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ORIGINAL PAPER

DO THE FACTORS AFFECTING INCOTERMS® SELECTION DIFFER FOR EXPORTERS AND IMPORTERS? A FUZZY ANALYTICAL HIERARCHY PROCESS (FAHP) APPLICATION

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ABSTRACT. **Background:** There are a few studies that have findings regarding the factors affecting Incoterms® selection decisions, however, the importance weights of the factors weren't revealed prominently for importers and exporters separately. This study intends to overcome this gap by examining the factors that influence Incoterms® selections to find out whether there are any differences or not between exporters and importers. For this purpose, we analyzed the importance weights of each factor and ranked them for both two parties.
Methods: We constructed a conceptual model based on different approaches, previous studies and expert decisions. Data were collected from 19 experts, 9 of whom are importers and 10 are exporters, via e-mail. We conducted Fuzzy Analytical Hierarchy Process (FAHP) with the geometric mean method to find out the importance weights of each criterion.
Results: Findings of the study revealed that the most important factor influencing the selection of international commercial terms for both exporters and importers is "transportation costs" while the least important one is "firm size". Four factors which are "relations with forwarding agents, type of goods, complexity of transportation and distance" differ according to importers and exporters in their selections. Relations with forwarding agents and distance are found to be more influential for exporters while the type of goods and complexity of transportation are more effective for importers.
Conclusions: We conclude that cost related factors are the most influential ones and apart from a few factors, there is no significant divergence between the selection decisions of importers and exporters. The small sample size and the sample consisting of companies operating in different sectors in a particular region are among the limitations of the study. We suppose that the factors determined in this study will contribute to future studies with a larger sample using different analysis methods.

Key words: Incoterms®, FAHP, export, import, foreign trade.

INTRODUCTION

International Chamber of Commerce (ICC) which was founded in 1919 states that "Incoterms® is an acronym standing for international commercial terms and a trademark of International Chamber of Commerce, registered in several countries" [ICC, 2021a].

The Incoterms® rules which are the world's crucial terms of trade, indicate abbreviations for terms such as EXW (Ex Works), FOB (Free on Board), CIP (Carriage and Insurance Paid To), DAP (Delivered at Place) and guide the individuals participating in the foreign trade [ICC, 2021a].

ICC studied on the commercial trade terms and published the first version of the Incoterms® rules in 1936 and updated the rules in 1953, 1967, 1974, 1980, 1990, 2000, 2010, and finally 2020 [ICC, 2021b].

The studies in the literature are generally concerned with the Incoterms® rules revisions

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in terms of risks, costs and responsibilities of the buyers and sellers. They particularly focus on the Incoterms® 2000 and Incoterms® 2010 comparison to reveal the reasons of the revision [Baslangic 2015], inadequacies [Yilmaz et al. 2011] and amendments [Bergami 2012]. However, they have not sufficient considerations in selecting the right trade terms. We suppose that the process of the selection of international commercial terms and finding out its determinants are crucial since they have an important relationship between firm export performance [Hien et al. 2009; Yaakub et al. 2018]. There are a few studies in the literature on identifying the influential factors on international commercial terms selections [Hien et al. 2009, Yaakub et al. 2018, Suraraksa et al. 2020]. However, although previous studies have findings regarding the factors affecting terms selection decisions, importance weights of the factors weren't revealed prominently for importers and exporters separately. This study intends to overcome this gap by examining the factors with the aim of finding any differences concerning factor importance weights with respect to importers and exporters. As a result of the aforementioned reasons concerning international commercial terms selection, we address the following research questions (RQ):

RQ1: Which criteria are the most influential ones on exporters' Incoterms® selection decisions?
RQ2. Which criteria are the most influential ones on importers' Incoterms® selection decisions?
RQ3. Which criteria influencing the Incoterms® selection decisions differ for exporters and importers?

The contributions of this study to the existing literature are like the following: (1) this study proposes a new conceptual model including terms selection criteria and sub-criteria by synthesizing three different approaches, (2) to the best of our knowledge, this study is the first to discuss whether there are any differences in importance weights of factors influencing international commercial terms selection decisions with respect to importers and exporters by using FAHP with the geometric mean method, and (3) the results of the study make recommendations that could guide the experts in selecting the appropriate terms.

The remainder of the study is organized as follows. Section 2 introduces the theoretical foundations of the study and literature review. Section 3 is the methodology part which involves the research plan, data collection and empirical application. Section 4 gives the results and discussions. Finally, we concluded the findings by giving recommendations for future studies in section 5.

THEORETICAL FOUNDATIONS AND LITERATURE REVIEW

Trade terms between two companies are determined as a result of an agreement with which both parties will choose the best mode that will be the minimum cost for them, taking into account environmental risks. Since this is an agreement, the advantageous party will play a more significant role. Accordingly, we constructed the conceptual framework of this study based on three approaches: (1) Resource Based View (RBV) [Barney 1991], (2) Transaction Cost Approach (TCA) [Williamson 1981], and (3) Institutional Theory (IT) [DiMaggio and Powell 1983, Yiu and Makino 2002] since each approach covers the designing problems of international channels via specific theoretical views that underline the distribution activities and essential agent relationship [Bello and Briggs 2009: 399].

