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2024

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MPRA Paper No. 123332, posted 22 Jan 2025 14:27 UTC

# Organizational structure and high-performance work practices

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*Accepted for publication in Industrial and Corporate Change*

**Abstract:** Using firm-level data from Denmark, a country characterized by a high level of adoption of “high-performance work practices” (HPWPs), we document a large percentage of firms with limited adoption and large differences depending on the firms’ organizational structures. To explain these differences, we propose a theoretical framework based on agency theory and on human resource (HR) process theory in which the benefits of HPWPs vary across organizations according to their organizational structure. We find that opportunity- and skill-enhancing practices are more frequently used in firms with a network structure than in firms with a divisional structure, which in turn use them more frequently than firms with a functional structure. These findings are consistent with the idea that firms whose structures are designed to rely more heavily on employee control benefit less from HPWPs than those whose structures are meant to promote employee commitment. The use of performance pay is greater in divisional firms than in functional firms, which is consistent with this same idea. However, we find that the use of performance pay is lower in network organizations than in divisional organizations and is not significantly different from its use in functional organizations.

## 1 Introduction

In the last two decades a large amount of research has been interested in the effect of “high-performance work practices” (HPWPs) on firm productivity (as well as other firm-level outcomes), finding for the most part a significant, positive relation between the two (e.g. Huselid 1995, MacDuffie 1995, Ichniowski et al. 1997, Batt 1999, Bailey et al. 2001, Collins and Smith 2006, Messersmith et al. 2011, Shin and Konrad 2017, Sheehan and Garavan 2021; see also the reviews and meta-analyses by Combs et al. 2006, Subramony 2009, Saridakis et al. 2017, Tzabbar et al. 2017, and Jiang and Messersmith 2018). The literature focusing on worker outcomes such as wages (Osterman 2000, Cappelli and Neumark 2001, Osterman 2006, Sgobbi and Cainarca 2015), wage dispersion (Black et al. 2003, Messersmith et al. 2018) or employee satisfaction (Batt 2004, Messersmith et al. 2011, Wood and De Menezes 2011) has also found that if not all, at least some employees also gain. Other studies have

found no effects on wages (Handel and Gittleman 2004) and negative effects on employee satisfaction (Godard 2010) and product quality (Frick et al. 2013), but empirical evidence has been for the most part supportive of the idea that these practices produce beneficial firm-level outcomes.

Despite the positive tone of this literature, empirical evidence shows great cross-sectional variation in the practices and, in particular, a large fraction of “non-adopters” (Blasi and Kruse 2006, Kaufman 2010, Kaufman and Miller 2011, Arthur et al. 2016, 2021). This is so even though more than two decades have passed since these practices started to be adopted and their benefits are well known to HR practitioners, which has led some researchers to consider this large percentage of non-adopters as an “empirical anomaly” (Kaufman 2015). However, despite this evidence non-adoption has received very little attention in the literature (Arthur et al. 2016, 2021). Our study aims to contribute to a better understanding of these firm-level differences in the use of HPWPs by analyzing how organizational structure may influence the benefits that firms obtain from the practices. Specifically, the hypothesis that we theoretically develop and empirically analyze is that differences in organizational structure may partly explain the fact that HPWPs are not as widely used as one would expect.

Our interest in organizational structure as a factor explaining inter-firm differences in HPWPs is motivated by the observation that HPWPs are implemented in an organizational context characterized by a formal organizational structure which, in most cases, is costly to change. Structural inertia has long been recognized as an important force in organizational ecology (Hannan and Freeman 1977, 1984, Freeman and Carroll 2015) and evolutionary economics (Nelson and Winter 1982) and has been corroborated by ample empirical evidence (e.g. Colombo and Delmastro 1999, 2002, Sørensen and Stuart 2000, Gilbert 2005, Rungtusanatham and Salvador 2008). Moreover, organizational rigidity has been shown to influence other strategic choices, e.g. the diversification decision (Rawley 2010, de Figueiredo et al. 2015).

In this context, to explain the link between organizational structure and HPWPs we develop a theoretical framework based on agency theory (Williamson 1975; Stiglitz 1975) and HR process theory (Bowen and Ostroff 2004; Nishii et al. 2008; Ostroff and Bowen, 2016). We build on the agency theory idea that organizational structure has consequences on the incentives of employees, because it affects the extent to which they can make decisions and their incentives to use their decision-making power to

achieve organizational goals (Jensen and Meckling 1992, Marino and Zabochnik 2004, Besanko et al. 2005, and de Motta and Ortega 2013). Since HPWPs serve the purpose of improving the employees' motivation and skills and to provide them with opportunities to achieve organizational goals (see the Ability-Motivation-Opportunity (AMO) framework proposed by Lepak et al. (2006)) we argue that the alignment between structure and HPWPs will vary across organizations. Based on HR process theory, we then argue that this degree of alignment will influence the extent to which HPWPs are beneficial to an organization's performance. Specifically, a greater alignment will imply a higher consistency of the practices, which will increase HR strength, thus leading to a higher organizational performance.

To test our hypotheses we use survey data from a representative sample of Danish firms which includes detailed information of their use of pay and work practices as well as information about their organizational structures. In these data we observe strikingly large differences in the use of practices between the different organizational structures, so that for instance pay and work practices scores are two to three times higher in divisional and matrix organizations than in firms with functional structures. To our knowledge, this is the first study in which such differences are empirically documented for a nationally representative sample of firms.

The country where we conduct our empirical analysis, Denmark, has several desirable features for our study. First, it ranks high on the other shift factors suggested in previous studies, which would make an organizational structure effect more compelling. Specifically, the country has a small, open economy, subject to strong foreign competition; it is one of the OECD countries with the highest share of investment in information technology relative to total non-residential investment; and due to high labor costs and a highly skilled labor force, a large proportion of firms base their strategies on high product and process quality and differentiation. The labor market is very flexible and employee turnover rates are high, which, to the extent that workers benefit from the practices, should also raise these benefits. Second, the high level of competition implies that firms have strong pressures to maximize profits and therefore use HPWPs if they are indeed profitable. Third, the high level of HPWPs (among the highest in Europe) and the fast pace with which they have been adopted (see e.g., Employment in

Europe 2007)<sup>1</sup> suggests that by the year of our data, 2009, most firms have already made their choice about the adoption of HPWPs. Since the diffusion of the practices began already in the 1990s, we think it is unlikely that firms did not adopt due to lack of information or bad practice. Fourth, consistent with previous studies, HPWPs are far from universal and, in our sample, about a half of the firms do not have any of them.

## **2 Literature review**

While in recent years a large part of the HPWPs literature has moved from the firm level of analysis to a more micro and behavioral level (e.g. Messersmith et al. 2011, Barrick et al. 2015, Pak and Kim 2018; see meta-analyses by Meijerink et al. 2021), our understanding of the firm-level factors explaining why many firms do not use these practices remains quite limited (Kaufman 2015, Arthur et al. 2016, 2021). Understanding non-adoption and differences in adoption across firms is particularly important because there is a large amount of empirical evidence that indicates a positive association between HPWPs and organizational performance (see e.g. the reviews by Saridakis et al. 2017, Tzabbar et al. 2017, and Jiang and Messersmith 2018). In light of this evidence, understanding why so many firms exhibit a low level of use of HPWPs is an important question.

A large part of the literature on firm-level differences has looked at differences in general business strategies as an antecedent of the use of HPWPs. This argument relies on the idea of “vertical fit” whereby firms choose the HR practices that are most consistent with their general business strategy (see Gerhart 2007 for a review). Thus, firms that emphasize quality and product differentiation benefit more from the practices because HPWPs help recruit and retain more productive employees, provide stronger incentives, and promote active participation, but are also associated with higher labor costs (see Bailey et al. 2001 and Cappelli and Neumark 2001). The practices would be unattractive to companies pursuing a low-cost strategy. Early work such as Arthur’s (1992) study of steel mini-mills found a positive correlation between having a differentiation strategy and practices promoting employee commitment. Osterman (1994), with a larger sample of manufacturing establishments, found a similar link (see also MacDuffie 1995), but some of the early studies like Huselid (1995) found almost no evidence that firm

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<sup>1</sup> The spread of HPWPs in Danish firms during the two previous decades is described in Author (2012).

strategy mattered. Vertical fit has also been studied in relation to other aspects of strategy. Thus, more recent work by Han et al. (2019) has found that among companies that introduce new products, those that follow an early market entry strategy benefit more from HPWPs. According to Snell and Morris (2021), one of the main challenges of this literature, which explains that empirical results have been limited, is the fact that strategy has many dimensions whose complexity is not well captured by the simple typologies that are normally used.

A related literature has examined whether firm-level differences in the use of HPWPs are associated with differences in the degree of market competition and in the level of investment in information technologies (Becker et al. 1997). This is consistent with early empirical evidence showing that the effects of HPWPs vary across industries (see the meta-analyses by Combs et al. 2006 and Subramony 2009), although these findings have more recently been questioned (see the meta-analysis by Tzabbar et al. 2017). Bloom and van Reenen (2007) find that a set of “good” managerial practices are more frequent in industries with stronger competition. Within this set they include a number of HPWPs that tie rewards to individual performance. Blasi and Kruse (2006) find significant differences in early adoption in the US according to the level of globalization of the industry, which would be consistent with the market competition argument. There is also indirect evidence that small and medium sized enterprises benefit more from HPWPs when they compete in high-technology industries (see the meta-analysis by Rauch and Hatak 2016), which suggests that investments in technology may moderate the link between HPWPs and firm performance. However, finding empirical evidence about the link between market competition or IT investments and HPWPs is difficult because of the challenges involved in establishing causality. Two examples of studies that address this issue are Cuñat and Guadalupe (2005, 2009), who find evidence of a positive link between foreign competition and executive incentive pay using variation in exchange rates as an exogenous source of variation. As far as information technology (IT) is concerned, several studies have found that investments in IT are associated with HPWPs. Bresnahan et al. (2002), who look at productivity of U.S. firms, find investments in IT to be positively related to HPWPs; Han and Liao (2010) find that these practices are positively correlated with the use of computer integrated manufacturing; and Aral et al. (2012) show that there is a complementarity between performance pay and investments in IT and in HR analytics.

