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Abstract: Drawing on the literature on innovation climate and employee attitudes, we discuss how innovations could impact job satisfaction. Using lagged predictors and relevant control variables, we investigate empirically this relationship on a large sample of French firms. Our estimation results show that employees in companies that engage in innovation activities are more likely to report increased job satisfaction. Moreover, building on previous organizational research arguing that layoffs are likely to create detrimental workplace atmosphere and conditions, we test whether the relationship between innovation and job satisfaction is moderated by downsizing decisions among the examined firms. We draw several theoretical and managerial implications.

Keywords: innovation activities; job satisfaction; downsizing; workplace.

1. Introduction

While the literature has devoted considerable attention to identifying the inputs conducive to more innovative economies and the crucial role of innovation in growth (Freeman, 1995), other organizational scholars (e.g. Amabile et al., 2005; Jensen et al., 2017) have argued that innovation activities may also generate non-economic benefits such as skill development, enhanced well-being, providing meaning or reaching flow. In addition to improved profits, market share, productivity (Pekovic and Galia, 2009), and higher levels of employment (Hou et al., 2009), Rasulzada and Dackert (2009) underlined that innovation orientation in the workplace may generate benefits for both employees and firm performance, such as psychological well-being associated to happiness, enthusiasm and optimism.

However, the outputs of innovative activities beyond economic outcomes have been somewhat neglected, notably by economists (Dolan and Metcalfe, 2012). Reviewing innovation literature for the last 50 years, Martin (2013) points out that scholars need to shift the focus of their empirical analyses from innovation for wealth to innovation for well-being. Similarly, Honkaniemi et al. (2015, p. 398) state that "little research has concerned the consequences of (especially low) innovativeness on well-being". Therefore, we contribute to fill this gap by examining whether innovations make employees more satisfied at their workplace. As stated by Huhtala and Parzefall (2007), it is important to analyze the relationship between employee outcomes and innovativeness as it will help firms to understand how employees can and should be supported. In addition, unveiling the nature of innovation-employee satisfaction relationship allows a better understanding of how firms can achieve performance improvement and competitive advantage (Wei et al., 2013) and possibly make the world a better place.

Accordingly, we examine at a micro-level whether innovation activities are associated with higher levels of job satisfaction, beyond pure economic benefits. Although there is a sizeable and increasing literature on the role of innovation in fostering sustainability at a macro level such as increasing the population well-being (OECD, 2011; Engelbrecht, 2018; Aldieri et al., 2021), the industrial and organizational psychology literature has examined the relationships between creativity, innovation and non-economic dimensions such as employee engagement and job satisfaction (Cheng et al., 2010; Honkaniemi et al., 2015).[1] As stressed

[1] Reviewing the substantial literature in organizational psychology that examines the relationships between organizational culture, organizational climate and various outcome variables such as performance, job engagement and job satisfaction is beyond the scope of our paper. Nevertheless, we would like to stress that there is supporting evidence of these relationships with refinements of their understanding over time (e.g., Pritchard and Karasick, 1973; Kline and Boyd, 1994; Shalley et al., 2000; Shanker et al., 2017).

above, the proposed analysis aims to unveil this relationship on a large sample of French firms, focusing on the relation between employees' job satisfaction and the level of innovation activities at the firm level.

We take advantage from two French firm surveys allowing to investigate such a relationship. While innovations can constitute both the input and output of job satisfaction, our data allows us to elucidate the relationship from innovation to job satisfaction. Going beyond a simple correlation study and estimating a causal relationship between innovation and satisfaction are important but challenging because of various issues that are difficult to address, such as confounding variables (i.e., a common cause that lurks behind the dependent and independent variables, leading to a spurious correlation that could be confused with a causal effect), direction of causation and so forth (Rohrer, 2018 and especially Rohrer and Lucas, 2020 in a subjective well-being context). Although our contribution is not perfect, it addresses a common concern of correlational studies, namely reverse causality by using lagged predictors. Providing a clearer and cleaner estimation of the strength and direction of causation between innovation and job satisfaction, by introducing both firm and employee's characteristics, is an important contribution of our paper.

Moreover, compared to the previous literature, we also test a boundary condition under which the previous relationship could not hold. In other words, does the potential effect of innovation on job satisfaction vanish under some conditions? For this purpose, we build on previous research arguing that layoffs are likely to create detrimental workplace atmosphere and conditions (e.g., Dougherty and Bowman, 1995; Orlando, 1999) and investigate whether innovation impacts or not job satisfaction in companies that implemented downsizing policies. Testing this moderator will also add to the organizational psychology literature.

The paper is organized as follows. Section 2 is devoted to a conceptual justification of the relationship between innovation and job satisfaction and well-being at the workplace.

Section 3 describes the data and the used methods. Section 4 provides the main results and discuss them. Section 5 draws some theoretical, policy and managerial implications. Section 6 indicates some limitations and suggests avenues for further research. Section 7 concludes.

2. The relationship between innovation activities and job satisfaction

Several non-mutually exclusive rationales can explain how innovation activities may impact satisfaction or well-being at the workplace.[2] We argue that the effects of innovations on satisfaction are complex, bidirectional and multidimensional. Indeed, all innovations are not created equal, and, their likely contribution to job satisfaction is variable. For instance, some innovations aim explicitly at improving subjective well-being by eliminating some strenuous or harmful tasks or allowing a better balance between private and occupational life or generating significant advances in the medical domain. If successful, they are more likely, at first glance, to deliver an increase in subjective well-being compared to innovations that are more profit-oriented, such as firing humans to replace them with robots. Rather than considering a specific category of innovations, we discuss how innovations, broadly defined, impact job satisfaction. In our context, the innovation has been defined as "the introduction on the market of a new or significantly modified product (good or service) compared to the products (goods or services) previously produced by the company (…), the introduction into the company of a production process, of method concerning the provision of services or the delivery of new or significantly modified products, support activity, or the introduction of new or clearly improved solutions concerning the organization or marketing (…). (https://www.insee.fr/fr/metadonnees/definition/c1182). Without purporting to be exhaustive, we develop below some explanations for this causal relationship.

[2] We use interchangeably well-being at the workplace and job satisfaction, although we are conscious that the overlap is not perfect.

