A Systems Approach on Collective Voice: Understanding the role of collective voice in the organization

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Abstract: *Grounded in the behavioral theory and collective voice model, I examine the effect of collective voice on organizational performance. I take a systems approach and view collective voice as a part of a system of HR practices, and examine how collective voice interacts with the other practices in the system. Results, based on a unique automated content analysis technique, revealed that there is a positive relationship between collective voice and organizational performance. Furthermore, the outcomes show a positive interaction effect between collective voice and HR practices based on the enhancing of the motivation of employees. The presented findings hold relevance for the literatures on collective voice and human resource management, inserting collective voice as an important practice within a system of HR practices.*

Introduction

Employees frequently face situations where they want to speak up and let their opinion be known on work-related issues (Bashshur & Oc, 2015). When employees speak up they are able to offer information, their ideas on problems, and opportunities for improvements, and they are thus able to affect organizational outcomes (Addison, 2001; Bashshur & Oc, 2015; Freeman & Lazear, 1994). This behavior is seen as expression of voice. Voice can be defined as "any type of mechanism, structure, or practice, which provides an employee with an opportunity to express an opinion or participate in decision-making within their organization" (Lavelle, Gunnigle, & McDonnell, 2010, p. 396). In literature a distinction is made between individual (direct) voice and collective (indirect) voice (Bashshur & Oc, 2015; Freeman & Lazear, 1994; Lavelle et al., 2010). Since individual voice is something that has been widely researched, whereas collective voice is not (Detert, Burris, Harrison, & Martin, 2013) and is in line with the dataset, the focus of this thesis is on the latter. It is believed that voice - both individual and collective - improves communication and therefore improves organizational efficiency (Freeman & Lazear, 1994). Voice can be beneficial in solving organizational bottlenecks because employees can have useful input in finding solutions for these problems, and give employees more control over their own working conditions and work security (Addison, 2001; Freeman & Medoff, 1984). This leads them to stay more loyal to the firm in the long run and thus invest extra to the benefits of the organization (Addison, Schnabel, & Wagner, 2004; van Den Berg, Grift, van Witteloostuijn, Boone, & Van der Brempt, 2013). In situations like a crisis or reorganization, where the financial situation is under pressure and future existence of the organization is at stake, this could be especially useful. Since the benefits of voice are expected to lead to increased organizational performance, which is the main motivator of most organizations (Bashshur & Oc, 2015; Freeman & Medoff, 1984).

In recent years, voice has come to the attention of researchers in human resource management (Detert et al., 2013; Wilkinson & Fay, 2011). Following their view, the mechanism through which voice is expressed is an HR practice which can provide concrete advantages to employers (Bashshur & Oc, 2015; Marchington, 2009). Despite the theoretical logic that voice has a positive effect on organizations, the empirical outcomes turn out to be inconsistent. For example, J. Kim, MacDuffie, & Pil (2010) find a positive relationship between team voice and productivity, whereas Delery & Doty (1996) find no impacts of voice on performance. This empirical inconsistency is especially a problem in the outcomes of voice for the larger groups, units, and organizations. Since most of the past research has focused on the individual outcomes of voice (e.g., Burris, 2012; Whiting, Podsakoff, & Pierce, 2008), there is little known about whether voice is beneficial for the collective and, if so, the conditions under which it will be beneficial (Detert et al., 2013; Mackenzie, Podsakoff, & Podsakoff, 2011).

This thesis extends on recent research directed to provide a better understanding of collective voice, which suggests that collective voice will be beneficial for organizational performance (Bashshur & Oc, 2015; Mackenzie et al., 2011; Mueller, 2015). Consistent with prior research (Dalton, Daily, Certo, & Roengpitya, 2003; Huselid, 1995; Shaw, Park, & Kim, 2013; Tangpong, Abebe, & Li, 2015), the widely used measure of return on equity is used to measure the organizational performance. Drawing on human resource management and following the paper of Mackenzie et al. (2011), I adopt a theoretical lens where the effects are looked at by investigating the system of HR practices. Certainly, collective voice and the pathways through which it influences the organization have often been viewed as an individual effect (Detert et al., 2013), and while the theoretical groundings suggest a positive relationship, the understanding is still limited. Following the paper of Mackenzie et al. (2011)

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and the suggestion of Bashshur & Oc (2015), I take a systems approach where collective

voice is seen as a part of a system of HR practices. A system of HR practices is the

combination of individual HR practices that are used by the organizations, respectively

(Chowhan, 2016; Lepak, Liao, Chung, & Harden, 2006). I see collective voice as a part of

such a system of HR practices, rather than viewing voice as an individual effect. This is done

by embracing the ability – motivation – opportunity (AMO) framework (Appelbaum, 2000),

which is a basic, but helpful, structure for this kind of research which focusses on

organizational performance (Boxall, Guthrie, & Paauwe, 2016). Systems of HR practices are

comprised of multiple HR practices, in the three domains of the AMO framework, that are

each instrumental in its composition and effectiveness (Appelbaum, 2000; Chuang, Jackson,

& Jiang, 2016; Lepak et al., 2006). HR research goes by the basic assumption that the

effectiveness of a practice is interdependent on the other practices in the system (Jiang,

Lepak, Hu, & Baer, 2012). So, in order to understand collective voice and the pathways

through which it influences the organization, it has to be seen as part of the system in which it

interacts (Bashshur & Oc, 2015), like Mackenzie et al. (2011) have done.

Traditionally, large interest has been paid to the ability and motivation domains of the

AMO framework, whereas the opportunity domain has been under-researched and less well

developed (Boxall et al., 2016; Chowhan, 2016). Collective voice as an HR practice falls

under the opportunity domain of the AMO framework within the system of HR practices,

since it offers employees the opportunity to express their voice (Addison, 2005; Jiang et al.,

2012). By taking the systems approach, this thesis will contribute to the development of the

AMO framework by giving more insights in how HR practices related to the opportunity

domain have their effects on the system as a whole, and the organizational performance.

Following recent research, I assess the system of HR practices following a behavioral perspective (e.g., Aryee, Walumbwa, Seidu, & Otaye, 2016; Jiang et al., 2012; Shin & Konrad, 2017). In order to understand collective voice in the system of HR practices, the collective voice model is weaved together with the behavioral perspective as suggested by Bashshur & Oc (2015). These two theories provide the framework to view the whole system, zoom in on collective voice as an HR practice, and understand the pathways through which the system and individual practices influences the organizational performance.

Specifically, I examine how collective voice influences organizational performance as an individual practice. In addition, and in line with the systems approach, I examine how other practices in systems of HR practices influence the organizational performance. And in order to fully understand the pathways through which collective voice affects the organizational performance, I examine the interaction effects of collective voice in combination with the other practices in the system of HR practices.

Based on the content analysis of collective labor agreements (CLAs) of 325 Dutch organizations, this study accounts for the role of collective voice - in combination with other HR practices – in influencing organizational performance. The data is extracted from the CLAs using a newly developed text-mining script. This script automates traditional content analysis by analyzing document in a digital way using so called *regular expressions* (Goyvaerts, 2006). The biggest advantage is that this software enables the number of analysed documents to be higher than in the traditional content analysis. This research shows some of the potential of this modern technique and hopes to contribute to the modernization of research techniques in our field.

Theoretical Background

Definition of voice

In the classic work of Hirschman (1970, p.30), *Exit, Voice, and Loyalty* (EVL), voice was defined as "any attempt at all to change rather than to escape from an objectionable state of affairs." EVL is still referred to by many authors to describe employee voice (Bashshur & Oc, 2015; Budd, Gollan, & Wilkinson, 2010; Marchington, 2009; Mueller, 2015; Wilkinson & Fay, 2011). Following EVL, employees are faced with a difference between desired and actual conditions in the workplace. To deal with this difference he or she can do two things; either exit the organization and search for better employment or engage in voice discussing with the employer the conditions that need changing without quitting the job. The definition of Hirschman is, even admitted by himself, a messy construct, which ranges from "faint grumbling to violent protest" (Hirschman, 1970, p.16). This leads to a range of literatures using different elements of the construct (Bashshur & Oc, 2015). In this thesis, a more modern approach is used to specifically look on voice that is acquired via a legal way.

To do so, the definition is expanded by modern works that are building on EVL, such as the collective voice model (Freeman & Medoff, 1984), voice in organizational citizenship behaviours (Mackenzie et al., 2011) and other works building on EVL like the papers of Lavelle, Gunnigle, & McDonnell (2010), Bashshur & Oc (2015), and Marchington (2009). Bashshur & Oc (2015, p.1531) note that voice is "discretionary or formal expression of ideas, opinions, suggestions, or alternative approaches directed to a specific target inside or outside of the organization with the intent to change an objectionable state of affairs and to improve the current functioning of the organization, group, or individual." Lavelle, Gunnigle, & McDonnell (2010, p.396) describe it in the following way: "Any type of mechanism, structure, or practice, which provides an employee with an opportunity to express an opinion

or participate in decision-making within their organization." The latter puts more emphasis on the mechanism through which voice is enabled, which corresponds with the view of Marchington (2009) of voice as practices which are designed to allow workers some say in the organization. Following this approach, the mechanism through which voice is implemented is an HR practice (Bashshur & Oc, 2015; Marchington, 2009), which is most in line with the perspective taken in this thesis.

As aforementioned, two different voice mechanisms can be distinguished; individual (direct) voice - on which this thesis focusses - and collective (indirect) voice (Bashshur & Oc, 2015; Freeman & Lazear, 1994; Lavelle et al., 2010). Individual voice mechanisms give employees direct involvement in managerial decision making affecting their jobs and work environment (Lavelle et al., 2010). Collective voice involves the articulation of workers views and input via some form of collective employee representation (Lavelle et al., 2010). Since individual voice is something that has been widely researched, whereas collective voice is not (Detert et al., 2013) and is in line with the dataset, the focus of this thesis is on the latter. This choice somewhat limits the generalizability of the results, since they can only be generalized to situations where collective voice is in play. However, it contributes to the still limited understanding of collective voice.