Within the literature on between firm differences in adoption of HPWPs, research on the role of organizational structure has been exiguous. Verburg et al. (2007) show that HPWPs are more correlated with firm performance when they have a better internal fit, defined according to whether the HPWPs consistently emphasize employee commitment or consistently seek better control of employees. Since organizational structures are characterized by placing a different emphasis on commitment versus control, their evidence is suggestive that organizational structure is important to understand firms' choices of HPWPs. However, their study does not include measures the firms' organizational structures and therefore cannot provide direct evidence. In our study we use this difference between commitment and control to theoretically explain how different organizational structures may affect firms' choices of HPWPs and we use data on organizational structure to explicitly test our hypotheses. Two studies that have explicit measures of structure are Colombo et al. (2007) and Camps and Luna-Arocas (2009). Colombo et al. (2007) have provided early longitudinal evidence from the 1990s indicating that the introduction of HPWPs had a larger effect on profitability (return on investment) in firms that had a greater degree of delegation; and Camps and Luna-Arocas (2009) have provided cross-sectional evidence of a positive correlation between decentralization and HPWPs. In our theoretical framework we take into account that structural configurations differ in terms of the level of delegation and therefore can be seen as complementary to their analysis. Our study is also related to more recent empirical research on HPWPs and organizational change. Jeong and Shin (2019) find that organizational change moderates the effect of HPWPs on organizational creativity. Theoretically, the reason for this positive effect lies in the fact that organizational change would force employees to be more involved and connected at work and to take greater risks. Their measure of organizational change includes changes in organizational structure, introduction of new technologies, and product and process innovation. While their study assumes that every change in organizational structure will have a similar effect, we hypothesize that the effects of organizational structure on HPWPs will differ across structures and we propose a theoretical framework explaining why.

Our study is also indirectly related to previous work on the negative consequences of HPWPs for employees. Jensen et al. (2013) have found that some of the negative employee-level effects of adoption (e.g. anxiety, work overload and turnover) appear when employees have low levels of job control. In

another study, Topcic et al. (2016) provide empirical evidence that employee stress is positively related to practices that imply greater challenges for employees. Kloutsiniotis and Mihail (2020) find that HPWPs are not associated with emotional exhaustion because in their sample HPWPs provided employees with job resources that allowed them to cope with the job demands. Thus, this literature suggests that an important variable explaining whether employees benefit from the HPWPs is the extent to which employees have autonomy and resources to meet the work demands implied by the practices. Since different organizational structures imply different degrees of autonomy, this evidence is suggestive of the role that organizational structure may play in the adoption of HPWPs.

### **3 Hypotheses development**

We propose a theoretical framework based on agency theory (Williamson 1975 and Stiglitz 1975) and on HR process theory (Bowen and Ostroff 2004) which is built around the idea of alignment or fit between HPWPs and a firm's organizational structure. To present our theoretical framework, we first introduce our conceptualization of organizational structure and HPWPs, we then explain our approach to alignment between practices and structure, and we finally develop our hypotheses.

#### **3.1 Conceptualization of organizational structure and HPWPs**

**Organizational structure.** Our definition of structure stems from the organizational design literature, according to which any organizational structure can be characterized along three dimensions: a grouping of individuals and units within the firm, a set of formal hierarchical relationships established among them, and systems designed to ensure communication and coordination across units (see Daft 2016, p. 86). Rather than focusing on one aspect or dimension of structure, e.g. the degree of centralization, we use a holistic approach that identifies the most frequent configurations that are currently chosen by organizations. Our main theoretical reason for choosing a configurational approach is that our framework is based on the idea that the alignment between HPWPs and structures can happen along several dimensions. For instance, in some cases the degree of centralization will be relevant to assessing the alignment between a given HPWP and structure, while in other cases a more relevant dimension will be the criterion used to group employees into units, e.g. functional versus product-based. Using this configurational approach therefore allows us to derive hypotheses for different HPWPs.



Within the configurational approach, we choose to use a typology that has a long tradition in organizational design and that distinguishes between functional, divisional, matrix, and modular (network) structures (Miles et al. 2010). The first three structures were theoretically analyzed in the early organizational design studies as they were the predominant structures around the 1970s (see particularly Chandler 1962, Galbraith 1971, Williamson 1975, Knight 1976 and Mintzberg 1979, 1980). In a functional or “unitary” form (Chandler 1962) units are defined according to business functions, in a divisional form they are defined according to product lines or geographical regions, and can therefore operate as profit centers (see Williamson 1975), and in a matrix form units are defined according to a combination of the two (e.g. product and function). To these three classical configurations we add the more recent modular or network structure, which developed in the 1980s and 90s and consists of a network in which the firm plays the role of a hub that outsources the services to a number of external partners (see Miles and Snow 1984, 1986, Powell 1990, Nohria and Eccles 1992 and Baker 1992).

Our proposed typology has been used more recently in studies that follow a configurational approach to organizational design (see Snow et al. 2005, Mosca et al. 2021, Junge et al. 2023). The main advantages of using this typology stem precisely from its long tradition in organizational design. Theoretically, the agency literature on organizational structure has primarily relied on this typology and therefore our analysis of alignment between HPWPs and structure is facilitated by the use of this typology. Moreover, this typology is well-known to managers and therefore, empirically, it limits the possibility that some of the managers who respond to our survey mis-classify their organization’s structure.

**HPWPs.** Our conceptualization of HPWPs is based on the definition of HR practices as “specific organizational actions designed to achieve some specific outcomes” (Lepak et al. 2006), i.e. as organizational activities that originate from the organizational strategy and that apply at the lower levels of the organization (see Schuler 1992). Thus, while the decision to implement a given set of practices comes from top management, the implementation itself is done by line managers at lower levels of the organization. Starting from this definition of practices, we classify HPWPs using Lepak et al.’s (2006) typology of motivation-enhancing, skill-enhancing and opportunity-enhancing practices. Within this framework, practices are used to provide employees with adequate skills (skill-enhancing practices), to

motivate them to use their skills to achieve organizational goals (motivation-enhancing practices) and to empower them so that they have opportunities to use their skills and motivation (opportunity-enhancing practices).

### **3.2 Alignment between HPWPs and structure**

For our analysis of alignment between HPWPs and structure, our starting point is to note that in any organization HPWPs are used in the broader context of a formal organizational structure which, as indicated by the literature on structural inertia (Colombo and Delmastro 1999, 2002, Sørensen and Stuart 2000, Gilbert 2005, Rungtusanatham and Salvador 2008), is difficult to change.

We point out that the choices that a firm makes regarding its organizational structure and its HR practices –the extent to which HPWPs are used– send messages to the employees about what the firm expects of them, thus influencing their behavior. Alignment between HPWPs and structure is important for performance because, as the literature on HR process has proposed, organizational practices send messages to employees about the behaviors that are desired by the organization (Bowen and Ostroff 2004; Ostroff and Bowen, 2016). Depending on their content, practices can lead to a strong situation, i.e. one in which employees have a shared perception about the behavior that the organization expects, or to a weak situation, characterized by the employees' differing views about the desired behaviors.

Bowen and Ostroff (2004) argue that the strength of the situation depends on the degree of distinctiveness, consistency and consensus of the practices. An organization's structure is characterized by a high degree of distinctiveness, as it is clearly visible and understandable and receives legitimacy from top management. Moreover, under a given organizational structure employees also understand the purpose of the unit that they belong to, i.e. the goals of the structure, which also contributes to its distinctiveness. Like organizational structure, HPWPs are also very salient and therefore rank high on distinctiveness: these practices are introduced by the HR management as formal practices and are therefore visible; they are also perceived as legitimate since the initiative for their adoption comes from HR management, and they have clearly understandable goals as they have a clear purpose of improving the organization's performance.

However, while structure and HPWPs have a high degree of distinctiveness, they are not necessarily consistent: when structure and HPWPs are misaligned, this lowers their consistency and can have

detrimental effects on performance, as employees the messages that employees receive from the HPWPs are not in line with the messages that the organization sends through its structural design. We therefore hypothesize that HPWPs are more likely to be used in organizations whose structure is more aligned with them.

To define the degree of alignment between HPWPs and structure, we focus on the commitment-control dimension, i.e. on whether the message sent to employees is that the firm wants to encourage their engagement in autonomous decision-making or that it is primarily interested in controlling their decisions. According to Nishii et al. (2008), employees make attributions about the reasons why managers introduce certain HR practices, and these attributions have consequences on their behavior. They propose that the HR attributions made by employees can be commitment-focused or control-focused. We extend this idea to the attributions that employees make about the firm's choice of organizational structure, i.e. we hypothesize that different organizational structures will send different messages about the importance given to commitment versus control.

We also base this extension on the agency theory literature, which following the work of Jensen and Meckling (1992) has identified two related mechanisms by which the choice of structure affects the behavior of employees. The first one has to do with how and to what extent employees at lower levels are formally entitled to make decisions, which is related not only to the level of decentralization but also to how responsibilities are divided horizontally across units, e.g. according to functions or products. The second mechanism is related to the types of incentive contracts that an organization can design. This mechanism is a consequence of the fact that structures group employees according to different criteria, and this influences how performance is measured and how incentive contracts are designed. The two mechanisms are closely related because in an agency setting empowering employees requires ensuring that their incentives are aligned with organizational goals, and performance pay plays a key role in this alignment: thus the two mechanisms have been examined together (see e.g. Prendergast 2002, Nagar 2002, Marino and Zabojsnik 2004, Besanko et al. 2005, Ortega 2009, de Motta and Ortega 2013, and Prasad and Tamada 2024).

