examined in an oligopoly setting by Brander and Lawis (1986, 1988).

Klein, Phillips and Shiu (2002) later tested the model of Spiegal and Spulber (1994) by analyzing the USA insurance sector, where once again the main aim of the regulator was to minimize costs through excessive debt. The empirical evidence confirms two main theories: i) debt burdens in regulated companies operating in the insurance sector are higher than those of companies operating in an unregulated context; ii) debt burden has a growing role in severe regulation, estimated on the basis of various parameters.

The Italian case represents an interesting natural experiment because both privatization of utilities (change of ownership from public to private) and market liberalisation (regime change) were launched at the same time - the 1990s - with the intervention of the regulator and other supervision mechanisms.

This dual change of regime had far-ranging results because before liberalization regulation geared toward political ends. In utilities, especially where there was public participation, the main objective was both to redistribute income and maintain employment, and to provide a comprehensive service to the public. These diverse objectives, not all concerned with maximizing profits, make the relationship between company and regulator similar to that between a publicly owned company and the government, where the taxpayers have the final say. In the regulation regime in which the process of privatization has been carried out, interaction takes place between the regulator and a private subject, shareholder or owner of the regulated company. The main difference is that the regulator is still acting as agent of the citizens, users and customers, but the latter are no longer the final owners of the private regulated company; they become so only in the sense that they become shareholders. This suggests a change in the regulator's perspective towards the opposite side in the bargaining on tariffs because the regulator can only act in the interest of the public or users of the service if and only if there is a clear separation of roles and interests and the company is privately owned.

Decisions on investment and financing, privatization and regulation introduce in the rapport between the regulator and the regulated a new conflict of interests. This occurs because it creates (at least in theory) separation between the person who decides the price and the actor who makes decisions regarding financing and investment.

Spiegel and Spulber (1994) show that threat of company failure, resulting from leverage, allows the company to raise prices. Yet this result crucially depends on the ownership structure and the private or public nature of the owner. In practice the threat of failure becomes real only when ownership is in private hands. The case analysed in the present study, focused on an economically weak area of the country, supports Spiegal and Spulber's theory. We find the real threat of failure has not only prevented operators from charging higher prices but also prevented them from carrying out strategies aimed at efficient restructuring. This occurs because the largest shareholder of the company providing the local public service is itself public.

EMPIRICAL ANALYSIS

Since 1997 there has been an environmental state of emergency in Calabria with regard to refuse collection. Refuse collection has always occupied an important position in environmental policy for the EU. Since 1972 the need to prevent and reduce the production of rubbish and encourage recycling has been accomplished through a key policy instrument called "action programmes". At the outset refuse disposal in Italy was regulated under TU (single text) of the laws on public health that delegated to local councils the task of organising the service through the issuing of local health regulations and by the law n. 366/1941 that governed the collection, transportation and disposal of solid waste in urban areas.

Over the years various other measures were taken, but it was the legal decree 22/1997, also known as the Ronchi decree, which reformed the area. Later the legal decree 152/2006 aimed to unify regulations governing the same sectors within a single text (*Testo Unico*) in order to avoid duplication and confusion and to put into practice directives from the EU. In particular, Optimal Territorial Ambits were introduced, coinciding with the provinces. The role of these ambits is to ensure unified management of urban refuse disposal and the drawing up of management plans.

Part of the role of the ambit authorities is to choose companies to run the service. The discipline in force is applied to the allocation of local public services. The relationship between ambit authorities and subject awarded the job of operating the integrated service is regulated by the service contract.

The ambit authority has legal powers in each of the Optimal Territorial Ambits, delimited by Region, to which local bodies must participate, and to which the exercise of power regarding matters of integrated refuse collection is transferred. The ambit authority organizes the service and determines the objectives to be pursued in order to guarantee functioning in accordance with criteria of efficiency, sound economics and transparency. The management and allocation of the integrated service and the fulfilment of the objectives laid down by the ambit authority are entrusted to subjects under art. 113 section 7 of the TUEL.