In a pathbreaking (economics) contribution, Dolan and Metcalfe (2012) advanced that examining the relation(s) between well-being and innovation deserves more academic attention, given that less is known about this important relationship. It is worthy to notice, however, that the literature in industrial and organizational psychology devoted consistent attention to this relationship (see below). Although Dolan and Metcalfe (2012) provided conceptual arguments justifying the possible existence of positive relationships from subjective well-being to innovation *and* from innovation to subjective well-being, we are more interested in the latter. Indeed, innovations can constitute both the input and output of well-being at the workplace (see also Wei et al., 2020). Our interest in the relationship from innovation to job satisfaction is mainly driven by the available data and our empirical study can also be considered as a partial test between these two competing hypotheses regarding the causality direction.

Given that there are several studies on the relationship from subjective well-being to innovation, we overview some of them. Indeed, several contributions have proposed and tested a positive relationship where higher levels of subjective well-being lead to higher levels of innovation-related dimensions, notably creativity (Isen et al., 1987; Amabile et al., 2005; Rasulzada and Dackert, 2009; Chau et al., 2018). Hage and Aiken (1967; 1970) contended that satisfied employees are more committed to their employers, more engaging in improving working conditions as well as initiating new innovative ideas. For instance, Shipton et al. (2006), using data from 3717 employees in 28 UK manufacturing organizations, found that aggregate job satisfaction was a significant predictor of subsequent organizational innovation. Regarding the mechanism underlying this effect, some authors (e.g., Amabile et al., 2005; see also Amabile and Pratt, 2016) argue that positive affects broaden the scope of cognitions, lead to more flexibility in thoughts and decision making, wider search behavior, that can result in greater creativity. In addition, Rasulzada and Dackert (2009) contended that the more creative

and innovative a firm is, the higher employees reported well-being, notably in terms of increased happiness, enthusiasm, and optimism. At the same time, some studies also found that negative affect can also lead to higher levels of creativity, because negative affect can signal a problematic task and motivate people to engage in a deeper, more detail-oriented, analytical and critical thinking (George and Zhou, 2002; see also Amabile and Pratt, 2016 and references therein). Amabile and Pratt (2016) reconcile these apparent paradoxes, by suggesting that these inconsistencies are due to the fact that different affective states are particularly facilitative at different stages of the creative process. In what follows, we devote our attention to explain the relationship from innovation to job satisfaction.

First, following the reasoning of Dolan and Metcalfe (2012) at the firm level, we argue that innovation is likely to generate higher profits. If employees benefit from these higher profits by direct or indirect ways (e.g., wage increase, enhanced workplace environment, higher employment level), they are more likely to enjoy higher levels of job satisfaction. In the same logic, these authors also advanced that innovations can create inequalities and decrease well-being. Applied to employees at the corporate level, if innovations lead to inequalities, e.g., because of unfair distribution of generated benefits, employees may experience decrease in their job satisfaction.

Second, innovation-oriented environments can also be (more or less) aligned with some individual characteristics of employees. These environments can allow oneself to find and give meaning to his/her work efforts, express his/her capabilities such as creativity, affirm his/her identity, or make a difference. Actually, creating an innovative work environment permits employees to feel that they can be more active in their jobs and feel better about themselves which can be positively reflected on improved job satisfaction (Lambert and Hogan, 2010; see also Ikiz and Asici, 2017 on counselor trainees). Most individuals need not just to keep the factory line moving by performing repetitive and boring tasks to get their

wages but to feel that their work makes a difference. If the fit between the company and its employees is good (bad), it can lead to higher (lower) levels of satisfaction. For instance, Dolan and Metcalfe (2012) stress that some evidence suggests that when more time is spent getting to the knowledge frontier, 'innovators' (e.g., employees working in R&D compared to employees from other departments) are getting older (Jones, 2009; Jones, 2010; see also Cheng et al., 2010). If a better life expectancy can capture just a little an increase in subjective well-being and working in an innovation-based environment contributes to a higher life expectancy, we can advance that working in innovative environments can be conducive to higher job satisfaction. However, engagement in innovation activities could significantly change work environment and eventually influences negatively job satisfaction which would be discussed later.

Third, working in innovation oriented environments frequently implies that innovation-related activities are more recognized, praised and rewarded, which can contribute to higher levels of job satisfaction. Some studies stressed that being involved in innovation activities, notably solving problems in a creative fashion can generate positive consequences and lead to positive affect such as the feelings of accomplishment, confidence and competence, pride and increased satisfaction (Burroughs and Mick, 2004; Honkaniemi et al., 2015). Some innovation activities are other-oriented, *i.e.,* they aim at increasing the well-being of others. These others can be collaborators, consumers, neighbors or other stakeholders. By increasing the well-being of others, involved employees are more likely to experience higher levels of job satisfaction (see Grant, 2014).

Fourth, in some plausible circumstances, innovations can also improve (but also degrade) the quality of work, or affect the balance between private and professional life. Sometimes, innovations are driven by the desire to address difficulties related to work and succeeding in solving them is likely to increase job satisfaction (St-Martin, 2019). In short,

innovation-oriented environments can lead individuals to be more satisfied with their job and express higher levels of subjective well-being. Accordingly, Lok and Crawford (2004) demonstrate that innovative culture has positive influence on job satisfaction. Similarly, Rasulzada and Dackert (2009) empirically show that the more creative and innovative the firm was perceived, the higher were the well-being in terms of happiness, enthusiasm and optimism. Using data on 33,519 entrepreneurs in China and around the world, Jensen et al. (2017) find that entrepreneurial innovation contributes to job satisfaction, balance between work and family and life satisfaction. Using survey data from 3960 individual employees in China, Wei et al. (2013) found that a perceived innovative culture significantly and positively affects employees' job satisfaction. They argue that "cultivating employees' interest in and commitment to innovation may lead them to feel that the firm is full of vitality and is keeping pace with changes in the environment, which can effectively reduce any anxiety caused by environmental uncertainty" (p. 1029) and as a result increase job satisfaction. These findings are consistent with the results of Lee and Chang (2008) in Taiwanese firms. Cheng et al. (2010) also examined on the effect of process and product innovation on R&D employees' job satisfaction. They found that both innovations (with a greater effect of product innovation) have a positive effect on R&D employees' job satisfaction, through the enhancement of organizational performance. Using survey data from staff at a US correctional facility, Lambert and Hogan (2009) also found a positive relationship between perceptions of organizational innovation and job satisfaction. In the same vein, Gallivan (2003) showed that software developers who are innovators report higher levels of job satisfaction, after the mandatory adoption of an innovation. Interestingly, in a public management context, Demircioglu (2021) showed that bottom-up innovations have a positive effect on job satisfaction of public servants.

