Journal of Infrastructure, Policy and Development 2024, 8(6), 3801.
https://doi.org/10.24294/jipd.v8i6.3801

Article

Analysis of principal-agent relationship in Slovenian water and wastewater management

Veronika Petkovšek[1,*], Nevenka Hrovatin[2], Primož Pevcin[1]

[1] Faculty of Public Administration, University of Ljubljana, Gosarjeva ulica 5, 1000 Ljubljana, Slovenia
[2] School of Economics and Business, University of Ljubljana, Kardeljeva ploščad 17, 1000 Ljubljana, Slovenia
*** Corresponding author:** Veronika Petkovšek, veronika.petkovsek@fu.uni-lj.si

CITATION

Petkovšek V, Hrovatin N, Pevcin P. (2024). Analysis of principal-agent relationship in Slovenian water and wastewater management. Journal of Infrastructure, Policy and Development. 8(6): 3801. https://doi.org/10.24294/jipd.v8i6.3801

ARTICLE INFO

Received: 23 December 2023
Accepted: 26 January 2024
Available online: 6 June 2024

Abstract: The paper at hand analyses the principal-agent relationship, where comparative perspective between principals' (municipalities) and agents' (public utility providers) in the field of water and wastewater management is scrutinized. The goal of the paper is twofold: firstly, to present empirical results validating principal-agent relationships that emerged due to the reorganization process of public enterprises; secondly, to highlight the similarities and differences between the perspectives of principals and agents regarding motives, advantages and disadvantages, and price-setting in relation to the reorganization process. The empirical research is based on the primary data collected through two self-prepared and structured online questionnaires—one for municipalities, and the other for public utility providers. The results reveal similarities between public enterprises and municipalities in motivating factors for full municipal ownership. However, differences are seen among the advantages of the reorganization process. Price-setting by public utilities is recognized as a motivating mechanism for agents.

Keywords: principal-agent theory; local public utilities; public enterprise; water and wastewater industry

1. Introduction

The paper at hand analyses the principal-agent relationship, offering a comparative perspective between principals (municipalities) and agents (public utility providers) in the field of water and wastewater management. The goal of the paper is to present empirical results to validate principal-agent relationships, which have emerged due to the reorganization process of public enterprises. Furthermore, the specific goal of the paper is to highlight the similarities and differences between the perspectives of principals and agents regarding motives, advantages and disadvantages, and price-setting in relation to the reorganization process. Three research questions are formulated to obtain answers: What are the motivating factors for full municipal ownership of public enterprises? What are the advantages and disadvantages of the reorganization process? Can price-setting be a motivating mechanism for agents?

The empirical research is based on the primary data collected through two self-prepared, detailed, and structured online questionnaires—one for municipalities, and the other for public utility providers. The results reveal similarities between public enterprises and municipalities, with simpler regulation of the provider and larger control over the provider identified as the most important motivating factors for full municipal ownership. However, differences are seen in the perceived advantages of the reorganization process. For public enterprises, monitoring the business of the enterprise by a municipality under the decree, and full control of the public utility's

performance by a municipality are seen as the most important advantages. In contrast, municipalities find the most significant advantages in developing expertise, improving the quality of the service provided, and better organization of work. Price-setting by public utilities is recognized as a motivating mechanism for agents. These results provide valuable insights for municipalities, local public utility providers, and public policy makers, enabling them to formulate improved policy proposals, implement good governance practices, and manage the delivery of public utilities more effectively.

2. Theoretical background on principal-agent relationship

The principal-agent relationship represents a contract by which one or more persons (principals) engage another person (agent) to perform certain acts on his or their behalf. In simpler terms, it is a contractual relationship, where principal hires an agent to perform certain tasks (Li et al., 2022). This involves delegating certain decision-making authority to the agent based on their skills, expertise and knowledge (Karanja et al., 2021). The principal is a person who invests in the business, which is entrusted to the agent and requires from the agent a certain outcome or refund of funds. The agent, on the other side, is a person who accepts the business from the principal, for which he is paid according to a contract. The relationship can arise between external and internal stakeholders of the organization. Internal stakeholders directly influence the operations of contractors and shape managerial decisions, while external stakeholders influence the formation, existence, and liquidation of the contractor and the selection of managers of contractors (Tajnikar et al., 2019).

In state-owned enterprises, according to Scrimgeour and Duppati (2014), the principal-agent relationship exists in multiple layers in such enterprises and stakeholder involvement ranges from government, ministries, boards, senior management, and other major stakeholders. Also, Horan and Mulreany (2020) expose the plurality of stakeholders as a feature typical for the public sector. This plurality of stakeholders presents difficulties in leadership, coordination, and control. Here we can also point out the feature of multiple principals, which creates potentially conflicting goals and conflicting interests between stakeholders. Similarly, Gumanti et al. (2016) define the principal-agent relationship as a “relationship between shareholders, the managers of firms, creditors, government, employees, and other stakeholders related to rights and obligations to achieve the firm’s goals”. And this multi-layered relationship can create under-performance, corporate collapse, corporate corruption etc. For this reason, state ownership is often connected to corporate inefficiency, and therefore good corporate governance is vital for state-owned enterprises (Scrimgeour and Duppati, 2014).