The aim of the present research is the analysis of the management and disposal of solid refuse in an economically underutilized area such as Calabria which is representative of Southern Italy as a whole. In areas which are considerably less developed than other parts of the country, from an economic point of view, public service companies can act as a break or a catalyst to wealth creation and, in this sense, they play a crucial role in the territory.

The research hypothesis to be tested, in line with the thesis of Spiegel and Spulber, is that the results concerning the income, capital and financial situation of public service companies examined, that constitute a real threat to their ability to continue to operate, do not allow the companies to charge higher prices, or to adopt a management policy that would enable the company to be saved from bankruptcy and work efficiently. Nor can these companies embark on a restructuring to improve efficiency because the majority shareholder of the company is public.

DATA AND METHOD

The study plan differentiated rubbish disposal into 5 Optimum Territorial Ambits coinciding with the 5 regional provinces: Optimal Territorial Ambit Cosenza refuse (ATO-Rn.1), Optimal Territorial Ambit Catanzaro refuse (ATO-Rn.2), Optimal Territorial Ambit Crotone refuse (ATO-Rn.3), Optimal Territorial Ambit ViboValentia refuse (ATO-Rn.4), Optimal Territorial Ambit Reggio Calabria refuse (ATO-Rn.5) The territory of each OTA is further subdivided into sub-ambits, called Collection Areas, which are the effective units.

There are 14 Collection Areas, each run by a joint private public company whose task it is to organize distinguished collection throughout the area. Looking at the situation in greater detail we examine the results obtained from a study of the 14 companies operating in the refuse collection and waste disposal sector, created by the Environmental Emergency Commission in Calabria for the three year period 2005-2007. The budget analysis is geared towards studying the company from three perspectives: 1) the economic profile; 2) capital adequacy; 3) financial solidity.

The first expresses the ability of the company to obtain positive results thereby remunerating adequately all the factors of production employed. The second is the ability of the company to maintain over time a capital basis, in the form of a composition of resources and investments that allow it to operate in stable conditions. This means that the sources of finance, i.e. the mode of raising capital, must be in line with the investments. The third perspective is management's attitude towards maintaining a financial balance between income and expenditure both in the short and medium to long term.

In the light of the above considerations the following phases were followed for the analysis of the 14 companies: 1) interpretation of budget data, including identification of the meaning and content of the single items (e.g. accruals and deferrals, risk capital and debts); 2) reclassification of profit and loss accounts and the balance sheet. The first was reclassified on the criteria of collectible liquid assets. For the second the value added criteria was used to identify the contribution of different business areas to the formation of the company's economic results; 3) calculation of indicators to highlight the company's weaknesses and strengths and 4) critical evaluation of the results.

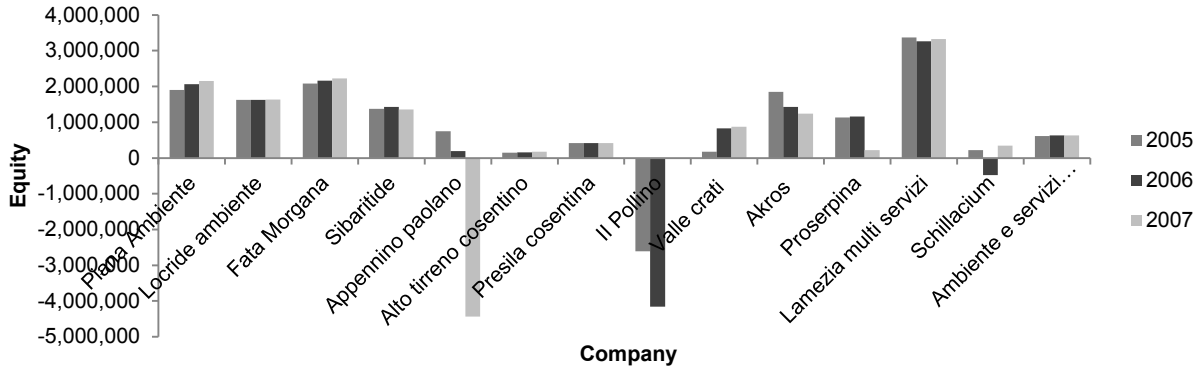
The 14 companies of the Calabrian OTAs are as follows: Sibaritide, Proserpina, Schillacium, Presila cosentina, Alto tirreno cosentino, Ambiente e servizi, Vallecrati, Lamezia multi servizi, Pollino, Piana Ambiente, Akros, Appennino Paolano, Fata morgana, Locride ambiente. The mixed companies with majority public shareholdings were set up under the commission's ordinance n. 1057/2000 with the aim to create a basic structure to provide the know-how and the operative capacity on the ground and to quickly set up a differentiated refuse collection service. The majority holding of 51% is publicly owned, while the remaining 49% is private.