Nevertheless, most of the previous studies suffer from similar limitations. They are frequently correlational studies and do not allow to discern causation directions. The measures used across studies are not always consistent, making comparisons among them more delicate. Moreover, several studies use specific samples of sectors or employees or specific subsets of innovations that can make generalization hazardous (e.g., R&D' employees, public servants, staff from a correctional facility, software developers) (St Martin, 2019).

In order to avoid a biased presentation, it is necessary to mention that some studies proposed that higher levels of innovations can lead to decreased job satisfaction. Employee well-being may be harmed when innovation activities induce uncertainty related to the future loss or when they are introduced in a way that is perceived to be unfair (Bryson et al., 2009). Huhtala and Parzefall (2007) contend that innovation activities may generate significant strains associated to complex, non-linear and highly uncertain innovation process which is expected to influence negatively employees' satisfaction. In the same vein, firm's innovative engagement could degrade well-being, as employees may consider innovation activities as "extra-curricular" ones (Honkaniemi, et al., 2015). In addition, as innovation may raise the level of unemployment, it could be also that it will negatively affect employees' well-being (Aldieri et al., 2021), especially if considered innovations are likely to threaten their jobs.

Although we are not unconditional advocates of a positive relationship between innovations activities and well-being at workplace, it seems reasonable at first glance to hypothesize that *the relationship exists and that companies that innovate more are also more likely to have employees who express higher levels of job satisfaction (H1).*

Moreover, as mentioned in the previous section, we also investigate a boundary condition under which innovation activities would arguably degrade job satisfaction if the company has faced downsizing. Indeed, layoffs are likely to create a work atmosphere and conditions that are detrimental to the effect of innovation activities on job satisfaction. Even if

it is involuntary, layoffs eliminate key collaborators, that could harm the teamwork and strategic linking that is conducive to innovation (Dougherty and Bowman, 1995; see also Datta et al., 2010). Moreover, layoffs broke trust, bring pessimism to the table and frequently push employees to think that their future is highly uncertain (Orlando, 1999). They can even perceive that innovations are used either as a driver of downsizing decisions or as a means to compensate for the downsizing consequences. In other words, does the effect of innovation activities on job satisfaction vanish or even become negative for companies that recently fired employees? Consequently, we hypothesize that *downsizing decisions will moderate the relationship between innovation activities and job satisfaction (H2).*

3. Data and methods

We use the data from two French surveys, namely the Community Innovation Survey (CIS, 2006–2008) and Industrial Relations and Business Negotiation (REPONSE, 2010-2011). These surveys offer an unanticipated opportunity to examine the relation between innovation activities and job satisfaction among a large sample of firms. The CIS in France was conducted by the Institute for Statistics and Economic Studies (INSEE) based on the Oslo Manual drawn up by the OECD. The main aim of the survey is to collect information related to innovation activities. The REPONSE survey is managed by the Ministry of Labor and presents the main sources of data on industrial relations and work organization in France. The survey is conducted every six years. In 2010, the survey was conducted on the sample of 4,000 establishments with 10 employees or more in the non-farm business sector. As a result of these merges, our sample includes 5,796 employees.

3.1. Variables

In order to operationalize *JOB_SATISFACTION*, our measurement scale used four-point Likert scales (1 = not at all satisfied; 4 =very satisfied) indicating the degree of employee's

general level of satisfaction. In order to operationalize variable *INNOVATION*, we use information from the CIS data indicating whether a firm innovates or not in four areas: product/services, process, organization, and marketing. More precisely, *INNOVATION* is the sum of four binary variables that can take values from 0 to 4.

We also introduced a set of control variables, based on previous studies about job satisfaction. We briefly describe below these control variables by organizing them in four categories. First, the literature examined the impact of firms' characteristics on job satisfaction. For instance, Idson (1990) provided empirical evidence that work organization inflexibility in the larger firms is the main source of employee's job dissatisfaction. Moreover, Gazioğlu and Tansel (2006) contend that job satisfaction may be dependent on the sector of activity. Accordingly, we introduced the variables *SIZE*, *HOLDING*, and *ACTIVITY*.

Second, previous literature is inconclusive regarding the link between job satisfaction and firm performance (Bernhardt et al., 2000). In order to provide further evidence, we introduced the variable denoted *SALES*.

Third, scholars examined the effect of individuals' characteristics on job satisfaction. For example, previous literature indicates that females are happier with their jobs than males (Artz, 2008). Several scholars (Warr, 1992; Clark, 1996; Clark et al., 1996) also found that the relationship between age and job satisfaction has a U-shaped form. Moreover, previous studies (Clark, 1996; Clark et al., 1996; Clark and Oswald, 1996) found a negative link between the level of education and job satisfaction. We thus control for these socio-demographic characteristics by introducing the variables *GENDER*, *AGE*, *AGE2*, and *EDUCATION*.

Fourth, previous studies analyzed the effect of some job characteristics, and work environment more broadly, as drivers of job satisfaction. For instance, the literature evidenced a positive relation between wage and job satisfaction (Warr, 2007; Bryson et al., 2012).

Moreover, Lanfranchi and Pekovic (2014) found that seniority is negatively correlated with indicators associated to job satisfaction. Scholars also documented that employees who perceive a balance between their work and private life feel more satisfied at work (Scholarios and Marks, 2004; Haar et al., 2014). In addition, Ting (1997) states that the possibility of employing skills and abilities at the workplace is a valuable predictor of job satisfaction. Moreover, intrinsic rewards like the possibility to develop new skills is considered as an important driver of job satisfaction (Linz and Semykina, 2012). It is also well documented that employees who experience autonomy at work report higher level of job satisfaction (Illardi et al., 1993; Brinck et al., 2019). The literature also contents that job intensity decreases job satisfaction (Bohle et al., 2011; Diaz et al., 2012). Furthermore, promotion opportunities have been identified as contributing to job satisfaction (Clark, 1998; Clark, et al., 2009; Clark and Oswald, 1996; Kosteas, 2011). Finally, in a similar vein to what is developed in the previous section, we control for the effect of precedent downsizing in the company. Indeed, Orlando (1999) argues that the survivors of downsizing experience considerable concerns about their job security which negatively influences job satisfaction. Therefore, we respectively introduced the variables *WAGE, SENIORITY, WORK-LIFE BALANCE*, *COMPETENCES, SKILLS, FREE, INTENSITY, PROMOTION*, and *DOWNSIZING.* The definition of all the previous variables and descriptive statistics are presented in Table 1.

