Journal of Accounting & Organizational Change



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Journal:	Journal of Accounting & Organizational Change
Manuscript ID	JAOC-11-2020-0188.R2
Manuscript Type:	Research Paper
Keywords:	Risk Management, Stakeholder Pressure, Top Management Support, Public Sector Accounting, Institutional Theory, Blame Avoidance



# STAKEHOLDER PRESSURE AS A DRIVER OF RISK MANAGEMENT PRACTICES IN PUBLIC ADMINISTRATIONS

## Abstract

#### Purpose

Drawing upon new institutional theory and blame avoidance theory, we examine how stakeholder pressure has an impact on the implementation and use of risk management practices in public administrations. Furthermore, we investigate whether top management support mediates this proposed relationship.

#### Design/methodology/approach

This paper is based on a survey among public financial managers of German municipalities and federal agencies. Data from 136 questionnaires were used to evaluate the model.

#### Findings

Our results indicate that top management support fully mediates the relationship between stakeholder pressure and risk management practices. This finding suggests that top management support is crucial for the successful implementation of accounting techniques, such as risk management, in public administrations.

## **Research limitations/implications**

This study is based on subjective answers by public financial managers. Moreover, this study is based solely on German data. Hence, future research could use a mixed-method approach and data from other countries.

#### **Originality/value**

We examine whether stakeholder pressure exerts an impact on the sophistication of public risk management practices.

**Keywords** risk management, stakeholder pressure, top management support, public sector, institutional theory, blame avoidance theory, PLS-SEM

Paper type Research Paper

#### 1. Introduction

Today, public administrations are confronted with various expectations of citizens, companies, and other organisations. As public administrations are often led or at least controlled by politicians, citizens are increasingly aware of their power to use the pressure of elections for formulating expectations of public administrations. As a consequence, public policy and the public management literature define citizens and other pressure groups as highly relevant stakeholders of public administrations (Collier and Woods, 2011; Riege and Lindsay, 2006; Winstanley *et al.*, 1995). To cope with increasing stakeholder pressure and to maintain legitimacy (Deephouse *et al.*, 2017; COSO 2017; Ferreira *et al.*, 2016), public administrations should be aware of the potential risks of their actions and decisions. Thus, they should actively consider implementing sophisticated risk management practices (Collier and Woods, 2011; Palermo, 2014; Oliveira *et al.*, 2011; Ferreira *et al.*, 2016).

In addition to legitimacy aspects, risk management in the public sector has a variety of sectorspecific objectives that include adherence to laws, and the fulfilment of the legal order (Palermo, 2014; Lee, 2019). Moreover, public risk management is considered to be a principle of good governance and can be linked to organisational performance (Woods, 2009; Andreeva *et al.*, 2014). For this reason, Woods (2009) recommends that every public administration should establish a risk management system.

The previous research has shown that risk management varies due to different tasks, various forms of decision making, the specific culture (bureaucracy), and the specific management style of public administrations (Palermo, 2014; Posner and Stanton, 2014; Brown and Osborne, 2013). Collier and Woods (2011) illustrate that the national context is relevant when risk management is practiced by local authorities, e.g., in England and Australia. Posner and Stanton (2014) show that public administrations are more vulnerable to uncertainty, performance risks, and financial gaps than their counterparts in the private sector. In this context, Mikes and Kaplan (2015), Lee (2019), and Cooper (2012) note that public sector organisations "face a broader range of risks" (Lee, 2019, p. 10) than private organisations. This is, on the one hand, due to the broad range of tasks they must deliver (Cooper, 2012). For example, in Germany, a public administration on the local level (county) is typically responsible for education infrastructure and health care. It also provides services such as the driver's license office, runs cultural facilities (e.g., libraries and theatre halls) and public swimming pools, and organizes services around waste. On the other hand, public services are often provided exclusively by the responsible public administration. As a consequence, failures or low-quality-delivery of public

 services affect the users of these services more seriously as in the case of a market setting with different service providers. To gain control of such monopoly-like service provision, public service providers are made publicly accountable for their actions; they must "explain and justify [their] conduct" (Bovens, 2007, p. 450).

As public administrations are supported through public funding and are treated as monopoly providers, bankruptcy is not a pressing burden (Meier and Bohte, 2003). However, resources are more finite in comparison with their private counterparts (Cooper, 2012). Oulasvirta and Anttiroiko (2017) explain that the 'scarcity' factor must be understood as a limiting factor concerning the introduction and use of risk management practices in the public context. Based on similar considerations, researchers conclude that risk management practices that are used in private organisations cannot be adopted unconditionally by public administrations (Power, 2007; Hood and Miller, 2009; Lapsley, 2009; Palermo, 2014).

Previously, the majority of risk management scholars who have studied the implementation and use of risk management systems have focused on private firms (Beasley et al., 2005; Paape and Speklé, 2012; Kleffner et al., 2003) or risk governance (Andreeva et al., 2014; Stein and Wiedemann, 2016; Renn, 2015). Not much is known about why public administrations do not use risk management practices at all or to their full potential or how risk management must be adapted to be used efficiently and effectively in public administrations (Paape and Speklé, 2012; Palermo, 2014; Woods, 2009). Because of the relevance of public administrations for a functioning society and the scarce research considering specific drivers of the implementation of a risk management system in the public sector, this study analyses the impact of pressure from public sector relevant stakeholders (like citizens, media, or superior authorities) on the implementation of risk management practices in public administrations. As top management support is an important driver of supporting change processes even in the public sector (Nitzl et al., 2020), this study additionally investigates how the relationship between stakeholder pressure and the implementation of risk management practices in public administrations may be affected by top management support. We thereby contribute to the literature on risk management drivers in public administrations.

The previous research has shown that the political environment and political culture do have an impact on the implementation of new accounting tools or change initiatives (Nitzl *et al.*, 2020). Therefore, we must explain the political system and the political tradition in which the implementation of a risk management system takes place. As German public administrations lack a regulation for implementing public risk management, we consider Germany as an

appropriate setting for a research project which focuses on the impact of stakeholder pressure. In the German context, public administrations have the freedom to choose whether to implement any risk management practices. So far, the establishment of risk management practices in German public administrations has been sparse (Burth and Hilgers, 2012). Because legal factors are mostly not applicable, the question arises of whether stakeholders and the pressure they place on public administrations lead to more sophisticated risk management practices.

Analysing data from a survey of 136 public financial managers with direct responsibility for the financial standing of a German public municipality or federal agency, we find that stakeholder pressure does not have a direct effect on public administrations' risk management practices. Nevertheless, we can show that top management support fully mediates the relationship between stakeholder pressure and three risk management practices: risk assessment, risk reporting, and strategy integration.