In a principal-agent relationship, principals often face a problem with regard to motivating mechanisms in order that agents pursue the goals of the organization. The principals should create motivating mechanisms that would minimize the opportunistic behaviour of the agents (Jia et al., 2019; Pevcin, 2018). Domadenik (2016) and Horan and Mulreany (2020) explain opportunistic behaviour on the part of the agent as taking actions by which his benefits increased at the expense of the principal. Besides the opportunistic behaviour of the agents, information asymmetry

can also be present, as agents usually have more and better information than do principals, and therefore it is harder for the principal to find out whether the agent has fulfilled the promised action. Information asymmetry arises regardless of corporate governance in the private or public sector, and in state-owned enterprises (with state principals) managerial agency risk connected to information asymmetry is present. Due to information asymmetry, the agent can misuse or even abuse his power, leading to unfulfillment of delegated tasks and incurring agency costs (Karanja et al., 2021). Information asymmetry and conflict of interest often give rise to moral hazard, implying that the outcome depends on agent's (hidden) efforts, which, however, cannot be verified and observed by the principal, as they constitute private information. To address this issue, Wen et al. (2023) propose, in their study, the establishment of an effective information-sharing mechanism to increase transparency of information and to build trust between the principal and agent. Consequently, trust and information transparency would foster motivation for efficient, reliable, and high-quality public service delivery.

As already mentioned, the agent does not always comply with the principal's interests, which in the end leads to the agent's costs. To lower the costs of the agent, the principal tries to motivate the agent to realize its interest, usually with controls and incentives or rewards (Tajnikar et al., 2019). To minimize agency conflicts that arise in the organization, we need a good corporate governance, also in the public sector. When a corporate governance mechanism works efficiently and effectively, the organization will also be able to perform well (Gumanti et al., 2016). The public sector differs from the private sector, especially in its different goals, which are publicly oriented (Blidisel, 2013). As a result, the community interested in service delivery is one of the key stakeholders. And efficient service delivery is an indicator of good public sector corporate governance (Dzomira, 2020).

The corporate governance theory is based on the principal-agent relationship. It presents a relationship between shareholders and managers (Branston et al., 2006). According to Papenfuß et al. (2018), corporate governance in the public sector presents a framework for controlling, monitoring, and managing publicly owned entities. It outlines management procedures, public fund administration and control, in an attempt to satisfy stakeholders and improve a public organization's function (Papachristou and Papachristou, 2014), as well as pursue the public interest (Ferry and Ahrens, 2017). In summary, corporate governance encompasses decision-making processes for the direction, management, and control of the organization to achieve corporate objectives (Karanja et al., 2021). In their study on the reporting relationship between principal and agent, Karanja et al. (2021) come to conclusion that agent's decision-making is influenced by IT support, climate in the organization, and the agent's power and effectiveness.

Lin et al. (2008) investigate if and to what extent corporate governance practices affect productivity and efficiency in state-owned enterprises and find that efficiency is positively related to public and employee ownership, but negatively related exclusively to state ownership. Similarly, Romano et al. (2017) analyse the relationship between corporate governance and efficiency on the local level. Their results provide evidence that state-owned enterprises are less efficient than public enterprises, also those with private shareholders. In contrast, Mocholi-Arce et al. (2022)

in their study conclude that public utility providers perform better than private ones and that fully private providers perform better than concessionary ones. They suggest managing the costs better to improve the performance of all providers. Locke and Duppati (2014) investigate agency costs in state-owned enterprises and find that costs tend to be lower in public enterprises with mixed ownership than in fully state-owned enterprises. Liu (2018) looks for a relationship between the government owners (state or local shareholders) and the size of its ownership. He finds that government owners are usually the largest shareholders. This has a significant implication for the firm's value and performance. Amaral et al. (2023), on the other hand, explore the connection between the size of water service providers and firm's performance. The results suggest aggregating small service providers to reach economies of scale.

Corporate governance mechanisms therefore have an influence on the financial outcomes (revenues) of the public institution. Munteanu et al. (2020) examine this influence in state-owned enterprises, and the results show that efficient corporate governance has a great impact on institutional revenue. Blidisel (2013) investigates which elements of corporate governance on the local level add value to institutional financial performance and concludes that the size of the local council board, clarity of roles, responsibility, and audit reports have a great influence on the financial performance of public entities. Hung and Berrett (2021) study the influence of information asymmetry between donors (i.e., government) and nonprofit managers on financial resources. They conclude that, in the presence of financial restrictions (where the agent has less control over the management of their financial resources), the principal can reduce information asymmetry.

Daiser and Wirtz (2019) examine various factors related to corporate governance, like shared vision, strategic coordination, and clarity of goals in connection with the success of the municipality-owned enterprises. The results show a positive significant impact of the analysed factors on the success of municipality-owned enterprises. Another advantage of corporate governance in the public sector is the reduction of moral hazard. In the context of reducing moral hazard, various control systems in principal-agent relationship have been examined. Järvenpää et al. (2022) investigated the process control system among others. In the process control system, information plays important role in task fulfilment and is embedded in specific standards. Such control means: (1) monitoring whether the agent correctly utilizes the provided information (i.e., methods, materials etc.); (2) formulating a comprehensive and detailed contract with specifications outlining what and how tasks should be performed; and (3) assessing the inputs provided by the agent.

3. Materials and methods

3.1. Research design

In connection with the above-presented theory of corporate governance in public sector and principal-agent relationship in section 2, the empirical part of our paper illustrates the classical principal-agent relationship in the context of corporate governance in the public sector. The stakeholders involved are municipalities (principals) and public utility providers, e.g., public enterprises (agents) in the field of water and wastewater management in Slovenia, more precisely, mandatory local

public utility services for drinking water supply, sewage and wastewater discharges, and urban wastewater and sewage treatment. In Slovenia, public utilities in the field of water and wastewater are managed locally, at the municipal level. Most common form of water and wastewater utility provision in Slovenia is public enterprise.

