



Empirical analysis of the incidence of accidents in the workplace on firms' financial performance



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ABSTRACT

This paper performs an empirical analysis on the incidence of labor accidents on firm financial performance. With data on financial statements and labor accidents of 299 Spanish firms for 6 different years we perform panel data estimations and find a negative influence of accident rate on return on assets, as well as on abnormal return on assets. The incidence of accident rate is not shown up immediately in the profit and loss statements. It is mainly realized in the future. We find a significant negative influence in one year ahead financial performance. This finding suggests that labor accidents are disruptors of business operations, affecting mostly to value-added activities related with long term coordination and planning. Results are robust across different estimations methods and with estimations with different control variables.

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1. Introduction

The academic attention given to accidents in the workplace has been matched by that examining their economic impact. Some authors report the negative economic consequences of workplace injuries for individual workers (e.g. [Reville and Schoeni, 2001](#); [Breslin et al., 2007](#); [Woock, 2009](#); [Crichton et al., 2011](#)), while others report the negative consequences for the economy as a whole. Thus, [Weil \(2001\)](#), for example, undertakes a review of previous studies examining the economic consequences of work injury and illness. In the main, the studies he reviews focus on the economy as a whole and consider expenditures on medical costs and loss of earnings in the households of injured workers, finding significant divergences between theoretical and actual valuations. More recent studies have adopted a similar approach (e.g. [Corso et al., 2006](#); [Lim et al., 2011](#)). [Barth et al. \(2007\)](#) report that a rising gross domestic product rate is associated with a decline in occupational injuries. [Mainardi \(2005\)](#) analyzed earnings differentials in the mining industry across various countries, and accounts for them in relation to different variables, including the occurrence of severe accidents. [Adnett and Dawson \(1998\)](#) point out that the conventional approach to the economic analyses of industrial

accidents relies upon a simple compensating wage premium. In a similar vein, [Martinello and Meng \(1992\)](#) and [Gunderson and Hyatt \(2001\)](#) report the existence of a wage premium associated with workplace risks.

However, very few studies examine the economic consequences of accidents in the workplace for firms; moreover, the empirical findings of those that do provide uncertain conclusions. [Kaminski \(2001\)](#) analyzed the impact of new organizational practices on productivity and injury rates, but finds no clear relations between a firm's performance and its safety objectives. For instance, and somewhat surprisingly, more hours worked was associated with a lower injury rate and lower productivity, while performance-based pay induced higher injury rates and lower productivity. By contrast, the number of training hours was negatively related to the injury rate and positively related to one specific measure of productivity. Similarly, [Saurin et al. \(2004\)](#) find contradictory evidence when examining the integration of production and safety plans in two industrial building projects in Brazil. Taking a qualitative approach, [Smallman and John \(2001\)](#) conducted in-depth interviews with eight business leaders of FTSE 500 organizations. On the basis of these responses, they report that poor occupational health safety performance would appear to lead to competitive disadvantage, but they offer no quantitative evidence to support this. According to the business leaders, this competitive disadvantage is the result of the impairment of a firm's status in the eyes of one or more of its stakeholders. The authors report that the companies

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have little idea of their on-going outlay on safety-related items or of the financial return on their investment in safety.

Elsewhere, Kjellén et al. (1997) analyzed a Norwegian aluminum plant that implemented a quality control system and a safety, health and environment management system over a ten-year period. They report a reduction in the plant's operation expenditures, in parallel with an improvement in quality control, safety, health and environment indicators, but the authors do not perform any statistical tests. Moreover, the study only includes one manufacturing plant, which impedes the drawing of any statistical inferences. Fernández-Muniz et al. (2009, 2012) report a significant positive relation between safety management and firm performance, but their studies have several limitations. As their findings are based on the responses to a questionnaire conducted with the firms' safety officers, the ultimate sample reflects the willingness of these officers to take part, a fact that could originate biases, with the firms with the best safety culture (and presumably the lowest accident rates) being more predisposed to participate. Similarly, the authors measured the firms' safety management systems in the light of participant responses, but presented no data for the firms' actual accident rates. Moreover, while the authors test the incidence of safety climate and safety management on company performance and competitiveness, they do not examine the incidence of accidents in the workplace on financial performance. In addition, as the authors themselves stress, they do not conduct a time-series data analysis in these studies.

