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**ANALYZING THE AMBIGUOUS RELATIONSHIP BETWEEN
TECHNOLOGICAL ORIENTATION AND GREEN
MANAGEMENT**

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Abstract

Green management is an innovative management approach that provide companies with comprehensive sources of information and control over their environmental and business processes. The level of technological knowledge can also become a source of competitive advantage, reflected in designing business processes. The mutual interaction between green management practices and technological orientation of companies reflect the systematically respectable design of entire business process which may directly improve the firm performance. Thereby, this study mainly aims to analyze direct and indirect relationship between technological orientation and green management practices and their impact on firm performance. The moderating effect of technological orientation between green management and firm performance is also examined. By analyzing the effect of technological orientation on green management, this study aims to contribute to the growing literature in the field. The paper offers interesting implications for companies, describing the real commitment to green management as well as technological orientation may result in a constructive effect on business performance.

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Keywords: Green management, process management, technological orientation, firm performance.



1. Introduction

In today's rapidly changing and competitive economic environment, companies need to focus on innovative and green solutions to response to the consumers' expectations. In this regard, well designed technologically supported processes considering the environmental priorities have become an essential part of companies. Technology based process management is designed to enhance the systematic structure of companies. Moreover, green management is also support this structure with regards to take into account the environmental issues. Green management is now recognized as an environmental improvement process of companies.

Thereby, companies are facing increasing pressure to become responsible and greener. Several stakeholders expect environment-friendly policies from companies. Thus, companies are increasingly challenged by green issues in their decisions, regarding the ethical and social issues as well as to ensure sustainable economic success. In fact, commitment to the environmental priorities has become crucial within the current competitive business world (Azorin, Cortes, Gamero, & Tari, 2009). Moreover, adopting green management into business processes provides more innovative approach to develop technological and organizational capabilities (Lee, 2009).

Regarding to the awareness of the environmental sensibility, reflected on domestic and international market, companies face growing pressure from various stakeholders to integrate green management into their business practices by using emerging technologies to provide innovative products and services (Li, Zhao, Zhang, Chen, & Cao, 2018). Accordingly, this study aims to access the impact of green management on firm performance as well as the moderating role of technological orientation on this relationship.

2. Literature Review and Theoretical Framework

Green management could be defined as the environmentally sensible policies of "green" organizations. While researchers have failed to develop a common definition of the term "green management", several accounts of what "green" managers consciously choose to manage their organizations have been documented in the literature (Haden, Oyler, & Humphreys, 2009).

One of the most referred definitions of sustainable development is developed by the World Commission on Environment and Development: "economic development that meets the needs of the present generation without compromising the ability of future generation to meet their own needs." (United Nations, 1987). Similarly, EPA (United States Environmental Protection Agency, 2003) introduces the following definition: "Sustainability creates and maintains the conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic and other requirements of present and future generations." Accordingly, green management and sustainability-related activities of companies are regarded as a crucial factor in the strategy making process (Arikboga, 2012).

Green management is not a tool which describes a new business model; it is rather a concept that motivates redesigning of business processes. Thus, redesigning of whole corporate processes might be better planned by using innovative approaches. Strategic sustainability is the incorporation the principles of sustainability with corporate strategic management processes, structures, cultures, systems as well as technologies. This approach is necessary in corporate decision making in order to create sustainable

solutions for the future (Arikboga, 2012). Accordingly, green management has become key for companies to offer sustainable strategic development in the new business world.

Furthermore, researchers claim that technology based applications might eliminate environmental problems, while increasing the effectiveness of companies (Zhu, Sarkis & Lai, 2012). Technological orientations' of companies propose an alternative approach to improve both environmental structure and firm performance by redesigning the whole processes of companies. As indicated the importance of technological improvement for green management is growing both in practice and in academia (Schiederig, Tietze, & Herstatt, 2012).

