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## IMPACT OF LEGAL PRESSURE, CUSTOMER PRESSURE AND DYNAMIC CAPABILITIES ON GREEN INNOVATION PERFORMANCE, WITH EMPHASIS ON THE MEDIATING ROLE OF SENIOR MANAGEMENT SUPPORT, TRAINING, INVESTMENT IN RESEARCH AND DEVELOPMENT, AND RELATIONAL LEARNING CAPABILITIES

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**Abstract.** This research aims to investigate the impact of legal pressure, customer pressure and dynamic capabilities on green innovation performance, with emphasis on the mediating role of senior management support, training, and investment in research and development and relational learning capabilities at the Oil Turbo Compressor Company. This descriptive research employs correlation and Structural equation research plan. The statistical population of the study includes managers, assistants, and experts of Oil Turbo Compressor Company, 281 subjects participate in the research. They responded to questionnaires on legal pressure, customer pressure, dynamic capabilities, senior management support, training, investment in research and development, relational learning capabilities, and green innovation performance. Correlation coefficient and structural equation method have been used with SMARTPLS software to analyze the data. The results showed that the effect of legal pressure on learning abilities is not significant. The impact of legal pressure on senior management support, training, and investment in research and development is positive and significant. The impact of customer pressure on relational learning capabilities, senior management support, investment in research and development, and training is positive and significant. The impact of dynamic capabilities on relational learning capabilities, senior management support, and investment in research and development is positive and significant; but the effect of dynamic capabilities on training is not significant. The impact of relational learning capabilities, senior management support, training, and investment in research and development on the green innovation performance is positive and significant.

**Keywords:** legal pressure, customer pressure, senior management support, training, investment in research and development, green innovation performance.

**Introduction.** Environmental sustainability, ecosystem balance (environment), generational benefits (economic), and people (community) have become a major concern [1]. In addition, sustained consumption is influenced by the increased attention of corporate decision makers due to strict regulation and increased pressure on stakeholders to focus on environmental protection [2,3]. With increasing environmental concerns of consumers, governments, and communities around the world, manufacturing companies have sought to develop eco-friendly applications such as green products, green brands, and green technology [4,5]. These concerns were drawn to various industries so that important factors in the activity of companies, from the provision of raw materials to the process of producing new products in the factory, and issues that arise when consumers use the product, have environmental considerations [6,7].

The transformation or change is the biggest issue facing each organization today and accepting this change by organizations is one of the biggest factors in the survival of the organization. In fact, innovation is the guarantee of the survival of any organization in this dynamic and competitive market. Accordingly, a new concept emerged as green innovation, meaning that any innovation should contribute to improving the organization's environmental performance. For instance, innovation in production processes that save energy and natural resources, improve the process of recycling, or reduce environmental pollution [8].

Green innovation refers to the innovations in products, processes, and management that can lead organization to achieving eco-friendly sustainable competitive advantage [9,10]. Chen [11] (Qtd in: [12]) defines green innovation as a software or hardware innovation in technology that depends on green products or processes such as energy saving, waste recycling, green product design, or environmental management of organization as it seeks to reduce negative environmental impacts [12].

In general, it can be said that the goal of green innovation is to reduce environmental adverse impacts [13] and this is a significant factor in the whole value chain from supplier to consumer [14]. An examination of empirical evidence shows that few studies have examined the impact of legal pressure, customer pressure, and dynamic capabilities on senior management support, training, investment in research and development, relational learning capabilities, and green innovation performance. In order to fill this gap in the green innovation literature, this

research emphasizes on institutional theory and resource-based approach to present the concept of organizational green responses (senior management support, training, investment in research and development) and relational learning capabilities as a mechanism to explain the impact of legal pressure, customer pressure, and dynamic capabilities on green innovation. Therefore, the fundamental question of the present research is whether senior management support, training, investment in research and development, and relational learning capabilities have mediator role in the impact of legal pressure, customer pressure and dynamic capabilities on green innovation performance.

**Theoretical foundations**

***Green innovation performance***: Green innovation refers to innovations in products, processes, and management that can lead organization to achieving eco-friendly sustainable competitive advantage [10]. In this study, we measured the green innovation performance by the 7 statements developed by Huang et al. [15].

***Organizational green responses***: Organizational green responses are used to describe organizational responses to specific external stimuli that affect the levels of green innovation [16]. These answers in the present research are senior management support, training, and investment in research and development. In order to measure organizational green responses, the present research employs the questionnaire by Huang et al. [15]. Organizational green responses are measured in three components (training, senior management support, and investment in research and development). 4 statements are used to measure training, 4 statements to measure senior management support, and 2 statements to measure investment in research and development.

***Relational learning capabilities***: Relational learning capability includes all interpersonal methods, mechanisms and processes used by individuals in order to achieve learning [17]. In order to measure relational learning capabilities, Selens and Salis (2003) questionnaires are used in this study.

***Legal pressures***: legal pressure refers to the organization's compliance with production technology standards, legal risks, enforcement of government regulations, and administrative punishment [15]. In order to measure legal pressure, five statements developed by Huang et al [15] are used in this study.

***Customer pressures***: Customer pressure refers to customer demand and expectations as one of the strong and influential drivers of the organization [15]. In order to measure customer pressure, four statements developed by Huang et al [15] are used in this study.

***Dynamic capabilities***: Dynamic capability refers to the conversion of ordinary capabilities into changes in production processes or company products or the creation of new generic capabilities [18]. In order to measure dynamic capabilities, this research uses the questionnaires developed by Paolo and Al-Sawuri (2011).