RESULTS

From the analysis of the companies' equity in Figure 1, we see in the three year period, the companies recorded a positive result with high levels of net capital growth (Piana Ambiente, Locride Ambiente, Fata Morgana, Sibaritide, Alto Tirreno Cosentino, Presila Cosentina, Vallecrati and Ambiente and Servizi). Companies whose assets were positive, but decreasing over the period considered, (Akros, Prosperina), recorded losses. Companies with net losses (Appenino Paolino, Pollino and Schillacium) find themselves in serious difficulties because these losses are significant enough to erode their capital base. The other companies show a variable capital structure on account of mixed earnings results.

From the ROE analysis in Table 1, it emerges that, in the companies considered the ROE is negative or is decreasing, with the exception of Lamezia Multiservizi, for which there is an increasing ROE trend in the three years considered. So, the ROE calculation shows the inability of firms to reward their shareholders. In the cases where an increase in annual profits was recorded in certain years (Locride ambiente, Alto tirreno cosentino, Presila Cosentina, Lamezia multiservizi and Schillacium) the result can be attributed not to a successful attempt to contain costs or to an increase in earnings, but to the arrival of regional funds.

Figure 1: Equity (in €)



This figure shows the analysis of the companies' equity. It emerges that, in the three year period, the companies recorded a positive result with high levels of growth of net capital (Piana Ambiente, Locride Ambiente, Fata Morgana, Sibaritide,, Alto Tirreno Cosentino, Presila Cosentina, Vallecrati and Ambiente and Servizi).The companies whose assets were positive, but decreasing over the period considered (Akros, Prosperina), recorded losses. Appenino Paolino, Pollino and Schillacium are the companies with net losses that find themselves in serious difficulties.

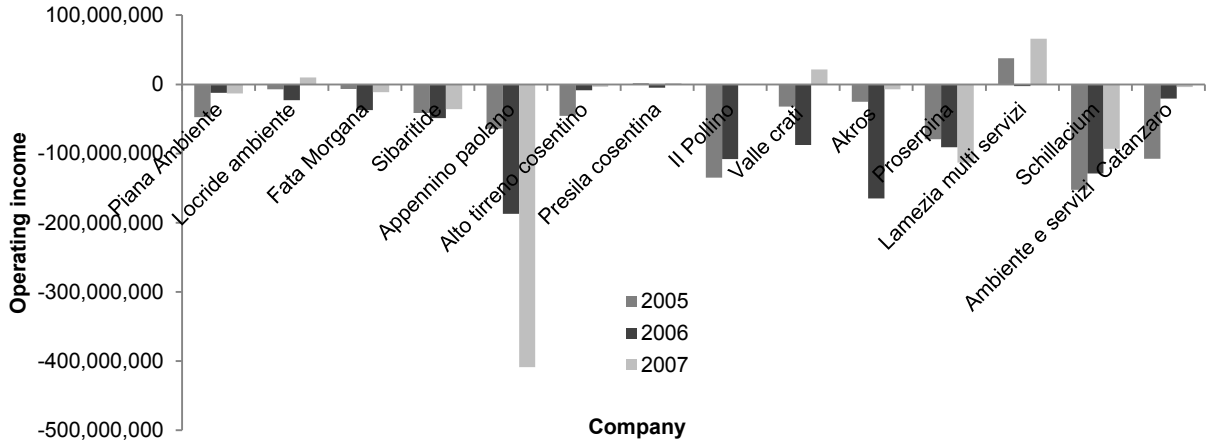
Table 1: Roe (in %)