Please, insert Table 1 around here

3.2. Empirical Model

A Tobit regression model is used given the nature of our dependent variable –job satisfaction. A Tobit regression model is an econometric approach considered as censored (Wooldridge, 2002). The model can be written as $Y_i^* = X_i'\beta + \varepsilon_i$, where X_i denotes the vector of the firm, employees and job characteristics; β is the coefficient's vector of independent variables, and ε_i represents the unobserved error term. The observed variable Y_i corresponding to job satisfaction can be written as: $Y_i = Y_i^* \; if \; Y_i^* > 0; \; Y_i = 0 \; if \; Y_i^* \leq 0$, where Y_i^* is an unobserved latent variable.

In order to overcome a potential reverse-causality concern, our estimations include lagged values. Actually, innovation activities are observed for the period between 2006 and 2008 while job satisfaction is observed for the period between 2010 and 2011. Moreover, to estimate the boundary condition that could cancel or even reverse the potential positive effect of innovation activities on job satisfaction, we interact the variable *INNOVATION* with the variable *DOWNSIZING*. In order to avoid multicollinearity between the interaction terms and their components, we mean-center the direct terms by subtracting the mean of each variable from the values of each observation (Aiken and West, 1991).

4. Results and discussion

The estimation results regarding the direct and moderating effects are presented in Table 2. Model 1 presents the direct effect while Model 2 presents the moderating effect. The fits for both models are reasonable, with an adjusted pseudo R2 of 0.1859 per cent ($p < 0.001$) and 0.1860 per cent ($p < 0.001$), respectively. We tested several versions of the direct model to examine the results' robustness to some variables omission. The main findings are robust (see the Appendix).

Please, insert Table 2 around here

The results presented in Model 1 support our main hypotheses that innovation is positively related with subjective well-being at the workplace, consistent with previous research suggesting that innovation activities can fulfill fundamental human needs which could be further reflected on job satisfaction (Jensen et al., 2017).

Regarding control variables, our findings suggest that higher sales have a positive impact on job satisfaction while size has a negative effect. In addition, age and education have a negative impact. Regarding job features, we notice that wage and variables presenting work-life balance, competences, skills, and autonomy are all positively statistically significant. On the opposite, seniority, intensity and downsizing are negatively significant.

Model 2 presents the results of the moderating effect. We found that the interaction term is not significant, leading us to conclude that layoffs do not constitute a moderator of the relationship between innovation activities and job satisfaction. Consequently, our hypothesis 2 is not supported.

5. Theoretical and managerial implications

Despite the well accepted argument that innovation activities lead to improved economic performance, the relationship between innovation and employee outcomes, such as job satisfaction, is less documented, especially with regards to the issue of reverse causality. From a theoretical perspective, we exposed several psychological mechanisms that can explain why higher levels of innovations are likely to generate increased job satisfaction. Moreover, we improved the understanding of the innovation-job satisfaction nexus, more precisely the relationship from innovation to job satisfaction. We used lagged predictors on a large sample

of firms and employees from various sectors to go beyond correlational studies and partially address legitimate causality concerns. We consider that this step also constitutes an encouragement for researchers to devote more attention to these data-related issues that are too frequently overlooked (Rohrer, 2018; Rohrer and Lucas, 2020).

Another important feature of our study was to test a moderating variable, namely downsizing that has occurred in the last three years. Interestingly, the positive effect of innovations on job satisfaction was not moderated by downsizing. The interaction term has a negative sign that could indicate a negative effect of downsizing on the studied relationship, but the coefficient is not significant. In itself, this result is very interesting because the positive effect of innovations on job satisfaction seems to hold even when controlling for downsizing that constitutes a very stressful event.

From a managerial perspective, our findings indicate that innovations could play a significant role in generating non-pecuniary benefits, notably in term of job satisfaction. Therefore, in a sense, we confirm the idea that both firms and employees enjoy benefits from innovative practices (Appelbaum and Batt, 1994; Kochan and Osterman, 1994; Appelbaum et al., 2000; Godard, 2004; Kalmi and Kauhanen, 2008). Moreover, job satisfaction constitutes a natural driver to improve business performance. Employees who evolve in innovation-oriented companies are more likely to express higher levels of happiness. These results can explain among other reasons why working in some tech companies seem so desirable. Beyond immediate and well-known economic benefits, developing a culture of innovation can bring more to the table and contribute to employees' well-being. Although this assertion is somewhat speculative, happier employees make their workplace even more attractive and innovative. If an innovative culture can deliver so much, it makes sense for managers to both act upon situational and individual characteristics. For instance, the latter could imply to prefer the recruitment of people that are innovation oriented, given that this orientation could

benefit collaborators and the organization. Rather than just emphasizing the economic or market benefit of innovations, business leaders and policy makers can develop innovation policies that are more people-centered. Our results can enrich the persuasion toolbox that policy makers can mobilize to promote innovation activities. Last but not least, even in very stressful periods such as downsizing periods, our results suggest to not neglect innovation activities that can avoid a too strong decrease in job satisfaction.

6. Limitations and extensions

Although the present analysis contributes to the literature in multiple ways, it is important to recognize some limitations. First, our cross-sectional French data does not account for evaluating the nature of innovation activities inside the firm as well as cultural differences. For instance, we do not distinguish between mandatory innovations versus voluntary ones. Although voluntary innovations seem intuitively more likely to cause increased job satisfaction because of the voluntary component, mandatory innovations (e.g. to ensure greater safety) can also lead to increased satisfaction among employees. Second, future studies would examine the precise mechanisms by which each kind of innovation activities influence job satisfaction. For instance, investigating how other-oriented innovations (e.g., environmental innovations) versus self-interested innovations (profit-centered innovations) impact well-being constitutes a promising extension. Third, time is an important dimension that can help to reconcile seemingly contradictory results. Indeed, innovation can have differentiated effects on job satisfaction at the short versus long term horizon. Gathering data allowing to study the effect of innovation over longer periods could be a fruitful extension. Fourth, complementing survey based studies with well-crafted experiments can allow to go further in exploring the causal relationships between innovation activities and job satisfaction.