**Research background.** Ashrafi [19] examined the impact of human capital on the green innovation strategy and financial performance. The research method was descriptive survey. A questionnaire was used to collect data. The structural equation model was used to analyze the data. The results showed that human capital can not only help the organization improve financial performance by learning financial principles, but can also indirectly affect the financial performance of the organization through creativity, innovation, and environmental initiatives. Huang et al. [15] investigated the effects of self-regulation and customer pressure on organizational green responses and green innovation performance. The research method was descriptive survey. A questionnaire was used to collect data. The structural equation model was used to analyze the data. The results of the research showed that self-regulatory and customer pressures improve the organization's green responses and increase green innovation performance. Tseng et al. [13] assessed the incentives for green innovation in Taiwan's electronic companies. The research method was descriptive survey. A questionnaire was used to collect data. Fuzzy analysis was used to analyze the data. The results show that green management innovation is one of the key drivers of green innovation implementation in the organization. In "Obstacles to Implementing Green Human Resource Management in Oil Industry Fayyazi et al [20] acknowledged that there is a growing need for integrating environmental management with humans. By reviewing existing literature, the study developed questions and interviewed 12 international experts in oil industry. The interview aimed to design a questionnaire and collect necessary information. The results of this study showed that the lack of comprehensive planning for the implementation of green human resources management and the vagueness of the green value at the highest level and the strength of the staff have the least importance.

**Research methodology.** This descriptive survey uses correlation of the structural equation model as its research model. Statistical population includes all senior managers, junior managers, and experts of Oil Turbo Compressor Company. The total population is 1200. Considering the population size, Cochran formula hs been used to determine sample size. In this manner, 291 senior managers, junior managers, and experts of Oil Turbo Compressor Company involve in the study as subjects. In this study, sampling was simple random sampling method. 300 questionnaires were distributed among the participants ensure the return of questionnaires. Of these, 287 questionnaires were returned; 6 questionnaires have been excluded from the analysis because of incomplete answers; finally, 281 questionnaires analyzed. The predicted acceptable alpha in this research is a value more than 0.7 for reliability. Therefore, reliability is measured using Cronbach's alpha and SPSS software 21. Composite reliability index is used to evaluate the reliability; values more than 0.7 indicates that each construct has a proper reliability [21]. Descriptive and inferential statistics have been used to analyze the data in this study. In the descriptive part, mean and standard deviation will be used; Pearson correlation coefficient and structural equations using partial least squares (PLS) will be used as inferential statistics. SPSS and SMARTPLS softwares will be used to analyze research data.

***Table 1.*** *Cronbach's alpha coefficients of research variables*

| Variable | Cronbach's alpha |
|---|---|
| Legal pressure | 0.79 |
| Customer pressure | 0.74 |
| Dynamic capabilities | 0.93 |
| Relational learning capabilities | 0.91 |
| Senior management support | 0.83 |
| training | 0.77 |
| R & D investment | 0.74 |
| Green innovation performance | 0.88 |

**Research conceptual model and hypotheses.** Figure 1 shows the variables in the framework of the conceptual model. According to this model, legal pressure, customer pressure, and dynamic capabilities are regarded as independent variables; green innovation performance is considered as a dependent variable; and relational learning capabilities, senior management support, training, and investment in research and development are regarded as intermediate variables.

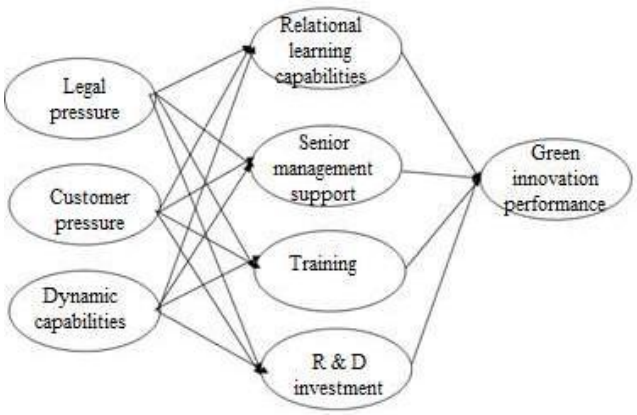


***Figure 1.*** *Research conceptual model (Source: [15]; [18]).*

**Research findings**

*Examining reliability and validity of measurement tools*

Testing measurement model includes internal consistency and validity (discriminant validity) of research tools and constructs. The reliability of the test relates to the accuracy of the measurement and its stability, so it has two different meanings. First, stability and reliability of test scores over time; it means that if a test is run multiple times on a responsive, its score is the same in all cases. Second, reliability refers to the consistency of the items; in other words, it shows the degree of consistency of research questions [22]. In order to evaluate constructs' reliability, Fornell and Larcker [23] suggested three models: (1) reliability of each item, (2) composite reliability of each construct, and (3) average variance extracted. For reliability of each item, loading factor of 0.5 and higher in confirmatory factor analysis indicates the appropriateness of each statement of the construct. Moreover, loading factor of the items should be significant at leat at the significance level of 0.01 [24]. Bootstrap test (300 subsamples) was used to calculate the T-test to determine significance of factor loadings. T-coefficient higher than ±1.96 to ±2.58 is significant at the level of 0.05; T-coefficient higher than ±2.58 is significant at the level of 0.01.

Dillon-Goldstein's rho (ρc) has been used to evaluate composite reliability of each construct. Since PLS, in contrast to multiple regressions of OLS (Ordinary Least Squares), uses factor scores of subjects for analysis, considering the factor load of each item is necessary to calculate the reliability index as he Cronbach Alpha coefficient gives the identical weight to the items and lessens the reliability. Therefore, cρ coefficient has been used [25]. Acceptable values of cρ should be 0.7 or greater [23]. The third criterion assessing reliability is the average variance extracted [23]. Fornell and Larcker suggest the values of AVE 0.04 and greater; it means that the intended construct explains about 50 percent or higher of variance of its markers [26].

*Results of confirmatory factor analysis for legal pressure*

Figures (2) and (3) as well as Table (2) represent results of confirmatory factor analysis for legal pressure. As observed, all the questions have significant loads on legal pressure construct.

