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# Developing a Scale to Measure the Institutionalization Level of Maritime Family Businesses

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## Abstract

Institutionalization is an important strategy that can help family businesses survive in developing market conditions. Measuring the institutionalization level of companies can improve the understanding of current corporate governance statuses and reveal institutionalization problems. Here, we developed a scale to measure the institutionalization level of maritime family businesses. Data obtained by questionnaires from 193 office employees in 177 Turkish family-owned ship management companies were analyzed by exploratory factor analysis and confirmatory factor analysis via structural equation modeling in the SPSS 23.0 and AMOS 23.0 statistical programs as quantitative methods. Following rigorous scale development procedures, a scale was developed consisting of 14 items and three dimensions. The three dimensions are effective organizational structure, internal audit, and transfer of authority. Based on the results, the scale was determined to be reliable and valid. Finally, the implications of the study were discussed and suggestions were given for additional studies.

**Keywords**

Maritime family businesses, Institutionalization level, Corporate governance, Ship management, Company generation

## 1. Introduction

Family businesses are important drivers of the world economy's Gross National Product (GDP). They constitute 80-98% businesses around the world, make up around 70-75% annual global GDP, and account for 50-80% jobs [1]. Traditionally, family-owned firms make up the largest proportion of maritime businesses. According to Alphaliners' Top 100 indicators [2], family firms are among the most effective shipping companies and play an important role in the maritime sector.

Institutionalization studies of family businesses have been a popular topic over the last two decades. The reason is that the researchers think institutionalization is necessary for the sustainability of family businesses due to intense competition conditions in the market [3,4]. Moreover, most family businesses lose their existence before reaching the second generation of company [5,6].

Institutionalization is defined either as the standardization of repetitive actions and habits within communities or the set of rules that must be followed [7]. Institutionalization is the process of "having rules, standards, and procedures independent of individuals, establishing systems that follow changing environmental conditions, establishing an organizational structure suitable for developments, making its own communication and business methods into a culture and thus transforming it into a distinctive identity from other businesses" [8]. This term is also used for corporate governance or corporate management in the literature.

In this study, we developed a scale to measure the institutionalization levels of maritime family businesses. Institutionalization studies in the maritime field typically measure the attitudes of business owners, shareholders, or chief executive officers (CEOs) [9,10]. However, the reflection of corporate governance practices is on the

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employees [11]; thus, we instead measured the attitudes of employees. Using this strategy, the institutionalization level of companies was better measured. Determining the institutionalization levels of businesses helps to understand their current corporate status [8]. The scale developed in this study is aimed to determine institutionalization levels of maritime family businesses and to reveal deficiencies in institutionalization. In addition, determining the institutionalization level of businesses can elucidate relationships between institutionalization and managerial factors, such as, human resources, leadership, strategic management, financial performance, and organizational culture. These relationships have been examined for other sectors [12-16]; however, studies about the maritime sector are limited.

The maritime industry has a unique structure; thus, the institutionalization of this industry should be evaluated within the scope of its own structure. In this study, we define the following three factors for the institutionalization level of maritime companies: effective organizational structure, transfer of authority, and internal audit.

Literature and expert opinions (EOs) were used to create the items in the questionnaire. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used as quantitative methods to analyze questionnaire data obtained from family-owned ship management companies registered with the Turkish Chamber of Shipping. The final scale consisted of 14 items and 3 dimensions. The developed scale was determined to be reliable and valid, and the impact of this study on the literature was discussed.

## 2. Background

The institutionalization of organizations is an approach that flourished with the emergence of institutional theory, which focuses on the development, legitimacy, and sustainability of organizations by using sociology, politics, and economics [17]. The main themes of institutional theory for organizations are formation of institutions, relationships between social characteristics and institutionalization, and the structure, function, and institutionalization of organizations.

Although the history of institutionalization dates back to the 19$^{th}$ century with the emergence of sociology, its effects on organizations were reflected only in the literature in the 20$^{th}$ century. This theory, founded by Selznick [18] after 1940, progressed into two different frameworks after 1970, the old and the new institutionalization approach. According to Selznick [18], the old institutionalization approach is related to deviations from personal interests, power, influence, competing values, and goals, and the new institutionalization approach is dependent on rules and laws, isomorphism, definitions, schemas, and routines.

Scott [19] defines institutionalization as a system of consistent and harmonious activities that emerge as a result of an enterprise's interaction with its environment, and the process of making the rules, policies, procedures, and practices that emerge as a result of this system. Accordingly, Kimberly [20], defines institutionalization as the effort to establish a mechanism that foresees the change of a new norm, value, and structure. This mechanism takes into account social relations by creating a structure suitable for the norms and values of organizations in order to keep up with the change. The common view in these definitions is that institutionalization is a process for businesses to build a certain structure to keep up with the environment and change.