7. Conclusion

We examined empirically the relationship between innovation activities and job satisfaction. While much of the literature on organizational climate and employee attitudes is limited by poor consideration of causal identifiability, we used lagged predictors. Our study contributes to the analysis of the causation between innovation and job satisfaction. We found that employees working in companies that engage in innovation activities are more likely to report increased job satisfaction. Interestingly, we do not find evidence that this positive relationship is moderated by recent downsizing decisions.

References

Aiken, L. S, & West, S. G. 1991. *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: SAGE.

Aldieri, L., Bruno, B., & Vinci, C. P. 2021. A Multi-Dimensional Approach to Happiness and Innovation. *Applied Economics,* 53, 1300–1310.

Amabile, T. M., & Pratt, M. G. 2016. The Dynamic Componential Model of Creativity and Innovation in Organizations: Making Progress, Making Meaning. *Research in Organizational Behavior*, 36, 157–183.

Amabile, T. M., Barsade, S. G., Mueller, J. S., & Staw, B. M. 2005. Affect and Creativity at Work. *Administrative Science Quarterly*, 50, 367–403.

Appelbaum, E., Bailey, T., & Berg, P. 2000. *Manufacturing Advantage: Why High Performance Systems pay off*. New York: ILR Press.

Appelbaum, E., & Batt, R. 1994. *The New American Workplace*. New York: ILR Press.

Artz, B. 2008. The Role of Firm Size and Performance Pay in Determining Employee Job Satisfaction. *Labour: Review of Labor Economics and Industrial Relations,* 22, 315–343.

Bernhardt, K. L., Donthu, N. & Kennet, P. A. 2000. A Longitudinal Analysis of Satisfaction and Profitability. *Journal of Business Research,* 47, 161–171.

Brinck, K., Otten, S., & Hauff, S. 2019. High-Performance Work Practices and Job Satisfaction: Gender's Moderating Role. *European Management Review,* 16, 333–345.

Bohle, P., Willaby, H., Quinlan, M., & McNamara, M. 2011. Flexible Work in Call Centres: Working Hours, Work-Life Conflict and Health. *Applied Ergonomics,* 42, 219–224.

Bryson, A., Dale-Olsen, H., & Barth, E. 2009. How Does Innovation Affect Worker Well-Being? CEP Discussion Paper No 953. LSE.

Bryson, A., Barth, E., & Dale-Olsen, H. 2012. Do Higher Wages Come at a Price*? Journal of Economic Psychology,* 33, 251–263.

Burroughs, J. E., & Mick, D. G. 2004. Exploring Antecedents and Consequences of Consumer Creativity in a Problem-Solving Context. *Journal of Consumer Research*, 31, 402–411.

Chau, K.-Y., Zhu, Y.-L., Shen, H.-W., & Huang, S.-Z. 2018. A Study on Creative Personality and Innovation Behavior-Well-Being as the Mediator. *Journal of Interdisciplinary Mathematics*, 21, 253–264.

Cheng, C. F., Lai, M. K., & Wu, W. Y. 2010. Exploring the Impact of Innovation Strategy on R&D Employees' Job Satisfaction: A Mathematical Model and Empirical Research. *Technovation*, 30, 459–470.

Clark, A. E. 1996. Job Satisfaction in Britain. *British Journal of Industrial Relations,* 34, 189–217.

Clark, A. E. 1998. Measures of Job Satisfaction: What Makes a Good Job? Evidence from OECD Countries. OCDE Labour Market and Social Policy – Occasional Papers, no. 34.

Clark, A. E., & Kristensen, N., Westergård-Nielsen, N. 2009. Job Satisfaction and Co-Worker Wages: Status or Signal? *Economic Journal,* 119, 430–447.

Clark, A. E., & Oswald, A. J. 1996. Satisfaction and Comparison Income. *Journal of Public Economics,* 61, 359–381.

Clark, A. E., Oswald, A. J., & Warr, P. B. 1996. Is Job Satisfaction U-Shaped in Age? *Journal of Occupational and Organizational Psychology,* 69, 57–81.

Datta, D. K., Guthrie, J. P., Basuil, D., & Pandey, A. 2010. Causes and Effects of Employee Downsizing: A Review and Synthesis. *Journal of Management*, 36, 281–348.

Demircioglu, M. A. 2021. Sources of Innovation, Autonomy, and Employee Job Satisfaction in Public Organizations. *Public Performance and Management Review*, 44, 155–186.

Dougherty, D., & Bowman, E. H. 1995. The Effects of Organizational Downsizing on Product Innovation. *California Management Review,* 37, 28–44.

Diaz, I., Chiaburu, D. S., Zimmerman, R. D., & Boswell, W. R. 2012. Communication Technology: Pros and Cons of Constant Connection to Work. *Journal of Vocational Behavior,* 80, 500–508.

Dolan, P., & Metcalfe, R. 2012. The Relationship Between Innovation and Subjective Wellbeing. *Research Policy,* 41, 1489–1498.

Engelbrecht, H.-J. 2014. A General Model of the Innovation – Subjective Well-Being Nexus. *Journal of Evolutionary Economics,* 24, 377–397.

Engelbrecht, H. J. 2018. The (Social) Innovation–Subjective Well-Being Nexus: Subjective Well-Being Impacts as an Additional Assessment Metric of Technological and Social Innovations. *Innovation: The European Journal of Social Science Research,* 31, 317–332.

Freeman, C. 1995. Innovation and Growth. In Dodgson, M., Rothwell, R. (eds), *The Handbook of Industrial Innovation*, Edward Elgar Publishing.

Gallivan, M. J. 2003. The Influence of Software Developers' Creative Style on their Attitudes to and Assimilation of a Software Process Innovation. *Information & Management*, 40, 443–465.

Gazioglu, S., & Tansel, A. 2006. Job Satisfaction in Britain: Individual and Job Related Factors. *Applied Economics,* 38, 1163–1171.

George, J. M., & Zhou, J. 2002. Understanding When Bad Moods Foster Creativity and Good Ones Don't: The Role of Context and Clarity of Feelings. *Journal of Applied Psychology*, 87, 687–697.

Godard, J. 2004. A Critical Assessment of the High-Performance Paradigm. *British Journal of Industrial Relations,* 42, 349–378.