Works councils provide employees of such a collective voice mechanism where the workers' voices can be expressed (Lavelle et al., 2010; Mueller, 2015). It creates multiple opportunities for the employees to express their voice (Addison, 2005; Sapulete, van Witteloostuijn, van den Berg, & Grift, 2011; Van Den Berg, Grift, & Van Witteloostuijn, 2011). For example, a works council has the right to give advice on many strategic decisions, irrespective of whether the direct interests of the employees are at stake (Van het Kaar,

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2008). Furthermore, it has the right of initiative – that is, to come up with ideas on how to improve organizational matters (Sapulete et al., 2011). In addition, works councils have the right to be informed on all relevant matters which enables them to express their voice more elaborately (Addison et al., 2004; Mueller, 2015). This thesis will focus on works councils as an HR practice for collective voice.

Voice and organizational performance

Collective voice, as in the works examining organizational performance, is often operationalized in the presence of a formal voice channel (Bashshur & Oc, 2015; Budd et al., 2010), such as the aforementioned works councils. Research on the effects of collective voice on group levels outcomes, such as organizational performance, remains scant, with limited theoretical or empirical work (Detert et al., 2013). Most theoretical rationale revolves around the work of Freeman & Medoff (1984) who adapted EVL into the collective voice model for elaborating on the effects of a collective voice mechanism on organizational performance. The underlying assumption of voice as enabler for suggestions of better ways of doing things and correcting problems (Bashshur & Oc, 2015; Mueller, 2015), leads to the expectance of a positive effect. When voice channels are existing within the organizations, employees become more satisfied and commited to the organization. They will try harder and engage in more productive behaviors. This will lead to improved individual performance and likewise into better organizational performance (Bashshur & Oc, 2015; Freeman & Medoff, 1984).

While there is the theoretical expectance of a positive effect, the empirical effect of collective voice on organizational performance is something that is not clear. The empirical findings are rather inconsistent. For example, Kim, MacDuffie, & Pil (2010) find a positive relationship between team voice and productivity, whereas Delery & Doty (1996) find no

impacts of voice on performance. This inconsistency is line with the more specified research on collective voice via works councils which are also mixed (Addison, 2009; Mueller, 2015; Van den Berg, Grift, & Van Witteloostuijn, 2011; Van der Brempt, Boone, van Witteloostuijn, & van den Berg, 2017). In some studies, the implementation of a works council leads to a decrease in performance (Addison, 2001; Addison & Teixeira, 2006), while in other research a positive effect was found (Jirjahn, 2009; Mueller, 2011).

Collective voice model.

The arguments for positive outcomes of collective voice are based on the collective voice model of Freeman & Medoff (1984). Building on this model, Freeman & Lazear (1994) identify three key elements of collective voice via works councils that are beneficial namely information sharing, consultation, and co-determination.

Information. The best-known element in the theory of collective voice is the role of the works council in getting information. Works councils have far reaching rights to be informed and get information from management. The economic theory shows that asymmetries in information can lead to inefficient outcomes (Freeman & Lazear, 1994). With the legal requirement for management to disclose information to the works council this problem gets addressed. Employees will have access to information that can verify or disprove the claims made by management (Addison et al., 2004). For example, in difficult economic times, if workers have no sufficient information about how the company is performing, they might distrust the claims of the management. If however they receive the information they might adjust themselves and make more effort for survival of the organization (Mueller, 2015). The opposite stream of information, from worker to management, also brings advantages to the organization. Employees can give important

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information management might not have themselves, for example, about working conditions or production methods that can be improved. This improved communication will "give management a better idea of what employees are willing to accept, and things come up in discussion that management did not know (Freeman & Lazear, 1994, p.38)." To conclude, the right for information will improve communication and therefore improve organizational efficiency.

Consultation. Works council receive consultation rights over some decisions. Even when management has the final decision, the works council can be influential with their consultation rights (Addison & Belfield, 2004; Freeman & Lazear, 1994). The consultation of the works council can be beneficial in solving organizational bottlenecks because employees can have useful input in finding solutions for these problems (van Den Berg et al., 2013). Addison et al. (2004, p.538) put it the following way: "consultation for its part allows new solutions to production and other problems by reason of the non-overlapping information sets of the two sides and the creativity of discussion." A counter-argument is that consultation might be costly since it could delay the time involved with the decision-making, thus decreasing organizational efficiency (Freeman & Lazear, 1994).

Co-determination. Co-determination is teamwork between the employees and management (Freeman & Lazear, 1994). Both management and employees have information the other does not have. By combining the effort and information of both, new ideas might arise, and a surplus is created. Co-determination is mainly about rights that give employees more control over their own working conditions and work security (Sapulete et al., 2011), what leads them to stay more loyal to the firm in the long run and thus invest extra to the benefits of the organization (Addison et al., 2004; van Den Berg et al., 2013). Co-

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determination also leads to an improved bargaining position, since they are able to block or change the ideas made by management (Freeman & Lazear, 1994; Hübler & Jirjahn, 2003). Co-determination might suffer from the same problem as consultation that it delays the decision-making, which might decrease organizational efficiency (Freeman and Lazear, 1995).

To conclude the discussion of collective voice model. The fundamental gains of collective voice are threefold: it offers a direct communication channel between workers and the firm, an alternative mode of expressing discontent other than quitting with attendant benefits in the firm of reduced turnover costs and greater training, and a necessary modification of the social relations of production (Freeman, 1976; Freeman & Lazear, 1994). These advantages are likely to improve the organizational performance. Therefore, the following hypothesis is created:

Hypothesis 1: Collective voice leads to improved organizational performance

Systems of HR practices

It is common in HR research to focus on the effects of systems of HR practices, instead of a single practice like voice (Flinchbaugh, Li, Luth, & Chadwick, 2016; Jiang et al., 2012; Shin & Konrad, 2017). This is done because its impact is best understood by examining the system of HR practices in place and the integration among the other separate HR practices effects the results (Jiang et al., 2012; Y. Kim & Ployhart, 2018; Lepak et al., 2006; Shin & Konrad, 2017). A system of HR practices is the combination of individual HR practices that are used by the organizations, respectively (Chowhan, 2016; Lepak et al., 2006). To explain the process by which HR practices influence organizational performance, it will also be

necessary to specify how individual effects build into group effects where mutually enforcing effects might take place (Bashshur & Oc, 2015; Bryson, Willman, Gomez, & Kretschmer, 2013). So, in order to understand collective voice as an HR practice, it has to be researched within its context of the system of HR practices and has to be taken into account how the effects of voice differ around other practices. The most common model to assess such a HR system is the ability-motivation-opportunity (AMO) framework which explains the pathways and effectiveness of systems of HR practices (Appelbaum, 2000; Boxall et al., 2016; Jiang et al., 2012).

AMO framework. Following the AMO framework, there are three key mechanisms through which organizational performance is influenced by HR: (1) ability enhancing practices, such as training; (2) motivation enhancing practices, such as good compensation, benefits and job security; and (3) practices that enhance the opportunities to contribute, such as (collective) voice and information sharing. Besides their additive solo effects, these three dimensions combine synergistically and result in employees who have the abilities, motivation and opportunities to engage strategically in their tasks (Aryee et al., 2016). Organizations that are able to provide employees with the necessary skill levels to successfully perform their jobs, encourage employees to use the appropriate level of discretionary effort toward organizational goals, and provide opportunities to maximize their potential contributions, will outperform organizations that fail to do so (Appelbaum, 2000; Lepak et al., 2006). The meta-study of Jiang et al. (2012) comprehensively studied this framework. Their analyses found positive and significant relationships between ability-, motivation- and opportunity-enhancing practices and operational and financial outcomes. Other examples are improved service quality (Aryee et al., 2016; Chuang & Liao, 2010; Liao,

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Toya, Lepak, & Hong, 2009), enhanced safety performance (Zacharatos, Barling, & Iverson, 2005), and improved knowledge acquisition and sharing (Chuang et al., 2016).

Theoretical foundation. The pathway of the effects of the HR system can be explained taking a behavioural perspective (Schuler & Jackson, 1987). The behavioural perspective suggests that organizations do not perform themselves, but instead they use HR practices to encourage employees to engage in productive behaviour and thus affects the organizational performance (Chuang et al., 2016; Jiang et al., 2012). If the way of acting by the employees is in line with the organizational goals and are engaged in productive behaviours, the performance is expected to improve. A system of HR practices can be seen as a way to guide the behaviour of the employees in the way that is in line with the organizational goals (Shin & Konrad, 2017).

Ability-enhancing practices. The primary objective of ability-enhancing practices is to ensure that the employees have the knowledge, skills and abilities that are needed to fulfil the task they need to carry out (Chuang et al., 2016). For example, recruitment and selection practices can be put in place to ensure that the employees have the required set of competencies needed for the job. Training can be used to improve the organization-specific skills, abilities and/or knowledge of the employee. Current employees knowledge and skills can be enhanced to fit organizational needs through training (Jiang et al., 2012). For example, ability-enhancing investments help employees identify ways to make their work processes more efficient (Wright, McMahan, & McWilliams, 1994). Ability-enhancing practices are believed to increase organizational performance because knowledgeable and skilled employees are more capable of generating valuable ideas and come up with innovations to

enhance productivity (Chowhan, 2016; Shin & Konrad, 2017). This leads to the following hypothesis:

Hypothesis 2: Ability-enhancing practices are positively related to organizational performance

Motivation-enhancing practices. Practices aimed at enhancing the motivation are likely to provide extrinsic motivation coming from external rewards based on the work efforts of the employees (Jiang et al., 2012). According to Nohria, Groysberg, & Lee (2008) motivational enhancing practices discriminate between good and poor performers, rewards good performers and gives them the opportunities to advance in their careers. Thus motivational-enhancing practices are aimed at driving the attention to the required activities and then to enhance and induce the employees' effort since it can give them extra benefits (Chuang et al., 2016). Shin & Konrad (2017, p.978) give the following example: "Incentives motivate employees to engage in the discretionary effort required to identify and act upon inefficiencies by strengthening the link between performance and rewards." Research gives the suggestion that practices like competitive compensation, extra benefits, and job security contribute to rewarding and encouraging employee behaviour, for example by promoting employee skill development and motivation to produce superior outcomes (Chowhan, 2016; Way, 2002). As an illustration, Curran & Walsworth (2014) find that incentive pay, profit-sharing and employee benefits can steer employees towards innovative behaviour by rewarding creativity and innovative ideas. In addition, motivation-enhancing practices can help in attracting competent employees by giving them certain intensive, both intrinsic and extrinsic, to join the organization (Chuang et al., 2016). Furthermore, these practices lead to