After the implementation of Public-Private Partnership Act (PPPA, Official Gazette of the Republic of Slovenia, No. 127/06) in Slovenia in 2007, the relationship between municipalities and public utility providers has become clear. Municipalities are the only owners of public enterprises and therefore the only principal in the relationship. The law demanded reorganization of the existing public enterprises in the period 2007–2009, either to transform into private law companies or remain public enterprises. Under the new regulation, a public enterprise may only be an enterprise that is wholly owned by the state or local government. The PPPA contributed to an increase in public ownership in local public utilities provision, and that most existing public enterprises retained or transformed into full municipal ownership.

Our research tries to provide a unique contribution to both the theory and practice, as no identical situation (to case Slovenia) has been identified in the literature review. Therefore, the focus of the research is on Slovenia exclusively. The research includes both views of the field studied—the view from the perspective of municipalities as principals, and the view of local public enterprises as agents. Therefore, the goal of the research is to present a comparison of motivating factors for full municipal ownership of public enterprises, the perceived advantages and disadvantages of the reorganization process and also the price-setting, as a possibility for motivation mechanism for agents, in the principal-agent relationship. As already stated in the Introduction, the research results will give us the answers to three research questions:

(1) What are the motivating factors for full municipal ownership of public enterprises?

(2) What are the advantages and disadvantages of the reorganization process?

(3) Can price-setting be a motivating mechanism for agents?

3.2. Research method

Empirical research was performed using primary data collection through two self-developed structured and detailed online questionnaires. The questionnaires are based on the literature review—content analysis (Petkovšek et al., 2021) where the types of delivery mechanisms (in-house provision, private provision, and inter-municipal cooperation) and the motives, factors influencing the local public services delivery mechanisms are analysed, based on empirical and non-empirical country and cross-country studies from Europe and the USA. The questionnaires were pre-tested by the Institute of Public Services in Slovenia in order to gain an expert opinion on the relevance of the survey content. One questionnaire was addressed to Slovenian municipalities, as the majority of public utilities in Slovenia in the field of water and wastewater are managed locally, on the municipal level. The other questionnaire was addressed to local public utility providers in water and wastewater management; more precisely, to public enterprises in the field of water and wastewater management in Slovenia, as public enterprise status is the most common form of water and wastewater utility provision. The invitation, with a link to each of the two questionnaires, was sent

to recipients by email. The survey data was collected in the period 2018–2020, due to unresponsiveness of the addressees. The collection time of two years did not affect the authenticity and comparability of the data among the respondents, as specific focus was placed on the collection of answers related to past events.

Content-wise the online questionnaires are structured very similarly, as we wanted to gain the comparative insight into the researched topic from the point of view of both actors—the municipality as a manager of public utilities, and the public enterprise as a public utility provider. Therefore, both questionnaires cover 5 thematic parts: (1) the basic data of the respondent, (2) the provision/management of public utilities in the area of drinking water supply and wastewater treatment, (3) the ownership structure of the public utility before the adoption of the new legislation, (4) the changes resulting from the reorganization of existing public enterprises and compliance with the new act, and (5) the pricing of the utilities. However, there are some differences in the thematic part of the questions (the number and the content) regarding the specifics of each actor. Both questionnaires use a combination of open-ended questions, multiple-choice answers, and a Likert scale of 1–5.

3.3. Research population and sample

As already mentioned, our research includes two groups of actors: Slovenian public enterprises, as public utility providers for drinking water supply, sewage and wastewater discharges, and urban wastewater and sewage treatment; and Slovenian municipalities as the owners of public enterprises. The small scale of Slovenia and the number of its utilities ensured that we sent questionnaire to all public enterprises in the water industry and to all Slovenian municipalities.

As presented in **Table 1**, on the one hand, the total population includes 72 public enterprises for water and wastewater treatment in Slovenia. The response rate was almost 42% (30 public enterprises responded). On the other hand, the total population included 212 Slovenian municipalities, where the response rate was slightly less than 20% (42 municipalities responded).

Table 1. Research population.

Research population	**Municipalities**		**Public enterprises (utilities)**	
	Number	**Share of total population (%)**	**Number**	**Share of total population (%)**
Research population total	72	100	212	100
Total no of responses	30	41.67	42	19.8
No of (almost) completed surveys	21	29.17	28	13.2
No of incomplete surveys	9	12.5	14	6.6

Source: Authors' calculations, 2023.

The reason for incomplete response rate might be attributed to the fact that questionnaires are rather long since it is aimed towards a detailed evaluation of the reorganisation process and its outcomes. The data analysis and results, which are presented in the following section, consider all responses, from partly completed to fully completed questionnaires, therefore the total number of responses differs between the presented results.

4. Research results

The results of both surveys provide us with insight into the motives of reorganization process and its advantages and disadvantages, both from the public utility provider's (public enterprise) perspective and from the municipal perspective, where the municipality is the principal, and the public enterprise is the agent. Besides that, the results also acquaint us with the price-setting, as a possibility for motivation mechanism for agents, in the principal-agent relationship.

4.1. Motives of reorganization process

Municipalities and public enterprises opted to retain or transform existing public enterprises into public enterprises with full municipal ownership as the result of various factors, regardless of any directions in the PPPA. Nine motivating factors were checked with public enterprises as well as with municipalities.