Multiple circumstances influence the incidence of occupational accidents, and many factors have been proposed as contributing to such hazards (e.g. Cheng et al., 2010). While the most important factors influencing accident rates would appear to be economic (Wooden, 1989), they are typically ignored in most analyses. The provision of new data on the interaction between accident rates and firms' financial performance at the microeconomic level should provide important information to prevent accidents in the workplace. Indeed, a precondition established by firms for promoting safety is that the economic benefits of such measures should be visible and quantifiable. Yet, the costs and losses attributable to unsafe work are usually not visible in a firm's accounting, and the potential gains of promoting safety are uncertain. As such, safety is likely to be sacrificed when management makes a trade-off between the costs and benefits of workplace safety. However, to the best of our knowledge, no single study has analyzed the incidence of occupational accidents on firm performance. Here, therefore, we seek to contribute to the literature by undertaking an empirical study of this relationship. While we find no significant influence of accident rates on the short-term financial performance of Spanish firms, we do find a significant negative influence of accidents in the workplace on one-year-ahead financial performance. Occupational accidents are unexpected events that entail a disruption to a firm's daily operations and which ultimately detract from strategic, value-adding activities and long-term financial performance.

The rest of the paper is organized as follows: Section 2 outlines the methodology employed, Section 3 presents our main findings and Section 4 concludes.

2. Methodology

2.1. Hypothesis development

Rechenthin (2004) claims that safety can provide a sustainable competitive advantage, since it has an impact on morale, profitability, turnover, and productivity, and reflects a well-run operation. Zacharatos et al. (2005) argue that sound human resource practices that encourage participative decision-making,

the sharing of information and high-quality training are significantly associated with occupational safety. Therefore, if we assume that such human resource practices ensure firms obtain greater productivity, a plausible link should exist between safety and firm performance. Thus, safety would be the outcome of a sound human resources policy entailing a participative and motivating setting, which in the end would boost a firm's profitability. The contrary would be the case for a lack of safety: accidents in the workplace undermine workers' motivation and participation, and threaten well-run operations and firm performance. Accidents interrupt the production process, generating financial and opportunity costs, disrupt production quantity and quality, and diminish a firm's productivity. Accidents can also cause firms to miss delivery dates and suffer delays that lead to economic losses and a deterioration in customer perceptions of the firm, etc. As far as the workers are concerned, unsafe conditions can undermine their motivation and productivity, with the result that skilled workers choose to leave the firm. When an accident occurs in the workplace, many additional, uncalculated, yet potentially substantial, costs are incurred (Harshbarger, 2001). Work accidents are unplanned and unwanted events that result in a whole series of undesirable events: damage to property, unscheduled halts in production, a loss of workers' skills, etc. In contrast, the careful introduction of safety measures should lower the number of accidents in the workplace, and contribute to a reduction in the costs and losses associated with these unwanted events. Weber and Weber (2004) report that reductions in inefficiency in the US trucking industry not only enhance real income, but also reduce traffic fatalities. This empirical evidence points to the existence of what would appear to be a highly plausible positive effect of a reduction in a firm's accident rate on profitability.

We can thus formulate the following hypothesis:

Hypothesis 1. Accidents in the workplace have a negative influence on firm performance.

Corcoran (2002) suggests that the true economic incidence of work accidents is not in fact realized until the future, because when an accident occurs employees must refocus their efforts to deal with the incident while simultaneously ensuring that production continues. All employees involved have to set aside the work they are then engaged in so as to deal with the unanticipated event. Often daily operations and production suffer very little as it is strategic and planning activities that are typically postponed in order to ensure operations are maintained. Thus, for instance, a supervisor might step into run a machine, or a quality meeting might be postponed to complete the production run. Indeed, the time of supervisors and managers is typically spent on bureaucratic procedures, such as seeking to replace the injured employee, undertaking an accident investigation, and generally dealing with the paperwork generated by the problem. In practice, therefore, it is strategic tasks, including those related to quality assurance, product development, process improvement, recruitment and upgrading the resource planning system, that are set aside. In short, efforts are redirected from value-added to operational activities and so a company's losses are incurred primarily in the area of competitive advantage. Thus, the incidence of accidents in the workplace does not show up immediately in the profit and loss statement, but becomes apparent in the future.

There is a widely held perception among managers of the importance of strategic planning and the need to devote sufficient time to it (e.g. Trachtman, 2012; Bradford, 2012); this concern is also expressed by academics. Despite some debate concerning the degree to which business planning should be formalized (Titus et al., 2011) and its actual impact on certain performance items such as new product development (e.g. Song et al., 2011),

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