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the retainment of the already positively contributing employees (Jiang et al., 2012). This leads to the following hypothesis:

Hypothesis 3: Motivation-enhancing practices are positively related to organizational performance

Opportunity-enhancing practices. The primary objective of opportunity-enhancing practices is to create conditions for the employees to improve their functioning (Chuang et al., 2016). This depends on the desired outcomes, for example, in knowledge intensive organizations a robust social network might be necessary to improve knowledge sharing (Chuang et al., 2016). Practices such as autonomous work, job design, voice, and information sharing are typical examples of practices enhancing the opportunities for employees (Boxall & MacKy, 2009). If employees have the feeling they can contribute by sharing their ideas, influence change and be autonomous, it will enable them to engage in the desired behaviour of improving their working conditions and become more productive (Chowhan, 2016). It will provide them with the opportunities to learn and share the acquired knowledge and thus improve organizational efficiency (Jiang et al., 2012). Most of the advantages have already been discussed in the section on collective voice. In this thesis, the choice is made to isolate collective voice from the rest of the practices in the opportunity domain. This is done in order to get a clear understanding on this specific practice and how it behaves within the rest of the system. Therefore, no further hypothesis is created for the opportunity domain.

Synergistical effects. Even though the different HR practices are conceptually categorized into the three different dimension of the AMO framework, it does not mean that these dimensions are independent by design or in their effect (Chuang et al., 2016). The

effects of the aforementioned dimension are not just additive, they combine also synergistically into an interactive effect (Appelbaum, 2000; Aryee et al., 2016; Lepak et al., 2006). The understanding of interactive effects of HR practices started with in the model of Vroom (1964), where ability and motivation where connected as interacting synergistical components. Delery and Shaw (2001, p. 175) explained it in the following way: "A high KSA [ability] work force might not necessarily be a high productive work force, if that work force is not highly motivated." In addition, it would also be reflected in the fact that training might lead to more productivity, and if productivity is rewarded by motivational practices, the employees will perform better in training (Felstead, Gallie, Green, & Zhou, 2010). This leads to the assumption that a combination is needed to achieve increased organizational performance.

The AMO framework builds on the same assumption of interaction between the interdependent domains (Boxall et al., 2016; Chowhan, 2016; Chuang et al., 2016; Datta, Guthrie, & Wright, 2005; Jiang et al., 2012; Lepak et al., 2006; Liao et al., 2009; Shin & Konrad, 2017). It goes by the basic assumption that the effectiveness of a practice is interdependent on the other practices in the system. If the system of HR practices exists of practices covering multiple domains of the AMO framework, there should be a synergistical effects that is bigger than the additive effect of the individual practices (Lepak et al., 2006). This is explained in the way that synergies can occur between the domains of the AMO (Appelbaum, 2000; Aryee et al., 2016; Huselid, 1995). For example, as Chuang et al. (2016, p.530) note: "HR practices that encourage members to build social relationships can serve the multiple purposes of providing opportunities to acquire knowledge, improving the communication skills required to exchange knowledge, and motivating employees to further develop their competencies." The notion that a combination of practices should have a

stronger effect than a single practices is supported in most of the research (Boxall et al., 2016; Jiang et al., 2012).

There has also been research focussing on the interactions of HR practices with collective voice, respectively. It suggests that combinations of HR practices and with collective voice included can also yield substantial productivity gains (Addison, 2005). For example, the qualities of both the training experience and on-the-job learning are strongly associated with the extent and nature of voice (Felstead et al., 2010). This is explained by the assumption that voice gives employees more incentive to take responsibility for their own performance and thus they get motivated to learn more (Felstead et al., 2010).
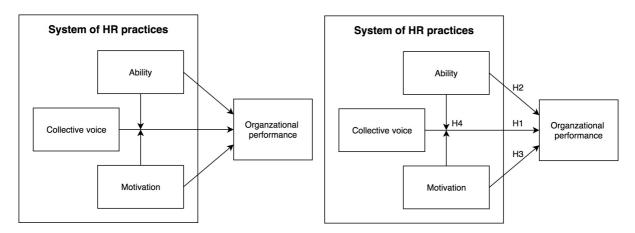
To conclude, the effectiveness of a practice is interdependent on the other practices in the system (Appelbaum, 2000). If the system of HR practices exists of practices covering multiple practice domains, this should result in a mutually enforced effect between the practices in those domains that is bigger than the additive effect of the individual practices (Lepak et al., 2006). This leads to the following hypothesis:

Hypothesis 4: A system of HR practices resulting in mutually enforced domains is positively related to organizational performance

Conceptual model
The hypotheses lead to the following conceptual model:

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Figure 1: Conceptual model without and with hypotheses

Method

Sample

For hypothesis testing, a large sample of Dutch CLA's has been collected. These have been collected from the website of the FNV, which contains most of the CLA's available. To make sure to capture all the documents, a script called Wget (version 1.19.4; 2017) was given the task to index the domain of FNV with all the subdomains and to download all CLA's. This batch was enriched with CLA's already available at the Radboud University. A selection within this dataset was eventually made based on the availability of the performance data (Geoffrey Love & Nohria, 2005), which resulted in 325 CLA's. This sample size is large enough to draw the conclusions. The CLA's vary in year from 2008 until 2017.

The performance data needed for the analysis was gathered from Orbis. Orbis provides a decent overview in the financials of the organizations it has in its database. One of the advantages is that Orbis also provides data out of the past. All Orbis output was manually checked for anomalies, and data out of the ordinary was removed. Orbis was also used to obtain a control sample of 3984 organizations not having an individual CLA or CLA at all. The size of the control sample is sufficient (Giroud, Mueller, Stomper, & Westerkamp, 2011).

Data identification

In this thesis, a new way of content analysis is used in order to gather the needed information from the CLA's. Following traditional ways of content analysis, a guideline of predefined words and word combinations was created. This guideline was converted to a computer language named *regular expressions*. A regular expression is a pattern describing a certain amount of text (Goyvaerts, 2006). It enables the user to automatically search for words and word combinations throughout text documents, instead of doing this manually. The regular expressions are combined and form the input for a computer script called *TextExtractor* (Van Boven & Aalbers, 2018). This script loops the different regular expressions through the targeted documents, in this case the CLA's, giving as output which patterns are found in which documents. This output is then used to build up the variables.

Using this software enables the number of analysed documents to be higher than in the traditional content analysis, since it is a lot less time-intensive. Even though the regular expressions have been around for a long time, the technique has not yet been applied into our academic field. This research shows some of the potential of this modern technique and hopes to contribute to the modernization of research techniques in our field.

Measures

Independent variables. Jiang, Lepak, Hu, & Baer (2012) did a meta-analytic investigation on the AMO framework. They identified 14 HR policies frequently examined in the literature. Based on the Ability-Motivation-Opportunity (AMO) framework (Appelbaum, 2000) these policies have been categorized under the dimensions of the framework. This outlining of policies has since been used in multiple HR operationalizations (Brueller, Carmeli, & Markman, 2018; Chuang et al., 2016; Y. Kim & Ployhart, 2018; Shin & Konrad, 2017). Building on this categorization, multiple practices can be deployed under a domain and

policy. Based on this outlining of the framework the operationalization for ability, motivation and collective voice is built.

Ability enhancing policies includes recruitment, selection and training. In this thesis recruitment has been left out of the dimension, since it is not a part of the negotiations in the Dutch labour agreements. Motivation enhancing policies that have been identified are performance appraisal, compensation, incentive, benefit, promotion and career development, and job security. Incentive and benefit was found to be overlapping in some research, therefore it has been decided to follow Shin & Konrad (2017) in merging these two.

Besides employee involvement and information sharing, which are a substantial part of the works council, opportunity related enhancing policies have been excluded. This is done because in this research the focus is on collective voice and the interactions with ability and motivation enhancing policies. The measure of collective voice via works councils, with the underlying policies, is based on the Dutch law on works council (WOR, articles 25-30).

In table 1, the AMO domains can be found with the 9 underlying policies and the keywords extracted from the literature. Both ability and motivation are independent variables and are measured based on their underlying set of policies. The independent variable *collective voice* is based on the opportunity domain and the underlying policies that overlap with collective voice as discussed in the theoretical background.

For the policies, respectively, keywords were gathered from the literature. Based on these keywords, the analysis of the CLA's was built. The keywords were used to generate the aforementioned regular expressions for each policy, respectively. A sample of 50 CLA's was used to test and make sure the regular expressions were able to extract the right information.

The list of regular expressions can be found in appendix A and B. In order to increase the validity of the regular expressions, they have been checked by a cybersecurity expert involved with this technique.

In order to create the measure for *ability, motivation* and *collective voice*, previous studies were followed in using additive indices of HR policies (MacDuffie, 1995; Shin & Konrad, 2017; Wright, Gardner, Moynihan, & Allen, 2005; Youndt, Snell, Dean Jr, & Lepak, 1996). These measures are based on the presence of the policy (Boselie, Dietz, & Boon, 2005). The presence of each specific policy in the different domains is coded as a dichotomous variable (1 = yes, 0 = no). The adoption of the policies combined is obtained by calculating the mean across the different domains, respectively.