Our study makes three contributions to the literature. First, we enhance the stakeholder literature. Collier and Woods (2011) show for local public authorities in England and Australia that risk management is "driven by the expectations of external stakeholders and enacted through boards of directors who [exert] influence over the policies and methods adopted for risk management" (p. 117). In our study, we show for a public sector context with a legalistic tradition that public-sector-specific stakeholder pressure has only an indirect effect on risk management practices as the relationship is mediated by top management support. We thereby illustrate that a different management tradition in public administrations (Anglo-Saxon versus legalistic tradition) makes a difference in terms of when and how risk management systems must be implemented and practiced. Second, we build on the literature on blame avoidance (Hood, 2002, 2007, 2011; Hood and Lodge, 2006; Howlett, 2012, 2014; Rajala, 2019; Weaver, 1986). We demonstrate that legitimacy reasons and blame avoidance lead top managers to implement managerial tools to cope with the pressures placed on them. Third, we extend the use of institutional theory in public administration research models (Collier and Woods, 2011; Palermo, 2014; Crawford and Stein, 2004) by analysing legitimacy aspects in the context of risk management by public administrations. We show that stakeholder pressure leads to increased risk management practices only when top management supports these practices.

The remainder of this study is structured as follows. Next, we provide the foundations of our hypotheses. The following section presents the study's analytical methods. After that, we report

the results of our survey study and discuss our findings. We then discuss the limitations of our study.

#### 2. Background and hypotheses

#### 2.1 The legitimacy of public administrations and stakeholder expectations

Institutional theory assumes that organisations react to the demands of their environment and endorse structures and practices that are associated with high social value to respond to external changes in expectations and rules (Burns and Scapens, 2000). According to institutional theory, institutional pressure exerts a strong influence on managers' strategic decisions. "[O]rganizations ... conform [to institutional pressures] because they are rewarded for doing so through increased legitimacy, resources, and survival capabilities" (Scott, 1987, p. 498; Meyer and Rowan, 1977). Suchman (1995) defines legitimacy as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (p. 574). Legitimacy is underpinned by a process through which an organization seeks approval from groups in society (Kaplan and Ruland, 1991).

According to new institutional theory, public sector organisations can attain legitimacy by adopting or using structures and procedures that reflect the rules, procedures, and norms that prevail in society (Carpenter and Feroz, 2001; Cavalluzzo and Ittner, 2004; Gigli *et al.*, 2018). More specifically, to obtain legitimacy, managers of public sector organisations may face pressure from stakeholder groups to act and respond in the best interest of the group (Yang and Callahan, 2007; Posner and Stanton, 2014; Palermo, 2014; Carlsson-Wall *et al.*, 2019). A discrepancy between stakeholder expectations and the observed organizational behaviour can lead to a lack of legitimacy for the organization as legitimacy is granted when the organization acts in accordance with the norms and values of its respective audience (Deephouse *et al.*, 2017).

As public administrations provide services to groups such as citizens, non- and for-profit organisations, stakeholders of public administrations are defined as any group or individual who is affected or served by the administration (Mitchell *et al.*, 1997). Since citizens can vote the head of local administrations (major or county head) directly or at least influence the composition of federal governments, they can be understood to be the most relevant stakeholders for public administrations (Hood 2011; Soroka 2006; Weaver 1986). A prominent role in supporting citizens by communicating their expectations and demands to public administrations is fulfilled by the media. In a democracy, the media is perceived as playing "the

role of a watchdog, highlighting policies, political events, public officials' decisions and public service performance" (Lindermüller *et al.*, 2021, p. 4). As an independent guardian, the media is expected to counterbalance the power of public officials and to identify and report problems in the public sector (Lindermüller *et al.*, 2021; Norris, 2014; Soroka, 2006). The political science research shows that the media concentrates on negative information and holds governments accountable rather than highlighting information in a favourable light and complimenting governments (Soroka, 2006; Soroka and McAdams, 2015). This poses high reputation risks to public administrations. As a consequence, appointed public managers or bureaucrats may be concerned that negative information could damage their autonomy and hurt their career prospects (Lindermüller *et al.*, 2021; Carpenter and Krause, 2012; Hood, 2011; Moynihan, 2012).

#### 2.2 Public sector risk management practices

Because of the high relevance of reputational risks as just described before, public institutions and public managers should consider implementing risk management practices to be able to actively assess and manage these risks. Despite of local and cultural specifics, risk management in public administrations should typically be guided by similar "principles and practices" (Collier and Woods, 2011, p. 117). The typical components of risk management, which are addressed by leading international standards such as COSO (2004) or ISO 31000 (International Organization for Standardization, 2018), are the processes of *risk assessment, risk reporting*, and *strategy integration*.

*Risk assessment* supports an organization's understanding of the extent to which potential events might impact its strategy and/or objectives (COSO, 2004). It is an important process to measure and prioritize risks. *Risk assessment* includes the formal sub-processes of *risk identification* and *risk evaluation* (e.g., by measuring the probability of risk occurrence and the extent of damage) (Braumann, 2018; COSO, 2004; COSO, 2017).

*Risk reporting* includes the documentation and communication of risks to the next hierarchical level (COSO, 2004; COSO, 2017) but also to external stakeholders, e.g., the federal audit office. Both sub-processes, risk assessment and risk reporting, are important drivers of risk management effectiveness (Paape and Speklé, 2012; Braumann, 2018).

Researchers and standard setters recommend that risk management serves as an integral part of strategic and operational decision-making in an organization (Epstein and Rejc Buhovac, 2005; Braumann, 2018; COSO, 2017; COSO, 2004). In this context, *strategy integration* is defined as a process that ensures the consideration of risk information in strategic and operational planning and decision making (Braumann, 2018; Epstein and Rejc Buhovac, 2005; Frigo and

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 Anderson, 2011). Such integration of risk information into strategic planning and decision making enables organisations to achieve their goals, e.g., to fulfil their legal mandate. Moreover, strategy integration is found to be essential when overall strategy changes or new initiatives are implemented as new risks may be introduced or existing risks may change in magnitude and degree (COSO, 2004).

