THE IMPACT OF DOWNSIZING ON INNOVATION OUTPUT

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ABSTRACT

This study investigates the relationship between downsizing and innovation output. We analyse a panel dataset of downsizings by UK firms during the 1996-2004 period. Our results reveal that while low and medium levels of downsizing have no significant impact on innovation output, high level downsizing is more likely to have a significant negative impact on innovation output.

INTRODUCTION

Downsizing or reduction of workforce has gained strategic legitimacy and has become a widely practiced cost cutting strategy (Cascio, 1993). In parallel, innovation has long been considered as critical factor to firms’ competitive advantage and survival (Cefis, & Marsili 2005; Higgins, 1995). Furthermore, several scholars provided evidence to suggest that downsizing has an impact on innovation (Boomer, & Jalajas, 1999; Amabile, & Conti, 1995; 1999; Doughetry, & Bowman, 1995; Brockner et al., 1987). Given the pivotal importance of innovation, the widespread practice of downsizing and the potential impact the latter has on the former, there is a practical and theoretical need to examine the link between the two. Yet, surprisingly little is known about the effects of downsizing on innovation. This study takes a critical step to close this research gap by examining the relationship between downsizing and innovation output. In line with a large body of research, this paper uses patents as an indicator of firms’ innovativeness (Acs, & Audretsch, 1999).

This study contributes towards both management theory and practice in at least two important ways. First, the little research that has looked at the link between downsizing and innovation input factors such as R&D expenditures (Boomer, & Jalajas, 1999) and innovative work environments (Amabile, & Conti, 1999; Doughetry & Bowman, 1995), does not help us fully understand the actual relationship between downsizing and innovation output. Mellahi & Wilkinson (2004) noted that a healthy work environment for innovation and high R&D expenditures or training do not necessarily result in high innovation output. Thus, this study makes a unique and significant contribution by examining the impact of downsizing on actual innovation output.

Second, past research on the association between downsizing and factors that are found to have an impact on innovation does not provide clear answers as to whether downsizing facilitates or stifles innovation. On the one hand, with few exceptions, prior research on psychological work environment for innovation reports a negative impact of downsizing on commitment and...
motivation of remaining employees (Vahtera et al., 1997), and a reduction in risk taking after downsizing (Brokner et al., 1987) and generally contends that downsizing has a deleterious impact on the organization ability to innovate. In addition, employees may be negatively affected by the stress and uncertainty created by downsizing (Brokner et al., 1987) and may respond with reduced organizational commitment, and reduced work efforts. Further, several scholars argue that given that downsizing is often associated with cutting costs, downsizing firms may provide less training for their employees, recruit less externally, and reduce the research and development (R&D) budget (Brommer, & Jalajas, 1999). Consequently, they argue, downsizing could negatively affect the level of knowledge and skills brought into the firm, which subsequently affects the firm’s ability to absorb and modify new technologies. As a result, downsizing could “hollow out” the firm’s skills capacity and subsequently its ability to innovate (Littler & Inns, 2003: 93).

In contrast to the above, several scholars noted that downsizing may produce financial slack that could be used in R&D, and lead to the development of multi-skilled teams and flatter organizations structures that can potentially lead to more, not less, innovation (Love, & Nohria, 2005). Boone (2000: 595) notes that while downsizing is bad for innovation “there are examples of successful downsizing operations which substantially improved a firm’s innovation record”. Amabile & Conti (1995, 1999) and Conti & Amabile (1999) noted that open communication between decision-makers and staff during the downsizing process may facilitate more creative work after downsizing. Similarly, Hammer (1996) argued that downsizing often results in more teamwork and an empowered multi-skilled workforce which encourage new idea generation, ingredients necessary for innovation. Further, elimination of positions and management layers by downsizing may create an internal environment favorable to the generation and survival of new innovative ideas (Ross, 1974). Employees working in flat organizations with few layers of management tend to work in diverse teams bringing together complementary skills. These employees frequently exchange ideas across teams, and have better communication channels than those working in centralized and hierarchical organizations, which in turn generate high level of new ideas.

We hope to reconcile the above conflicting and competing viewpoints by examining the link between the severity of downsizing and innovation output. We argue that the severity of downsizing will influence the impact of downsizing on innovation output. Past research shows that severe downsizing of employees has a stronger negative impact on employees’ morale, role stress, and employees’ commitment than small downsizing (Brokner et al, 1987). This is because severe downsizing leads to an increase of work load which may influence the time and efforts employees spend on innovation activities. In addition, past research reported that stress caused by major downsizing is significantly higher to that of minor or small downsizing (Vahtera et al., 1997). For instance, Vahtera et al., (1997) found that the rate of absenteeism was 2.3 times greater after major downsizing than after minor downsizing. One could also argue that excessive workforce reduction strategies are associated with inferior organizational innovation ability because of the loss of a significant level of skills with consequent negative effects on a firm’s ability to innovate.¹

**STUDY DESIGN**

We use patents to measure innovation output (Acs, & Audretsch, 1989). We accept that there are other innovation outputs that could be used such as new product development but these are beyond the scope of this paper. Further, this paper does not consider the economic value of
patents. The focus of this paper is not on innovation effectiveness or ability of firms to capitalize on patents but, rather, on the relationship between workforce reduction and the ability to produce patents. Thus, we used patents counts rather than patents’ economic value. To examine the relationship between downsizing and the number of patents granted to a particular firm we constructed a panel data that has the total number of patents granted to a particular firm in a given year over a period of 10 years. That is, our data forms a panel across time and across section.