Grant, A. 2014. *Give and Take, A Revolutionary Approach to Success*, Penguin Books.

Haar, J., Russo, M., Suñe, A., & Ollier-Malaterre, A. 2014. Outcomes of Work–Life Balance on Job Satisfaction, Life Satisfaction and Mental Health: A Study Across Seven Cultures. *Journal of Vocational Behavior,* 85, 361–373.

Hage, J., & Aiken, M. 1967. Program Change and Organizational Properties, A Comparative Analysis. *American Journal of Sociology*, 72, 503–519.

Hage, J., & Aiken, M. 1970. *Social Change in Complex Organizations*. New York: Random House.

Honkaniemi, L., Lehtonen, M. H., & Hasu, M. 2015. Well-Being and Innovativeness: Motivational Trigger Points for Mutual Enhancement. *European Journal of Training and Development,* 39, 393–408.

Hou, J., Huang, C., Licht, G., Mairesse, J., Mohnen, P., Mulkay, B., Peters, B., Wu, Y., Zhao, Y., & Zhen, F. 2019. Does Innovation Stimulate Employment? Evidence from China, France, Germany, and The Netherlands. *Industrial and Corporate Change*, 28, 109–121.

Huhtala, H., & Parzefall, M. R. 2007. A Review of Employee Well-Being and Innovativeness: An Opportunity for a Mutual Benefit. *Creativity and Innovation Management,* 16, 299–306.

Idson, T. L. 1990. Establishment Size, Job Satisfaction and the Structure of Work. *Applied*

Economics, 22, 1007–1018.

Ikiz, F. E., & Asici, E. 2017. The Relationship between Individual Innovativeness and Psychological Well-Being: The Example of Turkish Counselor Trainees. *International Journal of Progressive Education*, 13, 52–63.

Illardi, B. C., Leone, D., Kasser, T., & Ryan, R. M. 1993. Employee and Supervisor Ratings of Motivation: Main Effects and Discrepancies Associated with Job Satisfaction and Adjustment in a Factory Setting. *Journal of Applied Social Psychology,* 23, 1789–1805.

Isen, A. M., Daubman, K. A., & Nowicki, G. P. 1987. Positive Affect Facilitates Creative Problem Solving. *Journal of Personality and Social Psychology*, 52, 1122–1131.

Jensen, K. W., Liu, Y., & Schøtt, T. 2017. Entrepreneurs Innovation Bringing Job Satisfaction, Work-Family Balance, and Life Satisfaction: In China and Around the World. *International Journal of Innovation Studies,* 1, 193–206.

Jones, B. F. 2009. The Burden of Knowledge and the Death of the Renaissance Man: Is Innovation Getting Harder? *Review of Economic Studies,* 76, 283–317.

Jones, B. F. 2010. Age and Great Invention. *Review of Economics and Statistics,* 92, 1–14.

Kalmi, P., & Kauhanen, A. 2008. Workplace Innovations and Employee Outcomes: Evidence from Finland. *Industrial Relations,* 47, 430–459.

Kline, T. J. B. & Boyd, J. E. 1994. Organizational Structure, Context and Climate: Their Relationship to Job Satisfaction at Three Managerial Levels. *Journal of General Psychology*, 118, 305–316.

Kochan, T., & Osterman, P. 1994. *The Mutual Gains Enterprise*. Boston, MA: Harvard Business School press.

Kosteas, V. D. 2011. Job Satisfaction and Promotions. *Industrial Relations,* 50, 174–194.

Lambert, E. G., & Hogan, N. L. 2010. Wanting Change: The Relationship of Perceptions of Organizational Innovation with Correctional Staff Job Stress, Job Satisfaction, and Organizational Commitment. *Criminal Justice Police Review,* 21, 160–184.

Lanfranchi, J., & Pekovic, S. 2014. How Green is My Firm? Workers' Attitudes and Behaviors Towards Job in Environmentally-Related Firms. *Ecological Economics,* 100, 16–29.

Linz, S. J., & Semykina, A. 2012. What Makes Workers Happy? Anticipated Rewards and Job Satisfaction. *Industrial Relations,* 51, 811–844.

Lok, P., & Crawford, J. 2004. The Effect of Organizational Culture and Leadership Style on Job Satisfaction and Organizational Commitment: A Cross-National Comparison. *The Journal of Management Development,* 23, 321–338.

Martin, B. R. 2013. Innovation Studies: An Emerging Agenda. In Fagerberg, J., Martin, B. R., Andersen, E. S. (Eds), *Innovation Studies: Evolution and Future Challenges*, OUP Oxford, 168–186.

OECD. 2011. Fostering Innovation to Address Social Challenges. Proceedings of the CSTP expert workshop on fostering innovation to address social challenges, 1–99. https://www.oecd.org/sti/inno/47861327.pdf

Orlando, J. 1999. The Fourth Wave: The Ethics of Corporate Downsizing. *Business Ethics Quarterly,* 9, 295–314.

Pekovic, S., & Galia, F. 2009. From Quality to Innovation: Evidence from Two French Employer Surveys. *Technovation*, 29, 829–842.

Pritchard, R. D., & Karasick, B. W. 1973. The Effects of Organizational Climate on Managerial Job Performance and Job Satisfaction. *Organizational Behavior and Human Performance*, 9, 126–146.

Rasulzada, F., & Dackert, I. 2009. Organizational Creativity and Innovation in Relation to Psychological Well-Being and Organizational Factors. *Creativity Research Journal,* 21, 191–198.

Rohrer, J. M. 2018. Thinking Clearly about Correlations and Causation: Graphical Causal Models for Observational Data. *Advances in Methods and Practices in Psychological Science*, 1, 27–42.

Rohrer, J. M., & Lucas, R. E. 2020. Causal Effects of Well-Being on Health: It's Complicated. *PsyArXiv*. https://doi.org/10.31234/osf.io/wgbe4

Scholarios, D., & Marks, A. 2004. Work-Life Balance and the Software Worker. *Human Resource Management Journal,* 14, 54–74.

Shalley, Christina E., Gilson, L. L., & Blum, T. C. 2000. Matching Creativity Requirements and the Work Environment: Effects on Satisfaction and Intentions to Leave. *Academy of Management Journal*, 43, 215–223.

Shanker, R., Bhanugopan, R., Van der Heijden, B. I. & Farrell, M. 2017. Organizational Climate for Innovation and Organizational Performance: The Mediating Effect of Innovative Work Behaviour. *Journal of Vocational Behavior*, 100, 67–77.

