

Application of TOPSIS to Analyze Stakeholder Relations

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ABSTRACT

In parallel to the increasing competition in business environment, managing stakeholder relations has become critical for most organizations. Balancing the interests of various parties in the nexus of their relative power can increase the difficulty of managing relations with these key stakeholders. Therefore, most organizations need to adapt a new approach when evaluating their relations with stakeholders. The purpose of this study is to analyze stakeholder relations with considering their relative power and interests in a given set of stakeholders. A survey was conducted on a sample of 59 managers and the data was analyzed through following the technique for order of preference by similarity to ideal solution (TOPSIS). The results of study revealed that both power and interest of stakeholder should be considered in the assessment of stakeholder relationship.

Keywords: Interorganizational relations, multi-criteria decision making, stakeholders, TOPSIS

Introduction

Business environment has become more competitive and complex than in the past. While this increasing competitiveness improves the quality and speed of producing goods and services, it increases the pressure on organizations and requires adopting more proactive approach in their all business operations and relations. During the last decades, organizations start to recognize the importance and impact of their stakeholders on their every action. According to Daft (2010), there is an interplay between organization and its stakeholders, and this interaction can have a significant impact on the organizational performance and success. For instance, the study of Berman et al. (1999) indicated the importance of strategic stakeholder management and found that stakeholder relationships moderate the relationship between strategy and firm financial performance.

Today, most organizations try to improve their relations with their stakeholders. In doing so, they increasingly need to analyze their relations with these stakeholders and identify the most important stakeholders. A growing number of studies in the literature provide both theoretical and practical implications of stakeholder approach and analysis. As an extension of this conceptualization, the current study tried to investigate how managers can identify their key stakeholders in terms of some pre-determined criteria. Conducting a survey on a sample of logistics firms' managers, as the evaluator of stakeholder relationship of focal logistics firm, the balance of power and interest among the stakeholders were analyzed in terms of their strengths to explain stakeholder salience. The current study can contribute to the literature with providing a general framework to conduct a survey in this field of study and analyze the collected data with using a technique for order of preference to make sense for organizational leaders.

This study is organized as follows. In the first section, stakeholder approach is briefly mentioned with its fundamental propositions and shortcomings. Then, the literature on stakeholder analysis was provided with reviewing the related studies, which use different methodologies. In the third section, after the explanation on the selected methodology, the technique for order of preference by similarity to ideal solution (TOPSIS), and its

steps, a numerical example on the logistics sector was provided. The study was concluded with a discussion of the applicability of this methodology and main findings.