Institutionalization begins with the establishment and development of an enterprise [20]. Various institutionalization dimensions have been used in the literature to measure the structural changes and institutionalization level of a company since its establishment. Such institutionalization criteria or dimensions include formalization, strategic planning, professionalization, transfer of authority, participation in management, decision-making style, existence of an effective communication system, and internal audit [21,22].

Studies on the institutionalization of both family-owned and non-family-owned businesses have been reported. Leaptrott [23] emphasized the importance of institutionalization in family businesses and argued that institutional theory can explain the relationships between family, business, and ownership within family businesses, after taking into account other external factors. Family businesses are defined as companies established for the purpose of making a living for the family and for profit, having blood ties between the founders and some of their managers, with at least two generations working in the business, and for transferring knowledge and skills from the family to the business to create a culture [24].

The main problems in family businesses involve adapting to changing market conditions and sustainability [3,4]. Researchers have examined relationships between institutionalization and managerial factors by using institutionalization dimensions that measure the level of institutionalization in family businesses operating in various fields. For example, Alpay et al. [25] conducted a study with 436 respondents from 132 family businesses and examined the relationship between institutionalization and firm performance. They determined the following three different aspects of institutionalization: transparency (internal audit), objectivity or justice, and formalization or

professionalism. They emphasized that transparency had a strong direct effect on firm performance. Additionally, objectivity or fairness in employee relations exerted a positive influence on qualitative performance measures. Furthermore, it was determined that formalization and professionalism cannot be achieved without transparency. Another study by Çavuş and Demir [26], with 244 managers of family firms, pointed out the relationship between institutionalization and corporate entrepreneurship. This study used the institutionalization dimensions of formalization, autonomy, professionalization, transparency, and consistency, and emphasized the significant relationship between institutionalization and corporate entrepreneurship.

Family businesses play an important role in the maritime industry, especially in ship management [10]. The most effective ship management companies are typically established as family companies and subsequently institutionalized [2]. However, companies that cannot be institutionalized, particularly the Turkish firms that are the subject of this study, cannot ensure their sustainability [27]. Ship management companies that operate as family businesses in Turkey generally employ a management approach that is passed from father to son [28]. A child's lack of necessary skills or knowledge, or their preference to not continue in the maritime sector, can negatively affect the continuity of the business. In cases where there are multiple children per family, ship-sharing and company separations after the death of the head of the family can cause the company to divide into smaller parts and disappear over time, rather than growing and developing [28].

Studies on institutionalization in maritime family businesses are limited. These studies, which are mostly focused on data obtained from the financial performance of the company, generally deal with either corporate governance and the impact of having a CEO on the board of directors or shareholder relationships on business performance.

Giannakopoulou et al. [10] pointed out that corporate governance is beneficial for maritime managers and shareholders, especially in family-owned maritime businesses.

The only study on the institutional levels in maritime businesses was performed by Turhaner and Nas [9]. In this study, which was conducted on 64 Turkish maritime family businesses, data from the opinions of shipowners were used. In this qualitative study, they specified the level of institutionalization as pre, semi, or full institutionalization by using institutionalization dimensions.

In contrast to the literature, our study is quantitative and based on institutional theory for employees in ship management companies. Employees are directly affected by institutionalization [11]; thus, it is beneficial to get opinions from employees and to measure institutionalization practices rather than the opinions of shipowners. This method circumvents involuntary and prejudiced attitudes that may occur when shipowners evaluate their own institutions.

In this study, scale dimensions developed for maritime family businesses are defined as the effective organizational structure, transfer of authority, and internal audit, according to the institutionalization literature and EOs.

### 2.1. Effective Organizational Structure

The structure of an organization is closely related to the content of its activities and culture. It is important to create rules that are based on the culture of the organization and that represent the relationship between jobs, people, groups, and processes to achieve goals [29]. In order for these relations and rules to be regulated, the organizational structure should include a formalized, professional, centralized, and fair management approach [30-32]. Formalization implies that an organization's actions are managed by specific and written rules, standards, and procedures [33,34]. A formal structure controls and coordinates a business's actions. Thus, employees are provided with knowledge and the business is provided with stability. Since this structure contains a rational management relationship set, a formal structure reflects institutionalized values [35]. Professionalization implies that the work and transactions in an organization are performed by experts. In professionalization, the balance of duty, authority, and responsibility in a business is determined on the basis of expertise [36]. An alternative definition by Apaydın [35] suggests that professionalization involves employing professionals in business management, establishing an organizational culture in a way that supports the work of professionals, establishing relationships with professionals and sectoral institutions in the sector where the business is located, and is an indicator of institutionalization. A centralized and fair organizational structure accomplished by establishing a hierarchical structure helps to manage relations and jobs. There are strong relationships between procedural, distributive, and interactional justice and job satisfaction under conditions of high centralization [37].

