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Analysis of the relationship between the adoption of the OHSAS 18001 and business performance in different organizational contexts

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ABSTRACT

This paper investigates how the characteristics of operational processes—systematic and project-based—affect the impact of adopting the safety management systems on different performance metrics. The proposed approach allows the development of a framework which matches safety problems and risks encompassed by organizational tasks with solutions generated by new safety knowledge linked to the adoption of the OHSAS 18001 standard. Our analysis of the effect over work accidents, as well as operational and economic performance of implementing the OHSAS 18001 in Spanish manufacturing, construction and professional services organizations during 2006–2009 shows that organizations modify existing safety practices to mitigate work accidents, and that safety learning effects widely vary across industry sectors. Organizations whose current knowledge is mostly codified and processes are highly systematic benefit more from safety knowledge and experience, whereas the effects of the OHSAS 18001 dilute in organizations whose knowledge is high in tacitness, and whose processes difficult the visibility of the consequences of work accidents. This study has important implications for managing knowledge acquisition processes. The findings offer valuable insights on how managers can develop communication and coordination actions to cope with the potential incompatibilities between safety management systems, the properties of knowledge and work environmental conditions.

> "*Questions will be asked about whether more safety measures could have been applied to a route that only opened up in its current high-speed form 18 months ago. The answer to such questions is inevitably always yes. Accidents are usually the result of several failures. The more safety systems there are in placeS the less likely it is that all can fail.*"
>
> —The Economist: Train tragedy (July 27, 2013)[1]

1. Introduction

Managing risks at work is a key concern in today's working environment. Scholars and practitioners have witnessed a striking change in the role of safety management, which has evolved from a narrow view linked to a costly administrative burden to an operating priority with significant economic and social impact (Abad et al., 2013; Das et al., 2008). According to the European Agency for Safety and Health at Work (EU-OSHA, 2013), the economic costs and operational losses of work accidents to workers, businesses, and public administrations represent 3% of the EU's gross domestic product. The growing awareness of the importance of safety management has led European governing bodies to adopt specific policies within the EU 2020 strategic plan aimed at stimulating safe work conditions (European Commission, 2007).

Existing research on safety management supports the notion that businesses adopting safety systems experience performance improvements (Abad et al., 2013; de Koster et al., 2011; Lo et al., 2014). The analysis of how enhanced safety management systems improve various dimensions of performance is the focus of this study.

In this context, the OHSAS 18001 certification is becoming the dominant international safety system adopted by organizations to engage in processes to promote continuous improvements of work safety conditions (Fernández-Muñiz et al., 2012; Lo et al., 2014). Moreover, the OHSAS 18001 is the basis for the new ISO 45001 standard on work safety that will likely be available in 2017, which makes the strategic importance of the OHSAS 18001 more evident. The increased relevance of safety management for managers and policy makers had led to a growing body of work on the role of safety systems on performance; however, literature is relatively silent on how the OHSAS 18001 impacts performance metrics unrelated to work safety (Abad et al., 2013; Lo et al., 2014). The OHSAS 18001 is a source of knowledge but the characteristics of the safety system themselves, of the environment in

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[1] http://www.economist.com/blogs/charlemagne/2013/07/spains-rail-crash.

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which the system is used, and of the operational tasks which condition both the visibility of the consequences of accidents can each affect its influence.

In consonance with these arguments, this paper examines the conditions under which the acquisition of safety knowledge and accumulated safety experience impact various performance dimensions. Specifically, we evaluate the effect of adopting the OHSAS 18001 and cumulative safety experience on safety, operational and economic performance; while accounting for differences in the organizational context that can affect the effects of safety systems.

The empirical application considers a unique dataset of 149 Spanish manufacturing, construction and professional services firms during 2006–2009. The sample includes businesses that adopted the OHSAS 18001 in different years and a group of noncertified firms. This setting provides an opportunity to assess how safety knowledge and safety experience enhance different performance metrics in contexts where work environmental conditions and the causes and consequences of work accidents are complex and heterogeneous.

This study contributes to the literature on safety at work in two main ways. First, the proposed analysis of the effect of the operational context in moderating the relationship between the OHSAS 18001 and various performance metrics extends the literature on work safety. Second, by examining the effects of safety systems and accumulated OHSAS experience in different organizational contexts managers will be better equipped to identify those actions that can contribute to exploit the knowledge and experience that result from the adoption of safety systems.

The remainder of the paper is organized as follows. Section 2 presents the theory that underpins this study and the proposed hypotheses. In Section 3 the sample, variables and methods are presented. Empirical results are found in Section 4, while the final section provides the discussion and concluding remarks.