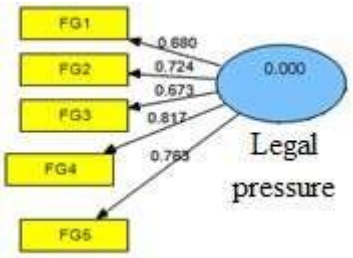


***Figure 2.*** *Confirmatory factor analysis of legal pressure*

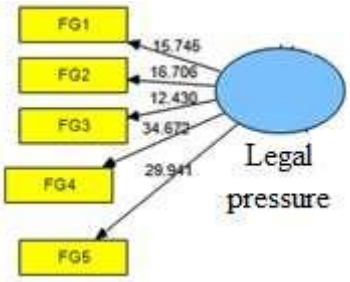


***Figure 3.*** *T coefficients of confirmatory factor analysis of legal pressure*

***Table 2.*** *Composite reliability and average variance for legal pressure*

| Variable / index | ρc | AVE | α |
|---|---|---|---|
| Legal pressure | 0.85 | 0.54 | 0.79 |

Table 2 shows the results of composite reliability (cρ), cronbach alpha (α) and average variance extracted (AVE) of the research variables. Composite reliability and Cronbach's alpha coefficient are for reliability testing, which should be higher than 0.7. Average extracted variance is a validation index that should be above 0.5; it means that the construct can explain about 50 percent or more variance of its indexes.

*Results of confirmatory factor analysis for customer pressure*

Figures (4) and (5) as well as Table (3) represent results of confirmatory factor analysis for customer pressure. As observed, all the questions have significant loads on legal pressure construct.

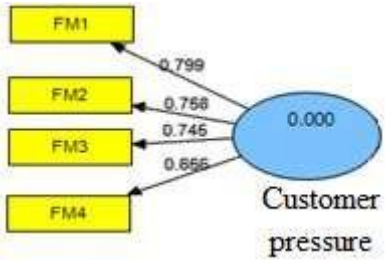


***Figure 4.*** *Confirmatory factor analysis of customer pressure*

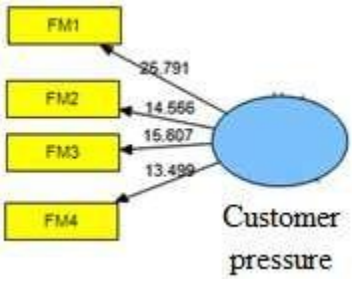


***Figure 5.*** *T coefficients of confirmatory factor analysis of customer pressure*

***Table 3.*** *Composite reliability and average variance for customer pressure*

| Variable / index | ρc | AVE | α |
|---|---|---|---|
| Customer pressure | 0.83 | 0.55 | 0.74 |

*Results of confirmatory factor analysis for dynamic capabilities*

Figures (6) and (7) as well as Table (4) represent results of confirmatory factor analysis for dynamic capabilities. As observed, all the questions have significant loads on dynamic capabilities construct.

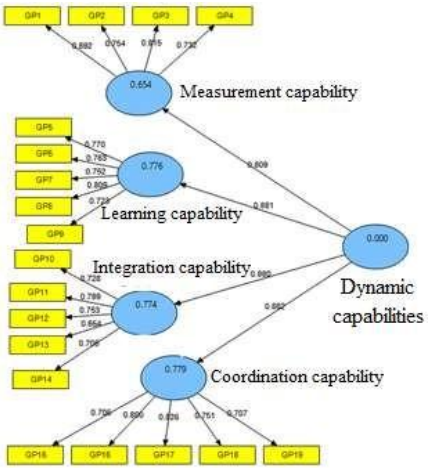


***Figure 6.*** *Confirmatory factor analysis of dynamic capabilities*

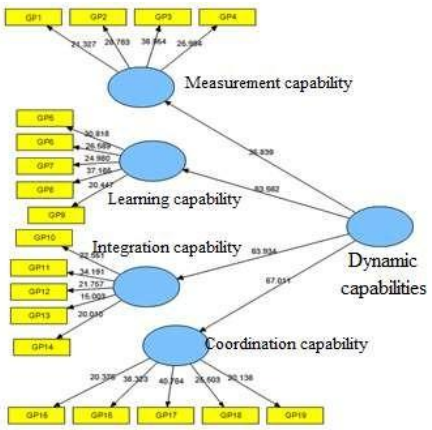


***Figure 7.*** *T coefficients of confirmatory factor analysis of dynamic capabilities*

***Table 4.*** *Composite reliability and average variance for dynamic capabilities*

| Variable / index | ρc | AVE | α |
|---|---|---|---|
| Measurement capability | 0.84 | 0.56 | 0.74 |
| Learning capability | 0.87 | 0.58 | 0.82 |
| Integration capability | 0.85 | 0.53 | 0.78 |
| Coordination capability | 0.87 | 0.58 | 0.81 |

*Results of confirmatory factor analysis for relational learning capabilities*

Figures (8) and (9) as well as Table (5) represent results of confirmatory factor analysis for relational learning capabilities. As observed, all the questions have significant loads on relational learning capabilities construct.

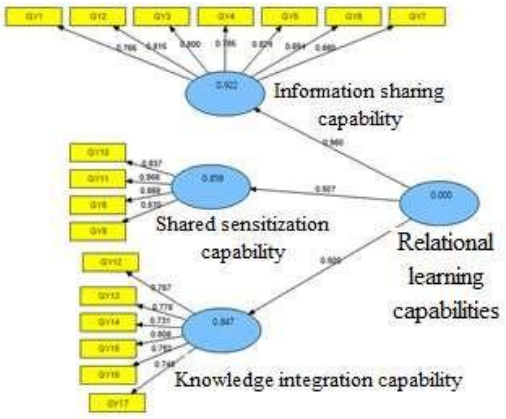


***Figure 8.*** *Confirmatory factor analysis of relational learning capabilities*

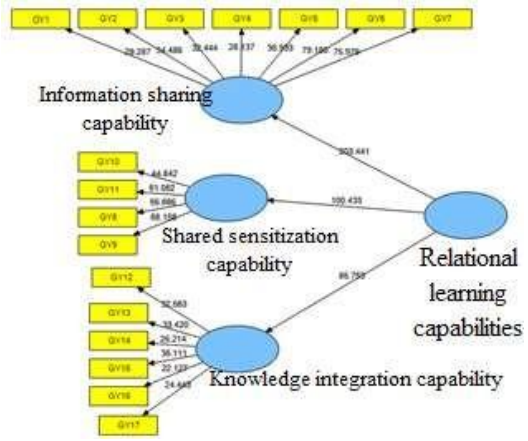


***Figure 9.*** *T coefficients of confirmatory factor analysis of relational learning capabilities*

***Table 5.*** *Composite reliability and average variance for relational learning capabilities*

| Variable / index | ρc | AVE | A |
|---|---|---|---|
| Information sharing capability | 0.94 | 0.68 | 0.92 |
| Shared sensitization capability | 0.92 | 0.74 | 0.88 |
| Knowledge integration capability | 0.89 | 0.58 | 0.86 |

*Results of confirmatory factor analysis for customer pressure*

Figures (10) and (11) as well as Table (6) represent results of confirmatory factor analysis for senior management support. As observed, all the questions have significant loads on senior management support construct.