Company	**Roe (in %)**		
	2005	**2006**	**2007**
Piana Ambiente	10.98	7.75	4.13
Locride ambiente	0.05	0.14	0.32
Fata Morgana	2.01	3.69	2.64
Sibaritide	-8.17	3.48	-5.30
Appennino paolano	-56.08	-297.02	104.26
Alto tirreno cosentino	-24.10	9.66	9.71
Presila cosentina	0.18	0.53	0.58
Pollino	128.23	37.16	ND
Valle crati	-78.03	4.97	1.60
Akros	-14.53	-28.89	-15.85
Proserpina	-52.83	2.04	-421.90
Lamezia multiservizi	5.55	8.86	17.60
Schillacium	-540.78	137.55	2.85
Ambiente e servizi Catanzaro	-100.07	2.79	1.09

*This figure shows the analysis of the companies' equity. It emerges that, in the three year period, the companies recorded a positive result with high levels of growth of net capital (Piana Ambiente, Locride Ambiente, Fata Morgana, Sibaritide,, Alto Tirreno Cosentino, Presila Cosentina, Vallecrati and Ambiente and Servizi).The companies whose assets were positive, but decreasing over the period considered (Akros, Prosperina), recorded losses. Appenino Paolino, Pollino and Schillacium are the companies with net losses that find themselves in serious difficulties. This table shows the trend in Roe (ROE =(net profits/net assets)*100) during the period 2005-2007. In the companies considered the Roe is negative or is decreasing, with the exception of Lamezia Multiservizi, for which there is an increasing trend in Roe in the three years considered. So, the calculation of ROE shows the inability of firms to reward their shareholders.*

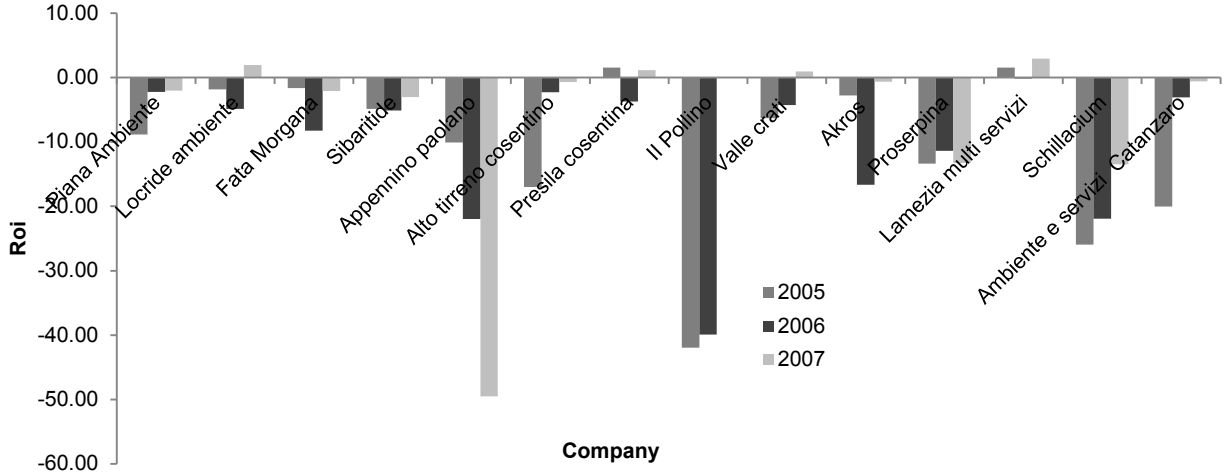
The analysis of operating income in Figure 2 shows negative values for all the companies analyzed except four in some years (Locride Ambiente and Vallecrati in 2007, and Presila Cosentina and Lamezia Multiservizi in 2005 and 2007). The ROI analysis in Figure 3 (ROI= (operating income/invested capital)*100) confirms the overall lack of efficiency that characterises many companies. ROI expresses the maximum remuneration that normal operations are able to produce for €100 of financial resources acquired as loans or risk capital. In particular: i) the numerator considers the result of ordinary business and not of extraordinary and fiscal operations or of financial management; ii) the denominator includes resources of a financial nature collected by the company in the form of debt or risk capital. As above, where the calculation of ROE demonstrated the inability of some firms to reward their shareholders, the negative ROI shows that some firms are even incapable of remunerating their creditors. In order to interpret this index accurately it is necessary to compare it with the average cost of borrowing expressed by the index of the credit burden on capital Shown in Table 2 (ROD=(financial burdens/borrowed capital)*100).