### **3.3 Hypotheses**

We derive hypotheses for the three types of HPWPs mentioned above: motivation-enhancing, opportunity-enhancing and skill-enhancing practices (Lepak et al. 2006). As the meta-analyses on HPWPs show (see e.g. Subramony 2009 and Jiang et al. 2012), previous studies have considered practices that fall into these three categories, but the specific practices that are considered within each category do not fully overlap across studies. We also do not claim to consider all possible practices within each category, but we focus on some selected practices which are the most frequently considered in the literature.

### **3.3.1 Motivation-enhancing practices**

Motivation-enhancing practices rely on establishing a link between the rewards that employees receive –particularly economic rewards—and their performance (Lepak et al. 2006). Within this category performance pay stands out as the most frequently used practice according to the meta analyses conducted on the topic (see e.g. Subramony 2009 and Jiang et al. 2012).

According to the agency literature (starting with Williamson 1975 and Stiglitz 1975) the main objective of performance pay is to improve employees’ incentives when their actions are not perfectly observable by their managers or by shareholders. This literature also suggests that organizational structures vary in the extent to which they seek to control employee behavior: thus, when structures are designed to control employees, employees’ actions are more observable, which makes performance pay less needed (Lazear 1986). Furthermore, empirical evidence indeed shows a positive relationship between the extent of delegation and the use of performance pay contracts (Nagar 2002, Ortega 2009, Hong et al. 2019). We hypothesize that the emphasis on employee control is higher in functional and divisional structures, whose hierarchical structures with simple “chains of command” are designed to supervise employees’ decisions. It is less so in matrix organizations because employees report to several superiors whose objectives differ and the chain of command is more ambiguous, and even less so in network organizations, which lack a formal hierarchical structure.

From an HR process perspective, performance pay practices send a clear message to employees that the organization values achieving certain organizational goals, and therefore the message that their actions should be oriented to these goals. However, if the structure is designed to give employees commands on what should be done and to control that they complete the required tasks – as in functional

and divisional organizations—the message sent by the firm’s structure is that employees should focus on the commands that they receive. This may imply some inconsistency as employees may have different views as to whether they have to focus on the commands that they receive or to pursue actions that have not been commanded but may lead to greater achievement of organizational goals. In organizations whose emphasis on supervision and the chain of command is less important –matrix and network organizations—this inconsistency is less likely to arise since there is more similarity between the message that employees receive from the organization’s choice of structure and the message implied by the performance pay practices. We therefore propose:

*Hypothesis 1A. Use of performance pay practices will be greater in matrix organizations than in functional or divisional organizations.*

*Hypothesis 1B. Use of performance pay practices will be greater in network organizations than in functional, divisional or matrix organizations.*

Organizational structure also influences the use of performance pay practices because it affects performance measurement, i.e. the choice of structure has implications on how organizations measure the performance of their units. Divisional firms are organized according to non-functional criteria, such as product or market, which implies that divisional profits can be measured, and this makes it easier to provide divisional-level incentives (Williamson 1975). It also sends a clear message to employees as to what type of performance is expected. As this is not the case in functional firms, the benefits of performance pay should be lower in these organizations (Besanko et al. 2005). As far as matrix organizations are concerned, research has found that matrix structures are advantageous for organizations that want to meet clearly defined goals but find themselves limited by the existence of internal silos (Burton et al. 2015). Hence, these organizations rely on group-based incentives (profit or gain sharing) whose aim is to promote internal collaboration to achieve performance goals (Burton et al. 2015).

From an HR process point of view we expect greater consistency between performance pay practices and structure in divisional and matrix organizations than in functional organizations. In all cases performance pay practices send the message that employees should orient their actions to improving performance. This message will be more clearly understood when the structure –divisional

or matrix—is also sending the message that there are some clear organizational goals in terms of which employees will be evaluated, compared to the case in which the structure is functional and it is harder to measure unit performance and to understand how unit performance contributes to organizational performance. We consequently propose:

*Hypothesis 2. Use of performance pay practices will be greater in divisional and matrix organizations than in functional organizations.*

### **3.3.2 Opportunity-enhancing practices**

Opportunity-enhancing practices promote the involvement of employees in decision-making so that they can use their motivation and knowledge to contribute to organizational goals (Lepak et al. 2006). While HR practices can in general be designed to promote commitment or to control employee behavior (Arthur 1992), from an early stage adoption of HPWPs has been based on the premise that commitment-based practices were better for performance (Wright and Essman 2021). According to the agency literature, one of the main benefits of involvement is that workers can use their specific knowledge (Jensen and Meckling 1992; Prendergast 2002; Raith 2008) and, according to the HR literature, involvement allows organizations to take more advantage of their employees' human capital (Lepak et al. 2006). Thus, opportunity-enhancing practices give employees more autonomy with the expectation that they will use their knowledge, skills and ability to improve performance. Coupled with a high degree of employee motivation, this would facilitate the achievement of organizational goals.

While HPWPs rely on a commitment approach, control often plays an important role in the design of organizational structures. Many organizations rely on strong hierarchical structures which are designed to control the decisions that employees make, while in other organizations hierarchical links are less marked. Functional structures in particular are characterized by high levels of control because a functional division of responsibilities creates interdependence among the different units, thus limiting the ability to make autonomous choices and leading employees to rely on the commands that come from higher levels, where coordination decisions are made. Thus, the proportion of executives with functional responsibilities has been associated to a greater degree of centralization (Guadalupe et al. 2014). In the divisional case there is also a strong chain of command, but the non-functional division of responsibilities makes it possible for certain units to operate with more autonomy, thus increasing the

possibilities for employee involvement. In matrix organizations there is also considerable formalization of hierarchical relations, but the multiplicity of reporting lines generates some scope for employees to make autonomous decisions, as explained above, while network organizations do not have any formal hierarchical structure.

From an HR process perspective, opportunity-enhancing practices send the message that employees should decide themselves about the actions or decisions that can more effectively lead to achieving organizational goals. If the organization has weak hierarchical links, its structure also sends the message that employee initiative is valuable to the firm, which leads employees to have strong, shared perceptions about their expected behavior. However, when the structure is characterized by strong hierarchical relations, employees are asked to strictly follow the commands they receive. These structures lead to high power distance cultures where employees are not used to make autonomous decisions and lack the skills to do so. In those cases, employees receive contradictory messages from the opportunity enhancing practices that the organization is using and the hierarchical structure in which employees are working. Thus we propose:

*Hypothesis 3A. Use of employee involvement practices will be greater in divisional and matrix organizations than in functional organizations.*

*Hypothesis 3B. Use of employee involvement practices will be greater in network organizations than divisional or matrix organizations.*

In the literature on HPWPs one of the main types of opportunity-enhancing practices is teamwork (see Subramony 2009 and Jiang et al. 2012). Although team learning is an important reason why teams contribute to performance (Wiese et al. 2022) and therefore teams have both opportunity-enhancing and skill-enhancing dimensions, we follow the HPWP literature in classifying teamwork primarily as an opportunity-enhancing practice.

At a managerial level, teamwork can increase cooperation between or within organizational units. The need for cooperation varies across structures. Divisional structures generate competition among divisions (see Williamson 1975), in particular for funding (Rajan et al. 2000). Functional organizations, in contrast, are less exposed to internal power struggles because the decision to fund one product over another does not have a large impact on the funds that functional managers receive. Consequently,

functional managers cooperate more than product managers, which implies that interdivisional coordination needs are lower in functional organizations than in divisional organizations (de Motta and Ortega 2013). There is also research showing that competition between divisions attenuates free-riding problems within divisions (Marino and Zabojnik 2004), which suggests that intradivisional teams will be more effective in divisional than in functional structures. Hence at a managerial level we expect a greater use of teamwork in divisional organizations compared to functional organizations.

As for non-managerial employees, in the agency literature teams have traditionally been associated with two drawbacks: free-riding and inefficiency due to lack of structure in teams. This literature has identified situations where teams are likely to generate benefits exceeding costs (see Lazear and Gibbs 2017, chs 6-8). These include production characterized by complementarity of tasks and need for task coordination. Here on-the-job learning is important and often is in the form of learning skills from coworkers that the employee would not otherwise have. Teams also contribute to greater understanding of how steps fit together in the production process. In problem-solving production, combining diverse skills and information is key and is facilitated by teamwork. Finally, when employees have distinct but relevant information sets, teams many times offer a setting for valuable knowledge transfer. Based on the economics literature, although free-riding is less of a problem in more hierarchical structures because of more widespread supervision and control and peers possessing information enabling them to recognize free-riding behaviors, teams are less common in functional structures as specialization is more prevalent and task complementarity, task coordination and knowledge transfer between units are more difficult than in divisional and matrix organizations. The reasons for teamwork are even more relevant in firms with modular structures in which it is necessary to have a high degree of task coordination and to encourage knowledge spillover.

The management literature provides more direct evidence of the link between teams and organizational structure. Thus, management research indicates that the benefits of teams in terms of organizational performance depend on the degree of formalization and on the importance of hierarchical links at the organizational level. While some formalization and hierarchy may be in some cases desirable within teams (see the meta-analysis by Stewart 2006 and more recent evidence by Bunderson and Boumgarden 2010), a high degree of formalization and strong hierarchical links at the



*organizational* level have been found to hinder team performance (Bresman and Zellmer-Bruhn 2013). Empirical evidence on matrix organizations is illustrative of the important role of team work in a context of weak hierarchical links: employee participation in multiple teams is typical of matrix organizations (Bazigos and Harter 2016), which rely on temporary, project-focused cross-functional teams, e.g. for product development purposes (Ford and Randolph 1992). The importance of cross-functional teams would increase with product complexity (see Söderlund and Tell 2009 for a detailed analysis of Asea/ABB's paradigmatic case). We have not found similar micro evidence on the role of teams in network organizations but the above-mentioned evidence by Bresman and Zellmer-Bruhn (2013) suggests that, given the absence of hierarchical links in network organizations, team collaboration would be even more important for coordination purposes. Furthermore, this idea of alignment between teams and organizational structure based on the strength of hierarchical links is also consistent with HR process theory. As an opportunity-enhancing practice, teamwork sends employees the message that they should use their autonomy to work towards a particular goal. This message is consistent with the message that employees receive from the firm's choice of structure as long as structure is characterized by weak hierarchical links.