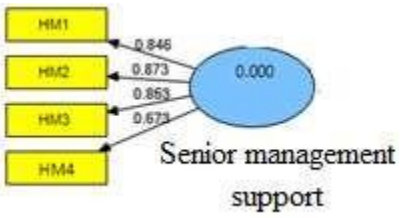


***Figure 10.*** *Confirmatory factor analysis of senior management support*

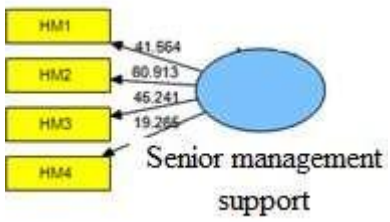


***Figure 11.*** *T coefficients of confirmatory factor analysis of senior management support*

***Table 6.*** *Composite reliability and average variance for senior management support*

| Variable / index | ρc | AVE | A |
|---|---|---|---|
| Senior management support | 0.87 | 0.66 | 0.83 |

*Results of confirmatory factor analysis for training*

Figures (12) and (13) as well as Table (7) represent results of confirmatory factor analysis for training. As observed, all the questions have significant loads on legal training.

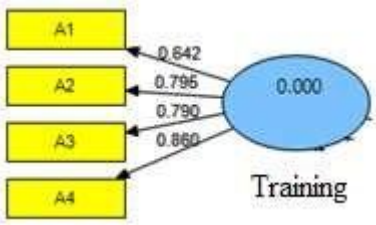


***Figure 12.*** *Confirmatory factor analysis of training*

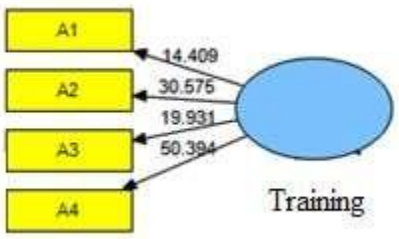


***Figure 13.*** *T coefficients of confirmatory factor analysis of training*

***Table 7.*** *Composite reliability and average variance for training*

| Variable / index | ρc | AVE | α |
|---|---|---|---|
| Training | 0.86 | 0.60 | 0.77 |

*Results of confirmatory factor analysis for investment in research and development*

Figures (14) and (15) as well as Table (8) represent results of confirmatory factor analysis for investment in research and development. As observed, all the questions have significant loads on investment in research and development construct.

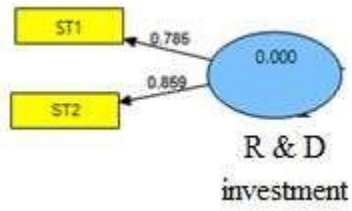


***Figure 14.*** *Confirmatory factor analysis of investment in research and development*

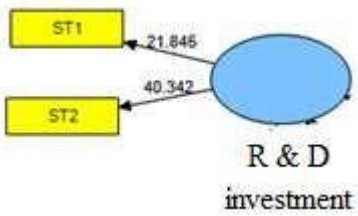


***Figure 15.*** *T coefficients of confirmatory factor analysis of investment in research and development*

***Table 8.*** *Composite reliability and average variance for investment in research and development*

| Variable / index | ρc | AVE | α |
|---|---|---|---|
| Investment in research and development | 0.81 | 0.68 | 0.74 |

*Results of confirmatory factor analysis for green innovation performance*

Figures (16) and (17) as well as Table (9) represent results of confirmatory factor analysis for green innovation performance. As observed, all the questions have significant loads on green innovation performance construct.

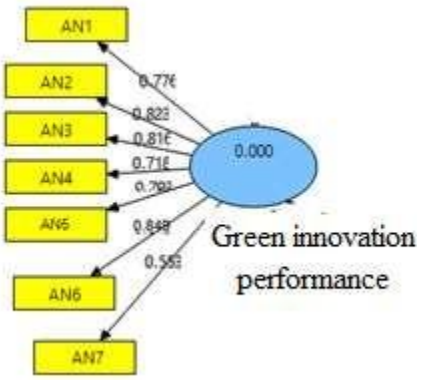


***Figure 16.*** *Confirmatory factor analysis of green innovation performance*

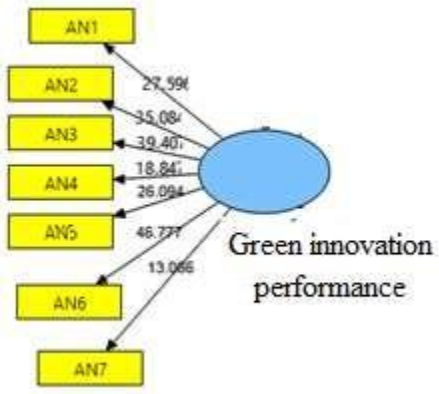


***Figure 17.*** *T coefficients of confirmatory factor analysis of green innovation performance*

***Table 9.*** *Composite reliability and average variance for green innovation performance*

| Variable / index | ρc | AVE | A |
|---|---|---|---|
| Green innovation performance | 0.91 | 0.59 | 0.88 |

*Examining Validity of Measurement Tools*

Table (10) reports crossover factor loadings of of items on the research constructs.