Figure 2: Operating Income (in €)



This figure shows the analysis of operating income. It registers negative values for all the companies analyzed except four in some years (Locride Ambiente and Vallecrati in 2007, and Presila Cosentina and Lamezia Multiservizi in 2005 and in 2007).

Figure 3: ROI (in %)



*This figure shows the analysis of ROI in years 2005-2007. Calculating ROI = (operating income/invested capital)*100) confirms the overall lack of efficiency characterizing many companies. In particular, the negative ROI shows that some firms are even incapable of paying their creditors.*

The comparison clearly shows that ROI is always less than ROD, hence the earning power generated by the companies from their normal activities does not appear to be sufficient to cover the passive interest on their debts. ROD is close to zero because the interest refers to debt versus the banks and suppliers. From the analysis of the balance sheet it emerges that the highest incidence of debt concerns taxation, pensions and national insurance payments. For this reason the interest has not been calculated. Borrowed capital is calculated as the sum between the cost of short term and funded liabilities.

The companies present serious problems of inefficiency in the running of their affairs and, therefore, the earnings from their normal business activities are not enough to cover operating costs. Thus we analysed the level of company debt and the ability to honor debt commitments in a reasonable time frame through the calculation of the treasury margin as shown in Table 3 and Figure.4 (Treasury margin= immediate liquidity + deferred liquidity – current liabilities). Treasury margin measures the company's ability to meet its current liabilities with immediate and deferred liquid assets. Appennino Paolano, Vallecrati, Akros, Prosperina, Schillacium and, above all, Pollino have liquidity problems.

Table 2: Analysis from ROI and ROD

Company	2005		2006		2007	
	Roi	Rod	Roi	Rod	Roi	Rod
Piana Ambiente	-8.85	0.82	-2.24	2.21	-2.06	1.35
Locride ambiente	-1.83	0.28	-4.86	0.20	1.96	0.52
Fata Morgana	-1.63	0.18	-8.25	0.30	-2.07	0.30
Sibaritide	-4.85	1.33	-5.13	1.56	-3.05	1.88
Appennino paolano	-10.09	1.05	-21.96	0.13	-49.52	0.59
Alto tirreno cosentino	-16.98	0.83	-2.29	0.49	-0.72	1.24
Presila cosentina	1.55	0.36	-3.72	0.29	1.13	0.77
Pollino	-41.97	2.12	-39.92	0.58	ND	ND
Valle crati	-6.29	ND	-4.26	ND	0.93	ND
Akros	-2.80	1.66	-16.63	1.84	-0.64	1.26
Proserpina	-13.37	0.70	-11.39	0.52	-13.26	0.40
Lamezia multiservizi	1.53	ND	-0.14	ND	2.92	ND
Schillacium	-25.95	10.80	-21.91	0.20	-13.45	0.40
Ambiente e servizi Catanzaro	-20.01	1.27	-3.10	0.75	-0.58	1.37

*This table shows a comparison between ROI [(operating income/invested capital)*100]) and ROD [(financial burdens/borrowed capital)*100] in the three years considered. In order to interpret ROI accurately it is necessary to compare it with the average cost of borrowing expressed by ROD. The comparison clearly shows that ROI is always less than ROD. Hence the earning power generated by the companies from their normal activities does not appear to be sufficient to cover the passive interest on their debts (ROD is close to zero).*

Table 3: Treasury Margin (in €)