Resource-Advantage (R-A) criteria: From the point of RBV [Barney 1991], firm resources are the sources of sustained competitive advantage of a firm, which are valuable, rare, non-substitutable and imperfectly imitable. They can be divided into three groups: (1) physical capital resources (a firm's plant and equipment, location, technology, etc.), (2) human capital resources (training, experience, relationships, intelligence, etc.), and (3) organizational capital resources (formal and informal planning, controlling and coordinating systems, informal relations within a firm and in its environment) [Barney 1991]. We suppose that these resources are effective in the

bargaining power of the parties in the selection of the terms. Firm size, for instance, as a firm's capital is found to be analyzed as a factor in the studies related to Incoterms® rules. In general, small size and amateur exporting firms prefer certain terms and the transportation process and the cost plan are executed by the buyer [Malfliet 2011]. Staff characteristics, as human capital resources, involve the knowledge, experience and attitudes of all personnel including employees and managers of a firm and could impact terms selections. Having greater knowledge of international commercial terms and considering them will lead a firm to a better export performance [Hien et al. 2009].

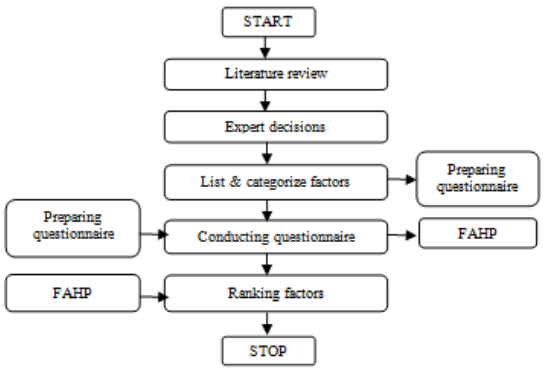
Efficiency-Cost (E-C) criteria: We use the TCA since the selection of the terms is a kind of firm behavior as a result of decisions concerning the cost and risk control activities of a company. TCA is based on "efficiency criteria" [Yiu and Makino 2002]. It proposes that economizing the transaction costs is central and the transactions are required to be dimensionalized as (1) uncertainty, (2) the frequency, and (3) asset specificity [Williamson 1981]. Trade terms rely on the affiliation between the exporter and importer and influence the costs of the trading process especially in global supply chains [Blanco, Ponce-Cueto 2015]. Suraraksa et al. [2020] argue that operating costs including shipment expenses, annual budget and value of products are the most effective factors while making decisions on international commercial terms selection. Another criterion affecting costs in the selection of terms is the mode of transport. Malfliet [2011] in his study, focuses on the impact of the transport mode on the selection of terms indicating that all the D-Terms can be used for any transport mode, even multimodal, while some terms such as FOB are used as maritime terms. Yaakub and Szu [2017] divided the factors influencing the selection of terms into two groups as external factors (freight, transport issue and tariff classification) and internal factors (mode of transportation, habit, experience and practices) of the firms and revealed that the mode of transportation is the most influential one.

Legitimacy – Environment (L-E) criteria: IT is based on "legitimacy criteria" [Yiu and Makino 2002]. Firm behaviors are a kind of response to institutional isomorphic changes through (1) political influence and the problem of legitimacy, (2) uncertainty and (3) professionalization in an environment [DiMaggio, Powell 1983]. Duncan [1972] defines the business environment as a total of physical and social factors considered in a decision-making of the individuals in a firm. The internal environment involves social and physical factors regarding organizational personnel, functional and staff units, and organizational level components inside of a firm while the external environment comprises the factors concerning customers, suppliers, competitors, technological and socio-political components outside the boundaries of the firm [Duncan 1972]. Erramilli [1992] states that the influential external factors on foreign market entry mode choice are host country restrictions, uncertainty-risk, market size and availability of acceptable partners and associates while indicating that the internal factors are firm's desire to get rapidly established, internal resources (capital and personnel) and corporate policy. Both exporters and importers have to realize the business environmental factors that affect the selection decisions of the most convenient international commercial terms [Hien et al. 2009]. International trade of goods is handled within varied international and domestic regulations and legislations that exporters and importers must pay attention to for conducting successful business activities [Bergami 2013]. The selection of delivery terms will be affected by a challenging risk distribution and transfer between importers and exporters [Shangina, 2007]. For instance, EXW and FCA are determined as the best terms for the buyer because of the visibility, control and command of shipping transactions [Stapleton et al. 2014]. Weight/value ratio of the products, income per capita and the distance between partner countries are also determined to be the factors influencing the choice of delivery terms [Rosal 2016].

METHODOLOGY

Research Plan

The research plan of the study consists of two main parts. In the first part, criteria were obtained and categorized as a consequence of the literature review and expert decisions to construct the questionnaire form.



Source: own work

Fig. 1. Research process

In the second part, questionnaire forms were filled out by the experts to analyze the criteria by using quantitative methods. Figure 1 demonstrates the steps of the research process in detail.