Based on both the economics agency literature and the management literature, we hypothesize that the benefits of teams will be larger in organizations with a network structure than in matrix or divisional organizations, and that benefits would be larger in the latter than in functional organizations. Thus we propose:

*Hypothesis 4A. Use of teamwork will be greater in divisional and matrix organizations than in functional organizations.*

*Hypothesis 4B. Use of teamwork will be greater in network organizations than in divisional and matrix organizations.*

### **3.3.3 Skill-enhancing practices**

Skill-enhancing practices have been defined as practices that increase employees' skills, knowledge and abilities (Lepak et al. 2006). Within this set of practices we focus on firm-provided training as it is the most widely used, according to the main meta analyses (see e.g. Subramony 2009 and Jiang et al. 2012). There is ample empirical evidence that training is positively related to organizational

performance but little empirical evidence on the role played by organizational context in general and no evidence on the role of organizational structure in particular (see the review by Garavan et al. 2021).

Gelade and Ivery (2003) found that the positive effect of training on organizational performance was mediated by a positive effect on work climate, which suggests that employees' interpretations of their work environment are important to understand the effect of training. Specifically, training is positively associated with an organizational climate index measuring perceptions of leader support, goal emphasis, reward orientation, job challenge and autonomy, task support, and unambiguity. This is in line with HR process theory according to which HR practices affect employees' perceptions about their expected behavior. In particular, it is consistent with the idea that training leads employees to perceive that they should work with autonomy to achieve specific goals and that they will be supported and rewarded by their managers.

We hypothesize that the benefits of training will be influenced by the organization's structure, through two mechanisms. First, structure affects the degree of responsibility of lower-level employees: in less hierarchical organizations lower-level employees are required to take on more responsibilities and it is therefore more important to increase their skills to ensure that they can meet the greater job demands. Training needs are therefore greater and training should have a larger effect on performance. Moreover, from an HR process perspective, in more decentralized organizations the message that employees receive from the structure is that they should take on responsibilities, which is consistent with the message that they receive from the training provided by the organization. We therefore expect a greater amount of firm-provided training in organizations that are more decentralized, i.e. there should be more training in network organizations than in matrix or divisional organizations, which in turn will offer more training than functional organizations.

Second, structure also affects the extent to which employees have to work together with other employees possessing different skill sets. This will be the case in firms where horizontal coordination and knowledge spillover play a central role. In these cases, employees will need to acquire a greater variety of skills to be able to interact with employees whose skill sets are different. Moreover, in organizations in which horizontal coordination and knowledge spillovers are important the message that employees receive from the structure is that they should take initiative, which is consistent with the

message received from the training programs. We expect horizontal coordination, combination of diverse skills and information and knowledge transfer to be more important in divisional and matrix organizations than in functional structures and to be even more important in modular forms than in divisional or matrix organizations. Based on these two mechanisms we therefore propose:

*Hypothesis 5A. Firm-provided training will be greater in divisional and matrix organizations than in functional organizations.*

*Hypothesis 5B. Firm-provided training will be greater in network organizations than in matrix or divisional organizations.*

## **4 Data and methods**

### **4.1 Sample**

The data used in the next sections come from a survey designed by the first author and carried out in Denmark in 2009. Some of the antecedents that previous literature has related to HPWPs are foreign competition and an intensive use of IT (see Section 2). Denmark provides an interesting setting for our study because it ranks high on both dimensions. In 2007 Denmark's share of investment in information and communication technology (ICT) was the second largest in the OECD (OECD 2017).<sup>2</sup> Denmark has a very open economy too, with strong foreign competition as measured by its rate of import penetration, one of the largest in the OECD (OECD 2010) and higher than in the countries whose data have been used in the literature on HPWPs.<sup>3</sup> As we show further down, despite a business environment that was "favorable" to the use of HPWPs, more than 50 percent of the firms did not have any, and within the set of firms that had at least some HPWP there was high variation.

The survey was directed at Danish private sector firms with more than 20 employees and contains a host of questions regarding the firms' work, compensation and other HR practices like internal training

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<sup>2</sup> In 2007 Denmark's investment in ICT was 24.57 percent of total non-residential investment. The country with the largest share was the United States, with a 26.31-percent share. Investment in ICT includes information technology equipment (computers and related hardware), communications equipment, and software.

<sup>3</sup> The rate of import penetration is the share of domestic demand that is met by imports. In 2007 (the latest year available) Denmark's rate of import penetration of goods and services was 51.26 percent (ninth largest rate among 30 OECD countries). The rate of import penetration was larger than in the countries whose data have been used in the previous empirical literature (Cuñat and Guadalupe 2005, 2009; and Bloom and Van Reenen 2007): United States (import penetration: 16.40 percent), France (27.86 percent), United Kingdom (28.86 percent), and Germany (42.91 percent).

and employee performance evaluations. For the work practices, the firms were asked to differentiate between salaried employees and production workers. Correspondingly, for the performance pay practices respondents were asked to distinguish between four categories of employees: top managers, middle management, salaried employees and production workers.

The survey was administered by Statistics Denmark and was sent to 3,940 firms in April-May in 2009. The questionnaire was sent out to the most relevant HR representative in each firm, according to a list maintained in Statistics Denmark. The firms were chosen from a random sample of the total population of firms with operations in Denmark, stratified according to size (as measured by the number of full-time employees) and industry. The survey over-sampled large and medium-sized firms; all firms with 50 employees or more were included, and 35 per cent of the firms in the 20-49 employees range.<sup>4</sup> The response rate was 49.4 per cent, which is quite satisfactory given the rather long and detailed questionnaire that was used.<sup>5</sup> In the current article we have excluded all responding firms with fewer than 100 employees and incomplete answers on the key questions of the analysis (that is, use of HPWPs and the firm's organizational form). There are two reasons for applying the size restriction of 100 employees. First, some HPWPs are for cost reasons only used in firms with a sufficiently large workforce. The other reason is that some organizational structures like the functional structure (see below) only exist for firms above a certain size. This gives us a sample consisting of 1,497 firms.

All the questions regarding the firm's use of HPWPs have a common structure. The respondents are given a list of practices (including definitions of key concepts) and asked whether the firm has implemented them, and if so, when. The firms are also asked about the proportion of employees covered by each practice, and in the case of the performance pay, they are furthermore asked about the typical

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<sup>4</sup>A partly similar survey was also carried in 1999. Making use of this, the sample for the 2009 survey actually consists of two parts. One is the 1,605 firms that had answered the survey ten years earlier, of which Statistics Denmark succeeded in identifying 1,144, but had to exclude 260 firms because of lacking data or because the firms no longer matched the sample restrictions. The other part is a supplementary sample of 2,791 firms chosen in order to have a data structure corresponding to the one in 1999. The total sample in 2009 is larger; about 700 more firms than in 1999 are included. Another difference is that in 2009 the firms were first asked to answer the questionnaire on the internet – 65 per cent of the respondents did so – and the remaining 35 per cent of the respondents were interviewed using telephone. For a detailed description of the results from both surveys; see Author (2012).

<sup>5</sup>The response rates for firm size and one-digit industry cells vary only little; between 45 and 53 percent. Thus, representativeness of the sample is of no major concern. For the retrospective questions (going up to ten years back in time) it should, of course, be noticed that responding firms come from the population of surviving firms.

share of an employee's total compensation that is due to the pay practice in question. The performance pay practices asked about were: individual bonus, team bonus, stock options or warrants, stock or employee stock ownership plan, profit sharing (and for production workers, piece rates). The work practices included were: self-managed teams, job rotation schemes, total quality management (TQM), quality circles, benchmarking programs, and knowledge sharing schemes. Moreover, the survey included a question on training, specifically the proportion of employees (salaried and production workers, separately) covered by firm-provided training during the previous year.

In the survey firms were also asked about the *proportion* of employees of each group covered by each practice. In the case of performance pay there were four employee groups (top managers, middle managers, salaried employees, and production workers) and in the case of work practices, two groups (salaried employees and production workers).

#### **4.2 Measures**

*Performance pay.* To measure the extent to which firms use performance-related pay (hypotheses 1 and 2), we use an index of pay practices called *Performance pay* and defined as the sum of scores for the use of individual performance pay practices. If a firm does not use a given practice the score is zero, and otherwise it is equal to the share of employees covered by it. Since we have pay practice information by employee groups, we define a score for each individual practice and employee group. Thus if individual bonuses are used for all top managers, 75 percent of middle managers, 25 percent of salaried employees, and 50 percent of production workers, the individual bonus scores would be 1, 0.75, 0.25, and 0.50 respectively, for each of the four employee groups. The firm's individual bonus score would be  $1 + 0.75 + 0.25 + 0.50 = 2.50$ . The *Performance pay* index is defined as the sum of these scores for the practices included in the survey: individual bonus, team bonus, stock options or warrants, stock or employee stock ownership plan, profit sharing, and (for production workers) piece rates.

*Employee involvement* (hypothesis 3) is an index (computed with the same method used to compute *Performance pay*) that measures the extent to which a firm uses work practices designed to increase employee direct participation in decision making. It excludes indirect participation, i.e. participation through representatives. The practices included in the index are self-managed work teams, quality circles and TQM. Self-managed teams are characterized by the high level of autonomy that workers

have in deciding how to allocate and perform tasks. A quality circle program is a participatory management program that seeks to involve workers in finding solutions to quality problems through regular, voluntary meetings (see e.g. Munchus 1983). TQM is a full management system oriented towards quality improvement and employee engagement is one of its main building blocks (see e.g. Olian and Rynes 1991 and Spencer 1994). Previous studies on human resource practices have also identified these three practices as the main employee involvement practices (e.g. Appelbaum and Batt 1994, Pil and MacDuffie 1996 and Cappelli and Neumark 2001).

