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Determinants of Manager Pay in German State-Owned Enterprises and International Public Policy Implications: 3-Year Study for Sectors, Performance and Gender

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Abstract:

Empirical studies have shown that state-owned enterprises (SOEs), and especially the compensation of top-managers, are very relevant to the performance and sustainable provision of public services. Whereas there are numerous studies on the compensation of top-management of private sector organizations, almost no empirical studies have been conducted for SOEs. This paper examines the determinants and disclosure of top-management compensation from 176 SOEs in eleven sectors over three financial years by assessing 498 annual statements. As a methodological contribution, the paper demonstrates the relevance for adjusting raw data from financial statements to obtain meaningful performance figures in order to represent the real economic situation. This provides perspectives for research on organizational success for several disciplines.

In contrast to the transparency requirements 75.2% of the companies do not disclose information about compensation in their annual financial statements. For the 233 annual financial statements with disclosed pay, firm size has a significant influence on the level of compensation. The number of employees, an important indicator for the relevance of the public service, has lower influence than balance sheet total and turnover. Furthermore, managers earn more in profitable sectors than in loss-making sectors; however loss-making sectors often have a special relevance of for society and for the sustainable provision of public services.

With regard to laws which also formulate financial goals for SOEs, there appears to be no link between financial performance ratios and the level of compensation. However, a strong and highly significant correlation exists between the developments of return on equity (ROE) and performance-based components. Return on total assets (ROA), which seems to be a better figure in this context to link performance and pay, was found to have no association. Regarding the discussion about a bonus-malus-system the data show far more compensation rises than decreases.

Women employed in top-management positions were found to earn, on average, notably less than men. This finding has special implications for the prevailing public policy discussion about the gender pay gap in which SOEs have a special responsibility.

In the ongoing debate about the appropriateness of compensation, the findings indicate that the level of compensation is not particularly strongly determined by the indicators that were investigated in this study. The paper provides new empirical insights, research perspectives and concrete international implications for public policy making as well as for practitioners.

Keywords: State-Owned Enterprises, Top-Manager Compensation, Public Corporate Governance

JEL Classification: G3, G38, L32, M4

1. Motivation

In an effort to reform public-service-provision by the state and to consolidate public-sector budgets there has been a trend in many countries to outsource public sector services away from the core administration. In the run of these development the sociopolitical and economic importance of state-owned enterprises (SOE)[1] have strongly increased with regard to the effectiveness, efficiency and quality of public service provision as well as for public finances (OECD 2011, OECD 2005, Florio/Fecher 2011, Grossi/Marcou/Reichard 2010). SOEs are a very relevant instrument for the implementation of public policies (Bernier 2014 and 2015, Farmer et al. 2013, Del Bo/Florio 2012, Millward 2011, OECD 2005).

Newer and older Studies for different countries demonstrate the significant role of SOEs (OECD 2011, OECD 2005, Aharoni 1981, Avsar/Karayalcin/Ulubasoglu 2013, Stan/Peng/Bruton 2014). For instance, empirical studies at the local/municipal level in Germany reveal that the number of employees in SOEs and other independent organizational forms are as high as in the core administration or often even higher. Over 54% of public investments are not made by the core administration. Debts located in SOEs, corporations and other independent organizational units often exceed the debts of the core administration (Bertelsmann Foundation 2013 and 2008).

Consequently, these organizational developments have caused new requirements for the effective and efficient service provision by public authorities as well as for responsible public corporate governance (OECD 2011, Florio/Fecher 2011, OECD 2005, Whincop 2005, Verhoest et al. 2012). The compensation of top-managers[2] of SOEs is of special importance to sustainable public service provision (OECD 2005, Whincop 2005, Farmer et al. 2013).

The design of compensation schemes is a key factor that affects the behaviour and awareness for acting in accordance with the overriding aims of the public authority. Moreover pay seems central to recruit and retain managers for the public management field in the competition for talents with the private sector (Burgess/Ratto 2003, Swiss 2005, Weibel/Rost/Osterloh 2010, Perry/Engbers/Jun 2009, Khumalo/Ngwenya 2012, Jerry/Pan/Tian 2011). Compensation also features central functional and/or dysfunctional incentives (Frey/Osterloh 2005, Carson et al. 2000, Conyon 2006, Zhou 1999).

In public policy documents as well as in the political discussion about the distribution of in-

[1] SOEs are defined as enterprises where the state or cities have significant control, through full, majority, or significant minority ownership (OECD 2005, p.11). In this context the definition should also include enterprises with significant control of municipalities and other government levels/public authorities. According to some categorizations, SOEs are also classified as type 2 or 3 agencies (van Thiel 2012).

[2] The term top-manager here corresponds to the first management level.

come within the society and the gender pay gap, transparency, appropriateness and determinants of the top-manager salary are one of the key topics on the international agenda (European Commission 2014, European Commission 2012, European Commission 2011, European Commission 2010a, European Commission 2010b, OECD 2005).

For the private sector – particularly for listed companies – there are numerous studies in leading scientific journals on level, design and determinants of top-managers compensation (i.a. van Essen/Otten/Carberry 2012, Fong/Misangyi/Tosi 2010, Rost/Osterloh 2009, Clarkson/van Bueren/Walker 2006, Elston/Goldberg 2003) as well as on social norms and fairness (Rost/Weibel 2013).

For SOEs, the literature only provides very few empirical studies. There are disproportionately more studies regarding the private sector companies on the one hand or the core public administration on the other hand neglecting the important research object "SOEs" in the middle between the private and the public sphere. Moreover some studies seem to use data from annual financial statements as dependent performance variable without adjusting them in a sufficient way which might influence the results. In crucial public policy documents of the European Commission and national governments concerning top-managers pay SOEs are often not addressed at all. Literature about the corporate governance of SOEs is in constant demand for empirical studies (i.a. Florio/Fecher 2011, Whincop 2005). There is a relevant research gap this study intends to address.

The aim of this paper is to analyse which factors determine the level of compensation of top-managers in SOEs and to discuss international public policy implications. As a new methodological, the paper strives to show the relevance for adjusting raw data from financial statements to obtain meaningful performance figures in order to represent the real economic situation. This should provide perspectives for research on organizational success for several disciplines in the private, public and non-profit sector around the world in different accounting regimes.

Chapter 2 illustrates the legal requirements for disclosure and design of top-management compensation, and outlines existing empirical studies. Chapter 3 derives the hypotheses. The methodology and the empirical design are presented in Chapter 4. The descriptive findings and the results of the statistical analysis are outlined in Chapter 5. Chapter 6 discusses the findings and policy implications and concludes with research perspectives.

2. Basic facts and legal requirements

2.1 Legal requirements on compensation design and appropriateness

In Germany, the corporate governance system is organized on the basis of the dual-board system. The management board is responsible for managing the enterprise. The supervisory board supervises and advises the members of the management board and is involved in decisions of fundamental importance. Because of greater competencies and more operational influence in the German two-tier system, the management board is of special importance (von Werder/Talaulicar 2011).

The level and design of the compensation of top-managers in the management boards is frequently the focus of public and political debate. In the case of Germany, the debate led to the adoption of the Act on the Appropriateness of Management Compensation (VorstAG) in 2009. In particular, detailed design criteria were codified for listed companies. Accordingly, the total compensation of each top-manager should depend on the performance of individual tasks as well as the financial situation of the company.[3] The German Corporate Governance Code (GCGC) for listed enterprises of the government commission emphasizes the importance of an appropriate, criteria-based compensation design as well (numeral 4.2.2).

However, most SOEs are non-listed companies firmed as Limited, why regulations and recommendations in German Stock Corporations Act not apply for SOEs. Thus specific laws for SOEs would be important, but do not exist in this way.

On a sub-legal level the Public Corporate Governance Codes (PCGC) [4] of the Federation as well as different PCGC[5] of cities define criteria for the appropriateness of SOE top-managers compensation. Central appropriateness standards are the personal performance, the success and the future prospects of the company as well as customary practice regarding compensation within peer companies. Nevertheless, several studies (i.a. Rost/Osterloh 2009, Garvey/Milbourn 2006, Frey/Osterloh 2005) and annual reports from audit offices[6] criticize the appropriateness of the level and design as well as the performance-relation of top-manger's compensation.

[3] See Sec. 87 Para. 1 German Stock Corporations Act.

[4] See German Federal Ministry of Finance, Public Corporate Governance Codex, in the vision dated June 30, 2014.

[5] See PCGC Bremen numeral 3.4.1, Düsseldorf 3.3.1, Essen 3.3.1, Frankfurt am Main 3.3.5, Hamburg 4.2.5, Cologne 3.3.1, Mainz 3.4.1, Potsdam 3.4.3, Saarbrücken D.II.87, Schwerin 3.3.1, Stuttgart 3.3.1.

[6] See i.a. Regional Audit Office Saxony (2011), p.92; Berlin (2011), p.14; Baden-Württemberg (2008), p.35; Rhineland-Palatinate (2006), p.122.

An international analysis of PCGC illustrates, that compensation also is a neuralgic field in different countries. Interestingly the contents of the PCGC[7] diverge strongly in important details such as appropriateness (PCGC Austrian Federation numeral 9.3.6.4, Salzburg 4.11, Aargau 26.1)

2.2 Legal requirements on compensation disclosure

According to the Executive Board Compensation Disclosure Act (VorstOG) and § 285 Sec. 1 No. 9 German Commercial Law every big corporate enterprise has to disclose individual compensation in the notes of the annual financial statements (salary, profit participations, subscription rights and other share-based payments, reimbursement of expenses, non-cash benefits, insurance premiums, commissions and other financial benefits of all kinds) (von Werder/Talaulicar 2011, p.47). In accordance with Sec. 288 Para. 1 German Commercial Law small corporate enterprises are able to use legal publishing exemptions for compensation disclosure.[8] Listed German public limited companies are required to report the individual compensation of every board member, citing the name, and the division between fixed and performance-based components, as well as components with long-term incentive effects since 2005. In unlisted German public limited companies, the disclosure can be omitted if the compensation of an individual member of the management board can be determined.[9]

In the discussion for SOEs about principles of good and responsible public corporate governance, scholars and practitioners have suggested and reinforced the need for transparent disclosure of top-management compensations for closing the transparency gap (OECD 2005, Whincop 2005, p. 227). Due to economic activity of public funds, the public has a fundamental and distinctive claim to the information, constituting a need for disclosure in both scientific and practical points of view. First established so called transparency laws[10] underline the political will to inform the general public. For instance, the federal capital Berlin and the federal state North Rhine-Westphalia commit all SOEs – no matter what size-class or legal form – to individualized disclosure of top-management compensation divided into fixed compensation and performance-based components.