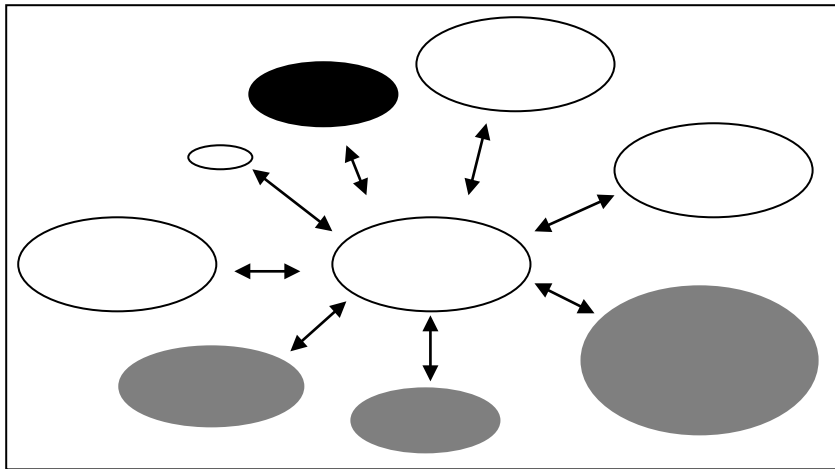
1. Stakeholder Approach

The importance of an organization's environment has been known since the 1950s. General systems theory (Bertalanffy, 1951) provides a theoretical framework to articulate how an organization can be viewed as a transformation model with considering its dynamic relationship with its environment (Kast and Rosenzweig, 1972, p.450) and how problems can be solved with the collective support of all related parties (Freeman and McVea, 2001). Depending on the increasing environmental and social problems during the 1970s, organizations start to recognize the importance of these groups and people in their environment. They sometimes take the form of a non-governmental organization (NGO) like Friends of the Earth or Greenpeace, sometimes local public, or media. Although the idea is not new, these parties that have a stake on the existence and operations of an organization started to be conceptualized during the 1960s. As an early attempt, in an internal memorandum of Stanford Research Institute in 1963, the concept was defined to connote only the stockholders, as a "group to whom management need to be responsive", but then the concept evolved to include "those groups without whose support the organization would cease to exist" like shareholders, employees, customers, suppliers etc. (Freeman et al., 2010). After the widely accepted definition of Freeman in 1984, that includes all individuals or groups who can affect or are affected by the achievement of the organization's objectives or are those actors with a direct or indirect interest in the company, the concept has been recognized as an umbrella term, which can include all 'others' that interacts with the organization when pursuing its goals (Wherther and Chandler, 2006). These 'others' can particularly encompass "individuals, groups, and other organizations who have an interest in the actions of an organization and who have the ability to influence it" (Savage et al., 1991).

Stakeholder management approach has been theoretically explored well and this theoretical approach is frequently used to understand various links on the stakeholder relationship. For instance, Garriga and Mele (2004, p.59) classified this approach as one of the integrative theories of corporate social responsibility (CSR) and stated that it tries "to integrate groups with a stake in the firm into managerial decision making". Stakeholder approach suggests a strategic perspective to managers to formulate and implement activities to satisfy all groups who have a stake in organization when achieving its objectives; understanding stakeholder relationships is "a matter of achieving the organization's objectives which is in turn a matter of survival" (Freeman and McVea, 2001). In their study, Donaldson and Preston (1995) consolidated the available literature on stakeholder management up to date and attempted to configure a theoretical understanding. According to the authors, management literature agrees upon three interrelated, but quite distinct aspects of stakeholder theory as its descriptive accuracy, instrumental power, and normative validity. From a descriptive standpoint, this theory tries to guide to an organization when dealing with the contrasting purposes of various and diverse parties. In doing so, the theory explains how an organization can take the advantage of involving such relationship. However, according to Donaldson and Preston (1995), the fundamental basis of this theory is still normative, which goes beyond the acceptance of legitimate interests of stakeholders and assign an 'intrinsic value' for the interests of all parties.

Although stakeholder approach has provided an important theoretical perspective, it has some important shortcomings. In his study Fassin (2008) analyzed the vagueness and ambiguity of stakeholder theory on a graphical framework. According to the author, one of the major weaknesses of this theory is its simplistic view of stakeholder as identical groups. Since the theory ignore the variability of salience and impact of various stakeholders, it is sometimes incorrectly interpreted that a manager should pay attention to the interest of all stakeholders equally irrespective of their contributions (Fassin, 2008, p.882). However, decision makers know that "the constellation of legitimate stakeholder interests cannot be weighted equally when making corporate decisions" (Gioia, 1999, p.229). Therefore, as Figure 1 shows that, from a managerial point of view, some stakeholders can be more important than others.

Figure 1. Variability in the Saliency and Impact of the Various Stakeholders



Source: (Fassin, 2008, p.882).

In order to clarify these differences among stakeholders, some scholars have attempted to classify them as primary and secondary stakeholders (Freeman, 1984), primary social, secondary social, primary nonsocial and secondary nonsocial stakeholders (Wheeler and Sillanpaa, 1998), external and internal (Verdeyen et al., 2004), internal, external, and societal stakeholders (Wherther and Chandler, 2006). Although all these classifications are contributing a lot to the conceptualization of stakeholders, they say little when a manager actually needs to analyze their stakeholders before making an important organizational decision. In order to analyze the stakeholder, a decision maker should decide upon what makes a stakeholder important when comparing others.