Based on these definitions, the establishment of an effective organizational structure for the institutionalization of family businesses depends on the following stages: determining the system and principles in the organizational structure, standardizing the work done, assigning powers and responsibilities to non-family employees according to

success, the existence of a fair system in the organization, the existence of a unique identity, and the system of selection and placement according to the requirements. In addition, measuring how this organizational structure is reflected on employees enables the effectiveness of current practices to be evaluated. Therefore, the first dimension in this study was determined to be an effective organizational structure.

### 2.2. Transfer of Authority

A major problem in family businesses is that authority cannot be transferred [38]. Authority is a combination of influencing and directing the behavior of others, which affects the organizational performance of businesses, as it is an important tool in building employee motivation and relationships [39]. However, authority does not only involve granting a status within a business, but also includes taking initiative. Sometimes authority must be transferred according to the needs of an organization and at critical times. Wells [40] defines authority as a managerial transfer of one or more duties or responsibilities to subordinates. Another definition according to Aşkun [41] is the transfer of authority from one manager or organizational unit to another to fulfill certain tasks. McClelland et al. [42] explained the transfer of authority as the reason for success or failure, and reported that employees will accept empowerment if they feel important and gain status in an organization. Thus, these motives should be evaluated with a reward and punishment system.

An organizational structure cannot be completed without the determination of a necessary structure, provision of appropriate physical equipment, and appointment of expert personnel to each department [7]. In order to ensure effective work from all employees, an organizational structure should be connected both horizontally and vertically with authority bonds [43]. The transfer of authority enables employees to take initiative and carry out work more effectively. Thus, employees can better adopt a vision and mission in line with the goals of the organization, and develop a sense of belonging and ownership. This transfer creates motivation for employees, and is therefore one of the important dynamics of orientation [44]. In this context, the transfer of authority was determined as the second indicator of institutionalization.

### 2.3. Internal Audit

Corporate governance sustains businesses by ensuring the efficient use of business resources together with internal audit processes [45]. According to The Institute of Internal Auditors [46], "Internal auditing is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes." Thus, an internal audit is based on the management policies and plans of an organization's activities with the purpose of measuring compliance with programs and laws to evaluate proper function. Karacalar [47] concluded that the establishment of an effective internal audit system within the framework of corporate governance ensured that financial statements, activities, information systems, contracts, compliance, and environmental audits were carried out in the most effective and ethical way.

Audits in maritime businesses are carried out in accordance with international regulations. These audits are for the safety of the environment, people, cargo, and ships at sea, and have been standardized using the International Safety Management Code (ISM). The ISM code advises companies to take precautions against all identified risks, to continuously improve the skills of personnel in the ISM code, and to create policies regarding safety of the environment [48]. According to the ISM code, flag states inspect businesses and their ships with external audits. In addition, ships are inspected by port states in international waters. Thus, ships or companies can be faced with sanctions if non-conformities are found from external audits. These sanctions adversely affect the operational and financial performance of businesses. As a precaution against sanctions, businesses must effectively carry out internal audits. A designated person ashore (DPA) is responsible for these audits. In this study, items involving minute details were prepared together with EOs, including DPAs, to test the structures that make up maritime internal audits.

## 3. Methodology

In this study, EFA and CFA were used as scale development methods. CFA was applied using structural equation modeling (SEM).

### 3.1. Scale Development

According to Schwab [49], scale development consists of the following three stages: creating a question pool, structuring the scale, and evaluating the scale. Chen et al. [50] used the scale development steps of item generation and questionnaire design, data collection and purification of measures, and the assessment and verification of the structure of the scale. In this study, scale development was carried out in line with the above assessments and consisted of item generation and questionnaire design and the structuring and assessment of the scale. A pilot study was also applied to test the understanding and reliability of the scale during the item generation and questionnaire design stage.

Data was obtained from 247 family-owned ship management companies registered with the Turkish Chamber of Shipping. A questionnaire made by Google forms was sent to these companies *via* e-mail, and their employees were asked to answer them. The questionnaire period was from October 2020 to February 2021. From the 247 family-owned companies, 193 office employees working in 177 companies responded to the questionnaire. Of the 177 companies, 154 were in İstanbul, 11 were in Kocaeli, 8 were in İzmir, 3 were in Mersin, and 1 was in the Trabzon province. All companies had at least 1 ship of 1000 gross tonnage and above operating in international waters.

According to Muthén and Muthén [51], a sample size of $N$=150 is generally acceptable for SEM. Thus, our sample size of 193 participants was adequate. The developed scale consists of 24 items, 6 of which are demographic characteristics and 18 are institutionalization levels. After EFA analysis, a final institutionalization level questionnaire was determined with 14 items. In order to acquire organizational culture data, participants working in the business for at least 1 year were sought out.

### *3.1.1. Item Generation and Questionnaire Design*

Items in the scale were generated in the following two ways: EOs and institutionalization literature. For EO, assistance was received through face-to-face interviews from four academics and three DPAs with 10 or more years of working experience. Since the original language of this study was Turkish, a Turkish linguist assisted with the accuracy of the scale. Information about the experts is shown in Table 1.