*Teamwork* (hypothesis 4) is the score constructed from the answers to the self-managed teams question, using the same method as for the performance pay practices, and to measure firm-provided training (hypothesis 5) we use the variable *Training*, defined as the percentage of employees who receive employer-provided training. This variable has the limitation that it does not capture the amount of human capital investment made by the firm, but it is similar to the measures used in similar large samples of firms (Bartel 2000).

In addition to these measures, for descriptive purposes we also use an aggregate index of practices, called *Work practices*, which includes all the work practices available at the survey: self-managed teams, job rotation schemes, TQM, quality circles, benchmarking programs, and knowledge sharing schemes; and an aggregate index called HPWP and defined as the sum of *Performance pay* and *Work practices*.

*Organizational structure.* In the survey managers were asked to identify the own organizational structure that applied to their company, specifically whether their firm was organized “according to functions (the so-called U-form)”, “in divisions (the M-form)”, “as a matrix-organization (a combination of U and M forms)”, “as a network structure”, or “in another way”. Based on the answers we created dichotomous variables for organizational structure.

*Controls.* The remaining explanatory and control variables are also taken from the 2009 firm survey and describe industry (five categories; default: manufacturing), ownership (domestic, Danish multi-national firms, foreign owned multi-national firms) and ownership type (stock company, family owned firm, other), whether the firm is an exporter or not and whether it has an R&D department.

Industry has been shown to be correlated with the use of HPWPs in previous empirical work (see Tzabbar et al. 2017). Whether the firm is multinational is also an important control variable. A key strategic decision of many firms is whether or not to aim for selling outside the (local or) domestic market. The so called Melitz (2003) hypothesis states that because exporting firms have to cover additional costs of exporting to non-domestic markets, they have to be more productive than non-exporters. They are in other words located in the right tail of the productivity distribution; see e.g., Bernard et al. (2007). The theory and most of the subsequent work on firms and trade are silent as to why they are more productive. There is considerable evidence showing that firms do not become much more productive from the experience of exporting, so it seems not to be the outcome of a learning process. A possibility is that successful exports-oriented strategies include use of HPWPs which contribute to improved productivity. The same reasoning applies to multi-national firms too, although it should be noticed that the superior performance of multi-nationals is often attributed to the higher quality of their employees. Multi-national firms may be able to recruit higher quality employees because they pay them better than local employers or because they use payment schemes which attract more productive workers.

Ownership type is also an important control because it influences the extent of agency problems in the firm (Jensen and Meckling 1976). Stock companies with a more dispersed ownership are likely to face a higher degree of misalignment of the owners' and the employed managers' interests and therefore need to use incentive schemes to mitigate the agency problems. A specific form of firm ownership which should also be controlled for is the family owned firm. There is evidence showing that family-owned firms offer less training, pay less, and have a lower labor productivity (Neckebrouck et al. 2018); as well as evidence that family ownership matters in terms of adoption of HPWPs, family firms being less likely to adopt them than firms with other types of ownership (Bryson et al. 2007).

In highly developed economies like Denmark an important strategy of firms is to be innovative both with respect to the products sold and how these are produced. In our sample, 9.3 per cent of the firms have an R&D department with its own budget.<sup>6</sup> The literature on corporate R&D provides arguments

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<sup>6</sup> This is presumably a lower bound estimate of R&D activities in the sample firms. On a separate question regarding the R&D expenditures, 13.6 per cent of the respondents reported non-zero expenditures.

both in favor and against use of incentive pay schemes. Performance related pay is said to create incentives for managers and other employees to move away from pet projects and to take more risks (be more innovative). Arguments against use of incentive pay are that it creates multi-tasking problems and that it leads to exploitation of only well-known approaches and avoidance of unexplored ones; see e.g., Lerner and Wulf (2007). Empirical evidence tends to suggest that HPWPs are positively correlated with investments in R&D (Michie and Sheehan 1999).

## 5 Empirical analysis

### 5.1 Descriptive information

With regard to the use of performance pay and work practices, two prominent features stand out from the data; see *Figure 1*. First, over half of the firms do not use any of the listed practices.<sup>7</sup> Second, for the firms that do, the spread in the use of the practices is quite large. The average value for the use of pay, work and HPWPs are 0.60, 0.80, and 1.40 respectively when the non-users are included, and 1.73, 2.31 and 3.24 when only firms with positive values are included.

Figure 1

As far as organizational structure is concerned, the frequency distribution of the answers for all firms (using firm population size and industry as weights) and the sample we are using in the subsequent analysis is given in *Table 1*. From this it can be seen that, of all the firms that answered the question a little over half and about three out of four of the firms in the estimation sample are organized as a functional structure. The second most common organizational form is the matrix structure, which accounts for a little over a tenth of the answers. Divisional firms make up 7.6 per cent of the estimation sample firms, whereas network structures are quite rare: less than one per cent of the firms in the sample. About 2.5 per cent chose the answer “other”.<sup>8</sup> 11.7 per cent did not answer the question.

Table 1

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<sup>7</sup> The survey asked respondents to report other pay and work practices used by the firm than those listed. They were some, but only a few, and none of these were adopted more frequently than those listed.

<sup>8</sup> The sample restriction of minimum 100 employees is of course arbitrary. Expanding the sample to include firms with minimum 50 employees yields many more observations (2,552 firms) and leads to a considerably lower share of U-form firms and correspondingly higher proportions of the other organizational forms, especially Hybrids and the category “other organizational forms”.



As both differences in key features of firms with different organizational structures and the use of HPWPs by organizational structure of firms have not been studied much before, we present briefly some descriptive information on this matter (see Appendix). Summarizing, compared to the functional companies, firms with a divisional or matrix-form are more likely found outside manufacturing (especially in the services sector), are larger and more likely to be multi-nationals and engaged in exporting. In accordance with our a priori expectations based on organizational economics theory more divisional and matrix firms make use of incentive pay schemes (for all categories of employees) and new work practices for their salaried employees. The differences are strikingly large. Compared to functional firms that use least pay and work practices, the pay and work practices scores for divisional and matrix organizations 2-3 times higher, and for networks the work practices score is five times higher. In line with expectations, functional firms make use of subjective evaluation standards in their employee evaluations and divisional firms are characterized by a higher number of job levels than the other organizational structures. Next, we will examine these differences in more detail and, in particular, whether they remain in a more formal regression analysis in which we include a host of control variables.

## 5.2 Econometric estimation results

In the sequel we will present estimates from simple linear models. As the dependent variable in most cases is bounded, that is, its lowest value is zero and there are also upper bounds owing to the construction of the measures of HPWP use, we have also estimated the models as Tobit models in order to account for these features of the dependent variables. The Tobit estimations yield the same results – that is, the sign, significance and marginal effects are very similar to those obtained from the linear model estimations.<sup>9</sup> Consequently, for their ease of interpretation, we present only the latter.

*Table 2* contains estimates of determinants of HPWPs for three broad measures: *Performance pay*, *Work practices* --which measures the use of all HPWPs except performance pay-- and *HPWP*, which is the sum of the other two indexes. In addition to the organizational structure indicators the models include several firm characteristics and some additional controls. All variables are taken from the survey

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<sup>9</sup> The same is true for taking the log of the dependent variables. The only major difference in this case is that we obtain better fit in terms of higher  $R^2$  values.

described above. For all three models we may note that besides the organizational structure indicators many of the added explanatory variables attach significant coefficient estimates.

Table 2

Model 1 shows results for firms' use of performance pay. The estimates to the divisional and matrix organizations are significantly different from zero, that is, significantly larger than in the omitted category, functional firms. Moreover, the size of the differences is very large: use of pay and work practices is about twice as common in the divisional and matrix organizations than in functional firms. Model 2 shows results for the use of HPWPs other than performance pay, and indicates that these practices are more prevalent in network, divisional and matrix organizations than in functional organizations, a pattern that is also shown in Model 3, which uses the index of all HPWPs as dependent variable. In Models 2 and 3 the estimates for divisional and matrix forms do not significantly differ from each other, whereas the estimate for networks is significantly larger in magnitude.

With regard to industry affiliations the default is manufacturing and thus the first column tells us that firms in the services industry have a greater use of performance pay than those in manufacturing. From the second column we can see that firms in the trade and services industries have a lower use of work practices. The pattern with opposite signs is interesting as it is commonly believed that work practices and incentive pay systems are complementary, that is, that organizations should not introduce performance pay (individual bonuses, say) without changing work practices (allowing employees more influence on their work performance).

A somewhat surprising finding is that firms that have a separate research and development (R&D) department rely less frequently on both pay and work practices. Innovation can be adversely affected by monetary incentives since it involves a high degree of multi-tasking and these settings performance pay schemes can lead to distortions (Holmstrom and Milgrom 1991). Moreover, innovation is a field where intrinsic motivation is very important and therefore explicit performance pay may not be needed.<sup>10</sup>

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<sup>10</sup> We may also add that scientific and research-oriented professions are professions in which employees may have strong views about how they should conduct their work. If these normative views are widely shared in the profession, the messages that employees receive from the firm's organizational structure may have relatively little weight, compared to the shared professional understanding as to how R&D should be conducted. This is

There are quantitatively very large differences in the firms' use of HPWPs for different types of firm ownership variables. Pay as well as work practices are considerably more often employed in multinational firms than in firms with exclusively domestic operations, and in stock and family owned firms than in cooperatives and limited liability firms which make up the default category. Notably, the difference between stock companies and family owned firms is insignificant. Even after controlling for all these traits of the firms, being an exporter is associated with a more frequent use of performance pay. We now turn to examining the tests of the hypotheses outlined in section 3.