Table 1: HR policies

AMO framework	Policies (Jiang et al., 2012)	Keywords	References
Ability	Selection	Job aptitude test, Professional ability test, Intelligence test, Personality test, General interview, Professional ability interview, Group discussion interview, Assessment center, Practical test, Practical test, Statement of purpose, Overall company fit, potential to learn and grow, screening of personnel	(Brueller et al., 2018; Chuang et al., 2016; Y. Kim & Ployhart, 2018; Liao et al., 2009)
	Training	Orientation for new employees, training, team building/leadership/ communication, occupational health/safety/environmental protection, mentoring program, mentoring assessment,	(Aryee et al., 2016; Chuang et al., 2016; Liao et al., 2009; Ostroff & Bowen, 2016; Shin & Konrad, 2017)
Motivation	Performance appraisal	Performance appraisal, performance management practices	(Aryee et al., 2016; Chuang et al., 2016; Liao et al., 2009)
	Compensation	Individual incentive systems, group incentives systems, profit-sharing plan, merit pay and skill-based pay, employee stock plans, performance related pay, bonusses, incentive plans	(Aryee et al., 2016; Chuang et al., 2016; Liao et al., 2009; Shin & Konrad, 2017)
	Benefit	Pension plan, life and/or disability insurance, supplemental medical, dental care, group RRSP, stock purchase or other savings plan, supplements to	(Chuang et al., 2016; Shin & Konrad, 2017)

		employment insurance benefits (e.g., for maternity or layoff), workers' compensation, severance allowances, flexible benefit plan, other, support attendance of conference, support learning events, wellness discounts, sports discounts	
	Promotion and career development	Promotion, demotion, coaching, guidance, career development plans, career enhancing programs, development programs	(Brueller et al., 2018; Chuang et al., 2016; Ostroff & Bowen, 2016)
	Job security	Internal hiring, social plan, restructuring limitations, compensation,	(Chuang et al., 2016; Liao et al., 2009)
Opportunity	Employee involvement & Information sharing	Infofreqentie, Sociaal, Economische info, investeringen, overwerk, uitzendkrachten, vakanties, functioneren personeel, opleidingen, bonussen, roosters, zorg, pensioen, verzuim, thuiswerken, arbeidsomstandigheden, arbeidsongeschiktheid, externe hulp	Based on Dutch law (WOR artikelen 25-30)

Control variables. The size of the organization was controlled for (total assets, then log10-transformed for potential non-linear effects), because large organizations are more likely to establish HR practices due to economies of scale (Datta et al., 2005; Huselid, 1995). Furthermore, industry was controlled for, since industries differ in economic growth and performance (Datta et al., 2005). The economic development in these industries differ, and are also different for the years, respectively. Therefore, a measure has been added that controls for GDP growth in each industry and year, respectively. This variable has been constructed for the following industry categories based on NACE-codes and CBS employment data:

A - Agriculture, forestry and fishing, B - Mining and quarrying, C – Manufacturing, D - Electricity, gas, steam and air conditioning supply, E - Water supply; sewerage, waste management and remediation activities, F – Construction, G - Wholesale and retail trade; repair of motor vehicles and motorcycles, H - Transportation and storage, I - Accommodation and food service activities, J - Information and communication, K - Financial and insurance activities, L - Real estate activities, M - Professional, scientific and technical activities, N -

Administrative and support service activities, O - Public administration and defense; compulsory social security, P – Education, Q - Human health and social work activities, R - Arts, entertainment and recreation, and S - Other service activities.[1]

Works council come in two forms in The Netherlands; personeelsvertegenwoordiging (PVT) or ondernemingraad (OR). In some CLA's neither or them appeared, so I added the *none* option resulting in: 0 = none, 1 = OR, 2 = PVT. This variable has also been controlled for.

Dependent variable. Consistent with prior research (Dalton et al., 2003; Huselid, 1995; Shaw et al., 2013; Tangpong et al., 2015), the widely used measure of return on equity was used to measure the organizational performance. It is the dependent variable in this research. Return on equity is one of the typical financial outcomes that reflects the fulfilment of economic goals of the organizations (Jiang et al., 2012). Some major outliers were detected in *Return on equity*. Therefore, following Giroud et al. (2011), *Return on Equity* was scaled and winsorized with 2 percent at the 1st and 99th percentiles of its empirical distribution to mitigate the effects of outliers.[2]

Results

Descriptive Statistics

Table 2 provides the means, standard deviations, maximum values, minimum values, and the correlations for all the variables used in the analyses. Following the rule of thumb by Hair,

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[1] CBS Statline, Approaches of domestic product (GDP), National Accounts, *SBI2008 & Regions*, Retrieved from https://opendata.cbs.nl/statline/#/CBS/nl/dataset/82262NED/table?ts=1524492032488
[2] In addition to return on equity (ROE), the model was run using return on assets (ROA) as dependent variable. The outcomes turned out to be better with ROE, so it was decided to leave the model with ROA out of the thesis. The model with ROA can be found in appendix C.

Black, Babin, & Anderson (2010), no correlations above 0.90 should exist. This rule of thumb has not been violated. To test for multicollinearity, the variance inflation factors (VIFs) were calculated for the independent variables. All VIF values were within the acceptable range (from 1.11 to 2.08, see appendix D). However, the inclusion of interaction terms in the model, as will be discussed below, did lead to some concerns about multicollinearity.

TABLE 2: Descriptive Statistics and Correlations

	M	SD	Max	Min	1	2	3	4	5	6	7
Return on equity	-1.83	1.00	2.49	-5.46							
OR/PVT/None	0.99	0.27	2	0	0.11*						
Size	8.18	1.08	12	4.02	0.09	-0.01					
Collective voice	0.39	0.24	1	0	0.25***	0.16**	-0.08				
Ability	0.67	0.34	1	0	-0.02	-0.04	-0.02	0.14*			
Motivation	0.47	0.25	1	0	0.14**	0.00	0.33***	0.06	0.15**		
Industry	7.09	4.28	19	1	-0.16**	-0.05	-0.01	-0.34***	-0.04	0.13*	
GDP growth	0.03	0.06	0.31	-0.31	-0.05	-0.04	-0.09	0.02	-0.12*	-0.01	-0.04

Note: n=325, ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$

The results of the regression analysis are provided in table 3. The first model represents the baseline model containing the control variables. As expected, the first factor of OR/PVT/None is significant and positive (Model 1, $\beta = 1.07$, $p < .001$), indicating that installing a works council is positively related to the organizational performance compared to none or a PVT. The other control variables turn out not to be significant. In the following models 2-5, each of the independent and moderating variables are introduced separately to measure their respective effects on the organizational performance.

Model 2 shows the isolated effect the variable *ability* against the background of the baseline model and thus provides a test for the ability-enhancing practices hypothesis. As the results indicate, there is no significant relationship between this independent variable and organizational performance (Model 2, $\beta = -0.15$, $p > .05$) and logically no support for hypothesis 2.

Model 3 provides a test of the motivation-enhancing practices hypothesis. It shows the isolated effect the variable *motivation* against the background of the baseline model.

Table 3: Results of analyses on collective voice, HR and financial performance

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
(Intercept)	-1.07	-0.96	-0.89	-1.15	-0.80	-0.61	-0.79	-1.24	-0.86
	(0.83)	(0.84)	(0.84)	(0.83)	(0.84)	(0.88)	(0.86)	(0.84)	(0.86)
Control variables									
Size	0.04	0.04	0.01	0.05	0.02	-0.00	0.05	0.02	0.02
	(0.05)	(0.05)	(0.06)	(0.05)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)
Factor(OR/PVT/None)1	1.07***	1.07***	0.98***	0.85**	0.76**	0.97***	0.83**	0.67*	0.75**
	(0.27)	(0.27)	(0.27)	(0.28)	(0.28)	(0.27)	(0.28)	(0.29)	(0.28)
Factor(OR/PVT/None)2	0.64	0.61	0.65	0.53	0.49	0.58	0.47	0.50	0.49
	(0.41)	(0.41)	(0.41)	(0.41)	(0.41)	(0.41)	(0.41)	(0.40)	(0.41)
GDP growth	-0.47	-0.57	-0.49	-0.44	-0.61	-0.64	-0.60	-0.35	-0.59
	(0.89)	(0.90)	(0.89)	(0.88)	(0.89)	(0.90)	(0.89)	(0.88)	(0.89)
Independent variables									
Ability		-0.15			-0.23	-0.36	-0.47		-0.18
		(0.16)			(0.16)	(0.35)	(0.31)		(0.21)
Motivation			0.42		0.43	0.21		1.21**	0.51
			(0.24)		(0.25)	(0.53)		(0.46)	(0.33)
Collective voice				0.66*	0.67*		0.19	1.56**	0.75*
				(0.26)	(0.26)		(0.54)	(0.51)	(0.37)
Interaction effects									
Ability X motivation						0.36			
						(0.68)			
Ability X collective voice							0.73		
							(0.68)		
Motivation X collective voice								-2.01*	
								(0.96)	
Ability X motivation X collective voice									-0.26
									(0.77)
R²	0.14	0.15	0.15	0.16	0.17	0.16	0.17	0.18	0.17
Adj. R²	0.09	0.09	0.09	0.10	0.11	0.09	0.11	0.12	0.11
Num. obs.	325	325	325	325	325	325	325	325	325
F	2.56***	2.48***	2.55***	2.80***	2.76***	2.44***	2.66***	2.89***	2.65***

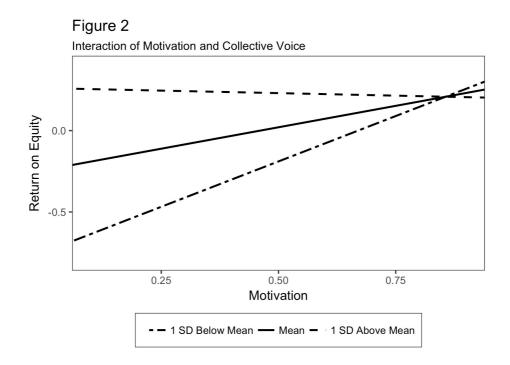***$p < 0.001$, **$p < 0.01$, *$p < 0.05$

Statistical models (Leifeld, 2013)

As the results indicate, there is no significant relationship between this independent variable and organizational performance (Model 3, β = 0.42, p > .05) and thus there is no evidence in support of hypothesis 3.

