



# An assessment of the OHSAS 18001 certification process: Objective drivers and consequences on safety performance and labour productivity



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## ABSTRACT

In this paper we examine the connection between the adoption of the OHSAS 18001 standard and performance from a comprehensive perspective. We first examine the adoption of the OHSAS 18001 as a function of objective safety metrics related to work accidents. Second, we evaluate the effect of this safety standard on safety performance and labour productivity, paying special attention to the returns to certified safety experience. For the empirical application we use a unique dataset of 149 Spanish firms for the period 2006–2009. The results reveal that objective safety variables explain the probability to adopt the OHSAS 18001; and that performance improvements follow the adoption of this safety system. In addition, the empirical findings tend to give ammunition to the argument that safety systems are worthwhile investments with strategic implications, as the experience on safety management may become a critical tool that can significantly improve safety and operating performance.

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## 1. Introduction

During the last decade academic literature has emphasised the central role of occupational health and safety management as a key long-range strategy, as it helps improve health at work and alleviate the different costs of work accidents (Frick, 2011; Robson et al., 2007). Managing occupational risk is a fundamental concern in today's dynamic working environment, and scholars and practitioners have witnessed a striking change in the role of occupational risk management in businesses. Occupational health and safety management has shifted from a narrow view with a regulatory compliance orientation more linked to technical aspects of occupational risk and workers' control (Herrero et al., 2002; Rahimi, 1995; Weinstein, 1996); towards a more complex holistic approach where various aspects of occupational risk management are taken into account within the strategic framework of the organisation. Nowadays, occupational health and safety systems comprise a wide array of proactive instruments that not only help minimise occupational risks, but also contribute to the continuous assessment of safety management practices within the firm (Robson et al., 2007). Most occupational health and safety management systems are based on guidelines published by various national and

international bodies and institutions (e.g. BS 8800, AS/NZS 4801, OHSAS 18001 or ILO-OHS-2001).

The Occupational Health and Safety Assessment Series (OHSAS) 18001 is becoming the dominant international standard for evaluating safety management processes at the firm level (Granerud and Rocha, 2011). Despite the increased use of this instrument to enhance safety conditions at the workplace, Robson et al. (2007) find that most research assesses certain elements of safety management systems that are potentially correlated with increased levels of safety management implementation within the business (La Montagne et al., 2004; Walker and Tait, 2004). Another research strand focuses on the relationship between self-reported measures of safety systems and variables related to safety climate and injury rates (Bunn et al., 2001; Torp et al., 2000).

Following the taxonomy proposed by Robson et al. (2007), there is a widespread tendency among academics to evaluate the quality of safety systems through proxy measures linked to intermediate outcomes of safety performance (safety climate, employees' beliefs and perceptions, employee's behaviours, and hazards). In this case information mainly emerges from the application of questionnaires to workers (Cadieux et al., 2006; De Koster et al., 2011; Vinodkumar and Bhasi, 2011) or managers (Fernández-Muñiz et al., 2009; De Koster et al., 2011); the creation of quantitative safety indexes determined by analytic hierarchy process techniques (Law et al., 2006; Teo and Ling, 2006); and interviews (Miller and Haslam, 2009). These methodologies have been criticised by their subjective character (Ramli et al., 2011; Sampaio et al., 2009). In line with the argument of Robson et al. (2007), the excessive use of subjective variables to study safety management suggests that

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the existing evidence is insufficient to make recommendations either in favour of or against any occupational health and safety management system.

Safety systems allow documenting safety processes and aim at minimising occupational risks within the business (HSE, 2001). Thus, the effectiveness of safety standards should be evaluated on the basis of final safety outcomes, such as the rate of accidents or injuries at the workplace; and performance indicators linked to business operations (Robson et al., 2007). Some scholars have begun to take steps along these lines. Yet, there are not many papers addressing the performance consequences of safety system on safety and business performance (Arocena and Nuñez, 2010; Fan and Lo, 2012).

In consonance with the abovementioned arguments, our main objective guiding this paper is to examine the relationship between the OHSAS 18001 standard and objective measures of safety performance from a comprehensive perspective. First, we evaluate the effect that variables related to accidents at the workplace have on the decision to adopt the OHSAS 18001 certification. Second, we assess the impact that the adoption of the OHSAS 18001 has on final safety outcomes, namely the rate of accidents, and labour productivity. The second stage analysis scrutinises the OHSAS 18001-performance relationship making a distinction between the immediate and the long-run effect of adopting this safety standard. To attain this, we explore the performance differences between OHSAS and non-OHSAS firms over time. In addition, we provide empirical evidence on the returns to certified safety experience, that is, the longitudinal consequences derived from the accumulated knowledge and experience linked to the adoption of this safety system.