Sample and Data Collection

Data in this study were obtained by surveying foreign trade experts from the Aegean region of Turkey using judgement sampling method. Survey forms were distributed via e-mail to 25 companies and received 22 responses of which 19 are completed and appropriate to analyse. Since the FAHP used in the study allows to measure the decisions of a single expert, as well as analyze the decisions of a group of experts, it was determined that the sample size used in the study is sufficient to solve the research questions. The sample of the study consists of 10 exporters and 9 importers operating in several sectors. Around 60 % are small and medium sized enterprises (SME's) and have more than 15-year experience. Table 1 presents the descriptive statistics of the sample.

Table 1. Descriptive statistics of sample (%)

	Number	**Position**			**Sector**			
	Participants	*Owner*	*Manager*	*Specialist*	*Medical*	*Machine*	*Textile*	*Other*
Exporter	52.63%	10.00%	60.00%	30.00%	10.00%	20.00%	10.00%	60.00%
Importer	47.37%	55.56%	33.33%	11.11%	44.44%	11.11%	11.11%	33.33%
Total	100.00%	31.58%	47.37%	21.05%	26.32%	15.79%	10.53%	47.37%
	Firm size				**Firm Experience**			
	Big-size	*Medium-size*	*Small-size*	*Micro-size*	*1-5 years*	*11-15 years*	*16-20 years*	*> 20 years*
Exporter	20.00%	10.00%	60.00%	10.00%	20.00%	20.00%	20.00%	40.00%
Importer	-	11.11%	44.44%	44.44%	22.22%	22.22%	11.11%	44.44%
Total	10.53%	10.53%	52.63%	26.32%	21.05%	21.05%	15.79%	42.11%

FAHP with Geometric Mean Method

FAHP can be defined as a kind of synthesis of Analytical Hierarchy Process (AHP) and fuzzy logic approaches. AHP is one of the widely used multi-criteria decision making methods which depends on decisions of experts to reveal priorities on the factors through pairwise comparisons [Saaty 2008]. However, decision makers may remain uncertain while making comparisons. Fuzzy logic approach and factor weighting methods are considered to be effective in correcting the deficiencies concerning the uncertainty of data used in computations of exact values and relative weight of the occurrence factors [Sari 2020]. Zadeh [1965] identified a fuzzy set as "characterized by a membership function which assigns to each object a grade of membership ranging between zero and one". Fuzzy numbers are indicated by a symbol "~" placed above them. In this study, we prefer to use triangular fuzzy numbers commonly used in fuzzy calculations. Figure 2 shows the triangular fuzzy number Ã represented by three parameters (a, b, c), and the membership function is defined as equation (1) (Figure 2) [Lee et al. 2008]:

$$\mu_{\tilde{A}}(x) = \begin{cases} \frac{x-a}{b-a}, & a \le x \le b \\ \frac{c-x}{c-b}, & b \le x \le c \\ 0, & otherwise \end{cases} \quad (1)$$

Parameter b is the middle (m) value and the strongest grade of membership that equals to 1, while parameter a and c are the lower (l) and upper (u) values, respectively [Lee et al. 2008]. Another crucial concept is the linguistic variable that refers to linguistic labels of fuzzy sets having values are words not numbers [Zadeh 1983].

Linguistic variables and fuzzy numbers used in this study are demonstrated in Table 2, and membership functions of linguistic variables are shown in Figure 2.

Table 2. Fuzzy AHP Scale numbers

Linguistic variables	Triangular fuzzy numbers	Reciprocal triangular fuzzy numbers
Equally strong	(1, 1, 1)	(1, 1, 1)
Intermediate	(1, 2, 3)	(1/3, 1/2, 1)
Moderately strong	(2, 3, 4)	(1/4, 1/3, 1/2)
Intermediate	(3, 4, 5)	(1/5, 1/4, 1/3)
Strong	(4, 5, 6)	(1/6, 1/5, 1/4)
Intermediate	(5, 6, 7)	(1/7, 1/6, 1/5)
Very strong	(6, 7, 8)	(1/8, 1/7, 1/6)
Intermediate	(7, 8, 9)	(1/9, 1/8, 1/7)
Extremely strong	(9, 9, 9)	(1/9, 1/9, 1/9)

Source: Lee et al. 2008

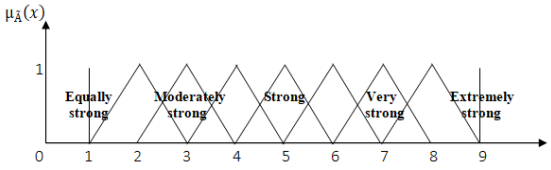


Fig. 2. Membership functions of linguistic variables

In this study, FAHP with geometric mean method proposed by Buckley [1985] is employed to determine primary factors according to expert decisions and to minimize uncertainties in the decision-making process. The process of application FAHP is explained by the following steps:

Step 1: Construct the decision hierarchy [Saaty 2008]

Step 2: Obtain one group decision

Saaty [2008] argued that the geometric mean is the unique way to construct a group judgment from individual judgments. Thus, geometric means of upper values, middle values and lower values obtained from expert decisions are calculated separately to build one group decision.