Table 2. Comparison of motives behind full municipal ownership.

Motivating factor	**Utilities**	**Municipalities**
	Weighted average	
Management problems in enterprise with mixed ownership/Bad experience with a private provider with a share in ownership	4.3	2.63
Simpler regulation of the provider	4.0	3.91
Greater control over the provider	3.95	4.02
More possibilities to influence business operations	3.8	3.77
Greater rationality and efficiency of business	3.8	3.7
To use in-house orders	2.9	3.34
Easier to obtain EU funds	2.6	2.84
Avoid public tenders for concessions	2.45	2.93
To prevent employee dismissal	2.15	2.52
	N = 20	N = 15

Note: A Likert scale 1–5 was used: 1—I totally disagree, 2—I disagree, 3—I neither agree nor disagree, 4—I agree, 5—I totally agree.
Source: Authors' calculations, 2023.

Table 2 shows that both public enterprises and municipalities rank (around 4) simpler regulation of the provider and greater control over the provider highly. There is a slight disparity in the results for using in-house orders and avoiding public tenders for concessions, where these factors are ranked higher by municipalities than by public enterprises. Municipalities also give more importance to factors like easier to obtain EU funds and ability to prevent employee dismissal. However, one factor is formulated differently for public enterprises and for municipalities, but whose meaning is similar. On one hand, this factor presents management problems in an enterprise with mixed ownership for public enterprises, which is ranked as the most important motivating factor (4.3). On the other hand, municipalities do not find bad experience with a private provider with a share in ownership an important factor (2.63).

4.2. Advantages and disadvantages of reorganization process

Both municipalities and public enterprises find mostly advantages of the reorganization process, while the disadvantages are not particularly pronounced. However, there are some differences found between public enterprises and municipalities, as seen in **Tables 3** and **4**.

Table 3. Comparison of advantages of the reorganization process.

Advantage	Utilities	Municipalities
	Weighted average	
Municipality monitors the business of the enterprise under the decree	4.06	3.58
The municipality has full control over the performance of utility provider	3.63	3.08
Institutional, corporate, and government rights are prescribed by a municipal decree	3.5	3.42
Better cooperation between the enterprise and the local community	3.44	3.5
Developing expertise and increasing quality of utility	3.13	3.75
Better use of labour and capital	2.75	3.5
Better job performance	2.63	3.36
Better organization of work	2.63	3.75
Lower costs of service provision/Lower transaction costs	2.5	3.33
Access to additional municipal financial sources	2.5	2.92
Easier to obtain European funds	2.44	3.58
Lower labour costs	2.31	3.5
Total profit from a public enterprise is transferred to the budget and devoted to investment in infrastructure	2.31	3.17
	N = 16	N = 12

Note: A Likert scale 1–5 was used: 1—I totally disagree, 2—I disagree, 3—I neither agree nor disagree, 4—I agree, 5—I totally agree.
Source: Authors' calculations, 2023.

Table 3 shows that public enterprises find the greatest advantages in *monitoring* the business of the enterprise by municipality under the decree (4.06) and in fully controlling the performance of public utility by municipality (3.63). This is also among the most important motivating factors, as seen in **Table 2**. The municipalities, however, give more importance to developing expertise and improving the quality of the utility's services (3.75) and to better organization of work (3.75). Surprisingly, public enterprises do not find such great advantages in lower costs of utility's provision (2.5) or in lower labour costs (2.31), regardless of their choosing greater rationality and efficiency of business (3.8) as a rather important motivating factor, as seen in **Table 2**. Municipalities also find important advantages in easier to obtain EU funds, better use of labour and capital, and better cooperation between the enterprise and the local community, whereas public enterprises ranked these lower, indicating that these advantages are not as important to public utilities providers as they are to municipalities as principals.

The disadvantages listed in **Table 4** did not turn out not to be particularly important factors in the reorganization process, as municipalities ranked all the of the

disadvantages listed below the middle grade of 3, and public enterprises also ranked half of the listed disadvantages below 3. Therefore, public enterprises see more disadvantages in the reorganisation process, with the biggest disadvantages the arrangement of a concession relationship requires the regulation of many legal acts (3.75) and regulatory pricing policy (3.5). An important fact is that both public enterprises and municipalities believe that the quality of public utilities did not deteriorate, and the prices of public utilities did not rise due to the reorganization process. Municipalities also do not see as particular disadvantages higher transaction costs due to public tenders for concessions (2.0) and due to controlling the concessionaire (2.0). This also confirms the results for motivating factors (**Table 2**), where avoiding public tenders for concessions was not ranked as an important motivating factor. Interestingly, the utilities do not see any essential changes in the effectiveness of their business as the result of the new legislation, even if they have recognised mostly advantages of legal amendments.

Table 4. Comparison of disadvantages of the reorganization process.

Disadvantage	**Utilities**	**Municipalities**
	Weighted average	
The arrangement of a concession relationship requires the regulation of many legal acts	3.75	2.5
Regulatory pricing policy	3.5	2.44
The municipality does not have control over the concessionaire through founding and corporate rights	3.0	2.3
Lack of municipal experience in providing control over the concession (for maintaining the high quality of service, and maintaining/increasing the value of the property for the municipality at justifiable service prices)	3.0	2.4
Higher transaction costs due to public tenders for concessions	2.75	2
Higher transaction costs for the municipality - controlling the concessionaire	2.75	2
Higher public utility prices	2.5	2.44
Poorer quality of public utility	2.5	1.9
	N = 13	N = 12

Note: A Likert scale 1–5 was used: 1—I totally disagree, 2—I disagree, 3—I neither agree nor disagree, 4—I agree, 5—I totally agree.
Source: Authors' calculations, 2023.