Model 4 shows that the independent variable *collective voice* has a significant effect on organizational performance when entered into the model in isolation (Model 4, β = 0.66, p < .05). This result indicates that when the collective voice is increased by 1, the organizational performance increases with the value of the beta-coefficient, which is 0.66. Given the specific research context, this means that the increasing collective voice indeed has a positive effect on the organizational performance. Also, when examined in combination with *ability* and *motivation* (Model 5), *collective voice* has a significant positive effect on organizational performance (Model 5, β = 0.67, p < .05) whilst the variables *ability* and *motivation* show no significant outcomes (Model 5, β = -0.23, p > .05) (Model 5, β = 0.43, p > .05). This suggest, in support of hypothesis 1, that collective voice via a works council leads to improved organizational performance.

In model 6-9 the main effects of the interaction terms are added. The first interaction term *ability X motivation* is introduced in model 6. It turns out not to be significant (Model 6, β = 0.36, p > .05). Model 7 shows that *ability X collective voice* is not significant either (Model 7, β = 0.73, p > .05). In model 9, the full interaction of the three independent variables is added. Contrary to the expectations, it turns out not to be significant (Model 9, β = -0.26, p > .05). The individual effect of collective voice still is significant and positive in this model (Model 9, β = 0.75, p < .05). The outcomes of these models give no indication of support for the fourth hypothesis.

However, regarding the interaction effect between motivation and collective voice, model 8 shows that there is a significant effect with a negative coefficient (Model 8, β = -2.01, p < .05). The correct interpretation of this negative coefficient is that the positive

relationships between the two independent variables and the organizational performance are smaller/weaker when the values of the other one is high. In this case, when the existence of motivation enhancing practices increases, the effect of collective voice is increased. When collective voice already is high, the effect of motivation enhancing practices decreases in strength. Figure 2 illustrates this interaction effect, indicating partial support for hypothesis 4.

Figure 2

Interaction of Motivation and Collective Voice

The variable *collective voice* shows significant outcomes throughout the analyses, except when entered in combination with *ability* (Model 7). Hypotheses 1 can therefore be confirmed: collective voice via a works council does indeed lead to increased organizational performance. For the independent variables *ability* and *motivation* no significant outcomes are found, and therefore there is no support for hypotheses 2 and 3.

For the hypothesized interaction (hypothesis 4) the outcomes are different for the HR domains, respectively. Nor for the interaction *ability X motivation* and *ability X collective voice*, neither for the system interaction *ability X motivation X collective voice*, significant outcomes are found. Only for *motivation X collective voice* a significant effect is found, so the hypothesis can only partially be confirmed.

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Sample selection

Organizations using individual CLA's rather than sector CLA's or no CLA's are a selected sample. To account for possible selection bias, I use Heckman's (1977) two step correction method as has been done in a similar research by Giroud et al. (2011). In order to do this, there is the need to estimate a selection equation. Therefore, the dataset is augmented with 3984 control organizations that do not have an individual CLA. These 3984 are Dutch organizations randomly selected by Orbis. Since the *ROE* variable consists of data from multiple years, also in the control group multiple years have been added. Employees is used as independent variable, in order to check if the size of an organization influences the fact of having an individual CLA. The variable *solvency ratio* is introduced to see if there is difference in slack resources, since slack resource theorist argue that slack resources provide the opportunity to invest in things like employee relations (Shin & Konrad, 2017; Waddock & Graves, 1997).

The following Probit selection equation is estimated:

$$Selection\ dummy_{it} = \beta\ x\ Size_{it}\ +\ \beta\ x\ ROE_{it}\ +\ \beta\ x\ SR_{it}\ +\ \gamma'\ X_c\ +\ \varepsilon_c$$

Where i indexes organizations, t indexes years. Selection dummy is a dummy that equals one when there is a individual CLA and equals zero otherwise. *Size, return on equity* and *solvency ratio* are the independent variables. **X** is a vector of the control variable including GDP growth.

Panel A of table 4 presents the results from a Probit regression in which the dependent variable is a dummy that equals 1 if the company has an own CLA and zero otherwise.

Table 4: Selection bias outcomes

Panel A: selection equation

Dependent variable: selection dummy	Model 1
(Intercept)	-5.52***
	(0.45)
Size	0.54***
	(0.03)
Return on equity	-0.15***
	(0.04)
Solvency ratio	0.02
	(0.04)
GDP growth	0.52
	(0.49)
Industry dummies	Yes
R²	0.11
Adj. R²	0.09
Num. obs.	4309

***p < 0.001, **p < 0.01, *p < 0.05

Panel B: Regression with Heckman Correction

Dependent variable: return on equity	Model 1
(Intercept)	-2.23***
	(0.54)
Ability	-0.11
	(0.12)
Motivation	0.33
	(0.17)
Collective voice	0.88***
	(0.17)
Size	0.15**
	(0.05)
GDP growth	-0.16
	(0.67)
invMillsRatio	0.34***
	(0.10)
sigma	0.77
rho	0.45
R²	0.11
Adj. R²	0.09
Num. obs.	4309
Censored	3984
Observed	325

***p < 0.001, **p < 0.01, *p < 0.05
R-package: sampleSelection (Toomet & Henningsen, 2008)

Panel A shows a total of 4309 observations. Panel B shows the regression in line with Model 5 in table 3, with exclusion of the dummy variables. The sample in Panel B is restricted to the 325 organizations with their own CLA. Panel A reports the results. The coefficient of *Size* is positive and significant (Panel A, β = 0.54, p < .001), implying that larger organizations are more likely to have their own CLA. Furthermore, *Return on Equity* is negative and significant (Panel A, β = -0.15, p < .001), indicating that organizations with their own CLA have less good organizational performance in comparison to other organizations. For better readability, the different industries have been removed from the table. The table with industries can be found in appendix E. The industry Manufacturing (C) turned out to have more individual CLA rates than on average (β = 0.81, p < .05), whereas Construction (F) and Real Estate (L) turned out to have lower CLA rates (β = -1.16, p < .05) (β = -1.04, p < .001). Using the estimates from the Equation of Panel A, the Inverse Mills ratio can be calculated. The Inverse Mills ratio is then included as an explanatory variable in the second stage, which resembles the regression of Model 5 in Table 3. Panel B shows the outcomes of this regression.

Like in the earlier regression models, *collective voice* is positive and significant (Panel B, β = 0.88, p < .001). Unlike the earlier regression, size turns out to be positively significant (Panel B, β = 0.15, p < .01). These outcomes have to be watched with caution, since not all control variables are included. Moreover, the Inverse Mills ratio turns out to be positively significant (Panel B, β = 0.34, p < .01), indicating that the results are likely to be driven by selection bias. The unobservables in the selection equation are thus positively related with choosing for an individual CLA, and positively related to the organizational performance. Since the data is likely to be driven by selection bias, it is necessary to take this into account when generalizing the results to the rest of the population.

Discussion

Grounded in the collective voice model and the behavioral theory, the effect of collective voice on organizational performance has been examined. More specifically, a systems approach was taken, and collective voice was viewed as a part of a system of HR practices. Integrating past research and theorizing on strategic human resource management, following the AMO framework, a model was developed for understanding the effects of voice in combination with other HR practices. The model is tested using collective labour agreements of 325 Dutch organizations. The findings revealed that with the increase of collective voice the organizational performance improves. Furthermore, the findings showed that collective voice interacts with motivation-enhancing practices. The effects of ability, motivation in isolation and the other parts of the interaction, respectively, could not be confirmed.

Theoretical implications

First, by providing evidence for a link between collective voice and organizational performance this thesis contributes to the understanding of the effects collective voice. The works on collective voice in the past have come up with inconsistent outcomes. For example, J. Kim, MacDuffie, & Pil (2010) find a positive relationship between team voice and productivity, whereas Delery & Doty (1996) find no impacts of voice on performance. The outcomes of this thesis contribute by giving evidence for a positive effect. It shows evidence that collective voice improves communication and therefore improves organizational efficiency (Freeman & Lazear, 1994). Furthermore, collective voice can be beneficial in solving organizational bottlenecks because employees can have useful input in finding solutions for these problems, and give employees more control over their own working conditions and work security, what leads them to stay more loyal to the firm in the long run and thus invest extra to the benefits of the organization (Addison, 2001; Freeman & Medoff,

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1984). To conclude, this thesis shows support that collective voice does lead to increased organizational performance.

By choosing works councils as the formal voice channel for collective voice to be expressed as research subject, this thesis answered to the call of Van der Brempt et al. (2017) for more research on the effects of works councils. In line with the inconsistent outcomes on collective voice, there were multiple contradicting outcomes in earlier research. The results implicate that in line with Jirjahn (2009) and Mueller (2011) works councils do contribute to organizational performance. This contradicts other research of J. T. Addison (2001) and John T. Addison & Teixeira (2006) where works councils had negative effects. This implicates that enhanced information sharing, consultation and co-determination that collective voice via works councils brings with it leads to better performance.

In addition, and importantly, this thesis furthers the understanding of how collective voice interacts with other practices in the system of HR practices that is used by an organization. This was done by viewing the mechanism through which collective voice can be expressed as an HR practice (Bashshur & Oc, 2015; Marchington, 2009). Following the suggestions of Bashshur & Oc (2015) and Mackenzie, Podsakoff, & Podsakoff (2011) the collective voice model was weaved together with the behavioural theory. In order to understand the system of HR practices, the AMO framework (Appelbaum, 2000) was adopted. Earlier work on the AMO framework has shown that the ability and motivation domains and their interaction effects lead to improved organizational performance (Jiang et al., 2012). This thesis however fails on confirming this, which is unexpected, since related research and more explicitly the research which this framework was based on, all had positive outcomes. For the individual effects of ability-enhancing and motivation-enhancing

practices no significant outcomes were found using this dataset. Regarding the interaction effects, the only significant outcome was that collective voice interacts with motivation-enhancing practices. This explains some part of how voice interacts within a system of HR practices. The outcomes showed that when the existence of motivation enhancing practices increases, the positive effect of collective voice is increased. The fact that nor for the individual effects and neither for the full interaction significant outcomes were found, does not necessarily imply that there are no effects, but merely that they could not be measured with the dataset that was used. The meta-study of Jiang et al. (2012) clearly showed consensus on the positive outcomes of the different domains. A possibility is that collective labour agreements are not suitable for identifying HR practices, which could have led to these outcomes.