Step 3: Construct the pairwise comparison matrix (2).

$$\tilde{A} = \begin{array}{c} \\ c_1 \\ c_2 \\ \vdots \\ c_n \end{array} \begin{array}{c} \begin{array}{cccc} c_1 & c_2 & \cdots & c_n \end{array} \\ \begin{bmatrix} 111 & \tilde{a}_{12} & \cdots & \tilde{a}_{1n} \\ \tilde{a}_{21} & 111 & \cdots & \tilde{a}_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ \tilde{a}_{n1} & \tilde{a}_{n2} & \cdots & 111 \end{bmatrix} \end{array} \quad (2)$$

where $\tilde{a}_{12}$ refers to the importance of criterion 1 relative to criterion 2 in a fuzzy pairwise comparison matrix.

Step 4: Calculate the geometric mean of fuzzy comparison value ($\tilde{r}_i$) and the fuzzy weights ($\tilde{w}_i$) of each factor by using equations (3) and (4) respectively [Buckley 1985].

$$\tilde{r}_i = (\tilde{a}_{i1} \otimes \tilde{a}_{i2} \otimes \ldots \otimes \tilde{a}_{in})^{1/n} \quad (3)$$

$$\tilde{w}_i = \tilde{r}_i \otimes (\tilde{r}_1 \oplus \tilde{r}_2 \oplus \ldots \oplus \tilde{r}_n)^{-1} \quad (4)$$

Step 5: To utilize the center of area (COA), a method of defuzzified fuzzy ranking, calculate Best Nonfuzzy Performance value (BNP) of each fuzzy number ($\tilde{R}_i$) by using the equation (5) [Hsieh et al. 2004].

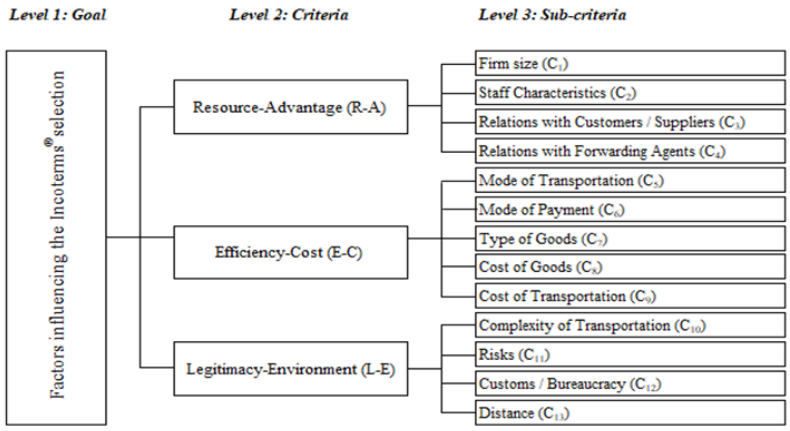
$$BNP_i = [(UR_i - LR_i) + (MR_i - LR_i)] / 3 + LR_i \quad \forall i \quad (5)$$

Application of FAHP

Step 1: We synthesized RBV, TCA, IT and literature review to list the influential criteria (factors) and sub-criteria (sub-factors) that should be evaluated while selecting international commercial terms. We grouped the sub-criteria under three main criteria. Each criterion has 4-5 sub-criteria for a total of 13 sub-criteria. These criteria and sub-criteria were validated by eleven foreign trade experts working in different industries to structure the conceptual model of the study. This model is provided as a "decision hierarchy" (Figure 3). Accordingly, (1) Resource-advantage criterion includes firm size, staff characteristics, relations with customers/suppliers, relations with forwarding agents; (2) Efficiency-cost

criterion involves mode of transportation, mode of payment, type of goods, cost of goods, cost of transportation; (3) Legitimacy-environment criterion covers the complexity of transportation, risks, customs/bureaucracy and distance.

Step 2-3: We obtained one group decision and construct fuzzy pairwise comparison matrices. Two fuzzy pairwise comparison matrices were structured for the sub-criteria (13x13 matrix) compared by 10 export experts and 9 import experts separately. Table 3 demonstrates the pairwise comparisons of the criteria with respect to export experts while Table 4 shows comparisons with respect to import experts.



Source: own work

Fig. 3. Decision hierarchy of the study

Table 3. Pairwise comparisons of the sub-criteria with respect to exporters (ex)