4.3. Price-setting for public utilities

Regulatory pricing policy is listed among the disadvantages of the reorganization process, as seen in the previous section (4.2) in **Table 4**, and which is seen as a greater disadvantage for public enterprises than for municipalities. Therefore, below we compare price setting scenarios in order to determine whether prices for an individual utility service differ within a single municipality, as well as between municipalities.

Consensus among stakeholders is required when it comes to setting prices for public utility services. As seen from **Table 5**, more than half (around 65%) of respondent public enterprises and municipalities affirmed that the price of a public utility service is already confirmed by the municipality upon the first proposal by a public enterprise. However, in most cases when the price is not confirmed upon first

proposal, the municipalities offer to negotiate (**Table 6**). This was affirmed by around 85% of respondent public enterprises and municipalities.

Table 5. Comparison of municipal confirmation of price of public utility.

Confirmation of price upon first proposal	Share of utilities (%)	Share of municipalities (%)
Yes	68.42	65.00
No	31.58	35.00
	N = 19	N = 19

Source: Authors' calculations, 2023.

Table 6. Comparison of possibility of price negotiation.

Possibility of price negotiation	Share of utilities (%)	Share of municipalities (%)
Yes	83.33	85.71
No	16.67	14.29
	N = 6	N = 7

Source: Authors' calculations, 2023.

A municipality can have more than just a single utility provider. As many of the respondent municipalities have more than one provider for an individual public utility service, prices between these providers differ; consequently, prices for a single public utility service inside an individual municipality can also differ.

Table 7 shows that almost two-thirds of respondent public enterprises charge different prices (for the utility service as well as for network charges) when providing an individual public utility service for different municipalities. On the other hand, 64% of respondent municipalities that have more than one public utility provider for an individual utility service charge the same prices inside the municipality. It can be assumed that equal prices are set (regardless of different utility providers) in order to ensure user satisfaction and social equality, and different prices are usually the result of differences in the cost of providing public utility services.

Table 7. Differences in prices between municipalities and inside a municipality.

Price-setting	Share of utilities providing individual utility service for more than one municipality (%)	Share of municipalities having more than one public utility provider for an individual utility service (%)
Same price for utility service and same price for network charges	22.22	64.29
Same price for utility service, but different price for network charges	11.11	7.14
Same price for network charges, but different price for utility service	0	0
Both price for utility service and price for network charges differ	66.67	28.57
	N = 9	N = 14

Source: Authors' calculations, 2023.

4.4. Principal-agent relationship example for optimization of municipal outcome

The disadvantages of the reorganisation process presented in **Table 4** in Section 4.2 help us to address the issue of the principal-agent relationship in terms of incentivising the agent (utilities) to work optimally for the principals (municipalities). Surprisingly, if we take the value of 3 as a threshold for the most severe weaknesses, municipalities do not perceive problems which would require a redesign of contracts, while utilities find 4 weaknesses with a value of 3 or more than 3. Nevertheless, both municipalities and utilities have a similar ranking of the first four major weaknesses, which are again listed in **Table 8** below.

Table 8. First four major weaknesses of the reorganization process.

Disadvantage/weakness	**Utilities**	**Municipalities**
	Weighted average	
The arrangement of a concession relationship requires the regulation of many legal acts	3.75	2.5
Regulatory pricing policy	3.5	2.44
The municipality does not have control over the concessionaire through founding and corporate rights	3.0	2.3
Lack of municipal experience in providing control over the concession (for maintaining the high quality of service, and maintaining/increasing the value of the property for the municipality at justifiable service prices)	3.0	2.4
	N = 13	N = 12

Note: A Likert scale 1–5 was used: 1—I totally disagree, 2—I disagree, 3—I neither agree nor disagree, 4—I agree, 5—I totally agree.
Source: Authors' calculations, 2023.

The first ranked weakness with a value of 3.75 for municipalities pertains to the arrangement of a concession relationship which requires the regulation of many legal acts. A possible remedy for this may be to adopt at the state level a legislative framework for awarding concessions for water supply to all water utilities in Slovenia. This should also include a template concession agreement that would allow municipalities enough flexibility to address their modalities. This could be potential both for principals, who do not always possess the required knowledge or have limited capacities for managing concessions, as well as for agents, who could have larger confidence in stated provisions, if we follow the logic of Monios and Bergqvist (2015). Such a concession framework for public utilities should also include the motivating factors for better performance of utilities (e.g., cost savings, organisational and technical improvements etc.). This could be done for example by requiring the implementation of certain incentive payment system in the municipalities for managers and employees, by implementing a stimulating profit–sharing system between municipalities and utilities etc., thus building upon the fundaments of industrial symbiosis approach (Lombardi and Laybourn, 2012).

This legislative framework should also address the problem of regulatory pricing policy which is perceived by both, utilities and municipalities as the second-ranked deficiency. The regulatory pricing policy should allow companies to cover all eligible

costs and earn a normal return on capital. It should also incentivise utilities to reduce costs and achieve economic efficiency. The Slovenian state has already adopted such a regulatory pricing policy by adopting and implementing the Decree on the methodology for determining prices of obligatory municipal public services for environmental protection (Uradni list RS, 2012). This regulation also ensures that the network is adequately depreciated, and that depreciation is transferred to the municipal budgets with intended use for the new investments and renewal of depreciated network assets. These arrangements guarantee that municipalities cannot use these accumulated sources for financing other municipalities' tasks and activities.