[7] See Austrian Federal Chancellor's Office, Public Corporate Governance Codex, in the vision dated 2012; Federal State Salzburg, Salzburger Corporate Governance Code, in the vision dated January 25,2012; Canton Aargau in Switzlerland, Guidelines to Public Corporate Governance, in the vision dated January 01, 2012.
[8] See Sec. 288 Para. 1 German Commercial Law.
[9] See Sec. 285 Subsec. 9 lit a and b as well as Sec. 286 Para. 4 German Commercial Law.
[10] See i.a. Sec. 108 Municipality Law of North Rhine-Westphalia, Sec. 65 Budget Order Berlin/ Compensation Transparency Law Berlin/ Sec. 16a Owner-Operated Municipal Enterprise Law Berlin, Sec. 3 Para. 15 Transparency Law Hamburg.

Numerous German and international PCGCs of federations (German PCGC numeral 6.2.2, Austria 14.2.5.5) and cities (i. a. Cologne 3.3.4, Stuttgart 3.3.3, Aargau 26.4c) recommend individualized disclosure as well.

2.3 Theoretical perspectives on top-management compensation

Consideration of the literature indicates that agency theory and managerial power theory are the dominant theoretical perspectives for explaining the disclosure, level and design of top-management compensation (Mengistae/Xu 2004, Cahan/Chua/Nyamori 2005, Shaoul/Stafford/Stapleton 2012, Lambert/Larcker/Weigelt 1993, Bruce/Buck/Main 2005, Schmidt/Schwalbach 2007, Bebchuk/Fried 2003). Principal-agent-theory argues that there is frequently no target congruency between the involved actors as a result from separation of ownership and management (Shleifer/Vishny 1997).

Agency theory suggests that political decisions for the outsourcing of public services have led to greater information asymmetries such as hidden characteristics, hidden information and hidden actions between numerous principals and agents including the general public, politicians, administration, supervisory and management boards (Hodges/Wright/Keasy 1996). Hence, there is a complex constellation of actors with multiple principal-agent-relationships and overlapping responsibilities in public corporate governance (Figure 1).

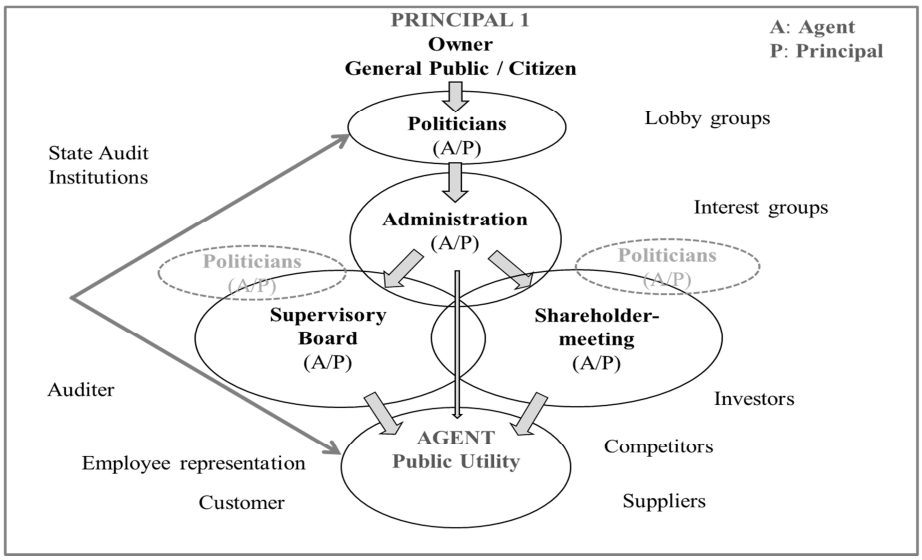

Figure 1: Theoretical conceptualization of transparency requirements (Own compilation).

Information asymmetries enable agents to pursue their own interests, so-called opportunistic action. Institutional arrangements have to ensure that the agents act according to the aims of first principal interests, and that their performance is observable and evaluable.

In an agency theoretical point of view the level and design of top-manager compensation are an important monetary incentive for the agents to act in accordance with the interests of the principal. Based on the agency theory there should be a link between pay and performance.

The reporting of SOEs has to eliminate information asymmetries in the best possible way (Bovens 2007, Greiling/Spraul 2010). To this end, information costs, as an integral part of agency costs must be minimized (i.e. the costs incurred by the principal getting information about the agent's actions). In particular, neuralgic information asymmetries need to be reduced at all stages in the multiple principal-agent chain. From a theoretical perspective the annual financial statement is a substantial reporting tool (Bushmann/Smith 2003). The disclosure of individual top-management compensation within the annual financial statements is necessary to minimize crucial information asymmetries and agency costs (i.e. OECD 2005, Whincop 2005, p.227).

According to the Property Rights Theory, the allocation and separation of property rights on politics, administration, shareholder meeting, board and top-management often leads to problems in public corporate governance. The non-systematical/non-transparent separation of property rights between the described actors leads to no clear and overlapping responsibilities (i.e. it is often not sufficiently clear who decides on the level and design of compensation).

The managerial power theory describes a concept of governance in which direction by the top-management is largely autonomous and without extensive control options available to the market or the shareholders (managerial control). The supervisory board or shareholder meeting hardly engage in arm's-length transaction due to structural and socio-psychological power mechanism of top-managers (Bebchuk/Fried 2003). When top-managers have more power over the supervisory board or shareholder meeting they are better positioned to negotiate their level and design of compensation according their own interests. The position provides incentives for top-manager to create compensation arrangements that support their interests, i.e. higher level of compensation and lower sensitivity to performance (van Essen/Otten/Carberry 2012). Findings of different studies indicate that the managerial power theory is able to predict selected compensation variables, especially deviations between the current state and the optimal target state of compensation design and/or level (for a meta-analysis van Essen/Otten/Carberry 2012).

2.4 Existing empirical studies and research gaps

In the private sector, many German empirical studies (i.a. Sommer/Lachmann/Judith 2013, Andres/Theissen 2007, Rapp/Wolff 2010, Schmidt/Schwalbach 2007, Schmid 1997) and international empirical studies (i.a. Rost/Osterloh 2009, van Essen/Otten/Carberry 2012, Bishop/Veliyath 1995, Core/Holthausen/Larcker 1999, Brunello/Graziano/Parigi 2001, Conyon/Schwalbach 1997, Elston/Goldberg 2003) have already investigated the disclosure, design and determinants of top-management compensation. The studies of determinants show that firm size, ownership structure and the sector are a key factor in the level, design and development of top-management compensation (i.a. Bebchuk/Grinstein 2005, Clarkson/van Bueren/Walker 2006, Core/Holthausen/Larcker 1999, Schmidt/Schwalbach 2007). Beside several studies examine the effects of performance-based pay in administration and public authorities (i.a. the overviews Perry/Engbers/Jun 2009, Weibel/Rost/Osterloh 2009).

In contrast, in the literature there are only very few empirical studies for SOEs regarding determinants of top-managers compensation such as size, performance and gender. The review focused the databases EBSCO Business Source Premier, WiSo-Net and ECONBIZ. The criterion for considering studies was an analysis of determinants for the level of compensation and/or correlations between pay and performance for SOEs. Further studies were identified by "Source Search" (i.e. the references of identified survey articles/publications were systematically reviewed for additional empirical studies). Table 1 illustrates studies examining determinants for compensation and performance-based compensation in SOEs.

Author	Year Journal	Focus and Findings
Minhat/ Abdullah	2014 Applied Economics	- Annual reports of 179 companies listed on Bursa Malaysia - Exploration of executive pay characteristics, equity ownership incentives and pay–performance relationship in government-controlled firms - Lower executive pay in government-linked companies and no evidence on positive pay–performance relationship
Cordeiro/He/ Conyon/Shaw	2013 Asia Pacific Journal of Management	- Comparison between overall 1.378 Chinese SOEs and non-SOEs over 2001–2007 - Evidence on the use of performance measures as determinants of top managers' compensation - Accounting returns are weighted more than stock returns in determining top executive compensation; SOEs rely significantly less on stock market returns than non-SOEs
Fang/Weiqiang	2013 China Economic Review	- Examination of listed SOEs of China from 2000–2007 - Effects of market forces and market-oriented reforms on the pay-performance sensitivity - The level of executive compensation increases and the relation between compensation and performance becomes more sensitive due to the progress of market reforms
Bhattacharyya	2013 Compensation & Benefits Review	- Examination of the performance-related compensation plans of the two largest SOEs in India - Correlation analysis between performance-related pay and financial performance/productivity - No significant impact of performance-related pay on a performance
Khumalo/ Ngwenya	2012 Corporate Ownership and Control	- Examination of 10 SOEs of South Africa from 2009–2011 - Correlation analysis between CEO compensation and financial performance, firm size - No positive relationship between compensation and financial performance; positive relationship between compensation and firm size (Revenue, Employees)
Jerry/Xiaofei/ Gary	2011 China Journal of Corporate Finance	- Examination of 1.129 China's listed firms: SOEs, state assets management bureaus, privately controlled firms - Impact of ownership structure on executive compensation - Significant impact of cash flow rights on accounting based pay performance in SOE controlled firms
Kato/Long	2006 Economic Development & Cultural Change	- Examination of a cross-sectional data set on 937 listed companies (Shanghai and Shenzhen Stock Exchange) for 1998-2002 - Correlation analysis between executive pay and corporate performance and the impact of ownership structure (especially the public sector) - Significant sensitivities and elasticities of annual cash compensation with respect to shareholder value
Cahan/Chua/ Nyamori	2005 Financial Accountability & Management	- Examination of 80 SOEs in New Zealand - Correlation analysis between the supervisory board size/-composition and financial performance and executive compensation - Board size/structure and director quality have an impact on CEO pay
Mengistae/Xu	2004 Journal of Labor Economics	- Examination of 400 Chinese SOEs mainly held py municipalities over 10 years - Analysis of determinants of executive compensation - CEO pay sensitivity decreases with the variance of performance; performance sensitivity of CEO pay increases with the marginal return
Cragg/Dyck	2003 Journal of Law, Economics and Organization	- Examination of data from 532 top managers from 41 state owned, 38 privatized and 33 listed enterprises in the UK - Correlation analysis between compensation and financial performance - No relationship between compensation and financial performance, both before and after corporate governance reform
Petroni/ Safieddine	1999 Journal of Accounting & Economics	- Examination of 18 publicly and 45 privately-held insurance companies from the USA - Correlation analysis between performance, state, company size and compensation - Significant positive association between return on assets and the level of compensation for publicly-held insurers
Zhuang/Xu	1996 Economic Change & Restructuring	- Examination of 800 SOEs in China for 1986 to 1991 - Effect of profit sharing on the company's financial performance - Bonus payments as a form of pofit-sharing have positive effects on both the total factor productivity and profitability

Table 1: Empirical studies examining determinants for compensation in SOEs.