Items that made up the internal audit factor were mostly shaped by EO, and items that made up the effective organizational structure and transfer of authority factors were adapted from the literature [7,52,53].

Additionally, experts were consulted to verify if items in the scale were within the scope of maritime businesses. All items and their sources are shown in Table 2.

The measurements of institutionalization level were conducted using a five-point Likert-type scale (1: Completely disagree, 2: Disagree, 3: Neither agree nor disagree, 4: Agree, and 5: Strongly agree).

After approval from experts, we proceeded with the pilot study. A scale consisting of 18 items was tested by the pilot study. To validate the understanding and reliability of the items in the scale, 60 participants from 35 family companies in İstanbul, who fit the criteria of the study, were invited to answer the questionnaire *via* Google forms. The questionnaire was sent *via* e-mail in August 2020 and 43 participants responded. The participants were asked if the items reflected the purpose of the study and whether they were understandable. Based on the pilot study, it was determined that the scale items properly reflected the purpose of the study and were understood by the participants.

To test the reliability of the scale, reliability analysis was performed *via* the SPSS 23.0 statistical program. The internal consistency level of the items that make up a scale reflects the reliability of that scale [54]. Cronbach's alpha coefficient is the typical method used for internal consistency, especially in Likert-type scales [54]. This coefficient should typically be greater than 0.70 [55]. The Cronbach alpha value of this pilot study was determined to be 0.92 (Table 3).

The item-reliability performance of the scale was also examined (Table 4). According to Brzoska and Razum [56], a corrected item-total correlation should be at least 0.3. Table 4 shows that the corrected item-total correlations are at an acceptable range (0.31-0.79). The column titled "Cronbach's Alpha Coefficient (Item Deleted)" reports the rate of change in Cronbach's alpha coefficient, if any item is deleted. This value recalculates the Cronbach alpha value for each removed variable. Thus, an increase in scale reliability can be determined based on removing specific variables.

***Table 1.*** *Expert descriptions*

| Expert | Employment | Expertise |
|---|---|---|
| Professor | Maritime faculty | Efficiency in maritime businesses/organizational and cognitive psychology |
| Ass. Prof. | Maritime faculty | Maritime business management/corporate management |
| Ass. Prof. | Maritime faculty | Maritime business management |
| Ass. Prof. | Maritime faculty | Maritime engineering/ISM code |
| Ass. Prof. (Linguist) | Faculty of education | Turkish language and literature |
| DPA | Family-owned ship management company | ISM code |
| DPA | Non-family-owned ship management company | ISM code |
| DPA | Corporate ship management company | ISM code |
| DPA: Designated person ashore, ISM: International Safety Management Code | | |

***Table 2.*** *Potential indictors of the institutionalization level of maritime family businesses*

| Item Number | Item Description | Relevant Sources |
|---|---|---|
| A1 | In our company, the final decisions are always made by the ship owner. | (EO) |
| A2 | The mission and vision of our company are known by all employees. | [53,7] |
| A3 | The duties, authorities, and responsibilities of the employees in our company are written in detail. | [52] |
| A4 | Our company's seafarers and office employees are recruited by experts. | (EO) |
| A5 | Our company has a fair promotion policy for all employees. | [53] |
| A6 | Employees of our company can easily communicate with each other and with their superiors. | [7] |
| A7 | A fair wage policy is applied for all employees, whether they are family members or not in our company. | [52] |
| A8 | The resignation of one of the company employees does not affect the work flow of our company. | (EO) |
| A9 | Employees in our company can transfer their authority and responsibilities to other employees, if necessary. | (EO), [52] |
| A10 | Employees of our company know whom to transfer their authority and responsibilities, if necessary. | [52] |
| A11 | Employees of our company can take initiative without asking their superiors. | [52] |
| A12 | DPAs are also assigned for jobs other than those defined by the ISM code. | (EO) |
| A13 | Our company has a reward and punishment system for employees. | [52,53] |
| A14 | Internal audits in our company are carried out effectively. | (EO) |
| A15 | The effectiveness of the ISM code is measured on an annual basis in our company. | (EO) |
| A16 | Our seafarers have sufficient knowledge about the function and requirements of the ISM code. | (EO) |
| A17 | Any non-conformity that arises during internal audits conducted in accordance with the requirements of the ISM code in our company is not repeated on our ships. | (EO) |
| A18 | Corrective actions of found non-conformities are carried out as soon as possible regardless of present market conditions. | (EO) |
| ISM: International Safety Management Code, EO: Expert opinion | | |

***Table 3.*** *Reliability analysis of the pilot study*

| Cronbach's Alpha Coefficient | Mean | Variance | N (Items) | N (Participants) |
|---|---|---|---|---|
| 0.92 | 58.97 | 191.62 | 18 | 43 |