The third ranked weakness refers to the inability of principals to have control over the concessionaire, i.e., agent, through founding and corporate rights. One possible solution for this weakness might be the introduction of limited-tenure concession, as the limitation of the tenure over which an agent can enjoy the public good and offered possibility of renewal contingent on ample private provision of that good can potentially improve the efficiency of utility provision (Quérou et al., 2022).

The fourth major weakness (i.e., lack of municipal experience in providing control over the concession) (for maintaining the high quality of service and maintaining/increasing the value of the property for the municipality at justifiable service prices) could be addressed by providing training at the state level for municipalities or by organising a network of municipalities where training and best practice sharing could take place. Besides, the potential exists to utilize the intermediaries for municipalities to build and develop their relational collaboration potential (Soberón et.al., 2023), which is fundamentally needed in directing and supervising agents. As utilities perceive this weakness as more severe than municipalities further insight into this issue would be needed in future research to reveal why control is not adequate and how it could be improved.

5. Discussion

The relationship between municipalities and the public enterprises that was created as a result of the reorganization process in Slovenia is a classic example of the principal-agent relationship in the context of corporate governance in the public sector. Our empirical results are consistent with and confirm the characteristics and expectations of the principal-agent theory. The conducted research presents a classical principal-agent relationship, where municipalities, as the owners of public enterprises, represent principals, and public utility providers, e.g., public enterprises, represent agents. The principal-agent relationship became clear after the implementation of the PPPA and the reorganization of public enterprises. Also, we find elements in our research results typical of corporate governance in the public sector as a whole.

Our research addresses and is based on certain elements of corporate governance in the public sector, as the stakeholders here are municipalities and public utility providers (e.g., public enterprises) in the field of water and wastewater management. The goals of water and wastewater management are publicly oriented, and are aimed at serving the needs of the local population, while at the same time it aims to operate efficiently, i.e., achieve allocative efficiency as well as technical and production

efficiency (Blidisel, 2013; Lin et al., 2008; Locke and Duppati, 2014; Munteanu et al., 2020; Romano, 2017).

On the other hand, if we take into consideration the principal-agent relationship as the basis of corporate governance theory, again we find explicit connections to our research. The principal-agent relationship, defined as a contracting relationship in which one side (principal) engages another side (agent) to perform certain tasks on its behalf (Gumanti et al., 2016; Scrimgeour and Duppati, 2014; Tajnikar et al., 2019). In our research it is defined as a relationship between municipalities, as the principals (the founders and sole owners of public enterprises) and public enterprises, as the agents (public utility providers and managers).

Municipalities are sole owners of public enterprises and therefore the only principal in the relationship. However, as seen from the results of our research, the ownership of an individual public enterprise can be divided among more than just one municipality. In such cases the public enterprise has more than one principal. Similarly, when a municipality has more than one public utility provider for the same utility, it has multiple agents. Plurality of stakeholders is therefore typical for the public sector and leads to difficulties in coordination and control, and to corporate inefficiency (Gumanti et al., 2016; Horan and Mulreany, 2020; Scrimgeour and Duppati, 2014). Multiple principals in particular create potentially conflicting goals and conflicting interests among stakeholders (Horan and Mulreany, 2020). The presence of multiple principals—e.g., before the implementation of the PPPA, when a public enterprise with mixed ownership was permitted, meaning that a municipality and a private legal person could both be owners (principals)—easily led to conflicts regarding goals and interests. Efficient service delivery is also an indicator of good corporate governance in the public sector, which is key to offsetting agency costs arising from the principal-agent relationship (Blidisel, 2013; Daiser and Wirtz, 2019; Liu, 2018). As the principal-agent relationship in the public sector consists of multiple stakeholders (e.g., multiple principals), we find more potential conflicting goals and conflicting interests between stakeholders. A plurality of stakeholders can also introduce difficulties with leadership, coordination, and control, and may consequentially lead to greater information asymmetry and moral hazard.

Therefore, it is clear why respondent public utility providers see management problems in an enterprise with mixed ownership as the most important factor behind transformation into full municipal ownership. And it is also clear why municipalities see simpler regulation of the provider and greater control over the provider as their most important motivating factors for full municipal ownership. Also, among the advantages of the reorganization process, research results indicate that public enterprises prefer the municipalities to monitor the business of the enterprise under the decree, and the municipalities to have full control over the performance of public utility providers. This reinforces the view that if the provision of an individual public utility should be efficient and serve the needs of the local population (public, social goals), then a good corporate governance system for public enterprises is needed (Scrimgeour and Duppati, 2014), and that the principal-agent relationship should be clear.

At this point, we also encounter the question how owners (principals) could motivate the managers (agents) to pursue public goals and minimize the opportunism

of the agents (Jia et al., 2019; Pevcin, 2018). Therefore, it seems that price-setting by public utilities is one such motivation mechanism, as prices of public utilities in Slovenia are set by the utility providers and confirmed by the municipality. The results of our research indicate that almost two-thirds of the respondent municipalities confirm the price upon first proposal; also, the rest of the respondents agreed that municipalities offer the opportunity to negotiate on price.