***Table 10.*** *Crossover factor loadings to test the validity of the tools in the research model*

| Question/variable | legal pressure | customer pressure | dynamic capabilities | Learning capability | management support | training | Research and Development | green innovation performance | AVE |
|---|---|---|---|---|---|---|---|---|---|
| FG1 | 0.68 | 0.38 | 0.37 | 0.30 | 0.28 | 0.35 | 0.27 | 0.25 | 0.54 |
| FG2 | 0.72 | 0.31 | 0.42 | 0.25 | 0.22 | 0.38 | 0.24 | 0.29 | |
| FG3 | 0.67 | 0.32 | 0.40 | 0.21 | 0.14 | 0.26 | 0.21 | 0.18 | |
| FG4 | 0.82 | 0.46 | 0.47 | 0.31 | 0.42 | 0.39 | 0.36 | 0.29 | |
| FG5 | 0.76 | 0.45 | 0.47 | 0.38 | 0.41 | 0.34 | 0.37 | 0.36 | |
| FM1 | 0.40 | 0.80 | 0.40 | 0.41 | 0.35 | 0.24 | 0.28 | 0.35 | 0.55 |
| FM2 | 0.42 | 0.76 | 0.34 | 0.36 | 0.18 | 0.12 | 0.13 | 0.18 | |
| FM3 | 0.37 | 0.74 | 0.29 | 0.36 | 0.24 | 0.10 | 0.18 | 0.13 | |
| FM4 | 0.38 | 0.66 | 0.36 | 0.33 | 0.40 | 0.50 | 0.41 | 0.40 | |
| Coordination | 0.49 | 0.41 | 0.88 | 0.44 | 0.35 | 0.24 | 0.36 | 0.43 | 0.74 |
| Measurement | 0.50 | 0.39 | 0.82 | 0.32 | 0.32 | 0.33 | 0.27 | 0.33 | |
| Learning | 0.56 | 0.45 | 0.88 | 0.40 | 0.41 | 0.32 | 0.40 | 0.38 | |
| Integration | 0.45 | 0.42 | 0.87 | 0.41 | 0.39 | 0.23 | 0.36 | 0.41 | |
| Shared sensitization | 0.35 | 0.44 | 0.43 | 0.93 | 0.47 | 0.32 | 0.41 | 0.39 | 0.87 |
| Information sharing | 0.40 | 0.46 | 0.44 | 0.94 | 0.44 | 0.34 | 0.41 | 0.37 | |
| Knowledge integration | 0.38 | 0.49 | 0.40 | 0.92 | 0.58 | 0.41 | 0.51 | 0.41 | |
| HM1 | 0.40 | 0.35 | 0.32 | 0.41 | 0.85 | 0.47 | 0.53 | 0.51 | 0.66 |
| HM2 | 0.38 | 0.32 | 0.31 | 0.45 | 0.87 | 0.53 | 0.52 | 0.46 | |
| HM3 | 0.31 | 0.31 | 0.33 | 0.45 | 0.85 | 0.52 | 0.44 | 0.47 | |
| HM4 | 0.29 | 0.42 | 0.42 | 0.43 | 0.67 | 0.36 | 0.39 | 0.41 | |
| A1 | 0.38 | 0.38 | 0.39 | 0.41 | 0.53 | 0.54 | 0.41 | 0.43 | 0.60 |
| A2 | 0.31 | 0.32 | 0.25 | 0.29 | 0.59 | 0.80 | 0.46 | 0.41 | |
| A3 | 0.35 | 0.23 | 0.15 | 0.20 | 0.42 | 0.79 | 0.33 | 0.39 | |
| A4 | 0.40 | 0.25 | 0.19 | 0.28 | 0.57 | 0.86 | 0.44 | 0.44 | |
| ST1 | 0.34 | 0.22 | 0.24 | 0.37 | 0.73 | 0.61 | 0.79 | 0.44 | 0.68 |
| ST2 | 0.34 | 0.40 | 0.41 | 0.44 | 0.63 | 0.43 | 0.86 | 0.46 | |
| AN1 | 0.20 | 0.29 | 0.29 | 0.26 | 0.42 | 0.35 | 0.30 | 0.78 | 0. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| AN2 | 0.27 | 0.28 | 0.32 | 0.26 | 0.37 | 0.38 | 0.34 | 0.82 | 5 |
| AN3 | 0.28 | 0.25 | 0.30 | 0.30 | 0.43 | 0.41 | 0.42 | 0.82 | 9 |
| AN4 | 0.25 | 0.26 | 0.30 | 0.24 | 0.34 | 0.33 | 0.25 | 0.72 | |
| AN5 | 0.28 | 0.28 | 0.39 | 0.33 | 0.35 | 0.38 | 0.30 | 0.79 | |
| AN6 | 0.35 | 0.30 | 0.31 | 0.32 | 0.43 | 0.49 | 0.40 | 0.85 | |
| AN7 | 0.34 | 0.40 | 0.43 | 0.43 | 0.57 | 0.46 | 0.68 | 0.55 | |

According to Table 10, all items have the highest loading factors on their own construct. The minimum distances between the factor loadings for own construct is more than 0.1. It shows that research constructs have proper validity. Table 10 shows results of evaluating correlation and second criteria (root square of average variance extracted).

***Table 11.*** *Correlation matrix and the square root of the average variance extracted of variables*

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1. Legal pressure | 0.73 | | | | | | | |
| 2. Customer pressure | 0.53** | 0.74 | | | | | | |
| 3. Dynamic capabilities | 0.50** | 0.48** | 0.86 | | | | | |
| 4. Relational learning capabilities | 0.41** | 0.49** | 0.45** | 0.93 | | | | |
| 5. Senior management support | 0.43** | 0.43** | 0.43** | 0.53** | 0.81 | | | |
| 6. Training | 0.47** | 0.38** | 0.32** | 0.39** | 0.52** | 0.77 | | |
| 7. Investment in research and development | 0.41** | 0.38** | 0.41** | 0.50** | 0.54** | 0.50** | 0.82 | |
| 8. green innovation performance | 0.38** | 0.40** | 0.45** | 0.39** | 0.42** | 0.54** | 0.46** | 0.77 |
| Note: The numbers on the diameter of the correlation matrix are the square root of the average variance extracted. | | | | | | | | |

*p<0.05, **p<0.01

According to Table 11, root square of average variance extracted for all variables are higher than their correlation with other variables. Accordingly, the second criterion of evaluating discriminant validity of research variables is met. In addition, the values under correlation matrix diameter have been reported to assess the relationships among variables. As observed, correlation coefficient among the variables is positive and significant.