## 2.3 Stakeholder pressure and top management support

In the past, it has been shown that stakeholders can mobilize public opinion and have an impact on an organization's image (Hood, 2007; Dai *et al.*, 2014). The previous research also indicates that external stakeholders, such as citizens and the media, respond asymmetrically to positive and negative information when evaluating governments and public organisations. James (2011) shows that poor prior performance of public administrations affects citizens' public service expectations more than excellent prior performance. As a consequence, the tendency of external stakeholders to be biased towards negative information affects the behaviour of individuals within the public sector. Hood (2011, p. 48) states that "victims of negativity bias" will exert a substantial effort "to correct such bias to keep blame at bay." The avoidance of negative information and accordingly blame is crucial to understanding the behaviour of public officials (Lindermüller *et al.*, 2021; Hood, 2007, 2011; Hood and Lodge, 2006; Sulitzeanu-Kenan, 2010; Weaver, 1986).

When stakeholders have the impression that public administrations are not working as expected, they are likely to place pressure on the top management of the public administration. As a consequence, we assume that top managers in particular fear being blamed for negative public information. Public (middle) managers who face stakeholder pressure are, therefore, expected to seek top management support and to forward such pressure to top management. Based on blame theory and new institutional theory, we expect that top management should realize this need for support by changing accounting routines in favour of the stakeholders' claims (ter Bogt and van Helden, 2000). The use of risk management practices can be considered a way to minimize institutional liability and to increase the legitimacy of the respective public administration (Spira and Page, 2003; Fraser and Henry, 2007). Risk management practices do not consist solely of actively identifying, assessing, and reporting risk-relevant activities. Risk information can also be used to develop risk avoidance strategies – and to thereby lower the probability of receiving blame (Lindermüller *et al.*, 2021; Olsen, 2017; Howlett, 2012; Rajala, 2019; Weaver, 1986; Hood, 2002) – to maintain or increase legitimacy. Given this rationale,

top managers should have an incentive to establish risk management practices to reduce stakeholder pressure (Cantor *et al.*, 2014). Thus, we expect that as stakeholder pressure increases, top managers' fear of a loss of legitimacy and their likelihood of supporting the implementation of risk management practices to maintain or enhance legitimacy will increase. Therefore, we hypothesize the following:

Hypothesis 1: Stakeholder pressure has a positive effect on top management's support for the establishment of risk management practices.

#### 2.4 Top management support and risk management practices

Because of their hierarchal status and power of decision making, the top management of an organisation can be expected to impact accounting and control systems (Hiebl, 2014) and to influence organizational actions in a more sophisticated manner (Finkelstein and Hambrick, 1990; Finkelstein and Hambrick, 1996). The previous research has even shown that the support provided by top management determines the degree of sophistication of (newly) implemented accounting practices (Ridder *et al.*, 2006; Kuhlmann *et al.*, 2008; Anessi-Pessina *et al.*, 2008).

The literature further suggests that top management support facilitates the provision of adequate financial and human resources to direct organizational actions (Swink, 2003; Colbert, 2004). Accordingly, in a public administration context, the implementation of risk management as a management accounting tool can perform well only if the top management of the public organization supports its use.

To fulfil stakeholder expectations and to avoid being blamed by the media, we propose that public managers implement sophisticated risk assessment practices in a way that information is available when a negative event occurs. Collier and Woods (2011) show that managing risks is not only enacted through top managers of public administrations who exert influence over risk management policies and methods but also driven by (external) stakeholders' expectations. We propose that these stakeholders' expectations should be reflected in risk assessment, risk reporting, and strategy integration practices. We additionally assume that this approach can only be implemented in a meaningful manner with the existence of top management support. Risk assessment as the first crucial step to the management of risks must be performed to respond to the pressure put forward by stakeholders. When top management perceives high stakeholder pressure, we assume that this motivates them to ask middle managers or financial experts to assess the risks of their organisation. As they want to avoid being blamed, top managers allocate higher resources (e.g., time and money) to risk management practices. As a

consequence, top management expects middle managers and financial experts to perform more thorough risk assessment practices to be able to respond to anticipated stakeholder pressure.

To cope with stakeholders' expectations and to manage media critique, top management should have an incentive to collect information about their administrations' risks for internal and external addresses. This information can be used for updating internal risk assessments and to eradicate the weaknesses discovered but it also enables public managers to adequately communicate with external stakeholders. As a consequence, we expect that when a public administration's top management realizes the benefits of risk management and supports risk reporting practices by providing adequate resources (e.g., time, money, and human) and attention, this approach will have a positive impact on the quality of the public administration's risk reporting practices. Oliveira et al. (2011) state that stakeholders assess legitimacy through monitoring. Therefore, we assume that for external legitimacy purposes (Hassan, 2005), public administrations that face high stakeholder pressure are more likely than others to implement more sophisticated risk reporting practices to satisfy external stakeholders' monitoring expectations. Pressure from stakeholders to report risks and to communicate how risks are handled by public administrations can be understood as an important driver of sophisticated risk reporting practices. To avoid being blamed, top management is also motivated to enhance the implementation of risk monitoring practices. Hence, we expect that stakeholder pressure exerts a positive influence on risk reporting practices and that this relationship is mediated by top management support.

Based on institutional theory, we argue that the more relevant stakeholder expectations are for the legitimacy of a public organization, the more likely it is that they will be considered in the strategic and operational decision-making of that organization. The literature on other business areas shows that managers incorporate stakeholder interests into their managerial decision processes (Phillips *et al.*, 2003; Cantor *et al.*, 2014) and that they will be more likely to take action when they perceive meeting stakeholders' needs as important to the organization's survival (Kolk and Pinkse, 2006; Cantor *et al.*, 2014). We expect that public administrations that perceive higher levels of stakeholder pressure integrate information about risks into their overall strategy more intensively. This is especially the case when stakeholders put forward new initiatives or ask for strategic changes in public administration. Then, the legitimation of the whole organisation can be questioned and reputational risks, in particular, should be considered when reformulating the administration's strategy. As the overall strategy is usually a topic covered by top management, support from top management must be granted to integrate stakeholder expectations and the corresponding challenges for the organisation in the organisation's strategy. Hence, we expect that stakeholder pressure exerts a positive influence on the strategy integration of risk information and that this relationship is mediated by top management support.

Thus, we expect the following:

Hypothesis 2: Top management support has a positive effect on (a) risk assessment practices, (b) risk reporting practices, and (c) the integration of risk aspects into the strategy of public administrations.

Hypothesis 3: Top management support mediates the relationship of stakeholder pressure and the (a) risk assessment practices, (b) risk reporting practices, and (c) strategy integration of a public administration.

Figure 1 shows our research model and the underlying hypotheses.