Shipton, H. J. West, M.A., Parkes, C. L., Dawson, J. F. & Patterson, M. G. 2006. When Promoting Positive Feelings Pays: Aggregate Job Satisfaction, Work Design Features, and Innovation in Manufacturing Organizations. *European Journal of Work and Organizational Psychology*, 15(4), 404–430.

St-Martin, A. K. 2019. Comportements innovants et bien-être psychologique au travail : Examen du rôle de la relation supérieur-subordonnée et des objectifs interpersonnels. Maîtrise en Intervention et changement organisationnel, Université de Sherbrooke.

Ting, Y. 1997. Determinants of Job Satisfaction of Federal Government Employees. *Public Personnel Management,* 26, 313–334.

Warr, P. B. 1992. Age and Occupational Well-Being. *Psychology and Aging,* 7, 37–45.

Warr, P. B. 2007. *Work, Happiness, and Unhappiness*. Mahwah: New Jersey.

Wei, Y., O'Neill, H., Lee, R. P., & Zhou, N. 2013. The Impact of Innovative Culture on Individual Employees: The Moderating Role of Market Information Sharing. *Journal of Product Innovation Management,* 30, 1027–1041.

Wei, Y., Nan, H., & Wei, G. 2020. The Impact of Employee Welfare on Innovation Performance: Evidence from China's Manufacturing Corporations. *International Journal of Production Economics,* 228, 107753.

Wooldridge, J. M. 2002. *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.

Table 1. Definition of variables and sample statistics (N=5.796)

Variables	Definition*	Mean	SD	Min	Max
Dependent variables					
JOB_SATISFACTION	Employee is, in his job: Very Satisfied=4; Satisfied=3; Not really Satisfied=2; Not at all Satisfied=1).	2.82	0.67	1.00	4.00
Main explanatory variable					
INNOVATION	The firm innovates (or not) in four areas: product/service, process, organization and marketing.	1.06	1.03	0.00	4.00
Control variables					
SIZE	Number of employees.	7296.132	20392.49	10.00	145936
HOLDING	Belongs to a holding group (=1 if yes).	0.86	0.34	0.00	1.00
SALES	Logarithm of firm's sales.	12.23	2.36	4.54	17.61
ACTIVITY	Manufacturing	0.39	0.49	0.00	1.00
	Agri-food (=1 if yes)	0.05	0.21	0.00	1.00
	Service (=1 if yes)	0.18	0.38	0.00	1.00
	Finance (=1 if yes)	0.05	0.21	0.00	1.00
	Commercial (=1 if yes)	0.19	0.39	0.00	1.00
	Transport (=1 if yes)	0.06	0.24	0.00	1.00
	Construction (=1 if yes).	0.09	0.29	0.00	1.00
GENDER	The employee is a woman (=1 if yes).	0.37	0.48	0.00	1.00
AGE	Age.	41.61	9.88	15.00	74.00
AGE2	Age square.	1828.74	814.13	225	5476
EDUCATION	Education1 (no-diploma)	0.16	0.37	0.00	1.00
	Education2 (Less than French Baccalaureate)	0.28	0.45	0.00	1.00
	Education3 (Baccalaureate)	0.15	0.36	0.00	1.00
	Education4 (2 years in university)	0.17	0.38	0.00	1.00
	Education5 (3 or more-years in university).	0.24	0.42	0.00	1.00
WAGE	Hourly wage.	15.36	9.58	3.2	208.4805
SENIORITY	Seniority.	15.04	10.55	1	57
WORK-LIFE BALANCE	Employee's job allows him to organize satisfactorily his private life (Always=4; Frequently=3; Occasionally=2; Never=1).	2.28	0.77	1.00	4.00

COMPETENCES	In his job, employees can employ fully his competences (Always=4; Frequently=3; Occasionally=2; Never=1).	2.73	0.81	1.00	4.00
SKILLS	Employee's job permits him to obtain new skills (Always=4; Frequently=3; Occasionally=2; Never=1).	2.44	0.81	1.00	4.00
FREE	Employee is free to organize his work (Always=4; Frequently=3; Occasionally=2; Never=1).	2.80	0.85	1.00	4.00
INTENSITY	Employee needs to harry to complete his work (Always=4; Frequently=3; Occasionally=2; Never=1).	3.06	0.78	1.00	4.00
DOWNSIZING	In the past three years, firm where an employee work, has encountered mass layoffs (=1 if yes).	0.18	0.39	1.00	4.00
PROMOTION	In last three years, employee got a promotion (=1 if yes).	0.29	0.45	0.00	1.00

Table 2. Tobit model estimates of the relationship between innovation and job satisfaction: Direct and Moderating effect

	JOB_SATISFACTION					
	Model 1			Model 2		
Variables	Estimate	z-value	95% Conf. Interval	Estimate	z-value	95% Conf. Interval
Intercept	1.74***	12.03	1.45 – 2.02	1.73***	11.92	1.44 – 2.02
INNOVATION	0.02**	2.07	0.00 – 0.03	0.02**	2.03	0.00 – 0.03
INNOVATION*DOWNSIZING	-	-	-	-0.02	-0.83	-0.06 – 0.03
SIZE	-1.54e-06***	-2.53	-2.74e06 – -3.74e07	-1.57e-06***	-2.54	-2.79e06 – -3.59e07
HOLDING	-0.03	-1.32	-0.09 – 0.02	-0.03	-1.31	-0.08– 0.02
SALES	0.01**	2.12	0.00 – 0.02	0.01**	2.11	0.00 – 0.02
ACTIVITY: Manufacturing	-0.06**	-2.02	-0.13 – -0.00	-0.06**	-2.00	-0.13 – -0.00
ACTIVITY: Agri-food	-0.02	-0.39	-0.11 – 0.07	-0.02	-0.36	-0.11 – 0.07
ACTIVITY: Service	-0.09***	-2.52	-0.16 – -0.02	-0.09***	-2.49	-0.16 – -0.02
ACTIVITY: Finance	-0.07	-1.36	-0.02 – 0.03	-0.07	-1.35	-0.02 – 0.03
ACTIVITY: Commercial	-0.04	-1.01	-0.11 – 0.03	-0.04	-0.99	-0.11 – 0.03
ACTIVITY: Construction	0.02	0.39	-0.07 – 0.10	0.02	0.39	-0.07 – 0.10
GENDER	-0.00	-0.23	-0.04 – 0.03	-0.00	-0.22	-0.04 – 0.03
AGE	-0.01*	-1.91	-0.02 – 0.00	-0.01*	-1.87	-0.02 – 0.00
AGE2	0.00	1.35	-0.00 – 0.00	0.00	1.32	-0.00 – 0.00
ECUCATION2	-0.05***	-2.26	-0.10 – - 0.01	-0.05***	-2.25	-0.10 – - 0.01
ECUCATION3	-0.07***	-2.55	-0.13 – -0.02	-0.07***	-2.55	-0.13 – -0.02
ECUCATION4	-0.12***	-4.34	-0.17 – -0.06	-0.12***	-4.34	-0.17 – -0.06
ECUCATION5	-0.17***	-5.54	-0.23– -0.11	-0.17***	-5.55	-0.23– -0.11

