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Occupational accidents and the economic cycle in Spain 1994–2014

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ABSTRACT

The sensitivity of occupational accidents to the economic cycle can shed light on the effectiveness of occupational health and safety policies. This work analyses the effect of the economic cycle on occupational accidents in Spain in the period 1994–2014. We first perform a regression analysis to evaluate the relation between GDP growth and incidence rate, comparing Spain and Germany. Statistics on GDP growth (OECD) and standardised incidence rates (from Eurostat) are used. Then, from a sectorial perspective, we perform a variance decomposition analysis to measure the effect of the increase in the incidence rates on the growth in the number of accidents in Spain between 2013 and 2014. We use data disaggregated by sector from national databases on occupational accidents to this end.

Our results show a strong association between the economic cycle and occupational accidents in Spain. The recent economic crisis led to a strong reduction in the incidence rate, which accelerated a decrease that began in 2001. With the economic recovery beginning in 2014 the incidence rate has gone up again. This evidence indicates that economic growth in Spain comes at the cost of a high level of occupational accidents, showing the weakness of its prevention system. Moreover, the growth in the number of accidents tends to concentrate in certain sectors, and is more due to an increase in their incidence rate than to the growth in their workforce. Firms in these sectors have also implemented prevention practices less intensely than the firms in other sectors.

1. Introduction

Act No. 31/1995 on Prevention of Occupational Risks (LPRL in its Spanish initials), which implemented the Council Directive 89/391/EEC, led to the creation of a new legal framework in Spain in harmony with EU regulation. It promoted an important institutional development that includes new instruments, agents and processes: prevention representatives, external prevention services, management systems, audits, official university courses in the area, and public prosecutors in the area of occupational accidents.

The LPRL has been amended several times since its approval to adapt it to the new organisational forms of work, in particular the various forms of subcontracting in the construction sector. The main objectives have been to encourage an effective and real compliance with the occupational health and safety (OHS) obligations and proscribe a merely formal or documentary compliance. The past few years have seen more legal changes aiming to improve how the external prevention services work and also to simplify compliance with the regulations for SMEs. These reforms address the main weaknesses evident in the national OHS system over time.

The Spanish law was approved 20 years ago, so now seems like a good time to evaluate its contribution to the improvement in working conditions in the country. Studying the Spanish case is particularly interesting because of the size of the problem the country faces and the large number of legal reforms adopted to tackle it. According to Eurostat, in 2000 the Spanish standardised incidence rate reached a maximum of 7052 accidents per 100,000 workers, and the rate remained above 5000 accidents per 100,000 workers until 2006. Spain had the highest standardised incidence rate in the EU uninterruptedly between 1995 and 2009. In 2010, France was first in the table and Spain second. In 2011 and 2012 Spain dropped to third place behind Portugal and France. Moreover, less than 5% of Spanish firms have their own prevention service. Most firms (72.8%) resort to an external prevention service, according to the Spanish National Occupational Health and Safety Institute (INSHT in its Spanish initials) in its latest National Survey on Health and Safety Enterprises Management (INSHT, 2009a). We should note that the spirit of the *Council Directive 89/391/EEC* is to resort to external services only as a complement, when the firm's own resources are insufficient. Finally, the impact of this regulation may have been quite uneven. Arocena and Nuñez (2009) observe that while the adoption of the OHS regulation did contribute to a reduction in the number of injuries in advanced manufacturing sectors, the same did not occur in

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traditional industries. They also find a negative relation between accidents at work and firm size and that larger firms are better able to implement the OHS law more effectively.

The recent economic crisis has led to a substantial reduction in the number of occupational accidents, with the obvious benefits of fewer days of absence from work, lower healthcare and accident compensation costs, and above all of course, fewer fatalities and serious injuries to workers. But these positive consequences should not blind us to a less favourable aspect. Although accidents tend to fall when growth is weak, if firms lack the right OHS management systems and an authentic safety culture they could be faced by big increases in the number of accidents (INSHT, 2009b). The most recent data confirm this concern: with the improvement in the economy occupational accidents have gone up again in Spain. Thus the strength of the association between the evolution in the economic cycle and the number of occupational accidents represents an authentic test of the quality of the OHS system in Spain.

The twofold objective of the current work is directly informed by this concern. Our main objective is to determine how strongly the economic cycle affects the number of occupational accidents in Spain. For this purpose we carry out a descriptive analysis of the behaviour of the incidence rates in Spain, including as benchmark a comparative analysis with another country – Germany – where the institutional environment is relatively comparable. The second objective of this work is to carry out an exploratory sectorial analysis to identify the possible explanatory hypotheses of a behaviour that – we can anticipate now – we find to be strongly pro-cyclical. This analysis will shed light on the effect of the change in the cycle. The incidence rates go up again with the economic upturn because the number of accidents is increasing faster than employment. It is important to examine whether this behaviour is the same in all sectors or whether some sectors suffer the negative effect of the change in the cycle on the incidence rate more intensely. According to Nichols (1989), at the start of an economic upturn employers take some time before hiring workers, thus resulting in an increase in work intensity and occupational accidents. This argument is based in a well-known relation between the labour market and the economic cycle: the labour market lags behind the economic cycle (Terrés et al., 2004).