< Insert Figure 1 about here >

## 3. Research design and method choice

We sent a survey to public financial managers ("Kämmerer") in all German cities and municipalities with more than 20,000 inhabitants (N = 1,000) and to the public financial managers of federal agencies in Germany (N = 79). Similar to Nitzl *et al.* (2020), we assumed that only in municipalities of a certain size will there be a financial manager function in the municipal organization. Typically, public financial managers are on the second hierarchical level of public administrations. They are key informants who are responsible for introducing new accounting practices into their respective administrations (Saliterer and Korac, 2014; Verbeeten and Speklé, 2015). Additionally, this group of participants was selected because they are typically involved in the organization's risk management processes (Lee, 2019) and are considered to be a "determinant force" (Lux and Petit, 2016, p. 266) with regard to the implementation and use of innovations in public administrations.

A pre-test was performed with the employees of the financial department of a district administration. The feedback from the pre-test was integrated into the final questionnaire. To increase the response rate, we used several incentives to participate in this study as suggested by Harzing (1997). We used a paper-pencil approach and distributed the surveys through the national mail service. An accompanying letter from the German Association of Cities and the German Federal Ministry of the Interior, both of which serve as "recommendation committees",

was enclosed. The survey was conducted in fall/winter 2019. We received 147 completed questionnaires, yielding a response rate of 13.6%. After examination of the data, 11 datasets were deleted due to a high number of missing values or due to a consistent response pattern, yielding a response rate of 12.6%. Missing values for indicators were replaced through mean value replacement where less than 5% of values were missing, as suggested by Hair *et al.* (2016). Considering the high hierarchical position of public financial managers, the response rate can be considered acceptable (Harzing, 1997; Hiebl and Richter, 2018). Table 1 shows the responses by the number of inhabitants (municipalities) or the number of employees (federal agencies) and the respondents' age.

#### < Insert Table I about here >

Using a survey to evaluate our proposed hypotheses could be considered precarious as the participants' evaluations are subjective. Subjective measures are more prone to common method variance (CMV) and could be affected by social desirability bias (Song and Meier 2018). Notwithstanding these concerns, there are several reasons why using a survey is a valid approach in our study (Abernethy *et al.*, 2013; Nicolaou *et al.*, 2011). Walker and Andrews (2015) find that in a local government context, studies using archival data are not more robust in terms of overemphasized effects than those using a survey. Due to the complexity and length of the questionnaire employed in this study, the likelihood that the respondents would provide biased estimations based on cognitive maps is quite small (Chang *et al.*, 2010).

Furthermore, several additional actions were taken to reduce CMV. We asked only public financial officers to participate in our survey study. Most of them had been working in the public sector for many years (average of 24.6 years), and, due to their function, they are expected to have good knowledge of the overall and financial situations of their municipality or federal agency (Verbeeten and Speklé, 2015). We granted them anonymity to mitigate the possible effects of social desirability. Additionally, we relied mainly on validated construct measurements (Anderson *et al.*, 2002; Shields, 1995). To account for the single informant approach in this study (Meier and O'Toole, 2013), we included red tape as a marker variable to control for CMV (Chin *et al.*, 2013). This construct is an independent factor. Moreover, it is not part of our research question. Chin *et al.* (2013) can show that 72% of the effect of CMV can be controlled by adding a marker variable in PLS-SEM. We created three versions of the questionnaire. The items in versions 2 and 3 were randomized. Demographic data and sensitive questions remained in all three versions at the end of the questionnaire. We received 41 responses for version 1, 54 responses for version 2, and 52 responses for version 3.

To measure the constructs, we referred to the previous literature. We adjusted the wording of items to fit the public context. All constructs were based on multiple items (Appendix A) and were measured on a 7-point Likert scale. The "stakeholder pressure" construct was based on Lyne's (1992) items on budget pressure. We adjusted these items to fit our context. Therefore, the items asked the participants to evaluate the pressure placed on them to manage risks. The construct involving the operationalization of "support from top management" was based on items developed by Nitzl et al. (2020); the authors refer to Anderson and Young (1999), Shields (1995), and Bouckenooghe et al. (2009). The participants were asked to assess the level of support from the mayor or the head of the administration concerning the implementation and use of risk management practices. The constructs "risk assessment", "risk reporting", and "strategy integration" use items based on Braumann (2018)<sup>1</sup>. The seven items for risk assessment related to the internal risk identification and evaluation process. Risk reporting included seven items to evaluate reporting and documentation standards. To measure strategy integration, we used five items that asked the participants to evaluate the extent to which risk management practices were integrated into strategic planning. We used three items from Giauque et al. (2012) and one item from Moynihan and Pandey (2007), who refer to Pandey and Scott (2002) and Bozeman (2000) for the measurement of the "red tape" construct. Additionally, a few other open questions regarding risk management practices (e.g., who is responsible for RM?) and the respondents' demographic data were also requested (e.g., age, sex, education, years working in the public sector, and type of authority). The latter serve as control variables.

To test complex models with direct and indirect effects, Hair *et al.* (2016) propose the use of partial least squares structural equation modelling (PLS-SEM) to analyse collected data. The respondents in our survey used the full range of possible responses (1 to 7), which indicated a high heterogeneity in the answers. The proportion of missing values in the survey is 0.50%. Based on Hair *et al.* (2019), we used the mean replacement procedure to replace the missing values. The required sample size for detecting statistical power of at least 0.8 at an  $\alpha$ -level of 0.05 is 77 (Nitzl, 2016). Thus, with a sample size of 136, the relevant effects can be detected in our research model.

<sup>&</sup>lt;sup>1</sup> Different from Braumann (2018), we did not include the two dimensions "Risk Awareness" and "Organizational Environment". The construct of "organizational environment" is too close to the construct of "Top Management Support" and was therefore not considered in our research model. Moreover, we consider "Risk Awareness" not as a part of the formal risk cycle. Hence, this construct was also not used answer our research question.

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## 4. Results

The evaluation of the model based on PLS follows a two-stage process (Hair *et al.*, 2019; Hair *et al.*, 2016). First, we evaluate the measurement model. Second, we analyse the inner path model.

Because previously developed construct measurements were used, we used composite confirmatory analysis (CCA) for the assessment of the construct measurements (Hair *et al.*, 2020). The measurement model contained only reflective measures. To evaluate these measurements<sup>2</sup>, we used Cronbach's alpha, which should be greater than 0.7; composite reliability, which should also be greater than 0.7; and average variance extracted (AVE), which should be greater than 0.5 (Hair *et al.*, 2020). Table II contains the values from the assessment of the reflective measurements.