Therefore, technological orientation might be considered as one of the underpinning characters of companies. Since innovation capability as well as green capability are directly associated with organizational performance, these capabilities might be improved by the level of technological orientation (Gatignon, & Xuereb, 1997). Hence, the moderating effect of technological orientation between green management and firm performance is also examined in this study.

Acknowledging, sustainable economic growth for companies as a micro-economic level and countries as a macro-economic level is a broad concept containing an ecological, economic and social dimension and requires innovative approaches for market demand (Rennings, 2000). In this regard, technology oriented management tools for green management might be considered as a specific solution for new era of business models.

3. Research Method

3.1. Sample and Data Collection

The survey of this study is conducted on 145 middle and senior managers of 82 firms operating in Turkey. Initially, survey was send to 205 managers from 143 firms in Turkey, however, 145 manager from these firms accepted to participate in and fill out the research questionnaire. Data obtained from those 145 questionnaires were analyzed through the SPSS statistical packet program and hypotheses were tested through regression analyses.

4. Findings

In this study, the stepwise process multiple regression analysis is used to analyze the moderator effects of technological orientation on the form of the relationship between green management and firm performance. Accordingly, the proposed research model in this study is presented in Figure. 1

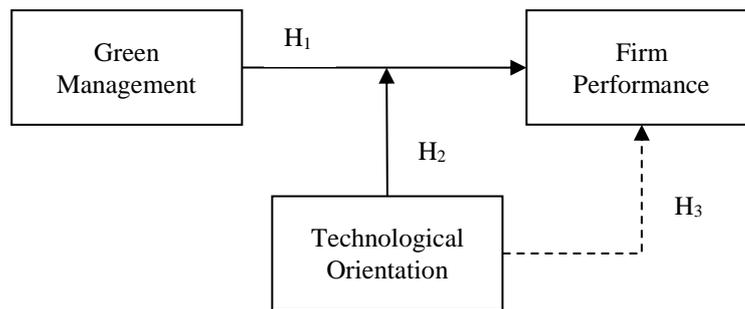


Figure 01. Proposed Research Model

The relationship between green management and firm performance, and the effect of technological orientation on this relationship are evaluated using the multiple regression analysis. The following regression model is developed for this analysis. Model 1 in Table 1 presents the results of this regression analysis.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + e \quad [\text{see Table 1, Model 1}]$$

In this equation, green management, technological orientation, and firm performance are represented by X1, X2, and Y, respectively.

Table 01. Regression Analysis Results

Model		Parameter estimate	Standard error	Tolerance value
1	Green management	0.297**	0.054	0.963
	Technological Orientation	0.328	0.096	0.852
2	Green management	0.764**	0.021	0.975
	Technological Orientation	0.346	0.127	0.779
	Interaction term	0.218*	0.094	0.923

Model 1: Adjusted R² value: 0.218; probability: 0.000**

Model 2: Adjusted R² value: 0.297; probability: 0.000**

* Significant at p < 0.10.

** Significant at p < 0.01

The model is significant at the p < 0.01 level. Here, green management significantly increases the firm performance, providing support for Hypothesis 1 ($\beta = 0.297$). Besides, tolerance values provide the evidence that there is not any multicollinearity between these variables. Although the technological orientation has not any significant influence on the firm performance, there might be an indirect relationship between them. One of the major research questions of our study is “how the technological orientation

changes the form of the relationship between green management and firm performance". Therefore, a second regression model is developed in order to examine this effect:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2 + e \quad [\text{see Table 1, Model 2}]$$

In this equation, the Interaction term ($\beta_3 X_1 X_2$) represents the moderator effect of technological orientation. The second model is significant at the $p < 0.01$ level. The regression analysis results suggest that technological orientation can be considered ($p < 0.1$) as a positive moderator ($\beta = -0.109$) on the relationship between green management and the firm performance.