2. Background literature and hypotheses development

The OHSAS 18001 standard is available in the marketplace since 1999. This framework was developed by several standardization and certification bodies in 'response to urgent customer demand for a recognizable occupational health and safety management system standard against which their management systems can be assessed and verified' (BSI, 2007). The fundamental objective of the OHSAS 18001 standard is to support and promote good practices in the area of occupational health and safety via systematic and structured management systems (Chang and Liang, 2009). Also, prior studies suggest that safety practices linked to the OHSAS 18001 improve both competences at existing operational procedures and the functioning of the business (Abad et al., 2013; Lo et al., 2014). As a result, adopting organizations could be in a solid position to minimize risks to its employees, and subsequently to reduce work accidents (Fernández-Muñiz et al., 2012). From a safety management perspective, the OHSAS 18001 entails the introduction of value-adding codified knowledge. This new knowledge is a source of continuous improvement that helps to mitigate work accidents by applying systematic safety controls and improving the previous safety practices (Robson et al., 2007).

We therefore propose a learning cycle (Fig. 1) which first focuses on the factors that encourage the implementation of the OHSAS 18001 (Stage 1). Next, we turn our attention to the short-term effects on organizational performance resulting from the adoption of the new safety-specific knowledge (OHSAS 18001), as well as the long-term effects derived from the accumulated OHSAS experience over time (Stage 2).

Concerning the first stage of the proposed framework, previous studies widely support that internal motivations related to improving safety practices are the most influential variables explaining the adoption of the OHSAS 18001 (Robson et al., 2007). Thus, the adoption of the OHSAS 18001 can be understood as a reaction to poor safety performance (Abad et al., 2013; Bevilacqua et al., 2016; Lo et al., 2014).

Organizations with weaker safety practices will show poor safety outcomes—in our case observable through the work accidents rate and the proportion of injuries and fatal accidents—and this is detrimental to business routines and operations. In this scenario, evidence of ineffective safety practices gives managers incentives to adopt safety tools such as the OHSAS 18001 standard. Therefore, the enhancement of safety practices through organizational change represents the baseline of the process presented in Fig. 1. This logic and evidence suggest the following relationship between safety outcomes and the adoption of OHS management systems (Stage 1):

H1. A negative relationship exists between work safety outcomes and the adoption of the OHSAS 18001 standard.

With this hypothesis as the starting point of the proposed model, we now focus on the effects of new safety-specific knowledge and OHSAS experience on performance (Stage 2 in Fig. 1).

The full implementation of the OHSAS 18001 entails the development of new tasks which are performed by members of all organizational levels. These encoded tasks serve as knowledge repositories, and the short-term impact of the OHSAS 18001 relies on the managers' capacity to transmit the value of the safety tool to organizational members. Nevertheless, organizations do not realize the positive effects of the OHSAS 18001 at the same intensity, and we argue that the characteristics of the business' operational process play a role.

Existing studies on the relationship between safety systems and safety performance mostly focus on perceptual outcomes linked to safety climate and behavior (Fernández-Muñiz et al., 2012; Robson et al., 2007), while few studies address this issue using objective safety measures, such as work accidents rates (Abad et al., 2013) and safety violations (Lo et al., 2014). But, does the knowledge acquired through the OHSAS 18001 impact other performance dimensions? Moreover, does the OHSAS 18001 have a homogenous impact on performance across organizations?

From an organizational point of view, we expect that the OHSAS 18001 impacts various performance dimensions. First, the prioritization of safety practices creates a safer working environment, which fulfils the workers' safety needs and allows them to pursue operational goals (Das et al., 2008; Ghahramani, 2016). Second, the OHSAS 18001 can contribute to decrease operational costs through the timely documentation of safety risks and the implementation of corrective actions whenever a safety incident occurs. Thus, increased safety controls might reduce operational losses linked to poor safety conditions, such as unpredicted production breaks, absenteeism and labor turnover, and this will likely impact economic performance (de Koster et al., 2011; Lo et al., 2014).

Concerning the characteristics of business operations, manufacturing organizations seem more compatible with the systematic and codified nature of the OHSAS 18001 than organizations in other industries. Manufacturing businesses enjoy a deeper systematization of operational tasks, well defined communication channels, and greater coordination and control mechanisms at all operational levels.

On contrary, the benefits of safety systems will likely be weaker in organizations with less systematic operational conditions. For instance, construction businesses are characterized by an organizational structure where multiple subcontractors with competing goals interact, and by changing work environments due to variations in project designs (Choudhry, 2014). This implies the development of project-specific safety plans, which limits the intensive use of safety knowledge (Caponecchia and Sheils, 2011; Kines et al., 2010). In the case of professional services organizations, knowledge is a critical input and the strong interaction with customers often guides the production process (Garicano and Wu, 2012). In this case, a mismatch might exist between the properties of the safety knowledge and internal operations, and organizations face communication challenges that, if not taken care of, might mitigate the potentially positive effects of the safety tool.

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