*Structural Model Test*

Figure 18 represents tested model of relationships among the research variables. According to this figure, the effect of legal pressure on senior management support, training, and investment in research and development is positive and significant, but its effect on relational learning capabilities is not significant. The impact of customer pressure on senior management support, training, relational learning capabilities and investment in research and development is positive and significant. The impact of dynamic capabilities on senior management support, training, relational learning capabilities and investment in research and development is positive and significant. The impact of senior management support, training, relational learning capabilities, and investment in research and development on the green innovation performance is positive and significant. The numbers inside the circles show explained variances.

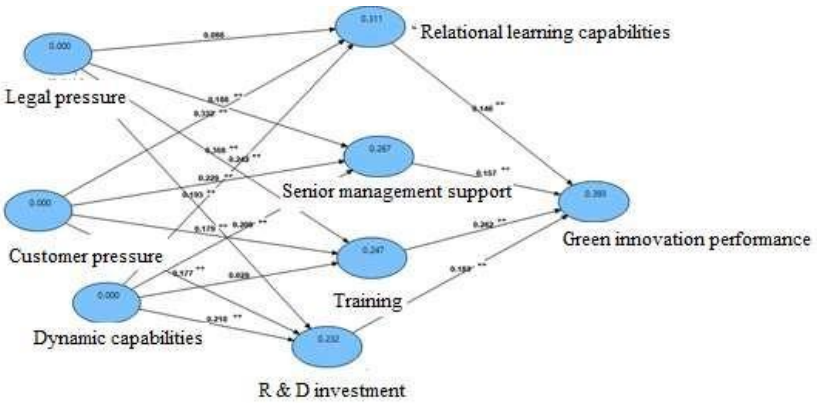


***Figure 18.*** *Research tested model*

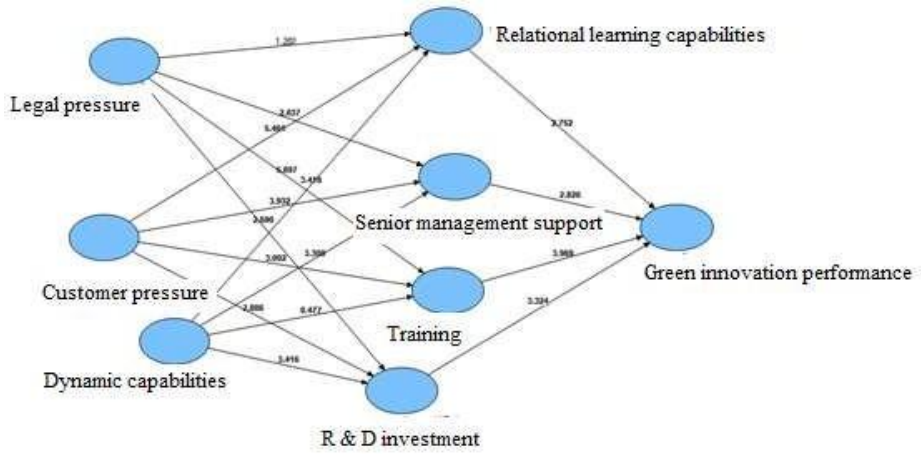


***Figure 19.*** *T coefficients for research tested model*

Figure 19 represents T coefficients for research paths. T coefficient higher than ±1.96 to ±2.58 is significant at the level of 0.05; T coefficient higher than ±2.58 is significant at the level of 0.01. T coefficient less than ±1.96 is not significant. Table 12 reports estimation of path coefficient and explained variance in the research model.

***Table 12.*** *Path coefficient and explained variance*

| Variables | Path coefficients | Variance explained |
|---|---|---|
| On green innovation performance from | | |
| Relational learning capabilities | 0.15** | |
| Senior management support | 0.16** | 0.39 |
| Training | 0.26** | |
| Investment in research and development | 0.18** | |
| On relational learning capabilities from | | |
| Legal pressure | 0.9 | 0.31 |
| Customer pressure | 0.33** | |
| Dynamic capabilities | 0.24** | |
| On senior management support from | | |
| Legal pressure | 0.19** | 0.27 |
| Customer pressure | 0.23** | |
| Dynamic capabilities | 0.21** | |
| On training from | | |
| Legal pressure | 0.36** | 0.25 |
| Customer pressure | 0.18** | |
| Dynamic capabilities | 0.03 | |
| On investment in research and development from | | |
| Legal pressure | 0.19** | 0.23 |
| Customer pressure | 0.18** | |
| Dynamic capabilities | 0.21** | |

*p<0.05, **p<0.01

As seen in Table 12, the impact of legal pressure on senior management support, training, and investment in research and development is positive and significant, but its effect on relational learning capabilities is not meaningful. The impact of customer pressure on senior management support, training, relational learning capabilities, and investment in research and development is positive and significant. The impact of dynamic capabilities on senior management support, training, relational learning capabilities and investment in research and development is positive and significant. The impact of senior management support, training, relational learning capabilities, and investment in research and development on the green innovation performance is positive and significant. According to Table 12, the research model explain 39% of variance of green innovation performance, 31% of variance of relational learning capabilities, 27% of senior management support variance, 25% of variance of training, and 23% of variance in investment in research and development.

Table 13 reports indirect coefficients of the research variables. The results showed that the indirect impact of legal pressure on green innovation performance is positive and significant through senior management support, training, and investment in research and development; but its impact through relational learning capabilities is not significant. The indirect impact of customer pressure on green innovation performance is positive and significant through relational learning capabilities, senior management support, training, and investment in research and development. The indirect impact of dynamic capacities on green innovation performance is positive and significant through senior management support, relational learning capabilities, and investment in research and development. The indirect impact of legal pressure on green innovation performance is positive and significant in terms of senior

management support, training, and investment in research and development, but its impact through relational learning capabilities is not significant.