Most studies consider the national government level, listed SOEs and Asian countries. However SOEs have the biggest relevance on local level and the most SOEs are not listed on stock exchanges (Bernier 2015, Bertelsmann Foundation 2013 and 2008, Grossi/Reichard 2008).

This article focuses SOEs on the local level for contributing to close this important research gap.

Nine out of the twelve outlined studies on SOEs use financial performance ratios (Return on Sales/Return on Capital/Return on Equity/Return Assets) to examine the pay-performance relation. Other studies use non-financial performance figures, e.g. workforce, labour productivity and/or labour capital ratio (Bhattacharyya 2013, Zhuang/Xu 1996).

The following chapter derives hypotheses from determinants of top-manager compensation in SOEs.

3. Derivation of hypotheses

The level of compensation should increase with the responsibility of top-management in accordance with applicable requirements. Firm size, as an analogue for organizational complexity, is frequently used as an indicator of increasing responsibility and helps explain why better-qualified staff and extensive property rights are required. Studies repeatedly show a positive correlation between firm size and compensation in the private sector (i.a. Khumalo/Ngwenya 2012, Hurst/Vos 2009, Bishop/Veliyath 1995, Sommer/Lachmann/Judith 2013). Firm size is included in the investigation of three indicators: number of employees, turnover and total assets. Formulations in the German Stock Corporation Act and in PCGCs or GCGC regarding the appropriateness of compensation suggest that compensation should increase with firm size. Consequently, firm size should be a significant factor influencing the level of compensation in SOEs. However, evidence from academic and practical studies suggests that management compensation design is very different in German SOEs, and that the size of the firm plays a much smaller role than expected. In this case, turnover and total assets appear to have a greater impact on the level of compensation than the number of employees, which is a particularly important indicator for the performance of public service provisions. The first two hypotheses are formulated as follows:

H_{1a}: Firm size affects the level of compensation, but the effect is only weakly significant.

H_{1b}: The number of employees has a lower effect on the level of compensation than turnover or total assets.

As an essential criterion for determining appropriate compensation, the level should be calculated in accordance with the customary practice for compensation within peer companies. Due to this requirement, the relative compensation per employee per euro turnover and total assets should be very similar within and for different sectors. In addition to size classes and sector-specific characteristics, other factors determine the level of compensation throughout Germany. Theoretically, the power position of the top-management could have a central influence. It can be hypothesized that the relative levels of compensation diverge significantly.

H_2: The relative level of compensation and thus standards for appropriateness diverges greatly between enterprises.

A bonus-malus system in the compensation scheme is widely regarded as a useful instrument to foster an incentive-compatible behaviour of top-managers in corporate governance theory and practice.[11] If top-managers profit from a better economic result of their company with a higher compensation, the compensation should accordingly decrease in case of a worsened economic result. If the discussion and codified rules cause effects it could be reasonably expected that the average total compensation in the different companies is not subject to continuous rise, but may also decrease from one business year to another in some cases. However, because of often non-existent rules for a bonus-malus system and insufficient bonding power of existing soft law recommendations, there is a high likelihood to suspect that a bonus-malus system is not structurally implemented:

H_3: A bonus-malus system is often required but not structurally practiced by a majority of the companies.

SOEs can be divided, based on their relative level of profitability, into ‘profitable’ and ‘loss-making’ companies. This classification is often made in municipality laws.[12] Profitable sectors (e.g. energy, waste, housing) regularly achieve revenue for the public/municipal budget; loss-making companies (e.g. theatres, public transport, swimming pools) frequently need sub-

[11] See Federal Ministry of Finance German Public Corporate Governance Codex, in the vision dated June 30, 2014, numeral 4.3.
[12] See Sec. 102 Para. 4 No. 1-3 Municipality Law of Baden-Württemberg, Sec. 101Para.2 Municipality Law of Brandenburg, Sec 136 Para. 3 Municipal Constitution of Lower Saxony, Sec. 101 Para. 3 Municipality Law of Schleswig-Holstein.

sidies or contributions to continue, to operate and to fulfil their public service objective. Even unprofitable sectors and policy areas have special relevance to public services. Belonging to a loss-making or profitable sector should not be decisive for the level of compensation. However, in consideration of debates about the level of compensation, it can be assumed there are significant differences between profitable and loss-making SOEs:

H_4: The (relative) level of compensation is higher in profitable than in loss-making enterprises.

The fulfilment of public services shall be made in accordance with the municipality law in compliance with economic efficiency. Apart from the constitutive goal, the public service provision goal, financial and profitability goals have a prominent role in the management of public financial resources (see 4.1). The reduction of grants and an economical deployment of available capital and assets are additional main tasks of top-managers. In some sectors there could correlations between performance and compensation. However, it can be assumed that the fulfilment of financial goals is very limited considering the level of compensation. With regard to discussions in practice and science, it is suspected that, structurally, no correlation is detectable between financial performance and level of compensation.

H_5: There is no relation between financial performance and the level of compensation.

In the context of determinants of the level of compensation, a pay gap between women and men is heavily discussed for the private sector as well as a frequent focus of public policy making and political debate (Vieito 2012; Bertrand/Hallock 2002, Holst/Busch 2009, European Commission 2014, European Commission 2010a, European Commission 2010b). Studies for private sector companies have shown that women often earn significantly less than men (European Commission 2014, European Commission 2010a, European Commission 2010b, Bertrand/Hallock 2002, Holst/Busch 2009). In contrast there are no studies with a special focus on SOEs. Many ascribe special responsibility to SOEs to eliminate a structural, gender-specific unequal treatment. Nevertheless, it is reasonable that there also exist significant differences in the level of compensation in favor of male top-managers in SOEs:

H_6: On average, women in the top-management earn less than men.

In the following section, the relevance of performance ratios for SOEs is examined. The importance of a uniform, adequate and accurate raw data adjustment from annual statements is highlighted. The chapter finishes with the description of data selection and design of the empirical study.

4. Methodology and Empirical Design

4.1. Relevant performance indicators of SOEs

SOEs are characterized by their dual goal system with public service provision goal and financial goals. In accordance with public laws, the provision of public services is constitutive to SOEs. Regardless of whether a focus on financial ratios in controlling is legally necessary or desirable for public-service-provision, it cannot denied that financial ratios are very important for the management of and in SOEs. The reduction of available subsidies/grants, respective minimization of (operating) cost reimbursements, and a more efficient use of disposable capital and assets must be considered by all decision-making bodies of SOEs. Municipality laws often require specific financial objectives, such as a market-related return of equity or a distribution of the profit of the SOE to the budget of the core administration.[13] As outlined nearly all studies for SOEs use financial performance figures (Minhat/Abdullah 2014, Cordeiro et al. 2013, Khumalo/Ngwenya 2012, Jerry/Xiaofei/Gary 2011, Kato/Long 2006, Cahan/Chua/Nyamori 2005, Mengistae/Xu 2004, Cragg/Dyck 2003, Petroni/Safieddine 1999).
The ongoing debate on public-sector budget consolidation and economic deficits in performance of public services requires meeting financial goals and efficiency requirements.
For assessing the pay-for-performance relationship in private companies (i.a. Rapp/Wolff 2010, Core/Holthausen/Larcker 1999) and SOEs (i.a. Jerry/Xiaofei/Gary 2010, Kato/Long 2006) several studies uses value- and market-based performance indicators, such as Tobin's Q, total shareholder value, stock market return. Most SOEs on a local/municipal level are not listed on any stock exchange, why value- and market-based indicators are frequently unimportant and negligible in contrast to traditional financial (accounting) performance ratios. This study examines financial performance ratios, which are assigned special relevance for SOEs both in research and in practice.

[13] See Sec. 107 Municipality Law of Brandenburg, Sec. 121 Para. 8 Municipality Law of Hesse, Sec. 75 Para. 2 Municipality Law of Mecklenburg-Vorpommern, Sec. 85 Para. 3 Municipality Law of Rhineland-Palatinate, Sec. 107 Municipality Law of Schleswig Holstein, Sec. 75 Para. 2 Municipality Law of Thuringia, Sec. 107 Para. 1 No. 1 Municipality Law of North Rhine-Westphalia.

Return on Equity (ROE): The return on equity is used as a performance indicator and demonstrates entrepreneur's returns (Gräfer 2012). It is considered as an efficiency indicator to measure how the company managed with (public) shareholders' deposits (Baetge/Kirsch/Thiele 2004). The Municipality Laws of Brandenburg, Lower Saxony, Schleswig-Holstein, Rhineland-Palatinate, Hessen and North Rhine-Westphalia require at least a market-related return on equity from SOEs. The ROE depends largely on the capital structure (leverage effect) and the interest expense (Coenenberg 2012).

Return on (Total) Assets (ROA): In comparison to the ROE, the return on total assets is a more suitable indicator to interpret the performance of enterprises because it is independent of the capital structure (Gräfer 2012). By adding interest expense to the ordinary annual income, the company is considered to be debt-free.