The Data and Variable Definitions

Our panel data comprises 258 UK firms with nine years of downsizing from 1996 to 2003 and ten years of patent data from 1995 to 2004. The panel includes all UK medium and large firms that met our four criteria listed below, and downsized and produced patents during the 1995-2004 period identifiable from two major datasets. For a firm to be included in our panel it had to meet four key criteria. First, the firm must be at least a medium-sized firm employing 250 employees or more because we believe that small firms are sensitive to the usual small fluctuations in the number of their employees that would have shown as downsizing. Second, the firm had to be a single business located in the UK. This condition eliminates the risk of including firms relocating their activities abroad and firms downsizing in one line of business but expanding or not changing other lines of businesses. Third, the firm must have downsized by at least 5% in any given year during the observed period. Fourth, the firm must have at least one accepted patent during the research period. We combined data from three major datasets to produce the panel. Firm level information is drawn from FAME (Financial Analysis Made Easy) database. Industry level data such as market share is obtained from the Office of National Statistics Annual Business Inquiry, and the count of successful patents is obtained from the European Patent Office database. The dependent variable, the count of successful patents granted to a firm in a year, is a non-negative integer ranging from zero to ninety in the sample. Of the independent variable, downsizing strategy is coded downsized = 1 if yes, and 0 if no. We used reduction in employee numbers as measures of level of downsizing: low downsizing if employee numbers are reduced between 5-9.99% in any given year, medium downsizing if employee numbers are reduced between 10-19.99% in any given year, and high downsizing if employee numbers are reduced by 20% or more in any given year.

Control Variables

We used six control variables. Past research shows that innovation output is different across sectors. Thus, we used sector of activity as a control variable. Our second control variable is the size of the firm. We used the number of employees employed to measure the size of the firm. We controlled for export because past research consistently shows that exporting firms tend to innovate more than non-exporting firms. Firm’s age was also included as a control variable in our sample. Finally, we controlled for foreign ownership and market share.

RESULTS

We assessed the relationship between downsizing and innovation output by regressing our measures of innovation output on lagged values of downsizing. We used lagged values of downsizing to take into consideration the delay in granting patents after firms apply for them,
and to account for the lagged impact an event like downsizing has on producing patents. We used the Negative Binomial model to examine the relationship between downsizing and innovation output. The results show that the overall effect of downsizing on patents is not statistically significant. However, when controlling for the level of downsizing, the results showed that all statistically significant “high downsizing” results were negative. Regarding medium level downsizing, the analysis revealed that four results were significant, three negative and one positive. However, because of the high number of non-significant results one could not infer that medium level downsizing had a significant impact on patents. Similarly, the analysis showed that low level downsizing was not significantly related to innovation output. The findings suggest that while low and medium downsizing levels do not have a significant impact on patents, high downsizing is more likely to have a significant negative impact on patents.

In addition to the analysis of the lagged yearly impact of downsizing on patents, we estimated a three year average of downsizing during 1999-2001 period on average patents during the 2002-2004 period, and average downsizing during the 1996-1998 period on average patents during 1999-2001 period. Results on the overall downsizing, low level downsizing and medium level downsizing were insignificant or produced a very small number of significant results. However, high level downsizing during both the 1999-2001 and 1996-1998 periods had a significant and negative impact on average patents granted during the 2002-2004 and 1999-2001 periods respectively. These results strengthen the year by year analysis which also showed that high level downsizing is more likely to have a significant negative impact on patents.

**DISCUSSION**

In this paper, we aimed to extend the current body of research on the association between downsizing and innovation by asking whether the intensity of downsizing has an impact on innovation output. While the results validate several previous findings from the innovation input literature, they provide new insights into the specific impact different levels of downsizing have on innovation output. The results confirm and refine the popular belief that contends that the more the firm downsizes, the less the ability to innovate.

We find no consistent evidence of an association between low and medium levels of downsizing and innovation output. In contrast, we find significant and consistent evidence to suggest that high level of downsizing is more likely to have a significant and negative relationship with innovation output. There are two possible interpretations for the lack of a signification association between low and medium levels of downsizing and innovation output. First savings from low and medium levels of downsizing are perhaps too small and thus may provide the firm with little extra resources which could be channelled to R&D and other supporting activities that could improve innovation output. Second, small and medium levels of downsizing may not have a strong negative impact on employees’ morale and are unlikely to lead to a significant increase in workload to impact on innovation negatively. The results suggest that high level downsizing is likely to have a significant and negative impact on innovation output. These findings challenges previous research that suggests that high downsizing produces high savings which could be channelled towards R&D and other supporting projects yielding more patents. This could be the result of savings from downsizing not being easily redeployed to improve or at least sustain the firm’s ability to produce patents (Love & Nohria, 2005). One interpretation for the negative impact is that high downsizing is likely to lead to an increase of work load which may influence the time and efforts employees spend on innovation activities.
and high stress level (Vahtera et al., 1997) which subsequently have deleterious consequences on the ability of the firm to innovate.

Our results demonstrate the merits of taking into account the intensity or level of downsizing into consideration when examining the impact of downsizing on innovation. Notwithstanding the consistency of our results, we highlight two caveats. It must be pointed out here that the above explanations provided for these findings are no more than thoughtful speculations. Further, given the limitation of our data, it is not clear whether the effect of downsizing on innovation output is both short-term and long-term. Ultimately, much more evidence is needed, including a better understanding of the underlying mechanisms that shape the relationship between downsizing and innovation output, before a stronger conclusion about the impact of downsizing on innovation output can be drawn.

ENDNOTES

1. ESRC grant number: RES-000-22-0637

REFERENCES