The remainder of the paper is organised as follows. Section 2 presents the theoretical framework. Section 3 describes the data and the methodological approach. Empirical results are offered in Section 4, and final conclusions are displayed in Section 5.

## 2. Literature review

### 2.1. Who adopts the OHSAS 18001 standard?

The OHSAS 18001 standard is available in the marketplace since 1999. This framework was developed by several standardisation 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, 1999). 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; Fernández-Muñiz et al., 2012b). As a result, the certified organisations are in a solid position to minimise risks to its employees and other affected parties (Zeng et al., 2011).

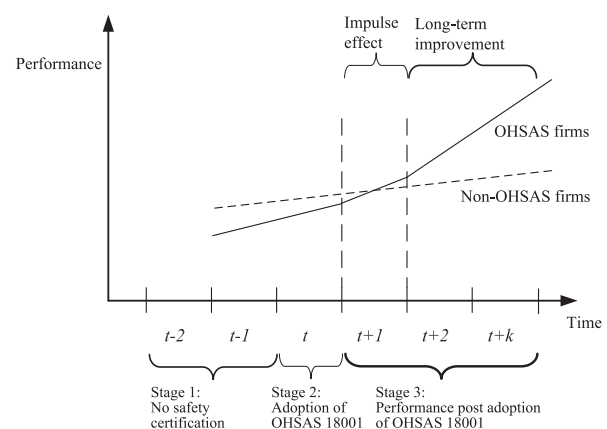
Another attractive feature of the OHSAS 18001 relies on its strong compatibility with quality (ISO 9001) and environmental (ISO 14001) management systems. This feature not only contributes to the integration of different management systems, but also facilitated the widespread adoption of the OHSAS 18001 (Karapetrovic and Casadesús, 2009). Nowadays, the OHSAS 18001:2007 is the dominant international standard for implementing safety management systems and the number of certified companies is rapidly growing around the world (Chang and Liang, 2009; Chen et al., 2009; Granerud and Rocha, 2011; Hohnen and Hasle, 2011).

Previous studies show that both external and internal factors drive the adoption of safety management systems. External factors deal with the possibility to use the safety certification as a market signal to entry into new markets, comply with suppliers’ demands,

and strengthen relations with different stakeholders (Smallman and John, 2001). Using information for 136 businesses from five European countries, Harms-Ringdahl et al. (2000) find that compliance with regulatory frameworks and the creation of a corporate image are the top reasons to adopt occupational health and safety management systems. In a study of eleven printed circuit board manufacturers in Taiwan, Chen et al. (2009) conclude that the decision to implement the OHSAS 18001 standard was primarily conditioned by customers’ requirements and by top management decisions related to the improvement of corporate image. To the contrary, factors such as reducing occupational accidents occurrence frequencies and productivity increases were not found to be influential factors explaining the adoption of the OHSAS 18001. In a scenario where the adoption of safety standards is mainly driven by external factors, managers may be tempted to use safety certifications as a commercial tool. Consequently, we argue that the lack of alignment between corporate objectives and the underlying intent of adopting the safety standard minimises the potentially positive repercussions of the certification on occupational health and safety outcomes.

The internal factors that motivate the adoption of the OHSAS 18001 relate to the introduction of a safety framework that, through the prevention and control of occupational risks, helps reduce the number of workplace accidents and their economic costs (Robson et al., 2007; Zeng et al., 2008). Other internal motivations to adopt safety management systems are linked to the objective of decreasing material losses and interruptions in the production process (Kjellén et al., 1997; Jallon et al., 2011) (Stage 1 in Fig. 1). Concerning empirical evidence, Fernández-Muñiz et al. (2012a) find that, among 131 Spanish firms that report the OHSAS 18001 certification, three internally-oriented factors are the most influential variables driving the adoption of this safety standard (prevention and reduction of accidents, integration of safety controls into corporate strategies, and improvement of the well-being of employees).

Thus, businesses with a weaker safety system are more likely to exhibit higher rates of accidents. This increases the economic cost of accidents related either to the number of lost workdays, or to the compensations for partial or total incapacities (Jallon et al., 2011; Oxenburgh and Marlow, 2005). Also, the costs of occupational accidents not only affect safety performance, but also the business’ competitive position. Bottani et al. (2009) and Kjellén et al. (1997) show that the lack of occupational and safety controls damages the firm’s internal working routines. We argue that businesses characterised by poor working and safety conditions would likely exhibit problems in their operations, and this negatively affects



Source: Self-devised

Fig. 1. Timeline: The relation between the adoption of the OHSAS 18001 and firm performance (safety performance and labour productivity). Source: Self-devised.

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