### **5.2.1 Motivation-enhancing practices**

With regard to the motivation-enhancing practices we focus on performance pay (Model 1 in Table 2) to test hypotheses 1 and 2. Hypothesis 1 posited that network organizations would have a greater use of performance pay, followed by matrix organizations, which would in turn have greater use than functional and divisional firms. The hypothesis that use in matrix organizations would be greater than that of functional and divisional firms (Hypothesis 1A) is partially supported by the estimates in Table 2: indeed, matrix firms use performance pay more than functional firms. However, there is no statistically significant difference between the use of performance pay in divisional and matrix organizations. On the other hand, the hypothesis that the adoption of them is largest in network organizations (Hypothesis 1B) is clearly rejected: networks' use of performance pay does not exceed that of divisional and matrix-forms; indeed it does not differ from that of functional forms. Since Hypothesis 1 is based on the idea that differences in performance pay across structures are due to differences in the importance of supervision, our empirical results provide only partial support for the idea that the monitoring systems in place may hinder or favor the adoption of performance pay. As for Hypothesis 2, according to which matrix and divisional firms would rely on performance pay more than functional firms, it is based on the idea that there are better measures of divisional performance in the former than in the latter. Our estimates are clearly supportive of this hypothesis.

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related to monetary incentives as in these cases employees may be more concerned about the impact of their work on their future career prospects than in their immediate compensation, as in a career concerns model (Holmstrom 1982). In any case, our data are at the firm-level and we cannot therefore conclude anything about the use of HPWPs within the R&D departments.

The estimates for four different categories of employees in *Table 3* uncover a few differences that were masked in the aggregate analysis. One is that for top managers there is surprisingly enough no difference between functional and divisional firms. Differences between matrix- and functional organizations are statistically significant, however, for all employee categories, whereas they are not between divisional and matrix firms, save managerial employees. We also do find that network organizations use significantly more performance pay than firms with other structures. Thus, *Table 3* suggests that the support for Hypothesis 1A is stronger than indicated in *Table 2*, as it shows how for all employee groups performance pay is significantly greater in matrix than in functional organizations, and for managerial employees performance pay is also greater in matrix than in divisional firms. The results in *Table 3* confirm the lack of support for Hypothesis 1B and the support for Hypothesis 2. Similar results are found in additional estimations (not shown but available upon request), distinguishing between different categories of performance pay, like individualized, team-based or stock-based pay.

Table 3

All in all, we can conclude from *Tables 2* and *3* that differences in the use of performance pay across organizations are consistent with divisional performance measurement being easier in divisional and matrix organizations than in functional organizations. Thus, the challenges of measuring divisional performance in functional organizations would be a factor explaining why these organizations rely on performance pay practices less than matrix or divisional firms. From these tables we can also conclude that the hypothesized role that differences in employee supervision across organizational structures would play receives only partial support in the data. Because of dual chains of command, in matrix organizations employees are subject to less supervision than in functional or divisional organizations. We consequently expected a greater use of performance pay in the former than in the latter, but this is only partially so. When we consider all employees, matrix organizations indeed use more performance pay than functional and divisional organizations, but we only find statistical significance in the difference between matrix and functional organizations.

### **5.2.2. Opportunity-enhancing practices**

With regard to opportunity-enhancing practices, which Hypothesis 3 refers to, we first use the variable *Employee involvement* which combines information regarding the use of three HPWPs: self-managed teams, quality circles and TQM. The estimates are set out in *Table 4* from which we may note that, when considering all employees, there is a higher use of these practices in divisional firms than in firms with a functional organization. However the use of these practices is not significantly greater in matrix than in functional organizations. Thus, Hypothesis 3A finds only partial support. For networks we observe a considerably higher reliance on practices promoting employee engagement than in all the other organizational structures, which implies a strong support for Hypothesis 3B. The use of involvement practices differs between firms mainly for salaried employees. The differences for production workers are smaller and significant only for networks. Hence on the whole our results are partially consistent with the idea that use of employee involvement practices is greater in firms that rely less on employee supervision.

Table 4

To test the specific hypotheses on teamwork we use as dependent variable a measure of the coverage of self-managed teams for salaried and production workers, respectively. Thus, this variable takes on values between zero and one. As can be seen from *Table 5*, among salaried workers there is a greater use of self-managed teams in divisional firms than in the functional organizations, which is consistent with Hypothesis 4A, but we do not find that self-managed teams are also more frequent in matrix organizations than in functional organizations. With regard to Hypothesis 4B, it is supported by the data as network organizations rely on self-managed teams more than matrix or divisional organizations.

Table 5

In summary, the results on the opportunity-enhancing practices provide partial support for Hypotheses 3A and 4A and full support for Hypotheses 3B and 4B. Network organizations rely on these practices more than any other type of organization and divisional organizations rely on these practices more than functional organizations, but there is little statistical difference in the use of these practices between matrix and functional organizations.

### **5.2.3. Skill-enhancing practices**

With regard to skill-enhancing practices, we focus on firms' provision of training. The reason for expecting differences across organizational structures in firm-provided training is that training is less important when employees are subject to greater control. Since functional firms rely more heavily on employee supervision, training should be less valuable in these firms (Hypothesis 5A). As can be seen from *Table 6*, functional firms indeed train their salaried employees less than all the other organizational forms do, and the differences are not small. Moreover, network organizations train their salaried employees more than divisional and matrix firms do, which supports Hypothesis 5B. The average portion of salaried employees trained is 0.22 (and 0.53 for firms that provide training) and the estimated differences hover around 0.1. Corresponding shares for production workers are somewhat lower: 0.14 and 0.50, respectively. The estimated differences are also positive for production workers, but smaller in magnitude and statistically significant only for the matrix organizations. Thus, in particular for salaried employees, the results support Hypotheses 5A and 5B.

Table 6

Several of the other regressors, which are not shown, are also statistically significant and some of them attach large coefficient estimates. The pattern in these is the same as in the use of pay and work practices functions suggesting that differences in how much firms train their employees are related to differences in their pay and work practices. Thus, we have for instance seen that multi-nationals and exporters more often have adopted pay and work practices, and the estimates indicate that they also train more of their employees than domestic and non-exporting firms. This is consistent with previous evidence that firms with HPWPs invest more in training (Whitfield 2000).

## 6 Conclusions

This study has theoretically and empirically examined the link between the use of HPWPs and firms' organizational structure. We have proposed a theoretical framework based on agency theory (Williamson 1975, Stiglitz 1975 and Jensen and Mecking 1992) and HR process theory (Ostroff and Bowen 2004 and Nishii et al. 2008) in which the benefits that firms derive from HPWPs are influenced by their organizational structure. In our theory the degree of alignment between HPWPs and organizational structure varies along the "commitment-control" dimension, i.e. according to whether firms have designed their organizational structure to primarily supervise employees (control) or to

promote their own decision making (commitment). When alignment is weaker, the messages that employees receive from the firm's choice of structure conflict with the messages implied by the use of HPWPs, which have a strong commitment orientation. This leads to lower benefits of the practices, while a stronger alignment produces greater benefits. If organizations are more likely to use HPWPs when the benefits from the practices are larger, this implies differences in the use of HPWPs across organizational structures.

We test our hypotheses with data from a detailed survey of Danish private sector firms. An important advantage of our data over previous studies on HPWPs and organizational structure (Verburg et al. 2007 and Camps and Luna-Arocas 2009) is that it constitutes a large, representative sample of firms. The main point which emerges from our empirical analysis is that there are indeed significant differences in the use of HPWPs across firms with different organizational structures. The overall pattern is that network organizations rely more on HPWPs than divisional firms, which in turn use more HPWPs than functional organizations. This is consistent with our theory as we hypothesized a greater degree of alignment between structure and HPWPs in network organizations, followed by divisional and functional organizations. However, our results for matrix organizations are only partially consistent with the theory. When significant, differences in HPWPs between matrix and functional organizations are as hypothesized –i.e. greater use in matrix organizations—but these differences are often insignificant.

The finding that most clearly contradicts our theory has to do with the use of performance pay in network organizations. Our hypothesis that HPWPs are more frequently used by network organizations than by other types of organizations is supported for all HPWPs but not for performance pay. In fact, we find that network organizations use as much performance pay as functional organizations and significantly less than matrix or divisional organizations. These organizations strongly rely on teamwork and shared responsibilities and one could think that paying employees according to their performance would therefore be difficult. However, companies could still pay according to team or organizational performance, which is not the case: in fact, according to our data in network organizations the use of individual bonuses is as frequent or more frequent than the use of team bonuses.

Within the already large literature on HPWPs, we believe we have contributed to a better understanding of the observed cross-sectional differences in the use of these practices. As the meta-analyses indicate (Subramony 2009, Jiang et al. 2012, Tzabbar et al. 2017) this literature has not paid much attention to the role that organizational structure could play in firms' decisions to implement these practices. Given the ample evidence on the structural inertia of organizations (e.g. Colombo and Delmastro 1999, 2002, Sørensen and Stuart 2000, Gilbert 2005, Rungtusanatham and Salvador 2008) and the fact that organizational structure affects employees' motivation, opportunities and skills, we believe an empirical examination of the role of structure was needed. Since structural characteristics are difficult to change, they may partially explain why, despite the compelling empirical evidence on the benefits of HPWPs (see e.g. Tzabbar et al. 2017), many organizations do not use these practices.

Earlier work by Colombo et al. (2007) provided longitudinal evidence from the 1990s on the effect of HPWPs on profitability for a sample of Italian manufacturing firms. They found that HPWPs had a larger effect when delegation of strategic and operational decisions was greater. One question raised by their findings is whether organizations would choose to decentralize in order to achieve greater gains from the HPWPs. We have looked at a cross-section of firms about ten years later and in a different European country –Denmark— and have found that non-adoption is correlated with the presence of organizational structures that rely less on delegation. This suggests that for some firms it may be difficult to delegate because of their structural design and this, in turn, may hamper their adoption of HPWPs. In their study of diffusion of HPWPs in the United States, Blasi and Kruse (2006) concluded that “the more a potential innovation disrupts existing organizational patterns, the less likely it will spread.” This is consistent with our finding that, years after these practices started to be adopted, there is still a large percentage of non-adopters and, moreover, that there is a significant correlation between the use of HPWPs and the presence of organizational structures that are more consistent with them – particularly network and divisional.