In the literature, a significant amount of attention is devoted to the problem of identifying stakeholder attributes (Frooman, 1999). In their well-known study, Mitchell, Agle, and Wood (1997: 854) focused on how managers give priority to competing stakeholder claims – stakeholder saliency – with identifying three main attributes of stakeholders as their power to influence the firm, the legitimacy of their relationship with the firm, and the urgency of their claim on the firm. Although some studies proposed new dimensions to this typology (e.g. in their study, Driscoll and Starik (2004) extended the scope of these attributes with adding ‘proximity’ dimension in order to give natural environment a primary stakeholder status), the study of Mitchell, Agle, and Wood (1997) has provided a sound theoretical foundation for the further studies (e.g. the studies of Elias et al., 2002, Harvey and Schaefer, 2001; Friedman and Mason, 2004; Ryan and Schneider, 2003)

Although both urgency and legitimacy dimensions of this model are sometimes found questionable, most scholars agree the importance of power as an attribute of stakeholder (Frooman, 1999, p. 193). For instance, according to Porter and Kramer (2006, 4), “nor the vehemence of a stakeholder group necessarily signify the importance of an issue - either to the company or to the world”. Therefore, since the stakeholders cannot fully understand a firm’s constraints and capabilities, it is the firm’s responsibility to decide its social agenda (Porter and Kramer, 2006) and the urgency of stakeholder claim. On the other hand, Freeman (1984) viewed stakeholder legitimacy as one of the bases of stakeholder power, together with institutionalized and economic basis. Therefore, considering its various bases (French and Raven, 2001) in relationship, power can be viewed as a more comprehensive term that encompasses legitimacy as well. As a potential ability to affect other’s behaviors (Mintzberg, 1983), power is among the basic dimensions in almost every type of interactions. Although it is most obviously perceived at the interpersonal level, power can be considered as a significant domain of relationships at the upper level relations - among organizations - since the 1970s (Hall et al., 1977; Kochan, 1975; Pfeffer & Leong, 1977; Schmidt & Kochan, 1977). It is clear that power can be an effective tool to influence others in relationship and very frequently used by various stakeholders in the competitive business environment.

Recalling the definition of Savage et al. (1991), an organization should take into account the parties who have the ability to influence it, as well as the parties that have ‘an interest’ in its actions. Therefore, in addition to power,

the stakeholders' interests and their direct or indirect benefits should be viewed as a signification dimension of stakeholder relationship. A brief review of stakeholder literature shows that 'interest' of stakeholders has been also one of the most arguable issues among scholars. Although all stakeholders are assumed to have 'a stake, a claim, or an interest in the operations and decisions of the firm' (Carroll, 1991: 43), for managers "...some interests are pragmatically more important or more sensitive than others" (Gioia, 1999, p.229). Basically, the stakeholder theory attributes a role or duty to managers to balance the interest of various stakeholders. Although it is sometimes possible to obtain a win-win situation for all stakeholders (Ogden and Watson, 1999), managers must cope with the management of these complex relations. In his study, Marcoux (2003, 4) was very skeptical on these 'fiduciary' duties of managers on trading-off the competing interests of various stakeholders, since "it is conceptually impossible to simultaneously place the interests of the shareholders ahead of all the others, the interests of employees ahead of all the others..." (including employees, customers, suppliers, etc.) and "it is practically impossible to serve the interests of each of these groups simultaneously". Therefore, both conceptually and practically, managers should consider the relative interests of various stakeholders when evaluating them. According to Donaldson and Preston (1995, p.67), "stakeholders are identified by their interests in the corporation, whether the corporation has any corresponding functional interest in them... ". Therefore, depending on the instrumental nature of stakeholder theory (Donaldson and Preston (1995), an organization needs to consider both the power and interests of various stakeholders in its own set of stakeholder relationship and evaluate their impact when making decisions.

2. Analyzing Stakeholder Relations

Depending on the pervasiveness of stakeholder conception over the business literature, some scholars focus on the question of how an organization can evaluate its stakeholders. Several theoretical approaches can be used in the evaluation of stakeholders. In her study, Vartiainen (2003) theoretically explored this field of study and provided suggestions on stakeholder evaluation methods. Although these theoretical approaches are invaluable, organizations need some practical guidance that is derived from quantitative approaches. The literature provides various examples on analyzing stakeholder relationships (Agle et al. 1999; Buanes et al., 2004; Elias et al., 2002; Harvey and Schaefer, 2001; Friedman and Mason, 2004; Ryan and Schneider, 2003). For instance, while the study of Harvey and Schaefer (2001) analyzed general approach of organizations in water and electricity sector towards green stakeholders with using Mitchell et al.'s (1997) model with following the comparative case study methodology, Elias et al. (2002) combined the approaches of Freeman (1984) and Mitchell, Agle, and Wood (1997) to identify the stakeholders, their interests and change over time with using a New Zealand case study on research and development (R&D) projects. In their study, Parent and Deephouse (2007) reviewed these empirical attempts and mentioned three research mainstreams that explore the stakeholder salience as the studies on archival material, surveys with using Likert scales to closed questions, and open ended interviews as part of case studies. Despite the contributions of these studies to the development of stakeholder analysis, the authors criticized many of these studies for their various methodological omissions. According to the Parent and Deephouse (2007), most of these studies do not reflect a managerial point of view, which is essential for the stakeholder analysis. Following three dimensional model of Mitchell et al. (1997), they tried to understand how managers identify and prioritize their stakeholders with using multi-method comparative case study and found power as the most important attribute of salience, followed by urgency and legitimacy (Parent and Deephouse, 2007).