	C_{1ex}			C_{2ex}			C_{3ex}			C_{4ex}			C_{5ex}			C_{6ex}			C_{7ex}			C_{8ex}			C_{9ex}			C_{10ex}			C_{11ex}			C_{12ex}			C_{13ex}		
C_{1ex}	1.00	1.00	1.00	0.13	0.14	0.16	0.20	0.22	0.25	0.17	0.18	0.21	0.48	0.57	0.67	0.25	0.28	0.31	0.73	0.87	1.04	0.31	0.34	0.38	0.15	0.16	0.17	0.30	0.34	0.41	0.51	0.60	0.69	0.31	0.37	0.43	1.07	1.13	1.23
C_{2ex}	6.45	7.19	7.88	1.00	1.00	1.00	1.50	1.74	2.08	1.14	1.31	1.49	0.93	1.07	1.21	0.15	0.17	0.18	0.56	0.64	0.71	0.12	0.13	0.14	0.18	0.19	0.19	0.94	1.08	1.22	1.08	1.19	1.30	0.65	0.76	0.91	0.59	0.70	0.77
C_{3ex}	4.00	4.54	5.07	0.48	0.57	0.67	1.00	1.00	1.00	1.78	2.07	2.35	1.39	1.65	1.90	0.51	0.55	0.59	1.11	1.20	1.30	0.23	0.25	0.28	0.13	0.14	0.16	1.39	1.62	1.88	1.45	1.61	1.78	1.20	1.42	1.65	1.94	2.24	2.58
C_{4ex}	4.74	5.42	6.05	0.67	0.76	0.88	0.43	0.48	0.56	1.00	1.00	1.00	1.04	1.15	1.27	0.20	0.23	0.26	0.58	0.65	0.74	0.22	0.23	0.26	0.12	0.13	0.15	2.26	2.54	2.89	0.86	0.98	1.15	0.75	0.85	0.96	1.57	1.70	1.82
C_{5ex}	1.50	1.75	2.10	0.82	0.94	1.08	0.53	0.60	0.72	0.79	0.87	0.96	1.00	1.00	1.00	0.18	0.21	0.23	0.68	0.80	0.98	0.13	0.13	0.15	0.12	0.12	0.13	0.72	0.84	0.95	0.58	0.63	0.68	0.42	0.48	0.54	0.75	0.88	1.06
C_{6ex}	3.27	3.60	3.96	5.45	6.05	6.86	1.71	1.82	1.96	3.88	4.34	4.99	4.41	4.84	5.43	1.00	1.00	1.00	4.80	5.08	5.41	0.80	0.91	1.05	0.15	0.17	0.20	2.24	2.73	3.19	0.82	0.92	1.01	1.26	1.63	2.08	2.31	2.67	3.10
C_{7ex}	0.96	1.15	1.36	1.41	1.57	1.78	0.77	0.83	0.90	1.35	1.53	1.73	1.03	1.25	1.47	0.18	0.20	0.21	1.00	1.00	1.00	0.29	0.32	0.36	0.18	0.19	0.20	0.40	0.46	0.54	0.44	0.51	0.61	0.33	0.40	0.51	0.67	0.72	0.80
C_{8ex}	2.66	2.96	3.22	7.14	7.63	8.05	3.60	3.95	4.27	3.91	4.28	4.65	6.84	7.46	8.00	0.95	1.10	1.24	2.80	3.15	3.43	1.00	1.00	1.00	0.44	0.48	0.54	1.96	2.38	2.84	1.19	1.27	1.34	1.45	1.65	1.90	1.93	2.22	2.55
C_{9ex}	6.03	6.38	6.69	5.14	5.40	5.64	6.38	7.20	7.97	6.79	7.45	8.05	7.70	8.19	8.64	4.95	5.94	6.78	5.00	5.36	5.69	1.86	2.09	2.29	1.00	1.00	1.00	5.23	5.81	6.36	4.07	4.51	4.87	4.16	4.53	4.93	3.27	3.45	3.61
C_{10ex}	2.44	2.92	3.37	0.82	0.93	1.06	0.53	0.62	0.72	0.35	0.39	0.44	1.05	1.19	1.39	0.31	0.37	0.45	1.87	2.17	2.51	0.35	0.42	0.51	0.16	0.17	0.19	1.00	1.00	1.00	0.42	0.46	0.52	0.59	0.70	0.82	1.02	1.17	1.34
C_{11ex}	1.44	1.67	1.96	0.77	0.84	0.92	0.56	0.62	0.69	0.87	1.02	1.17	1.46	1.59	1.73	0.99	1.09	1.21	1.63	1.95	2.27	0.74	0.79	0.84	0.21	0.22	0.25	1.93	2.17	2.41	1.00	1.00	1.00	2.04	2.33	2.67	1.85	2.16	2.51
C_{12ex}	2.31	2.73	3.25	1.10	1.31	1.53	0.61	0.70	0.84	1.04	1.17	1.33	1.86	2.09	2.38	0.48	0.61	0.79	1.98	2.49	3.04	0.53	0.61	0.69	0.20	0.22	0.24	1.22	1.44	1.68	0.37	0.43	0.49	1.00	1.00	1.00	1.73	2.02	2.39
C_{13ex}	0.81	0.88	0.93	1.30	1.43	1.68	0.39	0.45	0.52	0.55	0.59	0.64	0.95	1.14	1.33	0.32	0.37	0.43	1.25	1.38	1.49	0.39	0.45	0.52	0.28	0.29	0.31	0.75	0.86	0.98	0.40	0.46	0.54	0.42	0.49	0.58	1.00	1.00	1.00

Source: own work

Table 4. Pairwise comparisons of the sub-criteria with respect to importers (im)