***Table 13.*** *Indirect coefficients of research variables*

| Path | Indirect coefficients | T-coefficients |
|---|---|---|
| Impact of legal pressure on green innovation performance through: | | |
| Relational learning capabilities | 0.01 | 1.09 |
| Senior management support | 0.03* | 1.99 |
| Training | 0.09** | 3.26 |
| Investment in research and development | 0.03* | 2.04 |
| Impact of customer pressure on green innovation performance through: | | |
| Relational learning capabilities | 0.05* | 2.46 |
| Senior management support | 0.04* | 2.29 |
| Training | 0.05* | 2.39 |
| Investment in research and development | 0.03* | 2.18 |
| Impact of dynamic capabilities on green innovation performance through: | | |
| Relational learning capabilities | 0.04* | 2.14 |
| Senior management support | 0.03* | 2.15 |
| Training | 0.008 | 0.473 |
| Investment in research and development | 0.04* | 2.38 |

*P<0.05; **P<0.01

Table 14 shows CV-communality and redundancy of the variables. All values for CV-communality and redundancy of variables are positive; thus, research model has appropriate and acceptable quality.

***Table 14.*** *CV-Communality and redundancy of variables*

| Research Variables | CV-Redundancy | CV- Communality |
|---|---|---|
| Legal pressure | - | 0.537 |
| Customer pressure | - | 0.549 |
| Dynamic capabilities | - | 0.742 |
| Relational learning capabilities | 0.55 | 0.866 |
| Senior management support | 0.084 | 0.664 |
| Training | 0.122 | 0.602 |
| Investment in research and development | 0.082 | 0.678 |
| Green innovation performance | 0.054 | 0.588 |

*Structural Model Fit*

Finally, the fitting indices of structural equation models by partial least squares method have been used to demonstrate the validity of the findings of the research model.

Some methods are available to evaluate validity of the model in PLS. These cross-validation methods include CV-communality and CV-redundancy. CV-communality measures the quality of each block's measurement model. CV-redundancy, called also Stone-Geisser's Q2, measures quality of structural model for each endogenous block. Positive values of this index reflect appropriate and acceptable quality of measurement model and structural model [27]. As observed in Table 13, positive values for CV-communality and CV-redundancy indexes in all research variables indicates appropriate and acceptable quality of measurement model and structural model.

In addition to these indexes in Table 13, the overall model fit index is Goodness of Fit (GOF). It can be used to evaluate the overall validity or quality of PLS model. This indicator also acts as the indexes of fitting in LISREL model; it is between zero and one; the values closer to one represent higher quality [28]. This index evaluates the capability of overall prediction by model. It also determines whether testing model has been successful in anticipation of endogenous latent variables [29]. The obtained value for GOF in this study is 0.43; it indicates good fitting of testing model. GOF index of more than 0.35 reflects the proper quality and appropriateness of the model.

**Conclusion**

***First hypothesis: legal pressure influences on relational learning capabilities.***

The results showed that the impact of legal pressure on relational learning capabilities is not significant. Therefore, legal pressure leads to the creation of relational learning capabilities. Accordingly, it can be concluded that legal pressures do not affect relational learning capabilities with regard to environmental standards and regulations.

***Second hypothesis: Legal pressure influences on senior management support.***

The results showed that the impact of legal pressure on senior management support is positive and significant. Therefore, legal pressure leads to increase in senior management support. This finding is consistent with the results of Huang et al. [15]. In explaining the finding, one can say that senior management support will increase if

the company follows the standards for the distribution of fluids, observes production technology standards, takes legal risks into its activities, considers state supervision necessary to prevent environmental hazards, and considers administrative penalties for environmental protection.

***Third hypothesis: Legal pressure influences on training.***

The results showed that the impact of legal pressure on training is positive and significant. Therefore, legal pressure leads to increase in training. This finding is consistent with the results of Huang et al. [15]. This finding indicates that legal pressure leads a company to train staff in the skills required to accomplish and achieve environmental responsibility, increase the environmental awareness of employees, provide regular staffing training on environmental issues, provide opportunities for employees to engage in environmental issues, and provide resources for training environmental issues to employees.

***Fourth hypothesis: Legal pressure influences on investment in research and development.***

The results showed that the effect of legal pressure on investment in research and development is positive and significant. Therefore, legal pressure leads to increase of investment in research and development. This finding is consistent with the results of Huang et al. [15]. This finding suggests that environmental laws force the company to invest in research and development of employees in green innovation and provide funding for research and development staffing in green innovation.

***Fifth hypothesis: Customer pressure influences on relational learning capabilities.***

The results showed that the impact of customer pressure on relational learning capabilities is positive and significant. Therefore, customer pressure leads to increase in relational learning capabilities. This finding is consistent with the results of Huang et al. [15]. In explaining this finding, it can be said that relational learning capabilities increases if customers are aware of environmental issues, customers prefer products that help preserve the environment, consider the company's environmental behavior, and look to buy products that help protect the environment.

***Sixth hypothesis: Customer pressure influences on senior management support.***

The results showed that the effect of customer pressure on senior management support was positive and significant. Therefore, customer pressure leads to increase in senior management support. This finding is consistent with the results of Huang et al. [15]. This finding suggests that customer expectations in relation to environmental issues make the company's top management to focus on green innovation as one of the main strategies of the company, to consider green innovation as one of the effective strategies of the company, to launch programs for green innovations, and to provide enough resources to support green innovation.

***Seventh hypothesis: Customer pressure influences on training.***

The results showed that the effect of customer pressure on training is positive and significant. Therefore, customer pressure leads to increase in training. This finding is consistent with the results of Huang et al. [15]. This finding suggests that consumers' awareness of environmental issues, customers' preferences to buy products that protect the environment, and customers' attention to environmental behavior of the company will make the company to pay more emphasis on training its employees to learn about environmental issues and environmental protection.