In the context of the more specific literature on organizational structure and HPWPs, our study complements earlier work by Verburg et al. (2007), who found that organizational outcomes are better when HR practices are more consistently aligned in terms of favoring employee commitment. Verburg et al. (2007) related their bundles of HR practices to different organizational structures, but they did not



have measures of structure in their data. Our data include independent measures of HPWPs and structure and we can therefore analyze how they correlate. Our study also complements the work of Camps and Luna-Arocas (2009), in two ways: we theoretically highlight the importance of HR strength in understanding the link between HPWPs and structure and we provide evidence from a representative and larger sample of firms and from a country with different labor market institutions.

One of the main limitations of our study is the cross-sectional nature of the data, which implies that we cannot provide evidence about the dynamic process of adoption of HPWPs. Our assumption is that by 2009 firms have already analyzed whether they can or cannot benefit from HPWPs, and have acted accordingly, i.e. are using the practices if they are profitable. The year of the survey is also important in view of the evidence that HPWPs have lagged performance effects because of the time that companies need to adjust the practices after they are first introduced (Kato 2006). More importantly, the cross-sectional nature of the data implies that we cannot make any causality claims about the link between organizational structure and HPWPs. We can only show that HPWPs correlate with organizational structures in a way that is consistent with our hypotheses. Changes in macro structure are not frequent events, which implies that a long panel would be required to properly estimate within firm effects of organizational structure. Moreover, we would need to be able to observe exogenously-driven changes in organizational structure. There are a number of recent longitudinal studies on HPWPs (see the meta-analysis by Saridakis et al. 2017) but we know little about the role of organizational structure. One of the few exceptions is Jeong and Shin's (2019) study of how firms that undertake organizational change experience greater benefits of HPWPs in terms of creativity.

Other limitations of our study are related with the measures of HPWPs and organizational structure. With regard to HPWPs, we can only look at a selected number of practices. These practices belong to the three categories of motivation, opportunity and skill-enhancing practices, which are the three recognized categories of HPWPs (see Lepak et al. 2006, Subramony 2009 and Jiang et al. 2012). Moreover, within each category the practices that we consider are the most common ones, but there are others. As for organizational structure, we rely on a configurational approach. An alternative approach, which others have followed (Colombo et al. 2007, Camps and Luna-Arocas 2009) is to look at one or several dimensions of structure. We think both approaches are valuable and complementary. Arguably,

data about different structural dimensions of organizations can provide more detailed evidence about the effects of structure than data about structural configurations. However, focusing on structural configurations as we do limits response biases, since respondents in different firms have a common understanding as to, for instance, what a matrix or divisional structure is. Asking respondents about the degree of formalization or decentralization, as earlier studies have done, could induce greater measurement error.

With regard to the age of the data, the fact that the survey was conducted a number of years ago (in 2009) would be a disadvantage if we were studying a phenomenon that changes frequently. However, as Colombo et al. (1999, 2002, 2007) have shown, changes in organizational structure are rare. Some readers could also think that the use of HPWPs in our dataset is rather low, as more than 50 percent of the firms do not use any of the practices listed in the survey. However, we should not forget that our sample is representative and is therefore not restricted to large firms. As Blasi and Kruse (2006) have shown, when one looks at a representative sample of organizations, use of HPWPs is indeed quite low. In their data, which are based on the U.S. census, only 1 percent of establishments could be categorized as “high-performance” in terms of their HR practices.

Last, we should also point out that our data are restricted to one country and we cannot therefore draw conclusions about the role that national institutions or culture may play in explaining differences in the use of HPWPs. This can be relevant to our research question if organizational structures are implemented in different ways across different countries, due to differences in national cultures or institutions.

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## Figure and tables

Figure 1 HPWP scores

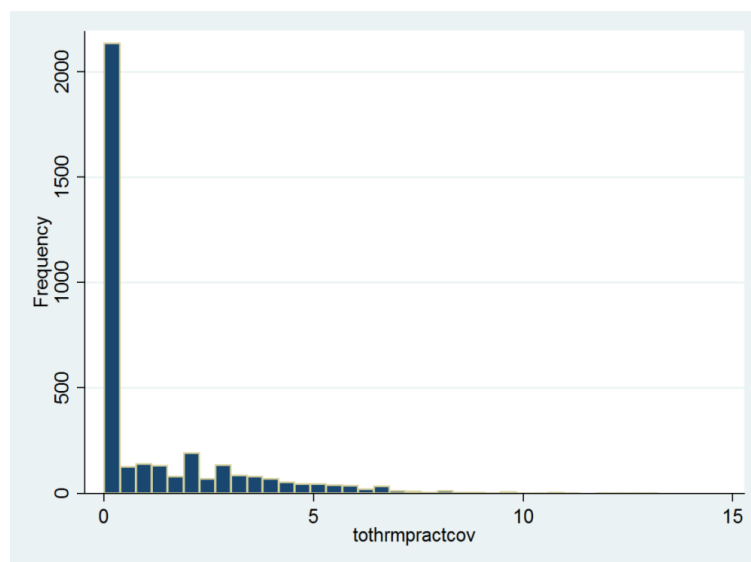


Table 1. Proportion of firms with different organizational structures (%)

Organizational structure	Whole data set	Estimation sample
Functional	53.6	76.5
Divisional	11.2	12.8
Matrix	23.3	7.6
Network	2.3	0.6
Other	9.6	2.5

Table 2. Estimates of firms' use of HPWPs

	Performance pay	Work practices	HPWP
Divisional structure	0.302*** (0.092)	0.462*** (0.145)	0.763*** (0.179)
Matrix structure	0.374*** (0.076)	0.280** (0.120)	0.655*** (0.148)
Network structure	0.021 (0.290)	1.977*** (0.456)	1.957*** (0.564)

Other org. structures	-0.109 (0.145)	0.154 (0.228)	0.046 (0.282)
R&D department	-0.109 (0.072)	-0.077 (0.114)	-0.186 (0.141)
Foreign owned	0.556*** (0.078)	0.426*** (0.122)	0.982*** (0.151)
Danish MNF	0.596*** (0.087)	0.798*** (0.136)	1.934*** (0.169)
Exporter	0.217** (0.071)	0.097 (0.111)	0.314** (0.138)
<i>Industry:</i>			
Construction	0.009 (0.095)	-0.123 (0.150)	-0.114 (0.185)
Trade	0.074 (0.063)	-0.345*** (0.100)	-0.271** (0.124)
Transports	-0.025 (0.083)	-0.098 (0.131)	-0.122 (0.162)
Service	0.104* (0.061)	-0.279*** (0.095)	-0.174 (0.118)
<i>Ownership:</i>			
Stock company	0.614*** (0.081)	0.984*** (0.127)	1.598*** (0.158)
Family owned	0.623*** (0.134)	0.931*** (0.210)	1.554*** (0.260)
R <sup>2</sup> adj.	0.364	0.285	0.436
N of obs.	1,497	1,497	1,497

Note. The omitted categories for organizational structure, industry and ownership are functional structure, manufacturing, and cooperatives and limited liability firms, respectively. Standard errors in parentheses.  
\* p<0.1 \*\* p<0.05 \*\*\* p<0.01.

Table 3. Estimates of firms' use of performance pay practices by categories of employees

	Performance pay Top managers	Performance pay Middle management	Performance pay Salaried employees	Performance pay Production workers
<i>Org. structure:</i>				
Divisional	0.011 (0.041)	0.087** (0.037)	0.124*** (0.034)	0.080*** (0.022)
Matrix	0.080** (0.034)	0.137*** (0.031)	0.078*** (0.028)	0.079*** (0.018)
Network	-0.003 (0.129)	0.041 (0.117)	0.007 (0.107)	-0.066 (0.071)
Other forms	-0.085 (0.056)	0.042 (0.059)	-0.095* (0.053)	0.029 (0.035)
R <sup>2</sup> adj.	0.262	0.266	0.195	0.090
N of obs.	1,497	1,497	1,497	1,497

Note. Firm characteristics – same as in Table 3 – are included in the estimation, but are not reported. The omitted category for organizational structure is the functional structure. Standard errors in parentheses. \* p<0.1 \*\* p<0.05 \*\*\* p<0.01.

Table 4. Estimates of firms' use of involvement practices by categories of employees

	All employees	Salaried employees	Production workers
<i>Organizational structure:</i>			
Divisional	0.149** (0.071)	0.107*** (0.040)	0.043 (0.040)
Matrix	0.036 (0.059)	0.057* (0.033)	-0.021 (0.033)
Network	0.936*** (0.225)	0.691*** (0.127)	0.245* (0.127)
Other forms	0.121 (0.112)	0.122* (0.064)	-0.001 (0.063)
R <sup>2</sup> adj.	0.173	0.161	0.142
N of obs.	1,497	1,497	1,497

Note. Firm characteristics – same as in Table 3 – are included in the estimation, but are not reported. The omitted category for organizational structure is the functional structure. Standard errors in parentheses. \* p<0.1 \*\* p<0.05 \*\*\* p<0.01.

Table 5. Estimates of firms' use of self-managed teams

	Salaried employees	Production workers
<i>Organizational structure:</i>		
Divisional	0.050* (0.027)	-0.019 (0.024)
Matrix	0.034 (0.022)	-0.015 (0.019)
Network	0.460*** (0.084)	0.176** (0.074)
Other forms	0.167*** (0.042)	0.019 (0.037)
R <sup>2</sup> adj.	0.165	0.145
N of obs.	1,497	1,497

Note. Firm characteristics – same as in Table 3 – are included in the estimation, but are not reported. The omitted category for organizational structure is the functional structure. Standard errors in parentheses. \* p<0.1 \*\* p<0.05 \*\*\* p<0.01.

Table 6. Determinants of firms' provision of employee training. Dependent variable: proportion of employees trained

	Salaried employees	Production workers
<i>Organizational structure:</i>		
Divisional	0.075*** (0.017)	0.014 (0.018)
Matrix	0.075*** (0.017)	0.036** (0.015)
Network	0.129**	0.028

	(0.054)	(0.056)
Other forms	0.072*** (0.027)	0.027 (0.028)
R <sup>2</sup> adj.	0.533	0.324
N of obs.	1,497	1,497

Note. Firm characteristics – same as in Table 3 – are included in the estimation, but are not reported. The omitted category for organizational structure is the functional structure. Standard errors in parentheses. \* p<0.1 \*\* p<0.05 \*\*\* p<0.01. Corresponding estimations with the log of (1+(proportion receiving training)) yielded very similar results.