	C_{1im}			C_{2im}			C_{3im}			C_{4im}			C_{5im}			C_{6im}			C_{7im}			C_{8im}			C_{9im}			C_{10im}			C_{11im}			C_{12im}			C_{13im}		
C_{1im}	1.00	1.00	1.00	0.12	0.13	0.14	0.12	0.13	0.15	0.21	0.24	0.29	0.46	0.51	0.56	0.14	0.14	0.15	0.48	0.60	0.77	0.13	0.14	0.15	0.12	0.12	0.12	0.30	0.35	0.42	0.19	0.22	0.26	0.54	0.71	0.94	1.18	1.24	1.31
C_{2im}	7.09	7.82	8.53	1.00	1.00	1.00	1.23	1.34	1.47	1.71	1.87	2.03	0.81	0.94	1.13	0.15	0.16	0.18	0.75	0.83	0.93	0.14	0.15	0.16	0.11	0.12	0.12	1.13	1.37	1.64	0.47	0.56	0.65	0.47	0.58	0.72	1.36	1.66	1.91
C_{3im}	6.61	7.45	8.27	0.68	0.75	0.82	1.00	1.00	1.00	0.97	1.25	1.51	1.55	1.86	2.20	0.24	0.26	0.27	1.16	1.27	1.39	0.19	0.20	0.22	0.13	0.14	0.16	0.66	0.78	0.92	0.41	0.47	0.55	0.74	0.88	1.03	2.08	2.48	2.83
C_{4im}	3.49	4.12	4.73	0.49	0.53	0.58	0.66	0.80	1.03	1.00	1.00	1.00	1.05	1.20	1.37	0.14	0.15	0.16	0.69	0.83	0.98	0.15	0.16	0.16	0.12	0.12	0.13	2.76	3.37	4.13	0.29	0.37	0.45	0.25	0.30	0.38	1.87	2.57	3.19
C_{5im}	1.79	1.97	2.15	0.89	1.06	1.23	0.45	0.54	0.65	0.73	0.83	0.96	1.00	1.00	1.00	0.14	0.16	0.16	0.27	0.31	0.37	0.12	0.13	0.14	0.13	0.13	0.15	0.22	0.24	0.28	0.20	0.23	0.28	0.18	0.22	0.31	0.44	0.51	0.64
C_{6im}	6.86	6.96	7.05	5.55	6.09	6.87	3.65	3.89	4.19	6.24	6.53	7.05	6.07	6.44	7.05	1.00	1.00	1.00	5.88	6.16	6.53	0.61	0.68	0.78	0.20	0.22	0.26	4.44	5.11	5.83	3.43	4.14	4.88	3.88	4.61	5.40	5.07	5.74	6.38
C_{7im}	1.30	1.67	2.08	1.08	1.21	1.34	0.72	0.79	0.86	1.02	1.21	1.44	2.68	3.19	3.69	0.15	0.16	0.17	1.00	1.00	1.00	0.13	0.13	0.14	0.12	0.12	0.13	0.16	0.19	0.23	0.20	0.23	0.28	0.33	0.40	0.48	0.76	0.84	0.89
C_{8im}	6.74	7.28	7.70	6.37	6.68	6.96	4.54	4.91	5.25	6.24	6.44	6.60	7.20	7.76	8.22	1.28	1.47	1.65	7.05	7.61	7.97	1.00	1.00	1.00	1.02	1.24	1.66	3.41	4.07	4.73	2.22	2.42	2.62	4.00	4.61	5.22	4.99	5.59	6.28
C_{9im}	8.22	8.43	8.60	8.14	8.53	8.88	6.31	7.02	7.68	7.86	8.20	8.49	6.86	7.52	7.97	3.90	4.49	4.98	7.97	8.22	8.43	0.60	0.81	0.98	1.00	1.00	1.00	5.99	6.34	6.65	8.00	8.32	8.60	7.78	8.21	8.60	6.44	7.13	7.61
C_{10im}	2.40	2.87	3.32	0.61	0.73	0.88	1.09	1.29	1.51	0.24	0.30	0.36	3.51	4.09	4.55	0.17	0.20	0.23	4.32	5.33	6.21	0.21	0.25	0.29	0.15	0.16	0.17	1.00	1.00	1.00	0.34	0.38	0.42	0.59	0.67	0.76	2.48	2.80	3.10
C_{11im}	3.82	4.56	5.25	1.53	1.78	2.12	1.82	2.11	2.44	2.20	2.74	3.42	3.51	4.37	5.05	0.20	0.24	0.29	3.56	4.43	5.11	0.38	0.41	0.45	0.12	0.12	0.13	2.37	2.64	2.94	1.00	1.00	1.00	7.08	7.99	8.88	7.83	8.43	9.00
C_{12im}	1.06	1.41	1.84	1.40	1.73	2.12	0.98	1.14	1.34	2.64	3.32	3.99	3.28	4.46	5.43	0.19	0.22	0.26	2.07	2.48	3.05	0.19	0.22	0.25	0.12	0.12	0.13	1.32	1.49	1.70	0.11	0.13	0.14	1.00	1.00	1.00	5.01	5.64	6.23
C_{13im}	0.76	0.81	0.85	0.52	0.60	0.73	0.35	0.40	0.48	0.31	0.39	0.53	1.56	1.96	2.27	0.16	0.17	0.20	1.13	1.20	1.31	0.16	0.18	0.20	0.13	0.14	0.16	0.32	0.36	0.40	0.11	0.12	0.13	0.16	0.18	0.20	1.00	1.00	1.00

Source: own work

Step 4-5: Table 5 shows the results of ($\tilde{r}_i$) and ($\tilde{w}_i$) of each sub-criterion for both exporters and importers by using equations (3) and (4). The importance weights (w_i) of sub-criteria to be normalized in the next section were calculated by using the equation (5).