***Eighth hypothesis: Customer pressure influences on investment in research and development.***

The results showed that the effect of customer pressure on investment in research and development was positive and significant. Therefore, customer pressure leads to increase in investment in research and development. This finding is consistent with the results of Huang et al. [15]. This finding suggests that consumers' awareness of environmental issues, customers' preferences to buy products that protect the environment, and customers' attention to environmental behavior of the company will make the company to more allocate more resources and funds to research and development with regard to environmental protection and environmental performance.

***Ninth hypothesis: Dynamic capabilities influences on relational learning capabilities.***

The results showed that the effect of dynamic capabilities on relational learning capabilities is positive and significant. Therefore, dynamic capacities lead to increased relational learning capabilities. This finding is consistent with the results of the Albort-Morant study [18]. In explaining this finding, it can be argued that relational learning capabilities will increase if company specifies and monitors the time it takes to complete the tasks, regularly analyzes the best method for performing specific tasks, classifies and codifies the activities of the company, examines the errors and analyzes the cause of the errors when providing services and products, the company has guidelines / checklist for the methods of conducting processes, always updates the knowledge about its industrial impact, always publishes regular reports on the environmental impacts of the company, and provides relevant information on the website.

***Tenth hypothesis: Dynamic capabilities influences on senior management support.***

The results showed that the effect of dynamic capabilities on senior management support is positive and significant. Thus, dynamic capabilities lead to increased senior management support. This finding is consistent with the results of the Albort-Morant study [18]. In explaining this finding, it can be said that dynamic capabilities lead senior managers to provide adequate resources for environmental issues, develop plans for many corporate activities on environmental issues, develop green growth initiatives in the organization, and allocate the resources necessary to innovate the green product.

***Eleventh hypothesis: Dynamic capabilities influences on training.***

The results showed that the effect of dynamic capabilities on training was not significant. Hence, dynamic capacities lead to increased training. This finding suggests that dynamic capabilities do not affect the training of staff in relation to environmental issues and their contribution to environmental issues.

***Twelfth hypothesis: Dynamic capabilities influences on investment in research and development.***

The results showed that the effect of dynamic capability on investment in research and development is positive and significant. Therefore, dynamic capacities lead to increased investment in research and development. This finding is consistent with the results of the Albort-Morant study [18]. This finding suggests that the company's ability to create manufacturing processes and services / products to quickly respond to environmental changes, as well as the ability to integrate, establish and transfer internal and external resources for better formulation to create and develop new capabilities and create new opportunities in market influence investment in research and development.

***Thirteenth hypothesis: Relational learning capabilities influences on green innovation performance.***

The results showed that the effect of relational learning capabilities on the green innovation performance is positive and significant. Therefore, relational learning capabilities lead to increased green innovation performance. This finding is consistent with the results of the Albort-Morant study [18]. Learning abilities are the process of acquiring and improving new knowledge and capacities. Moreover, this process can improve organizational performance. Improving knowledge also helps to facilitate organizational efficiency and effectiveness. Proper sharing, knowledge efficiency, and proper transfer of knowledge to members of the organization provide the opportunity to learn and engage, and also stimulate those employees to create new knowledge and apply new knowledge for innovation and organizational performance. Hence, organizational leaders have to look at "learning" as a valuable phenomenon and, to succeed in creating a better future, develop an organization that continually and effectively pursue learning; this leads to green innovation performance.

***Fourteenth hypothesis: Senior management support influences on green innovation performance.***

The results showed that the effect of senior management support on the green innovation performance is positive and significant. Therefore, senior management support will lead to increased green innovation performance. This finding is consistent with the results of Huang et al. [15]. This finding suggests that green innovation performance will increase if the company's top management emphasizes on green innovation as one of the company's main strategies, considers green innovation as one of the effective strategies of the company, launches green innovation programs, and provides enough resources to support green innovation.

***Fifteenth hypothesis: Training influences on green innovation performance.***

The results showed that the effect of training on green innovation performance is positive and significant. Therefore, training leads to increase in green innovation performance. This finding is consistent with the results of Huang et al. [15]. This finding suggests that green innovation performance will increase if the company has developed training programs in the field of environmental management to increase environmental awareness, skills and expertise of employees, the company has an integrated training to create an employee's emotional conflict in environmental management, the company has a green knowledge management, the staff receive training in the skills required to accomplish and achieve environmental responsibility, training to increase environmental awareness, regular training on environmental issues, the company provides opportunities for employees to engage in environmental issues, and the company provides resources needed to train environmental issues for employees.

***Fifteenth hypothesis: Investment in research and development influences on green innovation performance.***

The results showed that the effect of investment in research and development on green innovation performance is positive and significant. Therefore, investment in research and development leads to increased green innovation performance. This finding is consistent with the results of Huang et al. [15]. This finding suggests that green innovation performance will increase if the company has a research and development unit, the company spends many research and development activities, the company's budget allocated to the research and development unit is in line with the plans and expectations, the facilities and manpower will be provided to the research and development unit with the necessary expertise and skills. In this way, research and development cause the development of endogenous technology through the development and innovation of new products and new production processes. Accordingly, it improves economic growth and green innovation performance.

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## THE RELATIONSHIP BETWEEN THE EXPERTISE AND INDEPENDENCE OF AUDITORS AND AUDIT QUALITY

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**Abstract**. In this research, we investigate the relationship between the auditor's expertise in the industry and the auditor's independence and audit quality. For this purpose, we consider a sample of 87 firms chosen from listed firms in Tehran Stock Exchange and the study period include a 10-year period, from 2006 to 2015. In terms of methodology, research type is descriptive-correlational. This research consists of two main hypotheses. In order to test these hypotheses, a combination (year-firm) of multivariate linear regression tests has been used. The required data was extracted using the rahavardnovin Software, the Stock Exchange Organization website, the firms' website, financial statements, and board of directors' activities and shareholders list. We compute the research data collectively in an Excel file. Then, the variables were calculated and analyzed using the Eviews 9 econometric software. The main purpose of this study is to find an answer to this question; is there a positive and significant relationship between the