In the current study, we also followed this suggestion, which is originally based on the emphasis of Mitchell et al. (1997, p.871) regarding with the vital role of managerial perspective in stakeholder relationship. Conducting a survey on a sample of logistics firms' managers, as the evaluator of stakeholder relationship of focal logistics firm, two significant criteria (power and interest) were evaluated in terms of their strengths to explain stakeholder salience. Although the data on the managerial perception was collected with following the similar studies in the literature (e.g. Agle et al. (1999) and Buanes et al. (2004)), the study differs from these studies in its analysis method. In the literature, there are limited number studies that use weighting and order preferences techniques on stakeholder analysis. For instance, in their study, Partovi and Epperly (1999) presented a model to identify the peacekeeping activities in Bosnia with using the Analytical Hierarchy Process (AHP). In doing so, the authors relate the interests of stakeholders involved in the conflict and determine their weighted importance. On the other hand, the study of Jackson (2001) attempted to disprove the dominant marketing paradigm, which assumes customer as king, and showed how other stakeholders (employees and managers) should be also prioritized as key stakeholders with using the AHP. In a recent study of literature, Gholampour and Alvandi (2010)

followed TOPSIS to identify the manager's views on the stakeholders of Persian Gulf International Transport Company based on their satisfaction and goals. Besides its findings on organizational effectiveness, this study clearly showed that making order preferences for organizational stakeholders through TOPSIS can be applicable in the stakeholder analysis. Similar to this study, the current study used TOPSIS to analyze stakeholder relationship. Since collecting data based on a case study might limit the contribution and generalizability of findings, a survey was designed to show how TOPSIS can be used in such analysis.

3. Methodology

3.1. Analysis Method

Hwang and Yoon (1981) were firstly introduced a multi criteria decision model technique, then Chen and Hwang (1981) extended Hwang and Yoon model's and presented a unique technique, called TOPSIS. The TOPSIS method has two artificial alternatives; ideal alternative is the one which has the best level for all attributes considered whereas negative ideal alternative is the one which has the worst attribute values. Thus, solution is defined in the TOPSIS as the points that are simultaneously farthest from the negative-ideal point and closest to the ideal point. TOPSIS can be applied to rank alternatives and to propose a solution to the decision maker. Therefore, this method can be applied to both science and management areas. Chen and Tzeng (2004) used to select expatriate host countries, Hu (2005) performed to select the outsourcing firms, Shyur and Shih (2006) used for vendor selection, Milani et. al (2006) used to select material for gears, Gumus (2009) evaluated hazardous waste transportation firms, Kelemenis and Askounis (2010) applied TOPSIS to select the IT professional teams.

The algorithm for TOPSIS is as follows (Yang and Hung, 2007);

Step1: Build Matrix Form

In general, TOPSIS assumes that the MCDP can be expressed in matrix form which columns represent criteria (n), the sentences represent decision alternatives (m) and there should be score of each option with respect to each criterion.

Step2: Construct Normalized Decision Matrix

This step transforms various attribute dimensions into non-dimensional attributes which allows comparisons across criteria. Normalize scores can be calculated by equation 1;

$$r_{ij} = \frac{a_{ij}}{\sqrt{\sum_{k=1}^m a_{kj}^2}} \quad (1)$$

Step3: Construct the weighted normalized decision matrix

In that step, first determine each criteria weight (w_j). Total weights should be;

$$\sum_{i=1}^n w_i = 1 \quad (2)$$

Then multiple each column of the normalized decision matrix by associated weight and obtain new decision matrix (v_{ij}).