5. Conclusion and Discussions

This study mainly aims to analyze the relationship between green management, technological orientation and firm performance. Furthermore, we argued that the relationship between environmental management and firm performance is moderated by technological orientation. If environmental management facilitate the performance of a firm, the contingent factor -technological orientation- is strengthened this positive effect is identified according to the study findings. In this study, we intend to investigate the role of technological orientation on the relationship between environmental management and firm performance. More specifically whether innovative capabilities and innovation intends of companies provide to increase the performance of firms in accordance with environmental performance.

Essentially, as it was expected, the positive effect of green management on the firm performance was observed in the analysis results. Therefore, it is seen that environmentally sensible applies increased the firm performance. On the other hand, no direct effect of technological orientation on firm performance was found, but it was seen that technological orientation affected the relationship between green management and firm performance with a positive moderator effect.

In this sense, technology-based green applications have become more important for increasing the firm performance. Especially, technologically supported well-designed corporate processes which aim to improve environmental initiatives has become essential for sustainable firm performance.

These aforementioned findings have several implications. First, the results indicate that technological orientation enhances corporate focus on developing the existing production and management systems in parallel with green management aimed at corporate sustainable development. Corporate green management tools and practices need to be aligned with innovative approaches provided by technology-driven orientations. Moreover, green management principles should be incorporated into production processes of innovative products and services to create sustainable development.

Firms should further research the integration of innovation, technology and green tools with their core business processes in order to provide strategic competitive advantages in their domestic or international markets. Moreover, the appropriate environmental standards might provide green innovation within companies that might be lower the costs of compliance by redesigning of whole business processes in accordance with this initiative.

References

- Arikboga, F.S. (2012). From environmental responsibilities to Green Management: Case of Turkey and a comparative analysis. *Istanbul University Journal of Political Sciences*, 47, 31-58.
- Azorin, J.F.M., Cortes, E.C., Gamero, M.D.L., Tari, J.J. (2009). Green Management and Financial Performance: A literature review. *Management Decision*, 47, 1080-1100.
- Gatignon, H., Xuereb, J.M. (1997). Strategic Orientation of the firm and new product performance. *Journal of Marketing Research*, 34, 77-90.
- Haden, S.S.P., Oyler, J.D., Humphreys, J.H. (2009). Historical, practical, and theoretical perspectives on green management: An exploratory analysis. *Management Decision*, 47, 1041-1055.
- Lee, K.H. (2009). Why and how to adopt green management into business organizations?. *Management Decision*, 47, 1101-1121.
- Li, D., Zhao, Y., Zhang, L., Chen, X., Cao, C. (2018). Impact of quality management on green innovation. *Journal of Cleaner Production*, 170, 462-470.
- Renning, K. (2000). Redefining innovation-eco-innovation research and the contribution from ecological economics. *Ecological Economics*, 32, 319-332
- Schiederig, T., Tietze, F., Herstatt, C. (2012). Green innovation in technology and innovation management – an exploratory literature review. *R&D Management*, 42, 101-109.
- United Nations. (1987). *Report of the World Commission on Environment and Development: Our Common Future*. Retrieved from [http://www.exteriores.gob.es/Portal/es/PoliticaExteriorCooperacion/Desarrollosostenible/Documentos/Informe%20Brundtland%20\(En%20inglés\).pdf](http://www.exteriores.gob.es/Portal/es/PoliticaExteriorCooperacion/Desarrollosostenible/Documentos/Informe%20Brundtland%20(En%20inglés).pdf)
- United States Environmental Protection Agency. (2003). *Lean Manufacturing and the Environment: Research on Advanced Manufacturing Systems and the Environment and Recommendations for Leveraging Better Environmental Performance*. Retrieved from <https://www.epa.gov/sites/production/files/2013-10/documents/leanreport.pdf>
- Zhu, Q., Sarkis J., Lai, K. H. (2012). Green supply chain management innovation diffusion and its relationship to organizational improvement: An ecological modernization perspective. *Journal of Engineering and Technology Management*, 29, 168-185.