However, said plurality of stakeholders in the public sector principal-agent relationship leads to different prices for the same public utility, both among municipalities as well as inside a single municipality. On one hand, price variation is conditioned on multiple principals—when a public enterprise has multiple owner municipalities and each of these municipalities has the power to approve or negotiate different prices for a public utility. Our results show that the reason for different prices between municipalities is usually related to the technical and technological conditions surrounding the provision of a public utility service. On the other hand, when a municipality has multiple agents (multiple public utility providers), each of these providers can submit a different price for the same public utility service. This is usually due to differences in the costs of providing a public utility service, as shown in our research results. The costs of public utility service provision differ between municipalities due to various technical, technological, and economic factors, which all influence costs. As the price of the public utility service is set according to the costs involved, the setting of different prices is justified. However, respondent public enterprises in our research pointed to regulatory pricing policy as one of the biggest disadvantages of the reorganization process.

In line with some existing empirical evidence (Lin et al., 2008; Locke and Duppati, 2014; Romano et al., 2017), showing that full public (state) ownership does not bring higher efficiency and lower costs, also the respondent public enterprises in our research confirmed that the reorganization process did not bring any essential changes to the effectiveness of the business. In view of their position on this question, we can assume that reorganization changes into full municipal ownership did not have a significant effect on performance.

6. Conclusion

The principal-agent relationship considers the roles of multiple stakeholders in the public sector, with special attention given to corporate governance in Slovenian local government. In this context, municipalities acting as the owners of public utilities, assume the role of principals, while public utilities (e.g., public enterprises) act as agents. The research results confirm the expectations of principal-agent theory and provide answers to the posed research questions.

Among the most important motivating factors for full municipal ownership are simpler regulation of the provider and greater control over the provider, found for both for public enterprises and municipalities. However, differences exist in the advantages of the reorganization process. Public enterprises consider monitoring the business of the enterprise by a municipality under the decree and full control of the public utility's performance by a municipality as the most important advantages. Conversely,

municipalities find the most important advantages in developing expertise, improving the quality of the service provided, and better organization of work.

Arranging concession relationships requires the regulation of many legal acts, with regulatory pricing policies identified as the primary disadvantages associated with the reorganization process for both public enterprises and municipalities. Interestingly, respondent public enterprises do not perceive fundamental changes in the effectiveness of their business, even though they recognise the predominant advantages of the new legislation. The price-setting is detected as a motivating mechanism for agents, as the price of a public utility is usually confirmed by a municipality upon the initial proposal by the public enterprise.

As regards the focus of both questionnaires, the respondents who completed the questionnaires in full or in large part were in fact directly involved in the reorganization process and were therefore able to provide valuable and relevant information. These responses, along with the related analysis, represent a unique contribution to both the research area and the related theory. The results also provide valuable insights for municipalities, local public utility providers, and public policy makers in designing policies for the most efficient delivery of local public services. Our empirical research serves as a good basis for further investigation of the field studied, in the field of water and wastewater management, as well as other public utility services.

Author contributions: Conceptualization, VP, NH and PP; methodology, VP, NH and PP; validation, VP, NH and PP; formal analysis, VP; data curation, VP; writing—original draft preparation, VP; writing—review and editing, NH and PP; visualization, VP; supervision, NH and PP. All authors have read and agreed to the published version of the manuscript.

Funding: This research was sponsored by the Slovenian Research Agency (Research Programmes P5-0117 and P5-0093).

Conflict of interest: The authors declare no conflict of interest.

References

Amaral, A. L., Martins, R., & Dias, L. C. (2023). Drivers of water utilities' operational performance – An analysis from the Portuguese case. Journal of Cleaner Production, 389, 136004. https://doi.org/10.1016/j.jclepro.2023.136004

Blidisel, R.G. (2013). Corporate governance in local public sector. Metalurgia international, 18(3), 224–226.

Branston, J. R., Cowling, K., & Sugden, R. (2006). Corporate Governance and the Public Interest. International Review of Applied Economics, 20(2), 189–212. https://doi.org/10.1080/02692170600581110

Daiser, P., & Wirtz, B. W. (2019). Strategic corporate governance factors for municipally owned companies: an empirical analysis from a municipal perspective. International Review of Administrative Sciences, 87(1), 135–153. https://doi.org/10.1177/0020852319845451

Domadenik, P. (2016). Renewal of economic aspects of Slovenian healthcare (Slovenian). In: Čok, M., Došenović, P. B. Korže, B., et al. (editors). Sistemska prenova javnih izvajalcev zdravstvenega varstva v Sloveniji. Ljubljana: Ekonomska fakulteta; 2016. pp. 107–121.

Dzomira, S. (2020). Corporate Governance and Performance of Audit Committee and Internal Audit Functions in an Emerging Economy's Public Sector. Indian Journal of Corporate Governance, 13(1), 85–98. https://doi.org/10.1177/0974686220923789

Ferry, L., & Ahrens, T. (2017). Using management control to understand public sector corporate governance changes. Journal of Accounting & Organizational Change, 13(4), 548–567. https://doi.org/10.1108/jaoc-12-2016-0092

Gumanti, T. A., Nastiti, A. S., & Lestari, A. R. (2016). Good corporate governance and earnings management in Indonesian initial public offerings. Corporate Ownership and Control, 13(4), 558–565. Portico. https://doi.org/10.22495/cocv13i4c4p5

Horan, A., & Mulreany, M. (2020). Corporate governance in the public sector: Reflections on experience in Ireland. Administration, 68(4), 121–144. https://doi.org/10.2478/admin-2020-0027

Hung, C., & Berrett, J. (2021). Service Delivery Under Pressure: The Effect of Donor-Imposed Financial Restrictions. Public Performance & Management Review, 44(3), 580–601. https://doi.org/10.1080/15309576.2021.1916546