## < Insert Table II about here >

Table II shows that the value for the Cronbach's alpha of stakeholder pressure is slightly lower than the threshold. However, as Cronbach's alpha generally underestimates internal consistency reliability in PLS-SEM, composite reliability provides a more appropriate measure in a PLS-SEM context (Nitzl, 2016; Werts *et al.*, 1974). Therefore, we retained the construct and its related items. All other quality criteria for the measurements are fulfilled. The loadings and the composite reliability are above the critical value of 0.708. However, several items (SP1, SP3, TMS4, RA1, SI4, RT1, RT2, and RT3) were deleted because of low loadings. The deleted items are also reported in the appendix. Although the loadings for SP5 are slightly below the critical value of 0.708, we retained them for the construct measurement because they show acceptable values for composite reliability and AVE. To account for multicollinearity issues, we analysed the inner VIF values of our research model. All values [1.033;2.385] are below the critical value of 5 (Hair *et al.*, 2016).

To assess the inner model, we performed a two-tailed bootstrap test with 5,000 subsamples. The results are shown in Table III. The path coefficient from stakeholder pressure to top management support is highly significant (0.448, p = 0.000). This finding supports hypothesis H1, in which we assumed that stakeholder pressure exerts a positive influence on top management support for risk management practices. Furthermore, the path coefficients from

<sup>&</sup>lt;sup>2</sup> Appendix B provides the correlations of constructs and control variables.

top management support to risk assessment (0.542, p = 0.000), risk reporting (0.548, p = 0.000), and strategy integration (0.576, p = 0.000) are all highly significant. These findings support hypotheses H2a, H2b, and H2c, in which we hypothesized that there is a positive influence of top management support on risk management practices, specifically, risk assessment, risk reporting, and strategy integration. All control variables are nonsignificant.

## < Insert Table III about here >

To assess the mediation effect, we followed Nitzl *et al.* (2016) and Sarstedt *et al.*'s (2020) approach by using only PLS-SEM. According to Nitzl *et al.* (2016), mediation exists if the indirect effect is significant. If the direct effect is nonsignificant, full mediation exists; otherwise, partial mediation exists (Nitzl *et al.*, 2016). The results of the total, indirect, and direct effects, as well as the bias-corrected confidence intervals with a significance level of 0.05 in a two-tailed test, are given in Table IV. If zero is not included in the confidence intervals, the effect is significant at the level of 0.05. The results in Table IV indicate that only indirect effects via the mediator top management support exist, which constitutes full mediations and supports H3a, H3b, and H3c.

< Insert Table IV about here >

#### 5. Discussion

The results support hypothesis 1. This finding is in line with Wouters *et al.* (2005) who conclude "that both top management and functional management observe the environment of the organization and respond to it" (p. 175). As the top managers of a local public administration are typically elected by citizens, they likely examine the environment to respond to upcoming risks or opportunities. Political actors – in this paper, mayors and agency heads – must secure their legitimacy through participation and effectiveness (Blühdorn, 2009) to increase their chances of re-election or re-appointment and to avoid blame (Hood, 2007; Rajala, 2019). Risk management helps them fulfil their responsibilities more effectively and efficiently. Hence, this finding supports the literature on blame avoidance as we can show that risk management can be practiced to better avoid being blamed by external stakeholders.

Our data also support hypothesis 2. Hence, top management support can be understood as crucial for the implementation of new accounting systems. This finding expands upon the previous risk management research (Cavalluzzo and Ittner, 2004; Wouters *et al.*, 2005; Ifinedo,

2008; Bodemann *et al.*, 2015; Beasley *et al.*, 2005; Yigitbasioglu, 2017). We can now show that top management support is not only highly relevant for implementing accounting tools, such as risk management practices, in private organisations. We show that top management support positively influences risk assessment, risk reporting, and strategy integration more or less equally among public organisations. This indicates that all three steps are equally important when managing risks in public administrations. Nevertheless, we know from the previous research that top management support does not always remain stable over time. Top management may frequently rotate into and out of their positions in public administration. As Posner and Stanton (2014) note, "this can create a short-term perspective that precludes setting a tone at the top about risk management" (p. 65). Additionally, it is uncertain whether a newly appointed top manager will aim to keep existing risk management practices; it depends on the goals and priorities of the successor and how the newly appointed top manager wishes to boost his or her reputation through new initiatives (Posner and Stanton, 2014).

Running a mediation analysis, we find support for hypotheses 3a, 3b, and 3c. Hence, there is a full mediation of top management support on the relationship between stakeholder pressure and the three risk management practices in place. This finding suggests that stakeholder pressure exerts an impact when top management is aware of such pressure and supports risk management practices to reduce it. With this result, this study aligns with the stakeholder literature, e.g., Collier and Woods (2011), who show that managing risks should be driven by the expectations of external stakeholders and should be enacted through public managers who exert influence over risk management policies and methods. It becomes apparent that the sophistication of risk management practices depends not only on the pressure directed by stakeholders but also on internal support from the organization's top management.

#### 6. Conclusion

This study proposes a model to examine the relationship of stakeholder pressure on risk management practices in German public administrations, which do not have a clear legal obligation to implement risk management systems. A particular focus is given to top management support that mediates the proposed relationship. Based on survey data from public financial managers, we find a full mediation of top management support on the relationship of stakeholder pressure and risk management practices. Therefore, we can conclude that top management support is crucial for the implementation and sophistication of risk management practices in public administrations. Hence, top management support leads to a higher level in

the sophistication of risk management practices when it perceives high levels of pressure put forward by stakeholders.

Based on our findings, we can sensitize public financial managers in business practice that they must encourage their top management to invest time and money in risk management practices to adequately respond to pressures from external stakeholders. Therefore, management attention must be generated, which can be achieved by showing that risk management practices boost public administrations' efficiency and effectiveness and can reduce the danger of a public institution being blamed for unfavourable behaviour and decision making. Single case studies, e.g., Motel and Richter (2016), provide guidelines on how to establish and operate a risk management system in practice.

Like any study, this study faces limitations, some of which are discussed, alongside the actions adopted to mitigate them, in the research design section. First, several actions were taken to reduce the risks of CMV. However, this study may suffer from limitations related to its basis in self-reported responses. Second, the measure of stakeholder pressure used in this paper is based on perceptions rather than archival data. This approach has both advantages and disadvantages. On the one hand, subjectivity may reduce accuracy. On the other hand, it allows reliance on the views of key informants who should be well aware of their work environment. Additionally, subjective measurements have been found to be more inclusive and able to capture more heterogeneous aspects that are difficult to measure with archival data (Kroll, 2015). Third, the response rate remains in line with the limited rates that are usually registered in Europe (Nitzl *et al.*, 2019). Several incentives were provided to obtain the minimum number of participants required to assess the structural equation model. Fourth, we focus solely on a German sample. However, we have explained why a focus on German public administrations is necessary. Moreover, we respond to the call for more papers spotlighting German public administrations in the international research (Wegrich, 2020).