4.2 Data adjustment for raw data from annual statements: A methodological contribution

Various disciplines in both the private and the public/nonprofit sectors use indicators from financial statements and annual reports for empirical analysis of organizational success. In this context, accounting research emphasizes the necessity of an adjustment of the annual balance sheet figures to get meaningful parameters (Baetge/Kirsch/Thiele 2004, Coenenberg 2012, Gräfer 2012, Lachnit 2004, Küting/Weber 2009). The objective of financial statement analysis is the generation of decision-relevant information about the financial situation of the enterprise. For appropriate estimates, the economic situation must not be distorted due to different exercises of legal options. Though comparability is sought by the uniform adjustment of commercial approaches, disclosure and valuation options during the creation of the standardized balance sheet, there are no legal requirements for this purpose and no absolute uniformity of approach in the literature. The adjustment steps in this study are based on the fundamental works of Baetge/Kirsch/Thiele (2004), Coenenberg (2012), Gräfer (2012), Lachnit (2004), Küting/Weber (2012) for German Commercial Law. Also for other international accounting standard and systems (IFRS, US-GAAP) an uniform adjustment of legal options is frequently demand (Wahlen/Baginski/Bradshaw 2014, Wild/Bernstein/Subramanyam 2001).

The income and loss statement corresponding to German Commercial Law is inadequate for the analysis of income/loss sources and profitability analysis because the criteria period relatedness, sustainability and company affiliation are not followed stringently enough. In addition, the income and loss statement is determined by accounting and valuation measures and neither shows the actual profit nor management success. As part of the balance sheet analysis,

the commercial income and loss statement is subdivided in four components to meet the described criteria: extraordinary results, valuation results, ordinary operating results and financial results. The ordinary annual profit is sum of the ordinary operating and financial results and is a decision-useful, sustainable performance indicator apart from accounting policy differences and one-hit effects. To illustrate the relevance, Table 2 shows – representative of many other companies – adjusted and unadjusted performance ratios for the financial year 2012. In this connection, "adj." or "unadj." plus ratio shortcut describes the adjusted and unadjusted ratios; "Diff. abs." and "Diff in %" means absolute and percentage deviation/difference, AP stand for annual profit. Sorting is based on the "Diff in %" of ROE, in descending order.

SOE	unadj. ROE	adj. ROE in %	Diff. abs.	Diff. in %	unadj. ROA	adj. ROA in %	Diff. abs	Diff. in %	unadj. AP	adj AP	Diff. in %
Werkstatt für angepasste Arbeit Düsseldorf GmbH	6,2	-284,7	-290,8	-4704,8	2,5	-138,7	-141,2	-5559,6	537.422	-29.505.832	-5590,3
WISTA-Management GmbH	5,7	-3,7	-9,4	-165,2	1,0	-1,4	-2,4	-238,0	2.616.142	-4.426.698	-269,2
Klinikum Bremen Mitte gGmbH	-127,5	-28,4	99,1	-77,7	-8,0	-5,5	2,5	-31,5	-25.556.179	-21.741.064	-14,9
Stadtentwässerungsbetriebe Köln AöR	3,0	0,9	-2,1	-69,5	1,0	2,6	1,5	146,9	21.195.486	8.070.710	-61,9
Messe Berlin GmbH	9,0	5,0	-4,0	-44,1	3,1	2,0	-1,1	-34,7	4.602.000	2.701.000	-41,3
Städtische Bühnen Frankfurt am Main GmbH	-418,4	-280,2	138,2	-33,0	-121,4	-118,5	2,9	-2,4	-63.772.428	-62.921.428	-1,3
Städtische Werke Magdeburg GmbH & Co. KG	25,9	25,6	-0,3	-1,2	11,1	13,5	2,4	21,8	50.364.000	56.886.000	12,9
AVA Abfallverwertung Augsburg GmbH	13,7	16,1	2,4	17,5	3,6	7,6	4,0	111,4	3.299.000	3.875.000	17,5
Stuttgarter Straßenbahnen AG	-12,2	-15,2	-3,1	25,1	-3,0	-3,0	0,1	-2,0	-18.490.000	-23.136.000	25,1
Stadtwerke Erkrath GmbH	10,3	15,6	5,4	52,3	5,5	9,5	4,0	72,5	3.158.002	5.147.911	63,0
GWG Städtische Wohnungsgesellschaft München mbH	0,6	1,1	0,4	64,2	0,5	1,9	1,4	297,7	4.939.921	3.611.825	-26,9

Table 2: Deviations of adjusted and unadjusted ratios (exemplary).

The specific examples in this table illustrates, that the adjustment of data is of great importance in all studies which use data from annual financial statements. However, there is no trend towards a predominantly positive or negative impact of the adjustment neither in the performance ratios nor at the annual profit. Furthermore, there are partial reversals of the plus/minus signs after adjustment. These effects on organizational success and profitability prove the necessity of uniform adjustment of commercial approaches, disclosure and valuation options. In public sector the raw data adjustment is also crucial for all economical independent units publishing financial statements, i.e. certain agencies. The financial statements of nonprofit organizations and core administrations require an extensive adjustment.

Several studies in different research fields and of different sub-disciplines seem not to adjust financial figures in a sufficient manner, what could influence the results/conclusions (Gorton/Schmid 2000, Bassen et al. 2006, Bauer/Guenster/Otten 2003). In particular pay-performance studies for the privat sector (Bishop/Veliyath 1995, Clarkson/van Bueren/Walker 2006, Core/Holthausen/Larcker 1999) and SOEs (Khumalo/ Ngwenya 2012, Jerry/Pan/Tian

2011, Cahan/Cuhan/Nyamori 2005) mention the figures, but do not describe the calculation and necessary adjustment in detail. Some studies on SOEs (Kato/Long 2006, Mengistae/Xu 2004) use figures from databases, which might be adjusted by the institutional data provider. However it is not clear. All studies should at least provide brief references if and how the used raw data from financial statement were adjusted before statistical analysis.

As methodological contribution, the design of this paper shows the relevance for adjusting raw data from financial statements to get meaningful performance figures, to represent the real economic situation and to provide perspectives for organizational success research.

4.3 Design of the empirical study

The analysis includes 176 SOEs governed by private and public law of the thirteen federal capital cities and three city-states.

In comparison to private companies, especially listed companies, data collection and analysis are more complicated, because neither databases nor indices such as the DAX for listed companies are available. At the municipal level, SOEs have a special relevance to the services for the public and are frequently in the political and public focus. The aim of the empirical sample was the identification of one SOE per capital cities and city-states belonging in each of the following eleven sectors: energy, drink water provision/water disposal, municipal utilities, waste, public transport, housing, fairs and events, hospitals, health care and social services, culture, urban development.

1) Firstly based on an intensive and comprehensive internet research of the city websites all relevant and available aggregate holding reports were manually collected. An aggregate holding report is a report to the citizens and policy makers on the SOEs, investments, institutions governed by public law and municipal companies, which are assumed to be a very reliable information base. According to the OECD the ownership entity should publish an annual aggregate holdings report on SOEs (OECD 2005, numeral V.).
2) Secondly based on the aggregate holding reports and therein described corporate object, the enterprise enquiry and sector classification was realized. The sector classification based on a detailed examination of holding reports and companies' websites. Crucial for classification was the described corporate object.

3) The evaluation concluded all direct (1st degree) and indirect majority (at least 50%) SOEs/corporations (2nd/3rd degree). Some cities/countries administrate their SOEs by a unit in the administration other outsourced this task to another SOE (holding management company). In some cities/countries, the authority holds all major investments. For comparability of structures, companies were also categorized as directly, if they are direct subsidiaries of a holding management company, which is specifically responsible for the control and management. So the best possible comparability is achieved, regardless of different institutional approaches. The participation rate for indirect subsidiaries was always calculated in the usual adequate way, taking direct and indirect shares of parent, subsidiary or sub-subsidiary companies into account. Due to the lack of transparency of ownership structures and investment portfolios, the evaluation of indirect participations 3rd degree happened often with complex internet research and/or analysis of the consolidated financial statements of the parent company.
4) If a city owns several companies in a sector, the company with the highest total assets (financial year 2012) was identified and included in the study sample. If the city had no company in a sector, the next two largest cities (according to number of inhabitants) in the respective federal state were analysed for identifying a SOE. In some sectors, such as energy, drinking water provision/water disposal and waste, a sample of 16 companies could also not be generated by this approach due to privatization or the public service provision in other organizational forms than corporate enterprises.
5) In addition, the sectors were filled by SOEs of the cities of North Rhine-Westphalia. The reason for this is, that North Rhine-Westphalia has a transparency law which demands the disclosure of the remuneration of the SOEs. In addition this federal state contains numerous big cities (15 over 200.000 inhabitants) with a large number of relevant SOEs. According to the number of inhabitants descending the study identify still missing SOE for sectors, which could not be represented by every 16 federal states. With this approach, a large database of compensation variables is represented and every sector can be integrated properly.
6) Then the available 498 annual financial statements for the financial years 2010, 2011 and 2012, were collected manually in the Company Register[14]. According to sec. 325 para. 2 German Commercial Law corporate SOEs are obliged to disclose their annual statement in the Company Register not later than twelve month after the balance sheet

[14] Company Register, https://www.bundesanzeiger.de/ebanzwww/wexsservlet, access: 08.02.2015.

date. An examination of latest financial year (i.e. 2013) is not possible at the moment due to the delayed disclosure of many financial statements. In addition to the annual financial statements, the document analysis also tries to get remuneration data in the 102 available aggregate holding reports of the respective financial years.

7) In a final step, all relevant data of financial statements and aggregate holding reports were collected. It was first examined whether extent information has been disclosed to the level and design of top-management compensation in the annual statement. Next the aggregate holding reports were examined to complete the data collection.
8) All balance sheets and income statements items as well as compensation components were manually transferred into Microsoft Excel. Calculated financial and compensation ratios were exported to IBM SPSS Statistic 21, which represent the fundaments of following statistical calculations.

Following tables present the statistical values mean (arithmetic average), median and variation coefficient. The median is characterized by its robustness to outliers and often used in compensation studies of private (i.a. Sommer/Lachmann/Judith 2013, Clarkson/van Bueren/Walker 2006) and SOEs (i.a. Cahan/Chua/Nyamori 2005, Jerry/Xiaofei/Gary). Due to its high sensitivity to the consolidated values, mean instead possesses robustness even at low volume of data validity and here is a better estimator for the centre of a distribution. However, is not very meaningful at very low data rates. For this reason the study shows both figures. The variation coefficient (VC) as a relative measure of dispersion has related to the variance the advantage that it is not influence by fluctuating mean in the different sector or companies.