***Table 4.*** *Item-total statistics for the pilot study*

| Items | Scale Mean (Item Deleted) | Scale Variance if (Item Deleted) | Corrected Item Total Correlation | Cronbach's Alpha Coefficient (Item Deleted) |
|---|---|---|---|---|
| A1 | 57.09 | 198.56 | 0.43 | 0.919 |
| A2 | 55.55 | 189.91 | 0.76 | 0.912 |
| A3 | 55.69 | 188.12 | 0.62 | 0.915 |
| A4 | 55.46 | 186.54 | 0.70 | 0.913 |
| A5 | 56.00 | 182.90 | 0.77 | 0.910 |
| A6 | 54.90 | 190.56 | 0.79 | 0.912 |
| A7 | 56.04 | 182.95 | 0.74 | 0.911 |
| A8 | 55.95 | 188.33 | 0.68 | 0.913 |
| A9 | 55.67 | 185.32 | 0.72 | 0.912 |
| A10 | 55.46 | 181.25 | 0.79 | 0.910 |
| A11 | 56.27 | 192.30 | 0.55 | 0.916 |
| A12 | 55.76 | 201.25 | 0.31 | 0.923 |
| A13 | 56.79 | 196.55 | 0.44 | 0.919 |
| A14 | 55.72 | 194.96 | 0.51 | 0.918 |
| A15 | 55.30 | 191.07 | 0.72 | 0.913 |
| A16 | 56.48 | 203.01 | 0.32 | 0.921 |
| A17 | 55.46 | 197.96 | 0.46 | 0.918 |
| A18 | 55.18 | 197.77 | 0.52 | 0.917 |

Based on this column, it is clear that all items contribute to scale reliability. Removing any item does not positively affect the reliability of the scale. Thus, it was not necessary to remove any of the items that made up the 18-item scale. After the scale was determined to be understandable and reliable, the main study was performed.

The demographics of the 193 participants of the main study are shown in Table 5.

### *3.1.2. Structuring and Assessment of the Scale*

The scale structure was created *via* EFA and CFA.

In order to test the suitability of the data for factorization, Kaiser-Meyer-Olkin (KMO) and Bartlett's sphericity tests were applied using the SPSS 23.0 statistical software. A KMO value of 0.50 is the accepted lower limit of the KMO test [57]. A value that approaches 1.0 indicates a perfect fit for factorization. Additionally, a significant p-value ($p<0.001$) is expected from the Barlett sphericity test.

In this study, the results from the KMO test (0.852) were found to be close to perfect and the results from Bartlett's test (Bartlett's test of sphericity=1438.232, DF=153, $p<0.001$) were found to be significant. These results showed that the obtained data was suitable for factor analysis, which was performed using a principal component method and varimax rotation.

To understand which items have strong correlations to which factors, the acceptance levels of the factor load values of items were theoretically determined as suggested by Çokluk et al. [58]. First, items with load values below 0.40 were deleted from the scale. Second, if an item was involved with two factors, the factor with the highest item load value was selected. However, if the difference

***Table 5.*** *Demographics of study respondents*

| Characteristics | Category | Quantity | Percent (%) |
|---|---|---|---|
| Gender | Male | 173 | 90 |
| | Female | 20 | 10 |
| Age | 18-24 | 3 | 2 |
| | 25-35 | 65 | 34 |
| | 36-45 | 95 | 49 |
| | 46 and above | 30 | 15 |
| Education | High school | 9 | 5 |
| | Associate degree | 18 | 9 |
| | Bachelor's degree | 137 | 71 |
| | Postgraduate | 29 | 15 |
| Occupation/Department | DPA | 55 | 28 |
| | Operation department | 49 | 25 |
| | Technical department | 32 | 17 |
| | Chartering department | 22 | 11 |
| | Human resources department | 16 | 8 |
| | Purchasing department | 7 | 4 |
| | Accounting department | 2 | 1 |
| | General director | 6 | 3 |
| | Fleet manager | 3 | 2 |
| | Agency manager | 1 | 1 |
| Working year | 1-3 | 74 | 38 |
| | 4-9 | 77 | 40 |
| | 10-15 | 27 | 14 |
| | 16 and above | 15 | 8 |
| Company generation | 1st generation | 107 | 55 |
| | 2nd generation | 63 | 33 |
| | 3rd generation | 20 | 10 |
| | 4th generation | 3 | 2 |

DPA: Designated person ashore

between factor values was greater than 0.1, that item was deleted from the scale. Based on the factor analysis, four items (A1, A6, A12, and A15) that had factor load values less than 0.40 or a difference in factor load values greater than 0.1 were deleted, and the study proceeded with 14 items.

Results from the KMO and Barlett tests for the 14 items (KMO value=0.857 and Bartlett's test of sphericity=1204.443, DF=105, $p<0.001$) demonstrated that the data was suitable for factor analysis. A scale was formed by three factors using a principal component method and varimax rotation. The contribution to variance of the three factors was 57.268%, which was above the acceptable level of 0.50 [58]. The factor analysis results (Table 6) showed that factor load values of all items were above the acceptable level of 0.40.