Future research could advance this field of study by focusing on other countries with different institutional logics and basic conditions (e.g., statutory requirements). Countries such as the UK and Switzerland have organizational handbooks on risk management practices. It would be of interest to determine whether stakeholders can still influence the risk management practices in those countries with the same intensity. Moreover, Germany is a civil law country (Kuhlmann and Wollmann, 2013; Rosengart *et al.*, 2018). Other findings might be valid for common law countries. Lastly, the research area could be advanced by adding organizational variables, such as performance or transparency, to the research model.

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Appendix

< Insert Appendix A about here >

Figure 1. Research model.



		< 20,000	2	
		20,001-50,000	59	
		50,001-100,000	21	
lities	Number of	100,001-200,000	22	
cipa	inhabitants	200,001-300,000	9	
Auni		300,001-400,000	5	
4		> 400,000	4	
		Missing values	0	
		Sum # inhabitants	122	
		< 100	1	
		101-500	3	
es		501-1,000	1	
enci	Number of	1,001-1,500	2	
al ag	employees	1,501-2,000	2	
edera		2,001-2,500	2	
F.		> 2,501	3	
		Missing values	0	
		Sum # employees	14	
		Total	136	
		18 to 29 years	5	
		30 to 39 years	17	
	Age	40 to 49 years	40	
		50 to 59 years	53	
		Older than 60 years	18	
		Missing values	3	
		Total	136	

## Table II. Evaluation of the constructs.

2.		Converg Validi	gent ty	Internal Co Relia	onsistency bility	Discriminant Validity
	Indicators	Loadings	AVE	Cronbach's Alpha	Composite Reliability	HTMT
Critical values <sup>1</sup>		> 0.708	> 0.5	> 0.7	> 0.7	HTMT confidence interval does not include 1
	RA2	0.827				
	RA3	0.794				
Risk Assessment	RA4	0.730	0.631	0.883	0.011	Vec
(RA)	RA5	0.733	0.051	0.005	0.911	103
	RA6	0.859				
	RA7	0.814				
	RR1	0.840				
	RR2	0.766				
	RR3	0.748				
Risk Reporting (RR)	RR4	0.749	0.670	0.917	0.934	Yes
	RR5	0.877				
	RR6	0.868				
	RR7	0.868				
	SI1	0.826				
Strategy Integration	SI2	0.748	0.630	0 808	0.871	Yes
(SI)	SI3	0.741	0.020	0.000	0.071	105
	SI5	0.854				
Stakeholder Pressure	SP2	0.721				
(SP)	SP4	0.808	0.525	0.575	0.767	Yes
	SP5	0.635				
	TMSI	0.900				
Top Management	TMS2	0.922	0.828	0.931	0.951	Yes
Support (IMS)	TMS3	0.938				
	TMS5	0.880				
Red Tape (RT)	RT4	0.755	0.753	0.729	0.857	Yes
······································	RT5	0.970				

<sup>1</sup> Thresholds of the quality criteria needs to be met. Each threshold is stated for each quality criteria.

	Table	III.	Path	coefficients	and	р	values
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	Management Support	Risk Assessment	Risk Reporting	Strategy Integration	
Stakeholder Pressure	0.448***	0.010	-0.015	-0.082	
Top Management Support	7 -	0.542***	0.548***	0.576***	
Red Tape <sup>1</sup>	-	-0,110	-0.028	0.072	
Age <sup>2</sup>	°C-	-0.067	-0.135	0.052	
Gender <sup>2</sup>	0	-0.067	-0.046	-0.072	
Education <sup>2</sup>	3	-0.071	-0.037	-0.054	
Years Working in the Public Sector <sup>2</sup>	-	0.022	0.079	0.002	
Type of Authority <sup>2</sup>	-	-0.089	-0.091	-0.032	
R Square	-	0.358	0.333	0.311	
R Square Adjusted	-	0.317	0.291	0.267	
**, **, * Indicate sign Marker variable; <sup>2</sup> Coi	ntrol variables.	sent, 5 percent, and	10 percent levels (t	wo-tailed).	
**, **, * Indicate sign Marker variable; <sup>2</sup> Cor	ntrol variables.	eent, 5 percent, and	10 percent levels (t	wo-tailed).	

## Table IV. Evaluation of mediation effects.

		Total Effec	ets	Indirect Ef	fects <sup>3</sup>	Direct Effe	ects
Relations	Hypotheses <sup>2</sup>	Coefficient	95% confidence interval <sup>1</sup>	Coefficient	95% confidence interval <sup>1</sup>	Coefficient	95% confidence interval <sup>1</sup>
Stakeholder Pressure ->		0.252	[0.009:0.265]			0.010	[ 0 147.0 146]
Risk Assessment		0.233	[0.098,0.303]	-	-	0.010	[-0.147,0.140]
Stakeholder Pressure ->							
Top Management Support -> Risk	H1 x H2a		-	0.243	[0.162;0.331]	-	-
Assessment							
Stakeholder Pressure ->		0.221	[0.096.0.220]			0.015	[0.161.0.115]
Risk Reporting		0.231	[0.080,0.339]	-	-	-0,013	[-0.101,0.115]
Stakeholder Pressure ->							
Top Management Support -> Risk	H1 x H2b	-		0.245	[0.168;0.331]	-	-
Reporting							
Stakeholder Pressure ->		0.177	[0 004:0 215]			0.082	[ 0 245.0 084]
Strategy Integration		0.177	[0.004,0.313]	<u> </u>	-	-0,082	[-0.243,0.084]
Stakeholder Pressure ->							
Top Management Support ->	H1 x H2c	-	-	0.258	[0.185;0.342]	-	-
Strategy Integration							

Strategy Integration <sup>1</sup> <sup>1</sup> If the interval does not include 0, the relation is significant. <sup>2</sup>For a mediation, the path coefficients of the respective paths are multiplied. <sup>3</sup> A mediation exists if the indirect effect is significant. If the direct effect is non-significant, either a complementary (positive paths) or competitive (negative paths) mediation exists.