5. Empirical findings

5.1 Descriptive statistics

5.1.1 Findings on compensation disclosure

For outlining the availability of remuneration data and developing the necessary understanding of the sample for the following assessments analyse the disclosure of the top-manager pay. Figure 2 illustrates the scarce disclosures in the financial statements of the SOEs based on percentage values. The black bar depicts the individualized disclosure, the dark grey bar the disclosure as total amount and the light grey bar no disclosure. Those companies that pay any compensation (13 or 7.4%) are excluded.

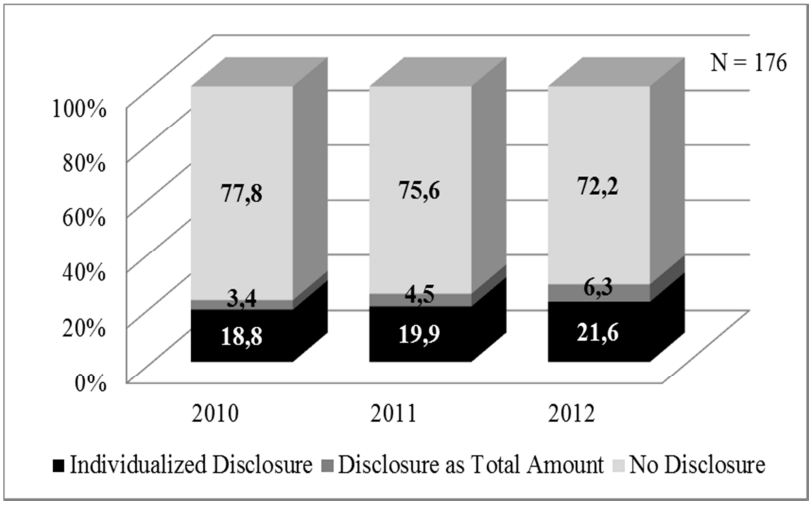

Figure 2: Disclosure ratio by financial years.

In contrast to the theoretical requirements and prevailing demands for more transparency (see section 2) the individualized disclosure remains constantly low around 20%.

Moreover it is necessary and enriching to get an insight about the different transparency cultures and availability of remuneration data in different sectors. For this purpose Figure 3 illustrates the disclosure behaviour differentiated according to individualized disclosure (light grey bar) and disclosure as total amount (dark grey bar) for all financial years and sectors. Inside the bar, the percentage ratio of each disclosure form is displayed. On the right edge of the graph, the percentage total ratio of all disclosure forms depending on sector or financial year is shown. It is obvious that there are significant differences in transparency culture regarding the top-manager pay.

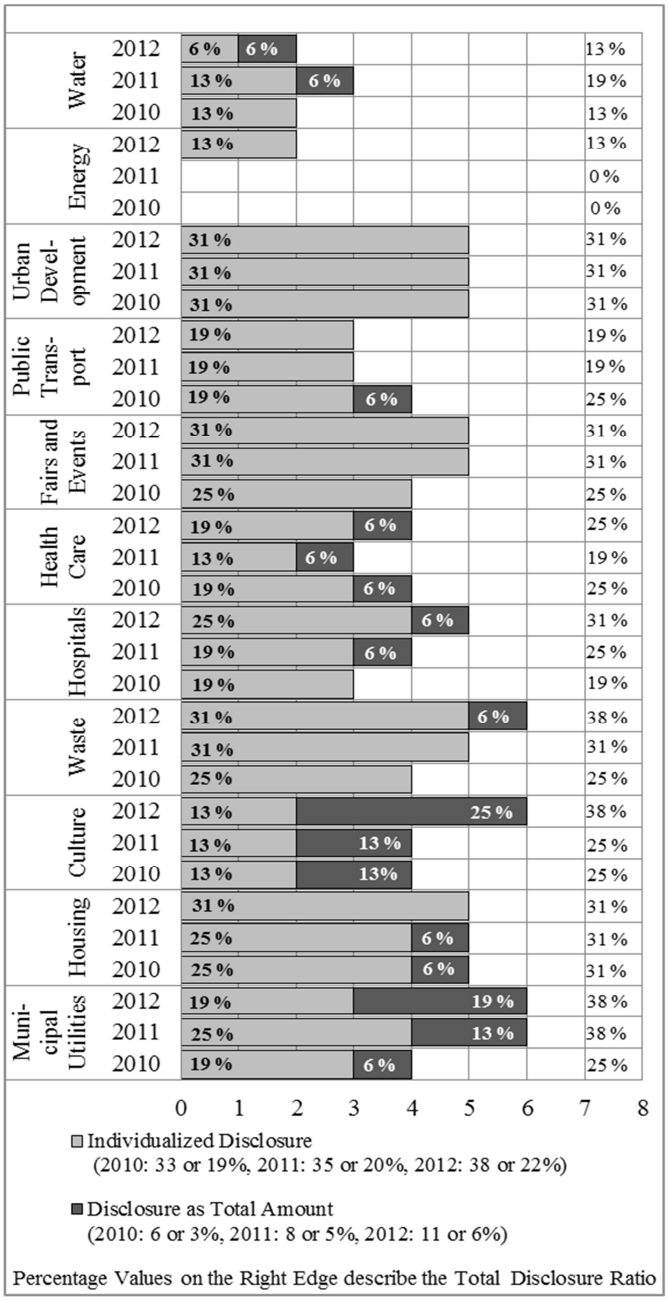

Figure 3: Compensation disclosure differentiated by financial years and sectors.

Especially the profitable and highly competitive sectors, such as fairs and events, housing and waste, partially show a higher percentage of individualized compensation disclosure. In particular, the sectors of drinking water provision/water disposal, energy, health care and public transport show specific transparency deficits with a disclosure rate of between 0 and 25% noticeable across periods. Waste, culture and municipal utilities achieve, with 38%, the peak values across all sectors and financial years in 2012.

In addition to the financial statements it is insightful if the remuneration of the different SOEs is disclosed in the aggregate holding reports of the cities/public authorities. Here the transparency is poor as well. Only seven of 42 examined cities (16.7%) publish the individualized or total amount of compen-

To guarantee a sound and fair assessment an aggregate holding report was coded with "fulfilled" if the information was provided in the report for more than 70% of the SOEs. The limit of 70% is both necessary and useful. For instance, if information about remuneration is only missing for one out of 30 SOEs, this single SOE should not determine the judgment for the whole report concerning this criterion. 70% ensures that the information is provided for far more than the half of the SOEs but also leaves enough space for single SOEs which are included without information on pay.

For the following assessments, it was possible to get the remuneration data of 70, 77 and 86 companies for the three financial years 2010-2012 in total. The following section provides

information about the design of available remuneration data and allows gaining insights into the pay level and structure differentiated by firm size and sectors.

5.1.2 Findings on the design of compensation by sectors and firm size

Table 3 shows the median, mean and VC of average total, fixed and performance-based compensation for each top-management member differentiated by sectors. In addition, the table illustrates the rate of performance-based and total compensation. The column "n" indicates the number of companies that deliver information on the respective compensation components. Sorting is based on the median of the average total compensation for each member of the top-management descending for the financial year 2012.

Sector	Financial Year	Total Compensation Ø				Fixed Compensation Ø				Performance-based Compensation Ø				Rate of Performance-based and Total Compensation in %			
		Median	Mean	VC	n	Median	Mean	VC	n	Median	Mean	VC	n	Median	Mean	VC	n
Municipal Utilities	2012	296.462	150.543	86,7	11	241.572	108.532	83,3	7	45.000	27.550	361,6	7	16,2	13,3	119,2	7
	2011	294.796	163.290	95,8	10	275.200	112.681	78,0	7	45.000	32.375	299,7	7	18,2	16,7	95,9	7
	2010	264.618	173.916	84,3	9	215.516	115.104	80,4	6	20.556	38.551	277,6	6	7,1	11,8	164,1	6
Public Transport	2012	294.500	279.016	20,5	5	205.000	215.821	13,9	5	43.500	46.500	46,4	5	17,0	16,7	81,0	5
	2011	293.667	267.521	17,0	5	195.000	190.512	31,0	5	34.000	42.450	38,5	5	13,2	15,5	26,9	5
	2010	255.500	265.476	21,1	6	210.000	199.490	20,1	5	30.667	43.437	47,0	5	12,2	15,5	35,7	5
Fairs and Events	2012	260.193	272.179	62,9	7	269.000	238.311	34,8	5	106.900	112.586	66,9	5	23,0	28,1	48,6	5
	2011	236.350	229.141	67,9	7	198.132	189.967	25,6	5	84.540	112.074	77,4	5	27,1	30,5	55,9	5
	2010	290.429	257.199	50,4	6	170.000	165.833	32,9	3	61.000	69.667	75,5	3	26,4	24,4	47,4	3
Hospitals	2012	224.050	211.278	36,3	9	188.083	186.167	29,6	4	8.750	20.717	112,9	3	7,6	8,2	84,7	3
	2011	226.624	251.718	36,5	8	197.288	218.602	43,2	4	55.875	55.794	70,1	4	18,9	18,7	51,1	4
	2010	219.586	221.877	30,7	7	166.250	186.333	39,5	3	26.000	35.917	95,0	3	19,4	13,9	71,2	3
Housing	2012	182.750	207.284	28,3	10	185.483	189.555	22,8	6	50.500	50.910	37,7	6	20,8	21,1	36,8	6
	2011	189.500	204.052	30,2	9	212.463	197.940	23,0	4	46.750	47.281	33,5	4	20,8	20,0	37,9	4
	2010	237.375	185.914	52,4	8	197.492	181.249	21,7	4	50.329	53.102	19,6	4	22,4	23,3	24,6	4
Drink Water Provision/Water Disposal	2012	162.309	182.732	64,8	5	187.680	170.913	31,8	3	20.000	37.711	106,2	3	25,1	25,1	32,2	3
	2011	130.290	138.206	70,8	4	141.870	141.870	32,5	2	54.887	54.887	72,7	2	23,5	23,5	42,5	2
	2010	107.949	125.667	80,4	4	123.768	123.768	50,5	2	48.267	48.267	89,6	2	20,2	20,2	62,7	2
Urban Development	2012	146.000	148.593	50,2	5	153.450	132.018	44,5	4	15.175	22.688	100,9	4	8,1	10,2	87,8	4
	2011	133.300	133.169	50,3	5	150.600	148.360	12,8	3	16.200	27.221	76,2	3	8,9	13,3	57,7	3
	2010	130.700	129.531	49,7	5	138.000	138.000	12,9	2	11.750	11.750	10,6	2	7,6	7,6	5,1	2
Energy	2012	135.500	113.424	84,0	7	150.950	152.130	10,6	4	7.250	7.250	58,6	2	4,9	4,9	54,4	2
	2011	22.000	68.500	99,2	5	147.549	147.549	0,0	1	-	-	-	-	-	-	-	-
	2010	16.000	43.983	113,3	3	-	-	-	-	-	-	-	-	-	-	-	-
Waste	2012	133.100	120.347	54,6	11	90.612	75.162	47,7	5	12.800	20.488	80,5	4	10,9	16,1	62,5	4
	2011	139.500	123.090	70,7	9	78.021	79.604	54,9	5	26.375	28.938	70,9	4	20,5	19,8	47,3	4
	2010	134.500	137.812	65,5	6	77.960	54.320	62,9	3	22.125	22.125	96,6	2	18,2	18,2	94,8	2
Culture	2012	127.500	150.033	32,6	9	154.635	157.878	30,8	3	0	7.000	141,4	3	0,0	2,8	141,4	3
	2011	121.000	146.539	36,6	9	188.707	188.707	16,1	2	17.304	17.304	21,4	2	8,1	8,1	2,8	2
	2010	133.000	147.089	35,4	9	175.258	175.258	15,3	2	11.725	11.725	62,0	2	5,6	5,6	47,7	2
Health Care and Social Services	2012	85.003	98.939	51,2	7	81.487	89.243	23,5	4	5.500	20.250	143,6	4	6,8	12,7	119,6	4
	2011	81.250	170.917	140,1	6	93.500	93.500	8,0	2	36.500	36.500	69,9	2	9,3	9,3	5,2	2
	2010	91.000	149.833	146,1	7	86.000	95.000	15,7	3	13.700	20.900	61,7	3	7,9	9,1	36,8	3
Total	2012	174.560	192.091	60,7	86	174.498	172.039	44,8	50	23.259	46.851	128,0	46	12,8	15,4	83,6	46
	2011	178.000	195.763	70,2	77	182.389	176.117	44,4	40	39.859	57.362	109,7	38	15,8	18,6	67,2	38
	2010	175.897	189.589	68,8	70	166.250	161.850	45,6	33	30.167	44.972	126,0	32	12,0	16,2	78,6	32