Furthermore, in earlier research large interest had been paid to the ability and motivation domains of the AMO framework, whereas the opportunity domain is under-researched and less well developed (Boxall et al., 2016; Chowhan, 2016). Collective voice as an HR practice falls under the opportunity domain of the AMO framework within the system of HR practices, since it offers employees the opportunity to express their voice (Addison, 2005; Jiang et al., 2012), so the outcomes of this thesis contribute to the development of the AMO framework. It showed evidence for the positive effects of a practice – collective voice – in this domain and delivered some understanding of the interaction with the motivation domain. According to the behavioural theory the systems of HR practices in place affect the way employees behave within the organization and can be used to influence the employees (Chuang et al., 2016; Shin & Konrad, 2017). The outcomes contribute to the understanding of the effects of HR practices on the behaviour of the employees (Chowhan, 2016).

Practical implications

This thesis has multiple practical implications. First, managers should recognize the importance of the works council as a formal collective voice mechanism and the benefits it can bring to the organization. Employees have valuable information ideas and intelligence that will help solve organizational bottlenecks, improve organizational efficiency, and they can come up with new ideas (Detert & Burris, 2016). For example, employees can share and improve best practices which is beneficial for the whole organization (Smart, 2007). Furthermore, employees want to be increasingly asked for input in order to feel engaged (Moritz, 2014). Second, employees should recognize the opportunity to express their voice as a collective through the works council. This gives them the opportunity to contribute to the organization and thus their own working environment (Detert & Burris, 2016). Third, in the collaborations for collective labour agreements between unions, employees, and employers, the importance of the works council as a formal voice mechanism should not be underestimated (Freeman & Lazear, 1994; Van der Brempt et al., 2017). In the bargaining process they should clearly assess the voice given to the works council. As this thesis has shown, the outcome of this bargaining process in the form of collective voice via works council can contribute positively to the organizational performance, and thus be beneficial to all involved parties.

Limitations and directions for future research

This thesis has some potential limitations and makes some assumptions that need to be recognized and possibly examined in future research. First, the nature or generalizability may be affected by the Dutch culture. The dataset on which the results are based consist only of Dutch firms. For example, the bargaining outcomes determining works council strength could be influenced by Dutch legal requirements, or the workings and views of collective voice via

works council could differ in other settings. Future research should recognize these factors and examine the relationships between collective voice and organizational performance in other settings. Second, a full explanation of the link between HR practices and performance, captured within the AMO framework, requires measures that cover the entire breadth of the framework (Shin & Konrad, 2017). However, since in this thesis CLAs are used as sole source, it turned out not to be possible to measure the entire breadth. Certain components such as recruitment, job design, formal grievance, and complaint processes had to be removed since they could not be measured using CLA's. Furthermore, the measures are dichotomous yes/no indicators for the presence of practices. There is no information on how well the practices are implemented across the organization, or what proportion of the employees truly experience it. Third, this thesis only focussed on the collective (indirect) part of voice, whereas voice also can be expressed individually (direct). The decision was made to focus solely on collective voice since it was best in line with the dataset that was used. Therefore, the results of this thesis cannot be generalized on voice as a whole, but merely on the collective part of voice. Fourth, the text mining is conducted using a script I developed myself and in this thesis is used to its full potential for the first time. Even though the codes and regular expressions for analysis were checked thoroughly, there is no guarantee that it matches the level of accuracy that would have been achieved by reviewing the text documents by hand. Since automation enabled me to use a larger dataset, this shortcoming is somewhat reduced. Still improvement is needed on the subject of automated text mining, and researchers should try it in other settings. Since this thesis already showed a significant outcome, the future for this technique is definitely positive. More research is needed to confirm that it functions as a valid academic technique. Lastly, the Heckman correction showed that the data potentially suffers from selection bias. There could be some unobservables that influence the outcomes of the regression. This means that the outcomes

had to be generalized onto the whole population with caution, reducing the explanatory power of the outcomes.

This thesis measured the CLA's at one fixed point for each organization. There are however past CLA's available which could be used to analyse the differences and developments over time. Future research should definitely focus on this in examining the ever-developing role works councils play. Furthermore, new forms of bargaining outcomes seem to be emerging throughout The Netherlands where employees via works councils choose for so called "arbeidsvoorwaardenregelingen" (NRC, 2018). Unions are no longer part of these negotiations and works councils get enhanced strength to negotiate on their own terms and for their own demands. Future research should definitely pay attention to this new form and the implications it has for the voice mechanisms. Lastly, in this thesis the system of HR practices and their interactions could not be confirmed to have an effect. Based on the AMO framework and its underlying assumptions there should be more interactions between voice and the other HR practices, than just collective voice with motivation. More research is needed to get insights in these relationships and to fully understand the pathways in which HR practices influence organizational performance.

Conclusion

Overall, this thesis provides empirical support in the discussion on collective voice effects on organizational performance. It took a systems approach on collective voice, which made it a part of a system of HR practices. This was grounded in the behavioural theory and based on the AMO framework (Appelbaum, 2000), which argues that a well-defined set of practices will perform better than an individual practice. Based on the theory of collective voice (Freeman & Medoff, 1984) it made the argument that collective voice leads to better

performing organizations by using the ideas of employees, reducing employee turnover, and

empowering employees to validate management. Empirical support was found for the

positive effect of collective voice. Furthermore, it was expected that collective voice would

interact with the HR practices in place, but only with practices in the motivation-enhancing

policy domain a positive significant interaction was found. The outcomes underline the

importance for employees, employers, managers, and unions to take the instalment of a

collective voice mechanism serious. Hopefully the findings of this thesis and the suggestions

for future research will provide actionable knowledge that will enable organizations to more

effectively develop, empower, and acknowledge the importance of collective voice.

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Appendix A: Regular expressions Ability and Motivation policies

Domain	keywords CLA in Dutch	regular expressions
Selection	functiezwaarte en vereiste expertise (kennis en vaardigheden) en competenties, competentiehandboek, functiezwaarte, zorgvuldige selectie werknemer, functie-eisen, werkbelasting, werknemer onbekwaamheid, werknemer kundigheid,	^(?=.*?\b(selectie|onbekwaamheid|kundigheid|competentie|expertise)\b)(?=.*?\b(werknemers?|mederwerk(st)?ers?)\b).*$\|^.*\b(functiezwaarte\|vereiste expertise\|competenties\|competentiehandboek\|functie-?eisen\|werkbelasting)\b.*$
Training	functiezwaarte en vereiste expertise (kennis en vaardigheden) en competenties, competentiehandboek, functiezwaarte, zorgvuldige selectie werknemer, functie-eisen, werkbelasting, werknemer onbekwaamheid, werknemer kundigheid,	^(?=.*?\b(betaal(t|d)|vergoedt?|tegemoetkoming|faciliteiten|vergoeding)\b)(?=.*?\b(studie(geld|kosten)?|cursus(geld|kosten)?|opleiding(en)?)\b).*$\|^.*\b(studiekostenregeling\|studiesubsidie\|studiefaciliteitenregeling\|scholingsplan)\b.*$|^(?=.*?\b(begeleiding)\b)(?=.*?\b(aanvang dienstbetrekking|nieuwe (werknemers?|mederwerk(st)?ers?))\b).*$
Performance appraisal	functiezwaarte en vereiste expertise (kennis en vaardigheden) en competenties, competentiehandboek, functiezwaarte, zorgvuldige selectie werknemer, functie-eisen, werkbelasting, werknemer onbekwaamheid, werknemer kundigheid,	^(?=.*?\b(beoordeling)\b)(?=.*?\b(functievervulling|prestatiegebonden|prestaties?|individu(eel|ele)?)\b).*$\|^.*\b(Appraisal\|(beoordelings-?\|functionering(sontwikkeling)?s-?\|ontwikkelings-?\|evaluatie-?)gesprek\|performance management)\b.*$
Compensation	salarisaanpassing waardering beoordeling individuele prestatie, jaarlijkse variabele uitkering, realisatiegraad individuele/team-gerelateerde doelen, Appraisal bepaling merit, realisatie vastgelegde doelstellingen bepalingbonus, variabele beloning werknemers, bonussen bereiken bonusdoelen, werknemer te bereiken resultaat, individuele bonusdoelen, groepsbonusdoel(en), bonusregeling prestatieafhankelijk, eenmalige uitzonderlijke prestatie van de medewerker een eenmalige bonus, bonusregeling groepsbonussen, winstdeling, resultaat afhankelijk beloning, prestatiebeloningsysteem, bijzondere beloningen, salarisverhoging (merit), Salarisverhogingen compa ratio, bonusuitkering bedrijfsresultaat, winstdelingsuitkering , winstdelingsregeling, performance uitkering, resultaatbeloning, winstdeelregeling, EBITDA-regeling, beoordelingsafhankelijke uitkering, resultaatafhankelijk uitkering	^(?=.*?\b((winst|resultaat|prestatie|beoordelings)(-|)?afhankelijke?|variabele|eenmalige|EBITDA-)\b)(?=.*?\b(uitkering|beloning|(bonus)?regeling|bonus)\b).*$\|^.*\b(merit\|(groeps)?bonusdoel(en)?\|groepsbonussen\|resultaatbeloning\|winstdeelregeling)\b.*$|^(?=.*?\b(salarisaanpassing)\b)(?=.*?\b(prestaties?|doel(stelling)?en)\b).*$
Benefit	la carte-regeling, spaar- en bestedingssysteem, werkgever voorziet pensioenregeling(en), cursus voorbereiding op pensioen, werknemer financieel advies, werkgever gesloten collectieve (aanvullende) zorgverzekering, pensioenregeling, collectieve ziektekostenverzekering, spaarloonregeling, kinderopvangregeling, verhuiskostenvergoeding, ongevallenverzekering, Flexible Benefits programma, flexibele arbeidsvoorwaardenmodel, WGA-hiaatverzekering, regeling kinderopvang, collectief afgesloten zorgverzekering, keuzesysteem arbeidsvoorwaarden, verhuiskosten	^.*\b((a-)?la carte|kinderopvang(regeling)?|verhuiskosten(vergoeding)?|keuzesysteem arbeidsvoorwaarden)\b.*$\|^(?=.*?\b(flexibele?\|keuzesysteem)\b)(?=.*?\b(arbeidsvoorwaarden(model)?)\b).*$|^(?=.*?\b(werknemers?|mederwerk(st)?ers?)\b)(?=.*?\b(financieel advies)\b).*$
Promotion and career development	Groeigesprek, loopbaanplanning, (persoonlijk) ontwikkelingsplan werknemer, loopbaanadvisering, Personal Development System, loopbaanadviseur, medewerkers ondersteunen/stimuleren ontwikkeling, competentiemanagement, gerichte ontwikkelingsprogramma's	^.*\b(groeigesprek|loopbaanplanning|loopbaanadvi(es|sering|seur)|competentiemanagement|ontwikkelings(-|)?programma('s)?|personal development system)\b.*$\|^(?=.*?\b(werknemers?\|mederwerk(st)?ers?)\b)(?=.*?\b(ontwikkelingsplan)\b).*$|^(?=.*?\b(werknemers?|mederwerk(st)?ers?)\b)(?=.*?\b(stimuleren|ondersteunen)\b)(?=.*?\b(ontwikkeling)\b).*$
Job security	vervangende werkzaamheden, sociaal plan, sociale consequenties plan, De werkgever voorziet in vacatures bij voorkeur uit reeds in dienst zijnde werknemers, voorrang naar deze vacatures te solliciteren, voorrang worden gegeven aan reeds in dienst zijnde medewerk(st)ers, ontstane vacatures te doen vervullen door eigen werknemers,	^(?=.*?\b(werknemers?|mederwerk(st)?ers?)\b)(?=.*?\b(vacatures?|gegeven)\b)(?=.*?\b(voorrang|eigen|in dienst zijnde)\b).*$\|^(?=.*?\b(sociale consequenties)\b)(?=.*?\b(plan)\b).*$|^.*\b(sociaal plan|vervangende werkzaamheden)\b.*$