## Appendix

We begin our description with Table A-1, which shows that the firms with a functional structure are predominantly operating in the manufacturing industry. As functional organizations (U-firms) is the most common organizational form in our sample, it implies that a large fraction of manufacturing firms have a functional structure. Compared to the U-firms, the pure divisional form companies and the matrix firms are more likely to be in the services sector and to be foreign or Danish owned multi-national firms. Firms organized as networks differ from the others in several regards: they are less likely to be foreign multinationals, stock companies and exporters. The residual category, “other organizational structures”, has in common with networks that they are less likely to be multinationals and have another other ownership form than a stock company or a family firm.<sup>11</sup>

Next, we turn to look at some descriptive statistics of how HPWPs vary across organizational structures. Table A-2 shows the average index scores for performance pay and work practices, respectively by organizational structure of the firm. As is clear from a glance at the table, the average score for both type of practices is lowest for the functional firms. For divisional firms and matrix organizations, the average score is 2.5 to 3 times higher. Use of performance pay practices do not seem to differ between networks and U-firms, whereas the average score for work practices is five times as high for network organizations. Thus, as pointed out above in the main text, the differences are large suggesting that organizational structure is a potentially important driver of firms’ adoption of pay and work practices.

*Table A-1. Characteristics of firms with different organizational structures (%)*

	Functional	Divisional	Matrix	Network	Other
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<sup>11</sup>They are mainly co-operatives and limited liability firms (APS firms in Danish).

<i>Industry (% share):</i>					
Manufacturing	40.6	33.3	36.1	33.3	47.4
Construction	6.8	7.9	6.8	0.0	2.6
Trade	20.8	17.5	17.3	22.2	15.8
Transports	8.4	10.8	7.9	0.0	7.9
Services	23.4	30.7	31.9	44.4	26.3
<i>Ownership (%):</i>					
Domestic	51.6	39.5	38.2	55.5	50.0
Danish MNF	21.7	26.3	26.2	33.3	26.3
Foreign MNF	26.6	34.2	35.6	11.1	23.7
Stock company	81.5	82.5	82.7	55.5	13.2
Family owned	7.1	10.5	7.3	0.0	0.0
Other ownership form	11.4	7.0	10.0	44.5	86.8
<i>Exporting firm (%)</i>	49.0	49.1	43.5	33.3	39.5

More disaggregated information is displayed in Tables A3-A7, below. Here, it should be recalled that the number of observations for networks and other forms are small and hence not too much should be concluded from observed differences between them and the functional, divisional and matrix forms. Beginning with work organization and work practices (Table A-3), we may note that for salaried employees the differences between functional, divisional and matrix organizations are relatively small. The only differences are that job rotation schemes are more used in functional than divisional and matrix firms and that knowledge sharing schemes are somewhat more prevalent in the divisional and matrix organizations. However, for production workers differences are more pronounced. Thus, divisional and matrix firms have more often job rotation schemes, TQM, benchmarking and knowledge sharing schemes than the functional firms. With the exception of quality circles and benchmarking, network organizations seem to use all the mentioned work practices more frequently than other firms.

*Table A-2. Average pay and work practices scores by organizational structure*

	Performance pay	Work practices
<i>Organizational structure:</i>		
Functional	0.36	0.49
Divisional	1.09	1.43
Matrix	1.11	1.22
Network	0.45	2.51
Other forms	0.51	0.98

*Table A-3. Use of different work practices for salaried and production workers, separately (% of firms in each category)*

	Functional	Divisional	Matrix	Network	Other

<u>Salaried employees:</u>					
Self-managed teams	35.5	37.3	31.6	50.0	36.7
Job rotation	40.6	29.3	33.8	50.0	50.0
TQM	10.3	17.3	10.3	25.0	3.3
Quality circles	8.1	8.0	5.1	0.0	10.0
Benchmarking	23.9	24.0	29.4	25.0	13.3
Knowledge sharing	42.7	52.0	50.0	50.0	30.0
<u>Production workers:</u>					
Self-managed teams	34.4	38.6	35.7	66.7	50.0
Job rotation	11.7	18.8	19.0	22.2	14.7
TQM	9.2	16.8	14.3	22.2	8.8
Quality circles	6.4	7.9	4.8	11.1	2.9
Benchmarking	25.2	33.7	32.8	33.3	17.6
Knowledge sharing	52.8	66.3	60.7	66.7	41.2

The prevalence of different types of performance pay practices is described in Table A-4. From this, we may note that individual bonuses are used more frequently in divisional and matrix-form organizations than in functional firms for all categories of employees. For non-production workers groups the same is observed for stock options, stock and employee share ownership programs. Otherwise, there are no systematic patterns in differences between functional, divisional and matrix firms, and differences are small. As for networks and other forms, all the types of performance pay described in Table 4 are less used than in the other organizations except team bonuses, which are more prevalent in network firms than in other organizational structures.

In Table A-5 the proportions of employees that during the previous year received training provided by their employer are shown for the different organizational structures. The overall high proportions are as expected as in international comparisons Danish firms are typically found to spend larger sums of money on training their employees than firms in other European countries. The differences between differently organized firms are not large and no systematic pattern stands out from the table.

*Table A-4. Use of different performance pay practices, four different categories of employees (% of firms in each category)*

	Functional	Divisional	Matrix	Network	Other
<u>Top executives:</u>					
Individual bonus	50.2	65.5	60.7	33.3	36.8
Team bonus	11.1	10.6	14.7	22.2	10.5
Stock options, warrants	8.8	17.7	13.6	11.1	10.5
Stock, ESOP	13.0	16.8	16.8	11.1	7.9
Profit sharing	13.4	12.4	11.0	22.2	2.6
<u>Middle management:</u>					
Individual bonus	38.8	53.1	57.6	44.4	31.6
Team bonus	9.8	10.6	11.0	44.4	7.9
Stock options, warrants	0.7	7.1	3.7	11.1	7.9
Stock, ESOP	8.1	12.4	10.5	11.1	7.9

Profit sharing	9.4	7.1	8.9	22.2	2.6
<u>Salaried employees:</u>					
Individual bonus	19.5	28.3	31.4	22.2	10.5
Team bonus	10.7	13.3	11.5	22.2	5.3
Stock options, warrants	0.3	2.7	2.6	0.0	0.0
Stock, ESOP	7.2	13.3	8.9	0.0	5.3
Profit sharing	9.1	8.0	6.3	11.1	2.6
<u>Production workers:</u>					
Individual bonus	3.9	12.4	7.9	0.0	5.3
Team bonus	12.4	8.8	16.8	0.0	7.9
Stock options, warrants	0.3	0.0	1.0	0.0	0.0
Stock, ESOP	4.6	6.2	5.8	0.0	2.6
Profit sharing	6.2	0.9	4.2	0.0	2.6
Qualification pay	16.6	15.9	16.8	22.2	23.7
Piece rates	6.8	7.1	5.8	0.0	2.6

Most of the firms in our sample report that they are evaluating their employees regularly (at least every three years, annually or more often). Thus, only 15, 11, 11, and 22 per cent of the firms do not carry out evaluations of top executives, middle management, salaried employees and production workers, respectively, and in this regard, there are only small differences between firms with different organizational structures. In the survey, the firms that regularly evaluate their employees were asked whether they used objective standards (that is quantitative measures, fulfillment of goals, etc.), subjective standards (qualitative information), or both type of standards in their evaluations. The distributions of answers by category of employees and organizational structure of firm are given in Table A-6.

Table A-5. Proportion of employees receiving firm provided training (in per cent)

	Functional	Divisional	Matrix	Network	Other
Salaried employees	44.4	52.8	48.9	46.6	39.9
Production workers	29.9	28.8	31.4	21.8	27.9

This shows that the majority of firms in each organizational type make use of both objective and subjective standards for all categories of employees. The only notable difference in the use of performance evaluation standards is in the proportion of firms using exclusively subjective standards. We would expect functional (and to some extent also matrix-) organizations to have less access to objective standards, and consequently they have to use subjective (both) standards more (less) often than divisionally organized firms. This is indeed what we observe in the table, although the differences are not large.

Finally, we briefly look at the hierarchical structure of the firms. In the survey, we asked the firms about the number of job levels for three categories of employees/jobs. Unfortunately, a non-trivial share (50.7 per cent) of the respondents did not answer the question, and so, the numbers in Table A-7 are not directly comparable to those shown above. Nevertheless, it is worth noting that the average number of layers in the hierarchy is, as expected, higher in the functional organizations than in firms organized in other forms.

*Table A-6. For employees evaluated, standards used (% of firms in each category)*

	Functional	Divisional	Matrix	Network	Other
Top executives:					
Objective standards	12.9	14.7	14.2	17.6	15.4
Subjective standards	20.0	12.4	18.5	23.6	9.6
Both standards	67.1	72.9	67.3	58.8	75.0
Middle management:					
Objective standards	13.5	14.1	13.6	25.0	20.0
Subjective standards	20.7	16.3	21.5	18.8	15.0
Both standards	65.8	69.6	64.9	56.2	65.0
Salaried employees:					
Objective standards	14.4	14.1	15.0	40.0	18.0
Subjective standards	22.9	15.6	21.5	30.0	18.0
Both standards	62.7	70.4	63.5	30.0	64.0
Production workers:					
Objective standards	17.6	12.5	16.7	25.0	15.7
Subjective standards	22.7	18.3	21.9	16.7	23.5
Both standards	59.7	69.2	61.4	58.3	60.8

*Table A-7. Number of job levels in firms with different organizational structures*

	Functional	Divisional	Matrix	Network	Other
For top executives	1.73	1.88	1.73	1.60	1.57
For middle management	1.66	1.91	1.78	1.45	1.60
For other employees	1.23	1.78	1.15	1.11	1.44