Company	Treasury margin (in €)		
	2005	2006	2007
Piana Ambiente	1.948.470	2.086.003	2.057.492
Locride ambiente	922,008	1,599,324	1,747,287
Fata Morgana	1,517,254	1,987,311	1,881,539
Sibaritide	933,367	1,357,900	1,444,793
Appennino paolano	343,600	-572,084	-149,367
Alto tirreno cosentino	-104,410	360,269	728,268
Presila cosentina	-16,728	101,141	131,360
Pollino	-3,101,907	-3,188,314	ND
Valle crati	812,594	-540,848	-47,065
Akros	-1,594,386	-619,288	588,066
Proserpina	-624,707	-214,512	-1,276,043
Lamezia multiservizi	1,631,344	2,363,165	3,290,548
Schillacium	-1,588,171	-2,365,262	-816,440
Ambiente e servizi Catanzaro	609,581	802,467	815,658

This table shows the trend in the treasury margin during the period 2005-2007. Treasury margin= immediate liquidity + deferred liquidity – current liabilities, measures the company's ability to meet its current liabilities with immediate and deferred liquid assets. Not all companies show the ability to honor debt commitments in a reasonable time frame. For some companies, treasury margin is negative.

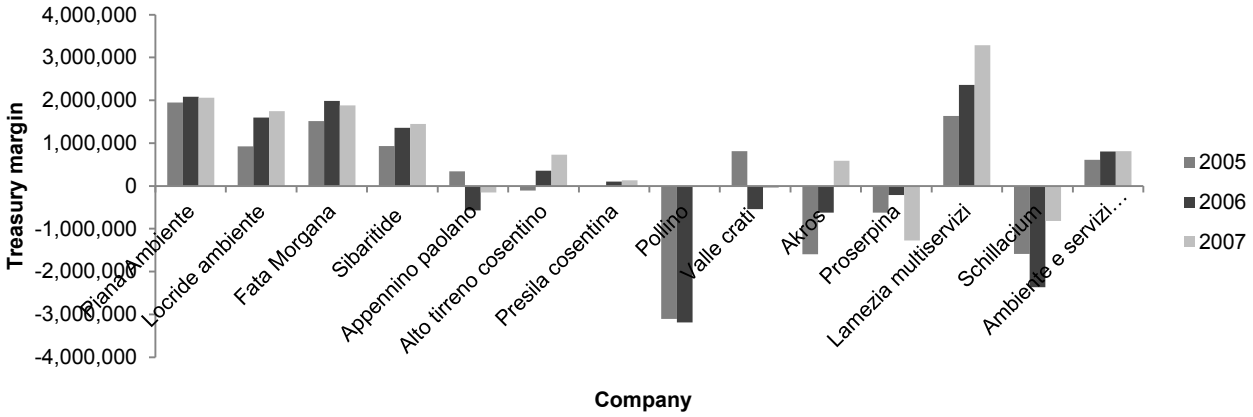
As we have seen, for some companies the treasury margin is negative, which is a symptom of grave imbalance as it will not be possible to cover short term debts with available liquid assets and others that will become available. Thus to cover these debts it is necessary to access resources that should be destined for long term investments.

By analyzing the average times of payments, shown in Table 4, one notes that even companies with higher levels of liquidity do not arrange payments satisfactorily. From a comparison of the average payment time (Average payment time= debts v/suppliers/purchases *365) and the average cashout time (Average cashout time= credit v/customers/turnover*365) index, one can see that companies are faced with a situation where they have to pay suppliers before receiving payment from their customers.

This state of affairs leads, in turn, to taking on new debts, asking their suppliers to accept delayed payment, borrowing money from the banks or making tax and national insurance payments in instalments. This explains why these companies are so dependent from finance as shown in Figure 5 (Index of