To test the reliability of the scale, Cronbach's alpha coefficient was calculated and determined to be 0.878 (Table 7). Moreover, the reliability levels of each factor in the scale were also measured. Cronbach's alpha coefficient for the three factors (EOS=0.707, TA=0.768, IA=0.838) were all above 0.70. Thus, all results from the reliability analysis were found to be satisfactory [55].

CFA was performed after EFA. This analysis is used to measure the adequacy of the relationship between the factors determined by EFA, the relationship of variables with factors, the interdependence of factors, and the adequacy of the factors to explain the model [59]. Therefore, CFA is a measurement tool for the structural validity of the scale [60]. Here, SEM was used to apply CFA to understand construct validity. SEM, which was implemented using various statistical programs, tests the relationships in CFA described above, using path analysis [60]. A SEM model was set up using these programs for path analysis. Next, the fit indices of the established model were examined. Model fit indices were verified based on suggested literature values [60]. A SEM model (Figure 1) was established for CFA using the AMOS 23.00 Statistical Program.

The model fit indices of the study were chi square/degrees of freedom ($\chi^2/df$)=1.76, standardized root mean square residual (SRMR)=0.059, comparative fit index (CFI)=0.94, goodness of fit index (GFI)=0.91, Tucker-Lewis index (TLI)=0.93. All model fit indices (Table 8) were determined to be satisfactory [58-61]. In addition, all items shown in Table 9 were found to be statistically significant ($p<0.001$).

***Table 6.*** *Exploratory factor analysis results*

| Dimensions | Items | | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|---|---|
| **Effective Organizational Structure (EOS)** | EOS1 | The mission and vision of our company are known by all employees. | 0.575 | | |
| | EOS2 | The duties, authorities, and responsibilities of the employees in our company are written in detail. | 0.807 | | |
| | EOS3 | Our company's seafarers and office employees are recruited by experts. | 0.551 | | |
| | EOS4 | Our company has a fair promotion policy for all employees. | 0.728 | | |
| | EOS5 | In our company, a fair wage policy is applied for all employees, whether they are family members or not. | 0.715 | | |
| | EOS6 | The resignation of one of the company employees does not affect the work flow of our company. | 0.682 | | |
| **Transfer of Authority (TA)** | TA1 | Employees in our company can transfer their authority and responsibilities to other employees, if necessary. | | 0.853 | |
| | TA2 | Employees of our company know whom to transfer their authority and responsibilities, if necessary. | | 0.744 | |
| | TA3 | Employees of our company can take initiative without asking their superiors. | | 0.607 | |
| | TA4 | Our company has a reward and punishment system for employees. | | 0.526 | |
| **Internal Audit (IA)** | IA1 | Internal audits in our company are carried out effectively. | | | 0.736 |
| | IA2 | Our seafarers have sufficient knowledge about the function and requirements of the ISM code. | | | 0.629 |
| | IA3 | Any non-conformity that arises during internal audits conducted in accordance with the requirements of the ISM code in our company is not repeated on our ships. | | | 0.794 |
| | IA4 | Corrective actions of found non-conformities are carried out as soon as possible regardless of present market conditions. | | | 0.724 |
| ISM: International Safety Management Code | | | | | |

***Table 7.*** *Reliability analysis results*

| Factors and scale | Reliability |
|---|---|
| Effective organizational structure | 0.707 |
| Transfer of authority | 0.768 |
| Internal audit | 0.838 |
| Institutionalization level scale | 0.878 |

***Table 8.*** *Model fit indices*

| Indices | Acceptable values | Confirmatory factor analysis model indices | Source |
|---|---|---|---|
| Chi-square/Degrees of freedom (CMIN/Df) | $0 \leq \chi^2/df \leq 3$ | 1.76 | [61] |
| Standardized root mean square residual (SRMR) | SRMR≤0.08 | 0.059 | [62] |
| Comparative fit index (CFI) | 0.90≤CFI≤1.00 | 0.94 | [63] |
| Goodness of fit index (GFI) | 0.90≤GFI≤1.00 | 0.91 | [64] |
| Tucker-Lewis index (TLI) | 0.90≤TLI≤1.00 | 0.93 | [61] |