## Appendix A. Constructs and their references

Construct	Label	Items	References
	SP1 <sup>1</sup>	I feel pressured by interest groups (e.g., business, citizens, the public, politicians) to manage risks.	
	SP2	I see the need to manage risks.	
Stakeholder Pressure	<del>SP3</del>	More pressure from interest groups to control risks helps public administration better exercise its public mandate.	Lyne (1988 1992)
	SP4	In recent years, the pressure on public administration to manage risks has increased.	
	SP5	I feel pressure from stakeholders to address the risks of public administration.	
	TMS1	Our head of administration is fully behind the introduction of risk management.	
-	TMS2	Our head of administration supports the intensive implementation of risk management.	
Top Management Support	TMS3	Our head of administration places a high priority on the implementation of risk management.	Nitzl et al. (2020)
	TMS4	The head of administration is only slightly interested in information on risk management.	
	TMS5	The administration is fully supported by the head of administration in the management of risks.	
	RA1	The identified risks are checked for plausibility by the respective supervisor.	
	RA2	Relevant risks are recorded correctly.	
	RA3	Relevant risks are recorded on time.	
Risk	RA4	All major risks are evaluated quantitatively (e.g., in $\in$ ) as much as possible.	
Assessment	RA5	All major risks are reviewed for their interdependencies.	
	RA6	Risks resulting in damage are thoroughly analysed with regard to the amount of damage.	Braumann (2018)
	RA7	An assessment of identified risks is carried out by our federal authority.	(2010)
	RR1	Our public administration has established a uniform reporting process for ad-hoc risks.	
Risk Reporting	RR2	Authority-wide, explicit tolerance limits or levels have been established for all major risk categories.	
	RR3	The risks evaluated are clearly documented.	
	RR4	The risks evaluated are reported to the top management regularly.	



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	RR5	The extent of a risk is reported in a standardized form throughout our public administration.	
	RR6	The monitoring measures of risks are reported in a standardized form throughout our public administration.	
	RR7	Risk reporting is an established process in our public administration.	
	SI1	Risk management is included in the organization's target system in the form of key performance indicators.	
	SI2	Risk management is quantitatively (e.g., in $\in$ ) included in the administration's planning.	
Strategy Integration	SI3	Key performance indicators are used for risk reporting.	
	<del>SI</del> 4	In the individual departments, early indicators are used for risk monitoring.	
	SI5	Information on the handling of risks is incorporated into the strategy.	
	<del>RT1</del>	In my community, even small matters need to be referred to a higher hierarchical employee to make a final decision.	
	RT2	I always have to consult with my boss before I make an important decision.	Giauque et al.
Red Tape	<del>RT3</del>	It is very important to the municipality that the procedural rules be followed.	(2012) and Moynihan and Pandey (2007)
	RT4	I would rate the level of bureaucracy in relation to other municipalities as high.	1 undey (2007)
	RT5	In our municipality, processes are determined by a high degree of bureaucracy.	
<sup>1</sup> Items that are cro	ossed out w	ere deleted due to insufficient loadings.	