Table 3: Descriptive findings of compensation design differentiated by sectors.

The significant compensation differences between sectors are particularly striking. The sectors municipal utilities, public transport, fairs and events and hospitals possess the highest average total compensation. Top-managers of these companies get more than 270% (as measured by the median) of total compensation than a top-manager of the health care sector. With a rate of about 20% fairs and events, housing companies and drinking water provision/water

disposal disclose relatively high performance-based components. Across sectors there are significant differences in the compensation design.

Considering the relative compensation shown in Table 4 it is apparent that enormous variations are present within and across the sectors. In some sectors, the results must be interpreted taking into account the small number of companies disclosing the pay. The relative compensation figures per euro turnover or total assets are represented in % in order to illustrate the results better. Sorting is based on the median of total compensation per euro turnover for the financial year 2012 descending.

Sector	Financial Year	Total Compensation per Euro Turnover in %				Total Compensation per Euro Total Assets in %				Total Compensation per Employee			
		Median	Mean	VC	n	Median	Mean	VC	n	Median	Mean	VC	n
Culture	2012	3,4	4,1	55,5	9	1,5	1,8	69,7	9	54.641	144.896	109,6	9
	2011	3,2	3,8	73,6	8	1,3	1,5	63,7	9	60.785	138.087	106,6	9
	2010	3,9	3,9	76,1	8	1,8	1,9	67,7	9	54.167	133.892	101,5	9
Urban Development	2012	1,5	2,0	67,5	5	0,2	1,7	153,1	5	221.212	409.583	87,7	5
	2011	1,5	1,9	60,3	5	0,1	2,7	165,6	5	230.185	385.685	87,8	5
	2010	1,5	1,9	64,2	5	0,1	2,1	158,3	5	213.214	685.422	129,5	5
Health Care and Social Services	2012	0,6	1,0	102,3	7	0,6	0,6	90,9	7	38.125	46.099	108,4	7
	2011	0,8	0,9	77,7	6	0,4	0,5	100,0	6	25.702	60.557	135,5	6
	2010	0,9	1,4	112,5	7	0,4	1,0	121,6	7	30.847	68.577	112,5	7
Drink Water Provision/Water Disposal	2012	0,3	0,2	56,3	5	0,1	0,1	110,8	5	117.615	98.113	59,5	5
	2011	0,3	0,3	55,5	4	0,1	0,2	93,3	4	134.141	108.607	57,6	4
	2010	0,3	0,2	53,2	4	0,1	0,1	106,0	4	129.881	113.108	59,7	4
Fairs and Events	2012	0,3	1,4	134,4	7	0,3	1,0	181,1	7	85.827	238.858	102,5	7
	2011	0,3	0,9	131,2	7	0,2	0,6	146,9	7	86.992	135.300	82,3	7
	2010	0,3	0,4	72,0	6	0,3	0,6	132,3	6	90.186	85.525	20,0	6
Energy	2012	0,3	47,4	221,4	6	1,0	1,0	137,8	7	1.060.006	1.060.006	122,3	5
	2011	0,2	0,2	63,2	3	1,3	1,3	171,0	5	443.381	443.381	135,0	4
	2010	0,2	0,2	0,0	1	2,4	2,4	135,3	3	130.179	130.179	25,1	2
Waste	2012	0,2	0,4	147,5	11	0,2	0,6	237,3	11	45.543	126.710	136,0	11
	2011	0,1	0,4	147,1	9	0,1	0,7	222,8	9	57.161	87.258	104,6	8
	2010	0,3	0,3	82,0	6	0,2	0,2	78,8	6	62.183	90.465	92,8	5
Public Transport	2012	0,2	0,1	45,1	5	0,0	0,1	59,6	5	9.180	9.464	41,8	5
	2011	0,2	0,1	47,9	5	0,0	0,1	64,0	5	10.650	9.509	42,9	5
	2010	0,2	0,2	75,1	6	0,1	0,1	126,9	6	11.158	14.854	82,5	6
Municipal Utilities	2012	0,2	0,9	232,0	10	0,0	0,0	66,6	11	37.825	177.729	176,7	11
	2011	0,1	0,9	229,2	9	0,1	0,0	62,5	10	40.189	147.065	216,1	10
	2010	0,2	0,9	206,4	8	0,0	0,0	64,0	9	32.583	137.599	204,1	9
Housing	2012	0,2	0,9	242,4	10	0,0	0,1	107,1	10	71.651	1.822.695	266,8	9
	2011	0,1	0,3	129,7	9	0,0	0,0	121,1	9	62.151	558.593	217,9	8
	2010	0,1	0,5	190,8	8	0,0	0,0	48,0	8	63.481	140.642	142,6	7
Hospitals	2012	0,1	0,1	67,5	9	0,1	0,1	79,0	9	4.906	5.939	53,0	9
	2011	0,1	0,1	67,1	7	0,1	0,1	69,1	7	6.288	6.814	45,8	7
	2010	0,1	0,1	66,2	7	0,1	0,1	67,8	7	5.025	6.222	51,8	7
Total	2012	0,3	4,4	689,0	84	0,1	0,6	211,8	86	57.235	373.387	464,7	83
	2011	0,3	1,0	178,8	72	0,1	0,7	249,0	76	57.290	183.867	266,2	73
	2010	0,3	1,0	175,9	66	0,1	0,7	219,3	70	54.167	136.507	236,3	67

Table 4: Descriptive findings of the relative level of compensation differentiated by sectors.

It is evident that culture and urban development companies pay the highest compensation in proportion to their turnover across all periods (median). In contrast, the capital-intensive housing companies, municipal utilities, public transport companies and hospitals have the

lowest median in total compensation per euro turnover and total assets. In relation to total compensation per employee, the personnel intensive sectors (hospitals, public transport, health care and social services, municipal utilities) show the lowest values.

Consequently, it can be stated that the level of relative compensation between the companies and sectors differs considerably. Turnover, total assets and number of employees are only in very limited extent standards for appropriateness in compensation. The hypothesized strong variation (H_2) can be confirmed for all relative compensation rates.

5.1.3 Findings on compensation differences between profitable and loss-making SOEs

The next section illustrates the differences in compensation regarding to the economic situation of SOEs. Table 5 shows that top-managers of profitable SOEs get a higher total average compensation than managers of loss-making enterprises.

SOEs	Ø Total Compensation			Total Compensation per Euro Turnover in %			Total Compensation per Euro Total Assets in %			Total Compensation per Employee		
	Median	Mean	VC	Median	Mean	VC	Median	Mean	VC	Median	Mean	VC
Profitable SOE	224.171	225.774	59,6	0,2	0,4	206,6	0,1	0,3	325,4	54.649	251.743	598,0
Loss-making SOEs	172.022	184.623	59,3	0,4	1,3	140,6	0,2	0,8	156,1	37.461	116.606	228,2

Table 5: Compensation differences of profitable and loss-making SOEs

Including the relative compensation ratios, we can recognize that both the total compensation per euro turnover and total assets are in loss-making SOEs structural higher. This effect is caused by the low turnover at loss-making enterprises (i.e. culture, urban development) and partly very high total assets in profitable companies (i.e. housing, municipal utilities). As a result, the ratio total compensation per euro turnover in loss-making enterprises is relatively higher, while the total compensation per euro total assets decreases in profitable enterprises. These findings are supplemented by the results of the comparison of mean in Table 6. The means of total compensation differs significantly per total assets, turnover and number of employees for loss-making companies compared to profitable companies. The analysis based on the Mann-Whitney-U-Test, because a T-Test/ANOVA is not reasonably practicable due to the lack of normal distribution (significance of KS-Test is well above 0.01 for variables).