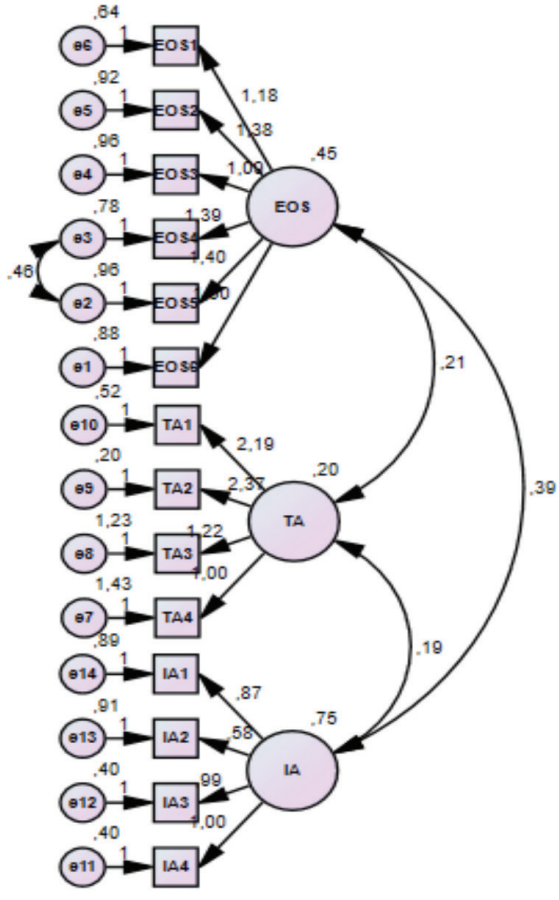


***Figure 1.*** *A confirmatory factor analysis model with structural equation modeling*

*EOS: Effective organization structure, TA: Transfer of authority, IA: Internal audit*

Based on these results, the scale was determined to be structurally valid.

This analysis was also used to understand the discriminant validity of the factors by comparing the correlation coefficients. Discriminant validity explains that factors in a scale measure different phenomena. The correlation between any two dimensions must be less than 0.85 for discriminant validity [65]. As seen in Table 10, the correlation between each dimension was less than 0.85.

The factor correlations were found to be statically significant ($p<0.001$); thus, the scale also passed the discriminant validity test.

Based on the EFA and CFA, we conclude that the developed institutionalization level scale for maritime family businesses is reliable and valid.

## 4. Discussion

In this study, a reliable and valid institutionalization level scale was developed for family-owned ship management companies. The originality of this study can be evaluated

***Table 9.*** *Regression weights for the confirmatory factor analysis model*

| | | | Estimate | S.E. | C.R. | P |
|---|---|---|---|---|---|---|
| EOS6 | <--- | EOY | 1.000 | | | |
| EOS5 | <--- | EOY | 1.399 | 0.196 | 7.127 | *** |
| EOS4 | <--- | EOY | 1.386 | 0.188 | 7.360 | *** |
| EOS3 | <--- | EOY | 1.087 | 0.167 | 6.493 | *** |
| EOS2 | <--- | EOY | 1.384 | 0.193 | 7.189 | *** |
| EOS1 | <--- | EOY | 1.176 | 0.163 | 7.234 | *** |
| TA4 | <--- | TA | 1.000 | | | |
| TA3 | <--- | TA | 1.224 | 0.314 | 3.903 | *** |
| TA2 | <--- | TA | 2.367 | 0.499 | 4.740 | *** |
| TA1 | <--- | TA | 2.194 | 0.466 | 4.709 | *** |
| IA4 | <--- | IA | 1.000 | | | |
| IA3 | <--- | IA | 0.988 | 0.095 | 10.357 | *** |
| IA2 | <--- | IA | 0.580 | 0.096 | 6.051 | *** |
| IA1 | <--- | IA | 0.866 | 0.105 | 8.222 | *** |
| ***P<0.001<br>S.E.: Standard error, TA: Transfer of authority, IA: Internal audit | | | | | | |

***Table 10****. Analysis results of discriminant validity*

| Factors | Correlations | | |
|---|---|---|---|
| | Effective organizational structure | Transfer of authority | Internal audit |
| Effective organizational structure | 1 | | |
| Transfer of authority | 0.68*** | 1 | |
| Internal audit | 0.67*** | 0.49*** | 1 |
| ***P<0.001 | | | |

based on several aspects. Previous studies that examined institutionalization or corporate governance in maritime businesses generally considered the presence of a CEO on the board as corporate governance [10]. In contrast to the literature, we evaluated the attitudes of company employees, not the company owners or board members, to prevent biased assessments that can occur when company owners evaluate their own businesses. By measuring the current corporate status of companies using this scale, the stages of corporate governance with deficiencies can be determined. Additionally, the relationships between institutionalization levels and managerial factors, which have been previously examined [12-16], can be examined within the scope of maritime businesses.

Non-family-owned businesses, where the majority of a company's shares are not owned by the family or at least two generations of the family do not work in the company, have also been studied [66]. Some studies have shown that the institutionalization levels of family-owned businesses are better than that of non-family-owned businesses, and that they may have more performance advantages [7,67,68]. Thus, the difference in institutionalization levels between family and non-family-owned ship management companies can be examined within the scope of maritime businesses.

## 5. Conclusion

Since maritime market conditions are constantly changing, it is important that ship management companies can adapt to these conditions to exist in the future. Family businesses, which have an important role in the maritime industry, need to establish certain standards in their managerial structures to adapt to these market conditions.

Institutionalization can ensure that these standards are created and integrated into the organizational culture. Hence, it is important to evaluate the current corporate governance status of businesses for institutionalization.