Since Kossoris's (1938) pioneering work, a large number of researchers has confirmed the association between economic cycle and occupational accidents (e.g., Ruser, 1985; Viscusi, 1986; Shea, 1990; Lanoie, 1992; Fabiano et al., 1995; Brooker et al., 1997; Davies et al., 2009; Asfaw et al., 2011). Nevertheless, evidence against this does exist and the causes of the phenomenon are unclear. Thus in a study of 16 OECD countries Boone and van Ours (2006) conclude that the positive correlation observed between economic cycle and occupational accident indicators (excluding accidents with fatalities) is a spurious phenomenon caused by a reduction in workers' reporting of accidents due to fear of losing their job in times of crisis (claim reporting effect), in line with Leigh's (1985) hypothesis. In contrast, in expansionary stages workers are more likely to report accidents, because if they lose their jobs as a consequence they will be able to find another job more easily. As extra evidence these authors observe that fatal accidents do not behave cyclically because reporting these accidents does not depend on the worker's propensity to report.

Davies et al. (2009) obtain similar results in a study carried out in the UK. They observe that unemployment is negatively related to the rate of minor injury but independent of the rate of major injury. Thus they offer evidence of the employee reporting behaviour effect attributable to changes in bargaining power. Likewise, Boone et al. (2011) find that workers who report an accident in a particular period of time are more likely to be fired later on. This result supports the idea that recessions have a negative effect on the reporting of minor occupational accidents. But Nielsen et al. (2015) show that changes in reporting behaviour do not seem to play a significant role in the relation between the business cycle and workplace injuries in a Danish context.

Various authors have observed the pro-cyclical behaviour of occupational accidents in Spain (e.g., Arango and Valdavia, 2000; Castejón, 2000; Arocena and Nuñez, 2005; Martín Román, 2006; Castejón and Crespán, 2007; Amuedo-Dorantes and Borra, 2013; De la Fuente et al., 2014). Martín Román (2006) tries to verify whether the pro-cyclical behaviour of occupational accidents in Spain can be considered a real phenomenon that reflects changes in the working conditions along the economic cycle, or is instead a purely statistical effect. This statistical effect could be associated with the reporting of accidents, under the hypothesis that workers are more likely to report accidents in growth stages than in recessions. This author uses data on incidence rates aggregated at the provincial level for 50 Spanish provinces in the period 1989–2001, and finds evidence for the claim reporting effect. But he also finds that fatal accidents are pro-cyclical. Amuedo-Dorantes and Borra (2013) analyse the effect of the economic crisis on work injuries and fatality rates in Spain over the decade 2001–2010. They find that the recession reduced work injuries rates, but not fatality rates, exclusively among immigrant workers. This result suggests that the fear of being fired discourages these workers from reporting their injuries. Likewise, De la Fuente et al. (2014) analyse the relation between economic crisis and occupational injuries in Spain in the period 2000–2009. These authors conclude that the economic crisis in Spain has reduced occupational injury rates, especially in the construction and industry sectors.

Other factors that may explain the reduction in the accident rate in recessions is the way firms cut workforces in times of crisis, and a type of survival bias, a hypothesis that researchers do not seem to have tested yet in the literature. With respect to cuts in the workforce, in countries where firing long-serving workers is very costly (e.g., Spain) firms fire younger and more inexpert workers. Likewise, De la Fuente et al. (2014) conclude that economic crisis seems to cause a type of "natural selection" in the labour market and only older workers, with more experience and permanent contracts, tend to remain. A more-experienced workforce that has a lower workload because of the crisis will tend to have a lower incidence rate. With high rates of economic growth the inverse mechanism sets in (Arocena and Nuñez, 2005). These authors conclude that the entry of new workers in growth stages in the economic cycle increases the incidence rate and that inexpert newcomers tend to increase the frequency of minor accidents, as other authors observe in previous studies (e.g., Blank et al., 1995; Quinlan, 1999; Wright and Lund, 1998).

We understand survival bias as a statistical error or misinterpretation caused by not considering the impact of the firms that have not survived the economic crisis on the occupational accidents data. "Natural selection" can also occur in the market for products. If survivor firms are the most competitive and the ones with the best management, including the OHS management (the ones with the lowest incidence rates), we should see a decrease in the incidence rate in the population of survivor firms. Thus the positive evolution in the incidence rates in economic recessions could be due to a competitive selection effect: the recession expels the worse-managed firms, the ones with the worst incidence rates.

To confirm this hypothesis we should also observe that the survivors have a better, more active or higher-level safety culture and OHS management system. If we compare the results obtained in the two latest National Surveys on Working Conditions carried out by INSHT in Spain in 2007 (pre-crisis) and 2011 (mid-crisis) we obtain some evidence that allows us if not exactly to confirm this hypothesis, at least not to contradict it. Table 1 reports the percentage of affirmative responses to four items concerning the organisation of occupational risk prevention, the prevention

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