Mann-Whitney-U-Test		N	Mean Rank	Rank Sum
Total Compensation per Euro Turnover	Profitable SOE	112	81,30	9.106,00
	Loss-making SOE	79	116,84	9.230,00
	Overall	191		
	Mann-Whitney-U	2.778,00		
	Asympt. Sig.	,000		
Total Compensation per Euro Total Assets	Profitable SOE	117	81,50	9.535,00
	Loss-making SOE	80	124,60	9.968,00
	Overall	197		
	Mann-Whitney-U	2.632,00		
	Asympt. Sig.	,000		
Total Compensation per Employee	Profitable SOE	111	102,25	11.350,00
	Loss-making SOE	79	86,01	6.795,00
	Overall	190		
	Mann-Whitney-U	3.635,00		
	Asympt. Sig.	,045		

Table 6: Comparison of mean between profitable and loss-making enterprises (Mann-Whitney-U-Test).

Contrary to the higher relative total compensation per euro total assets and turnover at loss-making companies, the relative total compensation per employees is lower for profitable companies. There are always significant differences between the means of the two samples. Overall, loss-making companies tend to a higher compensation in proportion to their turnover or total assets than profitable companies. For these two variables, the H_4 should be discarded as they can be confirmed for the relative total compensation per employee.

5.1.4 Findings on bonus-malus systems

With regard to the outlined requirements for a bonus-malus system table 7 reveals the compensations mostly increases from 2010 to 2011 and 2011 to 2012.

Compensation development	2010 - 2011	2011 - 2012
Compensation increase	63	55
Compensation decrease	14	28

Table 7: Compensation development regarding bonus-malus systems.

Considering the number of compensation increase/decrease it is evident that are far more increases that decreases in each observation period. In some cases the remuneration got higher, although the financial performance has decreased. The data give some reasons to carefully assume that bonus-malus systems are not structurally implemented. On the other hand, taking into account the considerable number of compensation declines, especially from 2011 to 2012, the approach “bonus-malus-compensation” seems to be practiced. Hence, H_3 can not be clearly confirmed or declined at this stage.

5.1.5 Findings on gender pay gap

Including the gender variable to the examination of the level of compensation with regard to the exemplified discussion we see that women in top-management of SOEs get a lower total compensation than male top-management members (Table 8). In this analysis, the individualized total compensation for each top-management member is implied, if disclosure was made for all three periods.

Gender Variable		Female Top-Management-Members			Male Top-Management-Member		
		2010	2011	2012	2010	2011	2012
Individualized Total Compensation	Mean	170.167,0	197.008,0	209.894,0	218.209,0	230.013,0	235.063,0
	Development Mean	+15.5 %	+6.5 %		+5.4 %	+2.2 %	
	Median	118.500,0	186.492,0	185.092,0	224.170,0	236.000,0	247.287,0
	Development Median	+57.4 %	-0.8 %		+5.3 %	+4.8 %	
	VC	60,9	56,5	66,6	64,7	55,4	58,3

Table 8: Descriptive findings of gender-specific level of compensation and development.

Looking at the average compensation development, the data show salary increases in both male and female top-managers over time. For singular consideration of each financial year, it can be asserted that 2010/2011 female top-management members received only about 78% of the total compensation of male top-managers. In 2012, the difference is still about 11%, which shows a certain rapprochement between the compensations. The described findings on gender-specific level/development of compensation can be validated with the comparison of mean in Table 9. Due to the small number of individualized total compensation for female top-managers and the lack of normal distribution of the individualized total compensation data (K-S-test: level of significance <0.05), the robust Mann-Whitney-U-Test with weighted cases was used.

Mann-Whitney-U-Test		2010			2011			2012			all FY		
		n	Mean Rank	Rank Sum	n	Mean Rank	Rank Sum	n	Mean Rank	Rank Sum	n	Mean Rank	Rank Sum
Individualized Total Compensation	Male	81	88,11	7.137,00	81	86,93	7.041,00	81	84,95	6.881,00	243	259,22	62.990,00
	Female	80	73,80	5.904,00	80	75,00	6.000,00	80	77,00	6.160,00	240	224,57	53.896,00
	Overall	161			161			161			483		
	Mann-Whitney-U	2.664,00			2.760,00			2.920,00			24.976,00		
	Asympt. Sig.	,051			,104			,279			,006		

Table 9: Comparison of mean between the total compensation of male and female top-managers.

It is evident that a highly significant difference between the two levels of compensation exists in favour of the compensation of male top-managers over all financial years. There is no significant difference for each financial year. In addition, the significance level and the difference between the rank sums increase, which affirms the rapprochement between the two levels of compensation.

5.2 Correlation analysis

5.2.1 Association between firm size and level of compensation

Firstly, the correlation analysis is executed with regard to the total compensation depending on the size characteristics of total assets, number of employees and turnover over all financial years. The firm size variables were logarithmized as in other studies (i.a. Grusky 1961, James/Soref 1981, Core/Holthausen/Larcker 1999, Andres/Theissen 2007, Rapp/Wolff 2010). Thus the partially high scattering variables could be integrated normally distributed in the usual statistical way. In subsequent statistics, the total compensation incorporates averaged over each top-management member. Table 10 shows a strong, highly significant correlation between all variables.

Correlation		∅ Total Compensation
Turnover	Correlation	,637**
	Significance (2-sided)	,000
	N	223
Total Assets	Correlation	,619**
	Significance (2-sided)	,000
	N	233
Employees	Correlation	,571**
	Significance (2-sided)	,000
	N	224
**. Correlation is significant at the 0,01 level (2-sided).		

Table 10: Correlation between firm size and level of compensation of all financial years.

The biggest correlation to the average total compensation has turnover and total assets. The number of employees has the lowest, but still strong influence. However, the results of the bivariate correlation analysis remain only partially stable in the multivariate analysis (Table 11). The requirements of a regression analysis were checked. The Durbin-Watson coefficient (DW-Stat close to 2) confirms no autocorrelation between the variables of the model. Data are taken from a random selection. Furthermore, there is no multi-collinearity (VIF <10). Including the F-value and the model significance (.000) global quality of the model can be assumed.

∅ Total Compensation					
	B	Beta	T	Sig.	VIF
(Constant)	-483.899,04		-6,939		
Turnover	16.830,73	,272	2,560	,011	4,369
Total Assets	17.836,26	,301	3,289	,001	3,245
Employees	9.698,20	,156	1,999	,047	2,343
(adj. R^2 = ,442; D-W-Stat = 1,639; F = 58,1; Sig = ,000)					

Table 11: Regression analysis of firm size and total compensation of all financial years.

In comparison to the correlation analysis, the explanatory power of total assets and turnovers can be confirmed with a (high) level of significance. The number of employees also has a significant effect in this model, although the explanatory value (beta =.156) is significantly lower compared with the other variables. Overall, the examined structural determinants explain between 40% and 50% of the variance.

All size variables have a positive significant impact on the level of total compensation. The suspected weak significance (H_{1a}) cannot be confirmed by the correlation analysis. The regression analysis shows also a (highly) significant impact. H_{1a} has to be rejected. The lesser influence of the number of employees within the meaning of H_{1b} can be confirmed.

5.2.2 Association between performance and compensation

The following chapter investigates the (non-)relationship between selected performance indicators and the average total compensation and performance-based compensation over all financial years. The annual financial statement contains both the financial performance and compensation data per financial year. The financial year matches the year of compensation, because the supervisory board or the shareholder meeting decide the performance-based compensation based on the accomplished financial objectives. It is suspected that an increase in performance-based compensation leads to a rise in total compensation, which properly justifies the consideration of both compensation aggregates. Since the sample consists of both profitable as well as loss-making companies, all determined performance ratios were increased by 2.000 percentage points. All values obtain positive signs and the percentage shift makes statistical analyses appropriate. Table 12 shows no (or only a very weak) correlation between the level of performance ratios and total compensation.

Correlation		**∅ Total Compensation**	**∅ Performance-based Compensation**
ROE	Correlation	,174*	,048
	Significance (2-sided)	,018	,628
	N	186	106
ROA	Correlation	,206**	,190*
	Significance (2-sided)	,004	,048
	N	198	109
**. Correlation is significant at the 0,01 level (2-sided).			
*. Correlation is significant at the 0,05 (2-sided).			

Table 12: Correlation between performance and total compensation.

It is striking that both the ROE as well as the ROA hardly have an influence on the level of total compensation. There is also no correlation between the level of performance ratios and performance-based compensation.

The weak correlation between the variables causes an unsatisfactory global quality for the regression model (F-value < 3, model significance > 0.05). The Durbin-Watson coefficient shows values well below two, suggesting an autocorrelation of variables. The generation of robust results is not appropriate possible for these models. However, the results of the correlation analysis already provide conclusions regarding to a correlation between performance ratios and compensation's level.

Focusing the compensation's sensitivity, the result can be partially confirmed. In this context, compensation's sensitivity means the percentage change in total compensation per percentage increase/decrease in performance ratio. Table 13 illustrates that the development of performance ratios has no effect on the development of average total compensation. At the same time, there is a strong, highly significant correlation between the development of ROE and performance-based components.

Correlation		**Develepment of Total Compensation**	**Developement of Performance-based Compensation**
Development ROE	Correlation	-,022	,638**
	Significance (2-sided)	,812	,000
	N	115	59
Development ROA	Correlation	-,039	0,154
	Significance (2-sided)	,664	,235
	N	122	61
**. Correlation is significant at the 0,01 level (2-sided).			

Table 13: Correlation matrix of compensation's sensitivity.

The results of correlation are confirmed by the regressions set in Table 14. Even the model quality shows, with negative adjusted coefficients of determination or low F-values and very high significance, that only a very small proportion of the variance is explained. At the same time, the close relationship between performance-based compensation and ROE can be confirmed.

Ø Total Compensation					
	B	Beta	T	Sig.	VIF
(Constant)	12,017		2,138	,035	
ROE	-0,011	-,025	-0,254	,800	1,092
ROA	0,034	,009	,091	,928	1,092
(adj. R^2 = -,017; D-W-Stat = 2,158; F = 0,032; Sig = ,968)					
Ø Performance-based Compensation					
	B	Beta	T	Sig.	VIF
(Constant)	27,041		1,419	,161	
ROE	0,701	,642	6,202	,000	1,013
ROA	-0,843	-,031	-,296	,768	1,013
(adj. R^2 = ,387; D-W-Stat = 2,070; F = 19,316; Sig = ,000)					

Table 14: Regression analysis of compensation's sensitivity.