In this study, a scale was developed to measure the institutionalization level of family-owned ship management companies. The scale development process was conducted in the following two stages: item generation and questionnaire design and the structuring and assessment of the scale. Literature reviews and in-depth interviews with experts were conducted for item generation and questionnaire design. The items that comprise this scale were determined as institutionalization indicators for family-owned ship management companies and are listed in Table 6.

Since maritime businesses have unique structures, institutionalization indicators were evaluated based on this structure. In the maritime industry, the ISM code was developed to achieve standardization for ship management companies. The ISM code is a quality management system and is expected to trigger businesses to cooperate with management; however, this is not always the case due to human factors. Both office employees and seafarers have intense working conditions. Thus, rewarding employees for their success in these conditions can initiate the function of the system. Studies show that employees who are family members in family businesses are positively discriminated against. Having a fair wage and promotion policy for all employees, whether they are family members or not, can contribute to the function of the system by increasing employee commitment to work. These practices can reduce personnel turnover rates by contributing to employee acquisition of organizational culture.

Conversely, maritime businesses have a hierarchical structure among employees. This hierarchy is considered important for the success of a maritime business. However, in this hierarchy, it is important for employees to be able to transfer power and to take initiative. Employees not only relieve the workload of supervisors, but also provide a sense of achievement and job satisfaction for those that work under them. However, the limits of the transfer of authority should be determined within the structure of the business itself. Having a punishment system against negative situations that may occur when these authority limits are exceeded can prevent these situations from occurring during system operation. In addition, the resignation of an employee in this hierarchical structure should not disrupt the workflow of the company. Therefore, for both institutionalization and the ISM code, it is necessary to operate in accordance with a specific system, and not by individuals.

In the items prepared for the institutionalization scale, the importance of professionalism was emphasized. Recruitment by experts is necessary in the corporate governance approach. To work on ships, seafarers must have a certification; however, these certificates alone do not predict the success of a seafarer in the system. Studies report that the majority of maritime accidents are caused by human error.

Thus, ship management companies must develop effective recruitment systems that are created and standardized by experts. These systems should also be applied to recruit office employees into effective management systems. Additionally, since the ISM code includes rules for the safety of seafarers, it is beneficial to inform and to train seafarers on these issues to reduce human error. Standardizing these practices will bring businesses closer to institutionalization.

Audits in maritime businesses are conducted in accordance with international regulations. Ships or companies are

faced with certain sanctions against non-conformities found in external audits. These sanctions negatively affect the operational and financial performance of businesses. As a precaution against these sanctions, businesses should carry out internal audits as recommended in the ISM code. However, market and financial conditions of ship management companies may delay their responses to corrective actions. Regardless, timely implementation of corrective actions will prevent potential major losses. Additionally, a non-conformity found on one ship that is not repeated on other ships may indicate that the company has carried out internal audits and implemented corrective actions.

## Theoretical and Practical Contributions

We developed a reliable and valid data collection tool with a new perspective for a specific field. Previously, only a qualitative method was evaluated to develop a model for the institutionalization levels of maritime businesses [9]. In our study, we developed a reliable and valid scale for institutionalization levels using quantitative methods. We obtained data from office employees rather than shipowners in ship management companies to prevent evaluation bias from shipowners. Additionally, employees are the workers that actually perform the assigned jobs in a company. Therefore, our study also fills a gap in the literature by addressing a different aspect of institutionalization studies in maritime family businesses. Moreover, Tagiuri and Davis [69] characterized family businesses as the institutionalization of the family, institutionalization of the businesses, and institutionalization of ownership. In this study, we focused and measured the institutionalization level of the business in maritime family businesses.

This scale is applicable to maritime family businesses and can be used in practice. Owners or senior managers of maritime family businesses can apply this scale to evaluate low attitudes based on employee answers. Thus, practices that negatively affect institutionalization in the organization can be identified and corrected.

The answers given by participants (1: completely disagree to 5: strongly agree) will determine the level of institutionalization of the business. The level of institutionalization will increase as the answers to the scale approach 5.

## Recommendations for Further Research

Different relationship analyses (e.g., institutionalization level and firm performance, human resource applications, strategic management, leadership, organizational culture, and corporate social responsibility) can be performed using the data collection tool presented in this study. Accordingly, the institutionalization levels of different types of ship management companies (e.g., family owned *vs.* non-family owned) can be compared. In addition, each institutionalization indicator of the ship management companies obtained within the scope of this study can be considered as a criterion and analyzed *via* multicriteria decision-making methods. Finally, this scale can be diversified by quantitative studies on the institutionalization of family and ownership in ship management companies.

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## Authorship Contributions

Concept design: B. Demir, L. Tavacıoğlu, Data Collection or Processing: B. Demir, L. Tavacıoğlu, Analysis or Interpretation: B. Demir, L. Tavacıoğlu, Literature Review: B. Demir, L. Tavacıoğlu, Writing, Reviewing and Editing: B. Demir, L. Tavacıoğlu.

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