Järvenpää, A.-T., Larsson, J., & Eriksson, P. E. (2022). How public client's control systems affect contractors' innovation possibilities. Construction Innovation, 24(7), 83–101. https://doi.org/10.1108/ci-03-2022-0054

Jia, N., Huang, K. G., & Man Zhang, C. (2019). Public Governance, Corporate Governance, and Firm Innovation: An Examination of State-Owned Enterprises. Academy of Management Journal, 62(1), 220–247. https://doi.org/10.5465/amj.2016.0543

Karanja, E., Grant, D., & Zaveri, J. S. (2021). CIO reporting structure and firm strategic orientation – a content analysis approach. Journal of Systems and Information Technology, 23(1), 20–52. https://doi.org/10.1108/jsit-02-2020-0022

Li, D., Su, M., Guo, X., et al. (2022). The Effect of Medical Choice on Health Costs of Middle-Aged and Elderly Patients with Chronic Disease: Based on Principal-Agent Theory. International Journal of Environmental Research and Public Health, 19(13), 7570. https://doi.org/10.3390/ijerph19137570

Lin, C., Ma, Y., & Su, D. (2008). Corporate governance and firm efficiency: evidence from China's publicly listed firms. Managerial and Decision Economics, 30(3), 193–209. Portico. https://doi.org/10.1002/mde.1447

Liu, K. (2018). Government Ownership in Listed Firms Around the World. Studies in Business and Economics, 13(2), 131–146. https://doi.org/10.2478/sbe-2018-0025

Locke, S., & Duppati, G. (2014). Agency costs and corporate governance mechanisms in Indian state-owned companies and privately owned companies—A panel data analysis. Corporate Ownership and Control, 11(4), 8–17. Portico. https://doi.org/10.22495/cocv11i4p1

Lombardi, D. R., & Laybourn, P. (2012). Redefining Industrial Symbiosis. Journal of Industrial Ecology, 16(1), 28–37. Portico. https://doi.org/10.1111/j.1530-9290.2011.00444.x

Mocholi-Arce, M., Sala-Garrido, R., Molinos-Senante, M., et al. (2022). Performance assessment of the Chilean water sector: A network data envelopment analysis approach. Utilities Policy, 75, 101350. https://doi.org/10.1016/j.jup.2022.101350

Monios, J., & Bergqvist, R. (2015). Intermodal terminal concessions: Lessons from the port sector. Research in Transportation Business & Management, 14, 90–96. https://doi.org/10.1016/j.rtbm.2014.09.002

Munteanu, I., Grigorescu, A., Condrea, E., et al. (2020). Convergent Insights for Sustainable Development and Ethical Cohesion: An Empirical Study on Corporate Governance in Romanian Public Entities. Sustainability, 12(7), 2990. https://doi.org/10.3390/su12072990

Papachristou, G., & Papachristou, M. K. (2014). The worthiness of corporate governance in public sector the case of public healthcare sector in Greece. Corporate Ownership and Control, 12(1), 490–501. Portico. https://doi.org/10.22495/cocv12i1c5p4

Papenfuß, U., van Genugten, M., de Kruijf, J., et al. (2018). Implementation of EU initiatives on gender diversity and executive directors' pay in municipally-owned enterprises in Germany and The Netherlands. Public Money & Management, 38(2), 87–96. https://doi.org/10.1080/09540962.2018.1407133

Petkovšek, V., Hrovatin, N. & Pevcin, P. (2021). Local Public Services Delivery Mechanisms: A Literature review. Lex Localis, 19(1), 39–64. https://doi.org/10.4335/19.1.39-64(2021)

Pevcin, P. (2018). Managerial economics in public and non-profit organisations (Slovenian), 1st ed. Ljubljana: Fakulteta za upravo.

Quérou, N., Tomini, A., Costello, C. (2022). Limited-tenure concessions for collective goods. Journal of Economic Dynamics and Control, 143, https://doi.org/10.1016/j.jedc.2022.104484

Romano, G., Salvati, N., & Guerrini, A. (2017). Governance, strategy and efficiency of water utilities: the Italian case. Water Policy, 20(1), 109–126. https://doi.org/10.2166/wp.2017.172

Scrimgeour, F., & Duppati, G. (2014). Corporate governance in the public sector: Dimensions; guidelines and practice In India and New Zealand. Corporate Ownership and Control, 11(2), 364–377. Portico. https://doi.org/10.22495/cocv11i2c4p2

Soberón, M., Ezquerra-Lázaro, I., Sánchez-Chaparro, T., et al. (2023). Supporting municipalities to develop collaboration capability to facilitate urban transitions and sustainability: Role of transition intermediaries in Madrid. Journal of Cleaner Production, 426, 138964. https://doi.org/10.1016/j.jclepro.2023.138964

Tajnikar, M., Aleksić, D., & Došenovič Bonča, P. (2019). Who's who in Slovenian public health institutions: an analysis of principals and agents (Slovenian). Economic and Business Review, 21(4). https://doi.org/10.15458/2335-4216.1073

Uradni list RS. (2012). Decree on the methodology for determining prices of obligatory municipal public services for environmental protection (Slovenian). Official Gazette of the Republic of Slovenia, 87.

Wen, X., Chen, X., & Yang, Z. (2023). Subsidization of public transit service under double moral hazard. Physica A: Statistical Mechanics and Its Applications, 632, 129304. https://doi.org/10.1016/j.physa.2023.129304