Table 5. Importance weights of sub-criteria

	Export							*Import*						
Sub-	$\tilde{r}_i$			$\tilde{w}_i$			w_i	$\tilde{r}_i$			$\tilde{w}_i$			w_i
criteria	*l*	*m*	*u*	*l*	*m*	*u*	*weights*	*l*	*m*	*u*	*l*	*m*	*u*	*weights*
C_1	0.341	0.381	0.428	0.019	0.023	0.029	0.023	0.276	0.305	0.344	0.013	0.015	0.019	0.016
C_2	0.685	0.765	0.848	0.037	0.046	0.057	0.047	0.685	0.769	0.857	0.031	0.039	0.048	0.039
C_3	0.926	1.043	1.162	0.050	0.063	0.078	0.064	0.738	0.836	0.938	0.034	0.042	0.052	0.043
C_4	0.702	0.780	0.868	0.038	0.047	0.058	0.048	0.578	0.664	0.761	0.026	0.033	0.042	0.034
C_5	0.500	0.559	0.630	0.027	0.034	0.042	0.034	0.348	0.391	0.452	0.016	0.020	0.025	0.020
C_6	1.763	1.976	2.233	0.096	0.119	0.149	0.121	2.921	3.195	3.525	0.133	0.161	0.197	0.164
C_7	0.560	0.627	0.707	0.030	0.038	0.047	0.039	0.466	0.525	0.591	0.021	0.026	0.033	0.027
C_8	2.083	2.307	2.532	0.113	0.139	0.169	0.141	3.508	3.860	4.223	0.160	0.194	0.236	0.197
C_9	4.226	4.599	4.931	0.230	0.277	0.330	0.279	4.932	5.338	5.662	0.225	0.269	0.316	0.270
C_{10}	0.642	0.730	0.837	0.035	0.044	0.056	0.045	0.727	0.834	0.948	0.033	0.042	0.053	0.043
C_{11}	1.028	1.144	1.274	0.056	0.069	0.085	0.070	1.569	1.790	2.019	0.072	0.090	0.113	0.092
C_{12}	0.896	1.035	1.197	0.049	0.062	0.080	0.064	0.823	0.963	1.119	0.038	0.049	0.062	0.050
C_{13}	0.595	0.665	0.745	0.032	0.040	0.050	0.041	0.356	0.396	0.449	0.016	0.020	0.025	0.020

Source: own work

RESULTS AND DISCUSSION

We normalized the importance weights of criteria by making the sum of the weight values equal to "1" and found the rankings of each criteria and sub-criteria for both exporters and importers separately (Table 6).

Table 6. Comparisons of the criteria and sub-criteria rankings

		Export				Import			
		Normalized weights		*Ranking*		*Normalized weights*		*Ranking*	
Criteria	*Sub-criteria*	*Criteria*	*Sub-criteria*	*Criteria*	*Sub-criteria*	*Criteria*	*Sub-criteria*	*Criteria*	*Sub-criteria*
R-A	C_1	0.17884	0.02304	3	13	0.13004	0.01550	3	13
	C_2		0.04601		8		0.03876		8
	C_3		0.06275		6		0.04215		6
	C_4		0.04705		7		0.03363		9
C-E	C_5	0.60489	0.03383	1	12	0.66858	0.01998	1	12
	C_6		0.11970		3		0.16150		3
	C_7		0.03794		11		0.02655		10
	C_8		0.13851		2		0.19415		2
	C_9		0.27492		1		0.26641		1
L-E	C_{10}	0.21627	0.04432	2	9	0.20138	0.04213	2	7
	C_{11}		0.06900		4		0.09026		4
	C_{12}		0.06280		5		0.04885		5
	C_{13}		0.04015		10		0.02014		11

Source: own work

It was revealed in the scope of the study that E-C was given the primary importance with a weight of 0.60 for exporters and 0.67 for importers while the secondary importance was given to L-E (0.22 for exporters, 0.20 for importers) and lastly to R-A (0.18 for exporters and 0.13 for importers) among the main factor groups. Although their rankings are the same, the importance weights of the main factors differ according to exporters and importers.

Findings show that the first three most effective sub-criteria in international commercial terms selection decisions are cost of transportation, cost of goods and mode of payment, respectively and there is no difference concerning the rankings for both exporters and importers. The costs involve not only the freight charges but also the value of the goods and payment terms. Thus, consistent with the results of Sураraksa et al.'s [2020] study, we argue that the companies consider mostly cost related factors while selecting the