With a comparatively high coefficient of determination (38.7%) a large proportion of the variance can be explained by the model "performance-based compensation". The ROE is with an explanatory value of .642 and a high significance of < .01 the relevant factor. The ROA has only a small role.

Based on the previous correlation and regression analysis, it can be shown that the suspected incoherence of performance ratios and level of compensation cannot be fully confirmed within H_5. It can be noted that the performance-based components and total compensation is not or only very weakly determined by the level of performance. However, the development of the ROE has a strong, highly significant correlation and explanatory value for the development of performance-based compensation across periods.

Figure 4 summarizes all significant results of the correlation analysis (single arrow) and the comparison of mean (dotted double arrow). The "+" indicates a (strong) positive correlation, and "sig" describes a significant level of at least 5%.

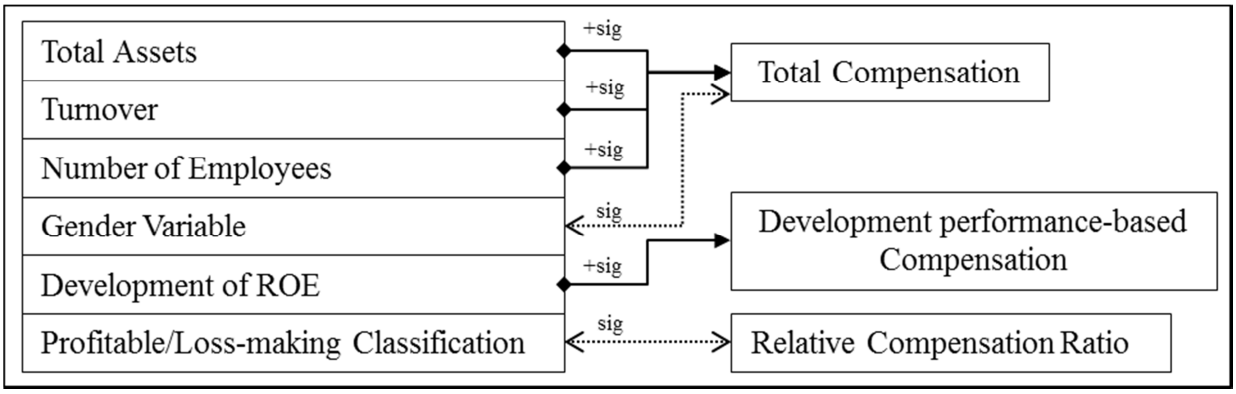

Figure 4: Summary of significant results.

A discussion of some key findings follows in the next section.

6. Discussion

The findings show that the governance practices of many SOEs do not meet to the outlined requirements for transparency. Regarding the results for the compensation disclosure, in perspective of agency theory, the emphasised information asymmetries concerning the general public/the citizen as first principal have not been appropriately reduced. According to the data, awareness and action for compensation transparency considerably differs among several sectors. Top-managers have not structurally developed a specific consciousness or culture for transparency in the public sector. The recommendations in PCGC have not extensively generated bonding power and behaviour control effects concerning the disclosure of compensation. It becomes evident that a large majority of SOEs does not apply this principle of good corporate governance. One the other hand the findings prove for the international scientific debate and for the policy making around the world that a transparent disclosure about performance-based components is at least realized by some German top-managers of SOEs as well.

Regarding the level and structure of remuneration the relative compensation ratios (per euro total assets or turnover and number of employees) and thus the standards for appropriateness vary very strong. In the ongoing debate about the appropriateness of compensation, the findings indicate that the level of compensation is not particularly strongly determined by the investigated facts. There is a need for reflection and reforms.

The data show that the agency theoretical favoured pay-performance-relation has not been structurally realized and a stronger link between financial performance and monetary incentives could exist in the perspective of agency theory to adapt the agent's behaviour to the principal interests.

With regard to managerial power theory the low impact of financial performance on the level of compensation and the strong variation of the relative compensation ratios could be explained by a certain power or special influence of top-managers in salary negotiations. According to the data managerial power theory special relevance for SOE.

Correlation analyses document no significant association between the level of ROA or ROE and compensation. Only the development of ROE seems to have an impact on the development of performance-based components. With regard to the codified requirements in municipality laws the focus on ROE as a management figure and a parameter of the level of compensation is comprehensible. However, the ROE is very sensitive to modifications in capital structure due to the leverage effect. In this context, not only the ROE but also the ROA should

be focused as an indicator of financial performance. The ROA is not as sensitive to modifications on capital structure. With regard to opportunistic behaviour and potential manipulation risk, the ROA would be a more preferable indicator to determine the level and development of top-manager compensation.

Firm size has a significant effect on the level of compensation, but the number of employees represents the smallest factor in comparison to total assets and turnover. Especially the number of employees seems to be a particularly important indicator in light of a sustainable and responsible public service provision.

That managers earn more in profitable sectors than in loss-making sectors – also regarding the relative compensation ratio pay per employees – is especially relevant for the discussion on effective, efficient and sustainable public service provision as well as for recruiting and retaining public managers. Loss-making sectors often also have special relevance for the society and for the sustainable public service provision. This call for reflections if the relative compensations ratios should be closer together in a comparison of sectors. Overall, the findings here provide reasons for a theoretical and political discussion how public authorities distribute tax money for remunerations of top-managers in SOEs comparing different sectors and if the highest salaries are paid for the top-managers of SOEs with the most relevance and impact for the really big challenges of the society.

The pay gap between men and women might be explained by the fact that women are often represented in top-management boards of smaller companies and sectors. However, with regard to the special responsibility of SOEs, it is an important insight for the current debate (European Commission 2014, European Commission 2010a, European Commission 2010b) and imply the need for assessments and initiatives by the policy makers.

As with all studies, this study has limitations. Based on the 498 annual financial statements of 176 companies and eleven sectors, the longitudinal study provides insightful and relevant findings. The number of companies and financial statements evaluated are significantly greater in comparison with other studies. Though some findings are meaningful, some statistical results, e.g. single correlation analysis, must be interpreted with caution because of the relatively low number of disclosed data.

SOEs are characterized by their dual goal system with public service goals and financial goals. Although the analysis of financial ratios is relevant (see section 4.1) and provides meaningful insights, performance figures for public service provision are particularly important. An exclusive control focus on financial figures can lead to dysfunctional effects on

the public service provision. Very often SOEs and public authorities do not report performance figures for public the service goal, presenting a challenge at the moment for all large scale scientific studies covering many different sectors in this field. Nevertheless, for upcoming research it would be beneficial to identify meaningful and in the future maybe publicly available performance data for the public service goal and integrate them into forthcoming studies.

7. International Implications for Public Policy Making, Practitioners and Research Perspectives

If the transparent disclosure of the management board in individualised form is perceived as appropriate by a majority of society and political representatives, the empirical findings of this study allow for the conclusion that this aim in Germany – and probably also in other countries – will in an overall view in the next years only be realisable through a clear legal obligation and not solely by a self-regulation approach with recommendations in a public corporate governance code (PCGC).

For the policy making in each country around the world, for initiatives of the European Commission and the governance in the multi-level European System as well as for many international organizations single German laws provide good practice examples with remuneration disclosure rules useful for benchlearning such as Sec. 108 Municipality Law of North Rhine-Westphalia, Sec. 65 Transparency Law/Budget Order Berlin, Sec. 3 Pars. 15 Transparency Law Hamburg). Moreover PCGC of different countries, federal states and cities (i.a. German Federation numeral 6.2.2, Cologne numeral 3.3.4, Stuttgart numeral 3.3.3, Austrian Federation numeral 14.2.5.5, Canton Aargau numeral 26.4c) already codify an individualized compensation disclosure for top-managers and supervisory board members in SOEs irrespective of firm size or legal from which could be a reference point in other countries as well.

The findings for determinants of the compensation level allow for comparing and assessing the different compensation policies on a broad empirical basis to support policy making in different countries. Overall the results indicate that policy initiatives in this field should integrate SOEs in a more specific way. Many of the mentioned laws and policy documents are only for private sector companies and do not include or mention SOEs.

With the Act on the Appropriateness of Management Compensation the German Policy Makers established a standard for an appropriate compensation for listed companies. However, these rules do not affect most SOEs. The findings give reasons for policy makers on all government levels in Germany to transfer the compensation appropriateness requirements for

SOEs into municipality laws and other specific laws for SOEs. A policy transfer into other countries seems to be a contribution as well. Furthermore the data justify to specify criteria for appropriateness on the sublegal level in a PCGC. Some PCGC in different countries already contain helpful examples (German Federation PCGC numeral 4.3.1, Austrian Federation PCGC numeral 9.3.6.4, Canton Aargau numeral 26.1). For fostering appropriateness of the top-management compensation, a PCGC can additionally inform which actors have which property rights. In the compensation decision processes it is often not clear enough between supervisory board, supervisory board chairman and the shareholder meeting who is exactly responsible for the level and structure of the top-managers pay. A PCGC can define these responsibilities very clearly because this self-regulation approach offers more flexibility than laws.

For the prevailing discussion the study provides new, valuable knowledge to numerous addressees, such as politicians, administration, supervisory/management boards, auditors and consultants.

With regard to future research gaining comparative empirical insights about more countries and in each single country would be a particularly fruitful objective. There are multitudinous studies for the contents of this paper for private sector enterprises. In comparison, there is still little empirical research on SOEs. Strengthening comparative approaches in this field seems especially valuable as a means of gathering new ideas and of benefiting from the insights of other countries for improving the effectiveness and efficiency of public-service-provision.

In a public policy research perspective it would be rewarding in single countries and in an international comparative perspective to assess the law creation processes andand to explore why the laws for SOEs and the rules in PCGCs for transparency and appropriateness of top-manager pay have been established by some public authorities in contrast to others, why the rules are formulated in different ways and why the diffusion diverges in several countries. In particular it would be also rewarding to consider why the policy documents of the European Commission on these issues and regarding gender pay gap do not include or address SOEs which have a special responsibility in the debates.

The empirical data about the relevance of SOEs prove that a sustainable public service provision and budget consolidation in many areas cannot be appropriately realized without a powerful management and control of SOEs. This substantiates a need for future research to generate more empirical insights for SOEs.

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