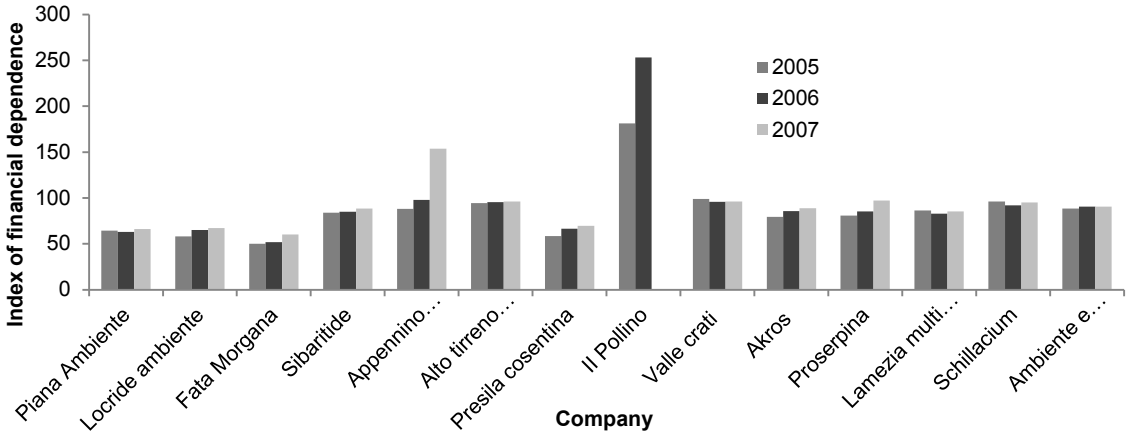
financial dependence= borrowed capital/total investments*100). Debt is measured as the Debt index (leverage = total investments/own capital), that clearly generates further running costs, adding to the burden of financial repayments and eating into the income from normal business operations.

Figure 4: Treasury Margin (in €)



This figure shows a more immediate presence of negative values for some companies, which is a symptom of grave imbalance. The company will not be able to cover short term debts with available liquid assets and others that will become available. Companies with liquidity problems include Appennino Paolano, Vallecrati, Akros, Prosperina, Schillacium and Pollino.

Figure 5: Index of Financial Dependence (in %)



This figure shows the index of financial dependence in the years 2005-2007. For all companies the index is between 50% and 100%. This indicates that the financial structures is unbalanced or otherwise tending toward imbalance. Compaines in a strong state of imbalance include Appennino Paolano (in 2007 the index is about 150%) and Pollino (the index of financial dependence is between 150% and 250%).

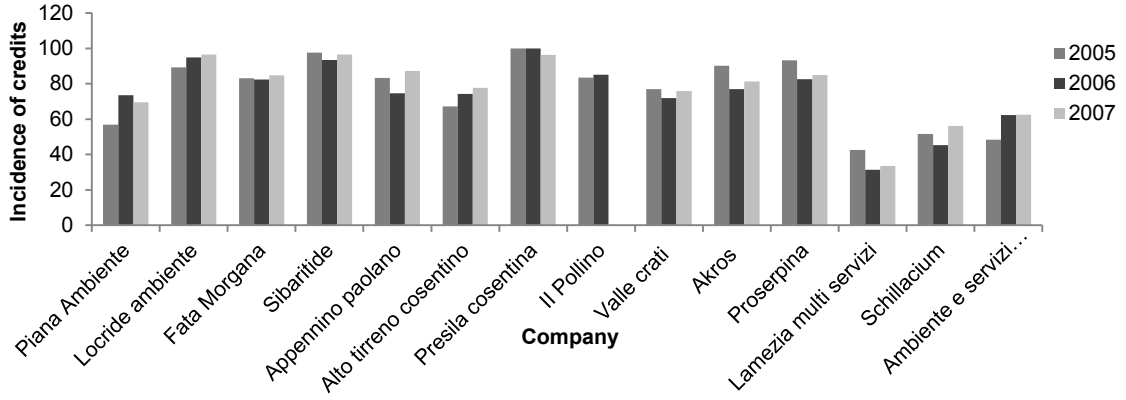
Analysis of the assets and liabilities confirms the results of the financial analysis. For all companies the incidence of credits over total investments, shown in Figure 6, is quite high (between 50% and 100%), except one, Lamezia Multiservizi, where credits is between 30% and 40%. The credit is mainly composed of claims on the Regional Administration for contributions not yet allocated, but also claims for payment on the municipalities that have awarded them the job of providing a refuse service. The incidence of loans to municipalities on the total credits during the period 2005-2007 is quite high. For a number of companies it is indeed over 80% of invested capital. Even, for Presila cosentina, the incidence of loans to municipality on the total credits is equal to 100% in 2005 and 2006 as shown in Table 6.