Appendix B: Regular expressions collective voice

WOR domain	Keywords CLA in Dutch	Regular expressions

Infofrequen tie	per maand Informeren|informatie, jaar informeren|informatie, jaarlijks gerapporteerd, periodiek inlichten, periodiek overleg, maandelijks informatie|informeren	`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(per)\b)(?=.*?\b(maand|jaar)\b)(?=.*?\b((ge)?rapport(eer(d|t))?|overleg(t|d)?|in(ge)?licht(en)?|(ge)?inform(atie|eren|eer(t|de?)?)))\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(jaarlijks|maandelijks|periodiek)\b)(?=.*?\b((ge)?rapport(eer(d|t))?|overleg(t|d)?|in(ge)?licht(en)?|(ge)?inform(atie|eren|eer(t|de?)?)))\b).*$`

Sociale gevolgen	sociale gevolgen, personele consequenties, collectief ontslag, sociale consequenties, reorganisatieplannen, fusieplannen, afvloeiing ... personeel, overtolligheid ... werknemers, reorganisaties, collectieve ontslagen	`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(sociale|persone(el|le))\b)(?=.*?\b(gevolgen|consequenties)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(collectief|collectieve)\b)(?=.*?\b(ontslag(en)?)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(reorganisatieplannen|fusieplannen|reorganisaties)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(afvloeiing|overtolligheid)\b)(?=.*?\b(personeel|werknemers)\b).*$`

Financiele informatie	Winstprognose, economische situatie, economische gang van zaken, economische vooruitzichten	`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(winstprognose)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(economische)\b)(?=.*?\b(situatie|vooruitzichten|gang)\b).*$`

Investering en	Investeringen, investeringsplannen	`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(investering(en|splannen)?)\b).*$`
Overwerk	Overwork, overuren, overwerken	`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(over(werk(en)?|uren)?)\b).*$`

Uitzendkra chten	Uitzendkrachten, ingeleende arbeidskrachten, inleenkrachten	`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(uitzendkrachten|inleenkrachten)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(ingeleende)\b)(?=.*?\b(arbeidskrachten)\b).*$`

Vakanties	roostervrije dagen, vrije roosteruren, collectieve vakantiedag, (vaste) snipperdagen, vakantieregeling, stopzetting | vakantie, bedrijfssluiting, collectieve vrije dagen, collectieve sluiting, verkorte werkweek, collectieve vakantie, fabrieksvakantie, bedrijfsvakantie, vakantieperiode, snipperdagenregeling	`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(roostervrije)\b)(?=.*?\b(dagen)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(vrije)\b)(?=.*?\b(roosteruren)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(collectieve)\b)(?=.*?\b(vakantiedag|sluiting|vakantie|vakantieperiode)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(snipperdagen(regeling)?|vakantieregeling|(bedrijfs|fabrieks)(sluiting|vakantie)|snipperdagen)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(stopzetting)\b)(?=.*?\b(vakantie)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(verkorte)\b)(?=.*?\b(werkweek)\b).*$`

Functioner en personeel	Demotiebeleid, procedure voor functiebeschrijving, beoordelingsgesprekken, functiewaardering, beoordeling … prestaties, periodieke beoordeling, Performance Appraisal, beoordeling Promotie, functioneringsgesprek(ken)	`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(demotiebeleid|beoordelingsgesprekken|functiewaardering|beoordeling|promotie)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(procedure)\b)(?=.*?\b(functiebeschrijving)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(beoordeling)\b)(?=.*?\b(prestaties)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(periodieke)\b)(?=.*?\b(beoordeling)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(performance)\b)(?=.*?\b(appraisal)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(functioneringsgesprek(ken)?)\b).*$`

Opleidinge n	Opleidingen, opleidingsplannen, trainingen, scholing, studiekostenregeling, opleiding, scholingsplan	`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(opleiding(en|splan(nen)?)?|studiekostenregeling(en)?|training(en|splan(nen)?)?|scholing(splan(nen)?)?)\b).*$`

Bonussen	eenmalige toeslagen, winstafhankelijke uitkering, loongebouw, resultaatafhankelijke beloning, Resultaat- afhankelijke regeling, beloningsystematiek, Functiewaarderingssysteem,	`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(eenmalige?|periodieke?)\b)(?=.*?\b(toeslag(en)?|beloning(en)?)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*?\b(loongebouw|beloningsystematiek|functiewaarderingsysteem|verhogingspercentage)\b).*$`
		
		`^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.*`

	verhogingspercentages, prestatie-afhankelijke beloning(svormen)	?\b(winst-?afhankelijke|resultaat-?afhankelijke|prestatie-?afhankelijke)\b)(?=.*?\b(uitkering|beloning|regeling)\b).*$
Roosters	Werktijdenregeling, dienstrooster(s), werktijdregeling, rooster(s), dienstoosterwijzigingen, dienstroostersysteem, Arbeids- en rusttijden en pauzes, arbeidstijden	^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.* ?\b(werktijd(en)?-?regeling|(dienst)?rooster(s|wijzigingen|systeem)?)\b).*$ ^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.* ?\b(arbeids(-|tijden)|rust(-|tijden)|pauzes)\b).*$
Zorg	collectieve zorgverzekering, ziektekostenverzekering	^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.* ?\b(ziektekostenverzekering|zorgverzekering)\b).*$
Pensioen	Pensioenregeling, pensioensfonds	^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.* ?\b(pensioens?(regeling|fonds|verzekering))\b).*$
Verzuim	Verzuimprotocol, verzuimbeleid, gedragsregels bij ziekte, reglement bij ziekte, ziekteverzuimprotocol	^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.* ?\b((ziekte)?verzuim(protocol|beleid|reglement)?)\b).*$ ^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.* ?\b((gedrags)?regels|reglement)\b)(?=.*?\b(ziekte)\b).*$
Thuiswerken	Telewerkbeleid, thuiswerken, thuis regeling	^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.* ?\b(thuis)\b)(?=.*?\b(werken|regeling)\b).*$ ^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.* ?\b((tele|thuis)werk(en|beleid))\b).*$
Arbeidsom standigheden	Veiligheid, gezondheid, milieu, hygiene, milieuhygienische, welzijn, milieu-hygiÎnische, hygiÎne	^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.* ?\b(veiligheid|gezondheid|milieu|hygi[.]ne|milieu-?hygi[.]nische?|welzijn)\b).*$
Arbeidsong eschiktheid	Arbeidsongeschiktheid, arbeidsongeschikt	^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.* ?\b(arbeidsongeschikt(heid)?)\b).*$
Externe bureaus	extern organisatiebureau, extern bureau, organisatieadviesbureau	^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.* ?\b(externe?)\b)(?=.*?\b((organisatie(advies)?|advies)?bureaus?)\b).*$ ^(?=.*?\b(ondernemingsraad|or|personeelsvertegenwoordiging|pvt)\b)(?=.* ?\b(organisatie(advies)?bureaus?)\b).*$