terms. Since the nature of the trade terms is about sharing the responsibilities of cost and risks between the parties, not surprisingly risk sub-criteria is found to be the fourth factor after the cost related factors for both exporters and importers. Similar to many studies [Malfliet 2011, Bergami 2013] we confirm that risks have a crucial impact on the selection of the terms. However, some studies reveal that country risk has a moderate effect [Yaakub, Szu 2017] and duration for risk taking has a lower effect [Suraraksa et al. 2020]. Another important sub-criteria is the customs/ bureaucracy which ranks fifth for both exporters and importers. Similarly, in international commercial terms selection, Suraraksa et al. [2020] revealed that the international trade laws factor ranks fifth while Yaakub and Szu [2017] found that tariff classification and government regulation are the primary external factors rank after freight and transport issues. We emphasize that companies should take into account additional responsibilities that may arise from customs processes and procedures, particularly in the foreign markets while selecting the terms. We suppose that failure to meet these responsibilities may result in additional costs in terms of time and money in foreign trade operations. The impact of relations with customers/suppliers which refers to the trust and negotiation between buyers and sellers found to be moderate. This finding is inconsistent with the study of Suraraksa et al. [2020] that revealed it has lower effects. We argue that long-term relations in international trade develop trust between parties, but the terms selections should be determined within the framework of written agreements, not verbal negotiations. The mode of transportation was determined as one of the lowest influential factors for both exporters and importers. Conversely, some studies stated that the mode of transportation is one of the effective factors that should be taken into account [Malfliet 2011, Yaakub and Szu 2017]. Our findings may be due to the decision makers perceiving the selection of the right term according to the mode of transport as a rule, rather than a criterion. We notice that not every term is used for every mode of transport, but we argue that the factors previously mentioned are more effective. Firm size is found to be the lowest effective factor. On the other side, some studies indicated that small-sized firms behave more amateurish in their terms selection decisions [Malfliet 2011]. We suppose that rather than the firm size, staff characteristics related to knowledge and the experience concerning the trade activities play an influential role in this regard.

Four factors which are “relations with forwarding agents, type of goods, complexity of transportation and distance” differ according to importers and exporters in their terms selection decisions. Distance is found to be more influential for exporters while type of goods for importers. However, Rosal [2016] stated that the distance has only a statistical effect on imports. Another finding of our study is that exporters give more weight to relations with forwarding agents than the complexity of transportation while importers have opposite views on this point. These findings may be a result of Turkey's imports from countries such as China and Russia and the fact that around 50% of its exports are carried out with relatively close EU countries with higher competition. Thus, we suppose that Turkish exporters may carry out different terms policies with their long distance partners and prefer to deliver goods with forwarding agents with whom they have good relations. On the other hand, importers should consider the responsibilities of costs and risks due to the type of goods and complexity of transportation to find the best mode to receive them smoothly.

CONCLUSIVE REMARKS

In this study, international commercial terms selection decisions that play an important role in foreign trade operations were discussed from the perspective of importers and exporters, and the gap related to the subject in the literature was aimed to be filled. The results were obtained with FAHP, one of the multi-criteria decision-making methods that minimize the uncertainties of the decisions. We concluded that cost-related factors are the most influential ones and apart from a few factors, there is no significant divergence between terms selection decisions

of importers and exporters. We suppose that the differences in terms selections between importers and exporters are due to the dissimilarities in competition conditions in foreign markets and product groups. The small sample size and the sample consisting of companies operating in various sectors in a particular region are among the limitations of the study. We suppose that the factors determined in this study will contribute to future studies by analyzing with a larger sample in different regions using different analysis methods.

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CZYNNIKI WYBORU WARUNKÓW INCOTERMS® WŚRÓD EKSPORTERÓW I IMPORTERÓW – APLIKACJA (FAHP) DLA ROZMYTEJ ANALIZY HIERARCHICZNEGO PROCESU

STRESZCZENIE. **Wstęp:** Są dostępne badania analizujące jakie czynniki i w jaki sposób wpływają na wybór warunków Incoterms®, jednak istotność wagi poszczególnych czynników osobno dla eksporterów i importerów nie są należycie zbadana. Praca ta ma na celu uzupełnienie tej luki w badaniach poprzez zbadania wpływu wyboru warunków Incoterms® oraz sprawdzenie czy są różnice pomiędzy importerami i eksporterami. W tym celu przeprowadzone analizę wagi poszczególnych czynników dla obu grup.
Metody: Stworzono model koncepcyjny oparty na różnych podejściach, poprzednich badaniach oraz decyzjach ekspertów. Dane zostały zebrane poprzez pocztę mailową od 19 eksporterów Incoterms®, wśród których 9 jest importerami, a 10 eksporterami. Następnie przeprowadzono analizę Fuzzy Analytical Hierarchy Process (FAHP) przy zastosowaniu średniej geometrycznej w celu określenia istotności wag poszczególnych kryteriów.
Wyniki: W wyniku przeprowadzonej analizy stwierdzono, że najistotniejszym czynnikiem wpływającym na wybór INCOTERMS zarówno dla eksporterów, jak i dla importerów są koszty transportu, podczas gdy najmniej istotnym czynnikiem jest wielkość firmy. Istotność czterech czynników: relacje ze spedycjami, typ wyrobów, kompleksowość transportu oraz odległość, różniła się w zależności od grupy. Relacje ze spedytorami oraz odległość były istotniejszym czynnikiem dla eksporterów, podczas gdy typ wyrobów i kompleksowość transportu miały większe znaczenie dla importerów.
Wnioski: W trakcie badania ustalono, że czynniki związane z kosztami mają istotniejszy wpływ na podejmowane decyzje oraz, że z kilkoma wyjątkami, nie ma istotnych różnic pomiędzy czynnikami wpływającymi na decyzję pomiędzy importerami a eksporterami. Mała próba badawcza złożona dodatkowo z przedsiębiorstw operujących w różnych sektorach gospodarki były głównymi ograniczenia tych badań. Niemniej mogą one stanowić podstawę do dalszych pogłębionych badań w tym zakresie.

Słowa kluczowe: Incoterms®, FAHP, eksport, import, handel zagraniczny

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