Table 5: Leverage

Company	Leverage = total investments / own capital		
	2005	2006	2007
Piana Ambiente	2.81	2.7	2.97
Locride ambiente	2.4	2.87	3.06
Fata Morgana	2.01	2.08	2.51
Sibaritide	6.17	6.68	8.63
Appennino paolano	8.47	45.1	-1.86
Alto tirreno cosentino	18.6	22.83	27.39
Presila cosentina	2.42	2.99	3.28
Il Pollino	-1.23	-0.65	ND
Valle crati	28.55	24.99	26.79
Akros	4.9	6.93	9.08
Proserpina	5.21	6.89	38.36
Lamezia multi servizi	7.29	5.92	6.8
Schillacium	27.12	-12.27	19.92
Ambiente e servizi Catanzaro	8.8	10.6	10.83

This table shows the trend in debt index (Leverage = total investments/own capital) during the 2005-2007 period. In all companies own capital is insufficient to finance total investment (leverage >2); this indicates that borrowed capital is greater than own capital. So, the companies are dependent on debt.

Figure 6: Incidence of Credits Over Total Investments (in %)



This figure shows credits over total investments during the 2005-2007 period. All companies show the high incidence of credits on total investments (between 50% and 100%), except one. Lamezia Multiservizi, incidence of credits is between 30% and 40% in the three years.

Table 6: Incidence of Loans to Municipalities on the Total Credits (in %)

Company	Loans to municipalities / total credits * 100		
	2005	2006	2007
Piana Ambiente	56.80	73.52	69.57
Locride ambiente	89.28	94.89	96.51
Fata Morgana	83.08	82.37	84.75
Sibaritide	97.57	93.45	96.59
Appennino paolano	83.38	74.60	87.20
Alto tirreno cosentino	67.26	74.31	77.73
Presila cosentina	100.00	100.00	96.3
Il Pollino	83.46	85.15	ND
Valle crati	76.90	71.95	75.96
Akros	90.24	76.96	81.35
Proserpina	93.27	82.54	84.86
Lamezia multi servizi	42.56	31.33	33.60
Schillacium	51.56	45.28	56.08
Ambiente e servizi	48.39	62.36	62.56

This table shows the incidence of loans to municipalities on the total credits during the 2005-2007 period. It is quite high. For a number of companies it is indeed over 80% of invested capital. Even, for Presila cosentina, the incidence of loans to municipality on the total credits is equal to 100% in 2005 and 2006.

CONCLUSIONS

Capital Structure plays an important role in regulating public utilities firms due to the interaction between investment and financial decisions and the level of regulated prices (Teisberg, 1993; Spiegel, 1994; Spiegel e Spulber, 1994).

This paper analyzes how relations between the financial and capital structure affect the dynamics of firms in regulated business. Specifically, we analyzed three years of budgets of companies that manage solid waste in a region economically underutilized area, Southern Italy, Calabria. In geographical areas lagging behind in terms of economic development, public enterprises may enhance or reduce the creation of economic wealth, and are therefore crucial for the territory.

The research hypothesis tested, is in line with the thesis of Spiegel and Spulber (2004). The argument is that the income, capital and financial situation of public service companies examined constitute a real threat to their ability to continue to operate. They are not allowed to charge higher prices which could would enable the company to be saved from bankruptcy and work efficiently. Nor can these companies embark on a restructuring to improve efficiency because the majority company shareholder is public.

The analysis conducted here shows how the current subdivision of territorial ambits in Calibre and the allocation of services for the collection and disposal of urban waste to public companies hinder efficiency, both from the economic and technical points of view. In particular, the financial management of these companies has led to a vicious circle triggered by a high incidence and level of outstanding debt vis-à-vis customers, especially local councils.

Other reasons for the management crisis are found in the legal basis of the public and private companies. These companies operate outside the dynamics of normal market competition, and are limited to certain territorial ambits limiting the ability to achieve economies of scale. Also, they have opted to remain providers of a single service instead of diversifying their product. To sum up, the empirical evidence found in the case of Calabria confirms that the presence of public money in mixed public service companies does not lead to the best economic outcomes.

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