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Age											
Agency Form	-0,026										
Education	0,027	0,250***									
Risk Assessment	0,029	-0,210**	-0,083								
Risk Reporting	-0,006	-0,208*	-0,061	0,714***							
Red Tape	-0,060	0,029	-0,076	-0,169	-0,092						
Strategy Integration	0,114	-0,145	-0,044	0,591***	0,679***	-0,023					
Stakeholder Pressure	0,122	-0,093	-0,054	0,227**	0,227***	0,257**	0,203**				
Gender	-0,040	-0,120*	-0,078	-0,047	-0,025	-0,006	-0,054	0,074			
Top Management Support	0,126	-0,201**	0,023	0,570***	0,556***	-0,127	0,542***	0,448***	0,014		
Years in Public Sector	0,718***	-0,088	-0,215**	0,084	0,078	0,014	0,130	0,166**	-0,061	0,148*	
*, * Indicate significa	ance at the 1 pe	ercent, 5 percent	, and 10 percer	nt levels (two-tai	lled).						
	Agency Form Education Risk Assessment Risk Reporting Red Tape Strategy ntegration Stakeholder Pressure Gender Fop Management Support Years in Public Sector *, * Indicate significa	Agency Form-0,026Education0,027Risk Assessment0,029Risk Reporting-0,006Red Tape-0,060Strategy0,114Other Strategy0,114Stakeholder0,122Pressure-0,040Fop Management0,126Support0,718***Sector*, * Indicate significance at the 1 per	Agency Form       -0,026         Education       0,027       0,250***         Risk Assessment       0,029       -0,210**         Risk Assessment       0,029       -0,208*         Red Tape       -0,060       0,029         Strategy       0,114       -0,145         Stakeholder       0,122       -0,093         Gender       -0,040       -0,120*         Top Management       0,126       -0,201**         Vears in Public       0,718***       -0,088         Sector       0,718***       -0,088	Agency Form       -0,026         Education       0,027       0,250***         Risk Assessment       0,029       -0,210**       -0,083         Risk Reporting       -0,006       -0,208*       -0,061         Red Tape       -0,060       0,029       -0,076         Strategy       0,114       -0,145       -0,044         Strategy       0,122       -0,093       -0,054         Strategive       0,122       -0,093       -0,078         Gender       -0,040       -0,120*       -0,078         Gop Management       0,126       -0,201**       0,023         Years in Public       0,718***       -0,088       -0,215**         *, * Indicate significance at the 1 percent, 5 percent, and 10 percent       ****	Agency Form         -0,026           Education         0,027         0,250***           Risk Assessment         0,029         -0,210**         -0,083           Risk Reporting         -0,006         -0,208*         -0,061         0,714***           Red Tape         -0,060         0,029         -0,076         -0,169           Strategy         0,114         -0,145         -0,044         0,591***           Stakeholder         0,122         -0,093         -0,054         0,227**           Gender         -0,040         -0,120*         -0,078         -0,047           Top Management         0,126         -0,201**         0,023         0,570***           Stector         0,718***         -0,088         -0,215**         0,084           *, * Indicate significarce at the 1 percent, 5 percent, and 10 percent levels (two-tails)	Agency Form-0,026Education0,0270,250***Risk Assessment0,029-0,210**-0,083Risk Reporting-0,006-0,208*-0,0610,714***Red Tape-0,0600,029-0,076-0,169-0,092Strategy Integration0,114-0,145-0,0440,591***0,679***Stakeholder Pressure0,122-0,093-0,0540,227**0,227***Gender-0,040-0,120*-0,078-0,047-0,025Fop Management Support0,126-0,201**0,0230,570***0,556***Stector0,718***-0,088-0,215**0,0840,078*, * Indicate significarce at the 1 percent. 5 percent. at 10 percent levels (two-tailed).	Agency Form-0,026Education0,0270,250***Risk Assessment0,029-0,210**-0,083Risk Assessment0,006-0,208*-0,0610,714***Red Tape-0,0600,029-0,076-0,169-0,092Strategy Integration0,114-0,145-0,0440,591***0,679***-0,023Stakeholder Pressure0,122-0,093-0,0540,227**0,227***0,257**Gender-0,040-0,120*-0,078-0,047-0,025-0,006Fop Management Support0,126-0,201**0,0230,570***0,556***-0,127Op Management Sector0,718***-0,088-0,215**0,0840,0780,014Sector0,718***-0,088-0,215**0,0840,0780,014	Agency Form-0,026Education0,0270,250***Risk Assessment0,029-0,210**-0,083Risk Reporting-0,006-0,208*-0,0610,714***Red Tape-0,0600,029-0,076-0,169-0,092Strategy Integration0,114-0,145-0,0440,591***0,679***-0,023Stakeholder Pressure0,122-0,093-0,0540,227**0,227***0,257**0,203**Gender-0,040-0,120*-0,078-0,047-0,025-0,006-0,054Stakeholder Pressure0,126-0,201**0,0230,570***0,556***-0,1270,542***Gender-0,040-0,120*-0,0230,570***0,556***-0,1270,542***Support Support0,718***-0,088-0,215**0,0840,0780,0140,130*, * Indicate significance at the 1 percent, s percent, and 10 percent levels (two-tailed).	Agency Form       -0,026         Education       0,027       0,250***         Risk Assessment       0,029       -0,210**       -0,083         Risk Reporting       -0,006       -0,208*       -0,061       0,714***         Red Tape       -0,060       0,029       -0,076       -0,169       -0,092         Strategy Integration       0,114       -0,145       -0,044       0,591***       0,679***       -0,023         Strategy Integration       0,122       -0,093       -0,054       0,227***       0,257***       0,203**         Stateholder       0,126       -0,201**       0,023       0,570***       0,556***       -0,127       0,542***       0,448***         Gender       -0,040       -0,120*       0,023       0,570***       0,556***       -0,127       0,542***       0,448***         Support       0,126       -0,201**       0,023       0,570***       0,556***       -0,127       0,542***       0,448***         Sector       0,718***       -0,088       -0,215**       0,084       0,078       0,014       0,130       0,166**         ** * Indicate significate	Agency Form       -0,026         Education       0,027       0,250***         Kisk Assessment       0,029       -0,210**         Opport       -0,061       0,714***         Kisk Reporting       -0,060       -0,028         Opport       -0,060       -0,076       -0,169       -0,023         Strategy       -0,114       -0,145       -0,044       0,591***       0,27***       0,203**         Strategy       -1,122       -0,093       -0,054       0,227***       0,257***       0,203**         Strategy       -1,120*       -0,078       -0,047       -0,025       -0,006       -0,054       0,074         Strategy       -1,120*       -0,078       -0,047       -0,025       -0,006       -0,054       0,074         Strategy       -0,120*       -0,078       -0,047       -0,025       -0,006       -0,054       0,074         Strategy       -0,120*       -0,078       -0,047       -0,025       -0,006       -0,054       0,074         Strategy       -0,120*       -0,021***       0,084       0,078       0,014       0,130       0,166**       -0,061         Strategy       -0,18***       -0,088       -0,215**	Agency Form       0,025         5ducation       0,027       0,250***         Kisk Assessmen       0,029       -0,210**       -0,083         Kisk Reporting       -0,006       -0,208       -0,010       -0,114***         Red Tape       -0,060       0,029       -0,076       -0,169       -0,092         Strategy Integration       0,114       -0,145       -0,044       0,591***       0,679***       -0,023         Strategy Integration       0,122       -0,093       -0,054       0,227**       0,257**       0,203**         Terssure       -0,120       -0,078       -0,047       -0,025       -0,006       -0,054       0,074         Gender       -0,040       -0,120*       -0,078       0,074       -0,127       0,542***       0,448***       0,014         Gender       -0,040       -0,215**       0,084       0,078       -0,127       0,542***       0,448***       0,014         Starkeholder       -0,120*       -0,088       -0,215**       0,084       0,078       0,130       0,166**       -0,061       0,148**         Starkeholder       -0,128       -0,088       -0,012       0,130       0,166***       -0,061       0,148***

Item	Mean	$SD^1$	Median	Min	Max <sup>2</sup>	Excess Kurtosis	Skewness
RA2	4.415	1 598	4	1	7	-0.712	-0.251
RA3	4.141	1.329	4	1	7	-0.339	-0.032
RA4	4.593	1.705	5	1	7	-1.044	-0.269
RA5	5.221	1.365	5	2	7	-0.649	-0.407
RA6	4.433	1.619	5	1	7	-0.695	-0.247
RA7	4.585	1.701	5	1	7	-0.704	-0.472
RR1	5.632	1.727	6	1	7	0.917	-1.374
RR2	5.971	1.328	7	2	7	0.875	-1.279
RR3	4.647	1.877	5	1	7	-0.825	-0.529
RR4	4.199	1.874	4	1	7	-1.112	-0.096
RR5	5.669	1.659	6	1	7	0.836	-1.318
RR6	5.654	1.620	6	1	7	0.731	-1.263
RR7	5.272	1.730	6	1	7	0.133	-0.988
SI1	5.904	1.408	6	1	7	1.948	-1.489
SI2	5.184	1.525	-6	1	7	-0.643	-0.579
SI3	6.154	1.130	7	2	7	2.954	-1.668
SI5	5.390	1.496	6	1	7	0.339	-0.917
SP2	2.213	1.134	2	1	5	-0.186	0.795
SP4	4.110	1.722	4	1	7	-1.032	0.028
SP5	5.074	1.634	6	<b>O</b> 1	7	-0.451	-0.661
TMS1	3.722	1.678	4	1	7	-0.868	0.207
TMS2	4.272	1.606	4	1	7	-0.895	-0.119
TMS3	4.257	1.627	4	1	7	-0.821	-0.123
TMS5	4.169	1.588	4	1	7	-0.807	-0.070
RT4	4.567	1.595	5	1	7	-0.678	-0.358
RT5	3.726	1.493	4	1	7	-0.655	0.304
<sup>1</sup> Standard Devi	iation. <sup>2</sup> A 7-p	oint Likert-scal	e was applied.				

Appendix C. Descriptive Statistics.