Appendix C

Model with Return on assets as DV

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
(Intercept)	5.16	5.86	6.38	4.26	6.65	6.60	6.86	4.15	6.31
	(7.67)	(7.76)	(7.73)	(7.56)	(7.71)	(8.13)	(7.86)	(7.70)	(7.93)
Control variables									
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Size	-0.16	-0.16	-0.40	-0.02	-0.24	-0.39	-0.03	-0.22	-0.23
	(0.50)	(0.50)	(0.53)	(0.49)	(0.53)	(0.54)	(0.50)	(0.53)	(0.53)
Factor(OR/PVT/None)1	4.35	4.35	3.80	1.75	1.18	3.78	1.65	0.84	1.13
	(2.47)	(2.47)	(2.51)	(2.56)	(2.59)	(2.52)	(2.56)	(2.63)	(2.61)
Factor(OR/PVT/None)2	-2.02	-2.21	-1.98	-3.40	-3.71	-2.04	-3.82	-3.52	-3.68
	(3.76)	(3.78)	(3.76)	(3.73)	(3.74)	(3.81)	(3.74)	(3.73)	(3.75)
GDP growth	9.67	9.04	9.56	10.01	8.82	8.86	8.82	10.39	8.92
	(8.22)	(8.29)	(8.22)	(8.09)	(8.15)	(8.30)	(8.16)	(8.11)	(8.18)
Independent variables									
Ability		-0.97			-1.66	-0.19	-3.42		-1.43
		(1.50)			(1.49)	(3.23)	(2.80)		(1.95)
Motivation			2.82		2.75	4.72		6.08	3.13
			(2.26)		(2.25)	(4.88)		(4.27)	(3.05)
Works council strength				7.84**	7.91**		4.43	11.81*	8.35*
				(2.38)	(2.39)		(4.90)	(4.72)	(3.37)
Interaction effects									
Ability X Motivation						-2.35			
						(6.25)			
Ability X works council strength							5.24		
							(6.20)		
Motivation X works council strenght								-8.93	
								(8.84)	
Ability X Motivation X works council strength									-1.31
									(7.04)
R^2	0.10	0.10	0.11	0.13	0.14	0.11	0.14	0.14	0.14
Adj. R^2	0.04	0.04	0.04	0.07	0.07	0.04	0.07	0.07	0.07
Num. obs.	325	325	325	325	325	325	325	325	325
RMSE	8.80	8.81	8.79	8.66	8.65	8.81	8.66	8.66	8.67

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$

Statistical models

Appendix D

variance inflation factors

	VIF	DF	GVIF^(1/(2*Df))
Ability	1.113661	1	1.055301
Motivation	1.316162	1	1.147241
Collective voice	1.435913	1	1.198296
Size	1.406547	1	1.185979
OR/PVT/none	1.320933	2	1.072063
GDP growth	1.119836	1	1.058223
Industry	2.089819	16	1.023301

Appendix E

	Model 1
(Intercept)	-5.52***
	(0.45)
Size	0.54***
	(0.03)
Return on equity	-0.15***
	(0.04)
Solvency ratio	0.02
	(0.04)
GDP growth	0.52
	(0.49)
(INDUSTRY)B	-0.46
	(0.53)
(INDUSTRY)C	0.81*
	(0.37)
(INDUSTRY)D	0.17
	(0.51)
(INDUSTRY)E	0.42
	(0.48)
(INDUSTRY)F	-1.16*
	(0.57)
(INDUSTRY)G	-0.19
	(0.38)
(INDUSTRY)H	0.71
	(0.38)
(INDUSTRY)I	-3.57
	(104.87)
(INDUSTRY)J	-0.82
	(0.51)
(INDUSTRY)K	-0.58
	(0.37)
(INDUSTRY)L	-1.04*
	(0.52)
(INDUSTRY)M	0.05
	(0.38)
(INDUSTRY)N	0.13
	(0.41)
(INDUSTRY)P	0.07
	(0.64)
(INDUSTRY)Q	-0.05
	(0.47)
(INDUSTRY)R	0.33
	(0.55)
(INDUSTRY)S	0.59

	(0.51)
R²	0.11
Adj. R²	0.09
Num. obs.	4309
Censored	3984
Observed	325

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Statistical models

Appendix F

#R-code masterthesis

#data

library(readxl)

#dataset regressie

RS <- read_excel("/Users/jaspervanboven/Dropbox/RU/master/Thesis/data/ROE.xlsx")

View(RS)

#dataset sampleselection

CG <- read_excel("~/Dropbox/RU/master/Thesis/data/controlgroup.xlsx",

        sheet = "heck")

View(CG)

#transform variables:

library(DescTools)

ROAn <- scale(Winsorize(RS$ROE, minval = NULL, maxval = NULL, probs = c(0.01,

0.99), na.rm = TRUE))

Ind <- as.factor(RS$INDUSTRY)

orpvt <- as.factor(RS$`OR1/PVT2`)

#regression

```
m1 <- lm(ROAn ~ Size + orpvt + aGDP + Ind, data = RS)

m2 <- lm(ROAn ~ Ability + Size + orpvt + aGDP + Ind, data = RS)

m3 <- lm(ROAn ~ Motivation + Size + orpvt + aGDP + Ind, data = RS)

m4 <- lm(ROAn ~ ORmacht + Size + orpvt + aGDP + Ind, data = RS)

m5 <- lm(ROAn ~ Ability + Motivation + ORmacht + Size + orpvt + aGDP + Ind, data =
RS)

m6 <- lm(ROAn ~ Ability:Motivation + Ability + Motivation + Size + orpvt + aGDP + Ind,
data = RS)

m7 <- lm(ROAn ~ Ability:ORmacht + Ability + ORmacht + Size + orpvt + aGDP + Ind, data
= RS)

m8 <- lm(ROAn ~ Motivation:ORmacht + Motivation + ORmacht + Size + orpvt + aGDP +
Ind, data = RS)

m9 <- lm(ROAn ~ Ability:Motivation:ORmacht + Ability + Motivation + ORmacht + Size +
orpvt + aGDP + Ind, data = RS)

library(texreg)

htmlreg(list(m1, m2, m3, m4, m5, m6, m7, m8, m9), file =

"/Users/jaspervanboven/Dropbox/RU/master/Thesis/data/R/m1-m9.2.html", inline.css =

FALSE, doctype = TRUE, html.tag = TRUE, head.tag = TRUE, body.tag = TRUE)


#sampleselection

library(sampleSelection)

h1 <- heckit(as.factor(TYPE) ~ Size + scale(Winsorize(ROE, minval = NULL, maxval =

NULL, probs = c(0.01, 0.99),  na.rm = TRUE)) + scale(SR) + aGDP +

as.factor(INDUSTRY),
```

```
        scale(Winsorize(ROE, minval = NULL, maxval = NULL, probs = c(0.01, 0.99),

na.rm = TRUE)) ~ Ability + Motivation + ORmacht + Size + aGDP, data = CG)

library(texreg)

htmlreg(h1, file =

"/Users/jaspervanboven/Dropbox/RU/master/Thesis/data/R/heckman.html", inline.css =

FALSE, doctype = TRUE, html.tag = TRUE, head.tag = TRUE, body.tag = TRUE)


#interactionplot

library(effects)

cv.c <- scale(RS$ORmacht, center = TRUE, scale = FALSE)[,]

mot.c <- RS$Motivation

fit <- lm(ROAn ~ cv.c*mot.c)

cv.SD <- c(mean(cv.c)-sd(cv.c),

        mean(cv.c),

        mean(cv.c)+sd(cv.c))

cv.SD <- round(cv.SD, 2)

cv.SD

Inter.SD <- effect(c("cv.c*mot.c"), fit,

        xlevels=list(cv.c=c(-0.24, 0, 0.24)))

Inter.SD <- as.data.frame(Inter.SD)

Inter.SD$cv <- factor(Inter.SD$cv.c,

        levels=c(-0.24, 0, 0.24),

        labels=c("1 SD Below Mean", "Mean", "1 SD Above Mean"))


library(ggplot2)
```

```
Plot.SD<-ggplot(data=Inter.SD, aes(x=mot.c, y=fit, linetype=cv))+

  stat_smooth(method = "lm", fullrange = TRUE, se = FALSE, color="black", size=0.8) +

  scale_linetype_manual(values=c("twodash", "solid", "dashed")) +

  theme_bw() +

  theme(panel.grid.major = element_blank(), panel.grid.minor = element_blank()) +

  theme(legend.background = element_rect(colour = 'black', fill = 'white', linetype='solid',

size=0.2)) +

  theme(legend.position="bottom", legend.box = "horizontal") +

  theme(legend.title=element_blank())+

  coord_cartesian(xlim=c(0.1, 0.9), ylim=c(-0.8, 0.4)) +

  labs(title="Figure 1", subtitle="Interaction of Motivation and Collective Voice", y="Return

on Equity", x="Motivation")

Plot.SD

ggsave(file="interactieplot.jpeg", plot = Plot.SD, path =

"/Users/jaspervanboven/Dropbox/RU/master/Thesis/data/R" , width=5.5, height=4)


#correlation matrix

my_data <- data.frame(ROAn, orpvt, RS$Size, RS$ORmacht, RS$Ability, RS$Motivation,

RS$test, RS$aGDP)


library(Hmisc)

corstarsl <- function(x){

  require(Hmisc)

  x <- as.matrix(x)

  R <- rcorr(x)$r
```

```r
  p <- rcorr(x)$P

  ## define notions for significance levels; spacing is important.
  mystars <- ifelse(p < .001, "***", ifelse(p < .01, "** ", ifelse(p < .05, "* ", " ")))

  ## trunctuate the matrix that holds the correlations to two decimal
  R <- format(round(cbind(rep(-1.11, ncol(x)), R), 2))[,-1]

  ## build a new matrix that includes the correlations with their apropriate stars
  Rnew <- matrix(paste(R, mystars, sep=""), ncol=ncol(x))
  diag(Rnew) <- paste(diag(R), " ", sep="")
  rownames(Rnew) <- colnames(x)
  colnames(Rnew) <- paste(colnames(x), "", sep="")

  ## remove upper triangle
  Rnew <- as.matrix(Rnew)
  Rnew[upper.tri(Rnew, diag = TRUE)] <- ""
  Rnew <- as.data.frame(Rnew)

  ## remove last column and return the matrix (which is now a data frame)
  Rnew <- cbind(Rnew[1:length(Rnew)-1])
  return(Rnew)
}
##Create table _insert your dataframe below
New_table<-corstarsl(my_data)
```

```
##output:

library(xtable)

x <- xtable(New_table, caption = "TABLE 1: Descriptive Statistics and Correlations", auto =

TRUE)

print(x,

    type = getOption("xtable.type", "html"),

    caption.placement = getOption("xtable.caption.placement", "top"),

    file = getOption("xtable.file",

"/Users/jaspervanboven/Dropbox/RU/master/Thesis/data/R/cor.html"))


#descriptives

library(psych)

describe(RS)

describe(ROAn)


#variance inflation factors

library(car)

vif(m5)
```