WAGE	0.01***	5.58	0.00–0.01	0.01***	5.70	0.00–0.01
SENIORITY	-0.00***	-2.33	-0.00 – -0.00	-0.00***	-2.33	-0.00 – -0.00
WORK-LIFE BALANCE	0.10***	8.96	0.08 – 0.12	0.10***	8.97	0.08 – 0.12
COMPETENCES	0.22***	17.86	0.20 – 0.25	0.22***	17.83	0.20 – 0.25
SKILLS	0.17***	15.53	0.15 – 0.19	0.17***	15.56	0.15 – 0.19
FREE	0.11***	9.39	0.08 – 0.13	0.11***	9.40	0.08 – 0.13
INTENSITY	-0.09***	-8.97	-0.11 – -0.07	-0.09***	-8.97	-0.11 – -0.07
DOWNSIZING	-0.08***	-3.78	-0.12 – -0.04	-0.08***	-3.82	-0.13 – -0.04
PROMOTION	0.10***	6.27	0.07 – 0.13	0.10***	6.26	0.07 – 0.13
Number of observations	5.796					
Pseudo R2	0.1859			0.1860		

(*), (**), (***) indicate parameter significance at the 10, 5 and 1 per cent level, respectively.

Appendix: Check of the robustness of the direct result

	JOB_SATISFACTION									
Variables	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value	Estimate	z-value
Intercept	1.74***	12.03	1.96***	13.01	1.44***	9.86	1.74***	11.98	1.62***	11.34
INNOVATION	0.02**	2.04	0.02***	2.32	0.01*	1.85	0.02**	2.14	0.02***	2.17
SIZE	-1.44e-06***	-2.28	-1.58e-06***	-2.53	-1.59e-06***	-2.53	-1.45e-06***	-2.27	-1.73e-06***	-2.88
HOLDING	-0.03	-1.20	-0.05*	-1.69	-0.04	-1.48	-0.04	-1.47	-0.04	-1.32
SALES	0.01*	1.90	0.01*	1.88	0.01***	2.29	0.01***	2.18	0.02***	2.82
ACTIVITY: Manufacturing	-0.04	-1.28	-0.10***	-2.95	-0.06*	-1.74	-0.07***	-2.29	-0.07***	-2.24
ACTIVITY: Agri-food	0.00	0.07	-0.05	-0.94	-0.02	-0.45	-0.02	-0.44	-0.02	-0.53
ACTIVITY: Service	-0.07*	-1.88	-0.13***	-3.52	-0.09***	-2.43	-0.09***	-2.60	-0.10***	-2.71
ACTIVITY: Finance	-0.04	-0.95	-0.11**	-2.07	-0.06	-1.12	-0.06	-1.29	-0.04	-0.87
ACTIVITY: Commercial	-0.02	-0.63	-0.06	-1.53	-0.04	-1.17	-0.04	-1.10	-0.05	-1.49
ACTIVITY: Construction	0.03	0.63	-0.00	-0.05	0.03	0.73	0.01	0.31	0.01	0.24
GENDER	0.05	0.27	-0.01	-0.85	-0.01	-0.40	-0.00	-0.32	-0.02	-1.40
AGE	-0.01*	-1.75	-0.01	-1.47	-0.01***	-2.30	-0.01**	-2.05	-0.01	-1.24
AGE2	0.00	1.29	0.00	0.11	0.00*	1.75	0.00	1.51	0.00	0.96
EDUCATION2	-0.06***	-2.32	-0.08***	-3.06	-0.05***	-2.22	-0.05**	-2.24	-0.05**	-2.10
EDUCATION3	-0.08***	-2.68	-0.12***	-4.22	-0.07***	-2.51	-0.07***	-2.60	-0.05*	-1.79
EDUCATION4	-0.12***	-4.32	-0.17***	-5.98	-0.12***	-4.51	-0.12***	-4.36	-0.08***	-3.20
EDUCATION5	-0.17***	-5.49	-0.26***	-7.42	-0.19***	-6.09	-0.17***	-5.63	-0.09***	-3.37
WAGE	0.00***	5.16	0.01***	6.25	0.01***	5.69	0.01***	5.59	-	-
SENIORITY	-0.00***	-2.19	-0.00*	1.73	-0.02***	-2.33	-0.00***	-2.42	-0.00***	-2.26

WORK-LIFE BALANCE	-	-	0.12***	10.04	0.12***	10.56	0.10***	9.10	0.09***	8.43
COMPETENCES	0.23***	18.57	-	-	0.23***	17.88	0.23***	17.80	0.23***	18.21
SKILLS	0.17***	15.57	0.25***	22.47	0.17***	15.26	0.17***	15.51	0.17***	16.01
FREE	0.12***	10.74	0.16***	14.06	0.11***	10.14	0.11***	9.42	0.11***	9.83
INTENSITY	-0.11***	-10.80	0.09***	-9.05	-	-	-0.09***	-9.06	-0.09***	-8.88
DOWNSIZING	-0.09***	-4.15	-0.09***	-3.90	-0.09***	-3.98	-	-	-0.08***	-3.63
PROMOTION	0.10***	6.24	0.13***	8.00	0.10***	6.27	0.10***	6.38	0.10***	6.53
Number of observations	5.796									
Pseudo R2	0.1779		0.1532		0.1793		0.1844		0.1825	

(*), (**), (***) indicate parameter significance at the 10, 5 and 1 per cent level, respectively.