Step4: Determine the ideal and the negative solutions

Calculate the ideal and negative solutions by using the equation 3 & 4.

$$A^* = \{v_1^*, v_2^*, \dots, v_n^*\} \text{ where } v_j^* = \{ \max_i (v_{ij}) \text{ if } j \in J; \min_i (v_{ij}) \text{ if } j \in J' \} \quad (3)$$

$$A^- = \{v_1^-, v_2^-, \dots, v_n^-\} \text{ where } v_j^- = \{ \min_i (v_{ij}) \text{ if } j \in J; \max_i (v_{ij}) \text{ if } j \in J' \} \quad (4)$$

Step 5: Calculate the separation measures for each alternative

Calculate the separation measures using the equation 5 & 6. The separation from the ideal alternative is;

$$S_i^* = \sqrt{\sum_{j=1}^n (v_{ij} - v_j^*)^2} \quad i: 1, \dots, m \quad (5)$$

Similarly, the separation from the negative ideal alternative is;

$$S_i^- = \sqrt{\sum_{j=1}^n (v_{ij} - v_j^-)^2} \quad i: 1, \dots, m \quad (6)$$

Step 6: Calculate the relative closeness to the ideal solution

Calculate the relative closeness to the ideal solution with given equation in the below and then rank the preference order;

$$C_i^* = \frac{S_i^-}{S_i^- + S_i^*} \quad (7)$$

3.2. Numerical Example

3.2.1. Data Collection

Logistics sector was chosen for the numerical example of study, since organizations in this sector must interact with their stakeholders very frequently. The study of author identified 8 key organizational stakeholders based on the views of professionals working in this sector. This set of stakeholders was used in the prepared matrices of study:

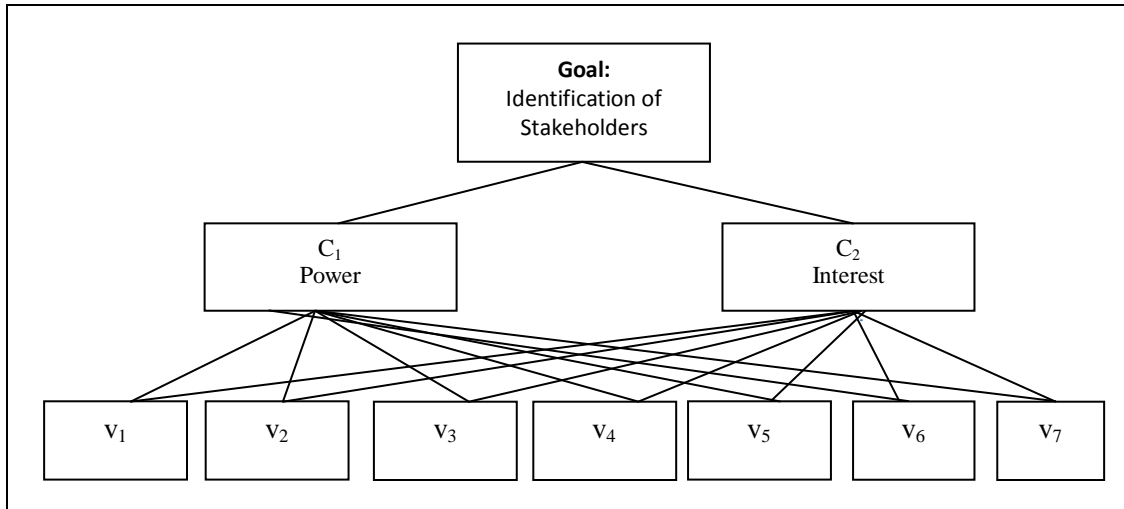
v₁: focal organization; v₂: customers; v₃: competitors; v₄: suppliers/subcontractors, v₅: banks & financial institutions, v₆: public organizations, v₇: chamber of commerce & associations, and v₈: non-governmental organizations (NGOs) & universities

A self-administrated questionnaire that includes two adjacency matrices (including 28 dyadic relations) was delivered to the members of a logistics association in Turkey. At the end of a pre-specified period of time (after sending two reminding e-mails and contacting with some managers via phone), a data was obtained from a sample of 59 managers. In the questionnaire, respondent managers, as the main representatives of focal organizations, evaluated the relations among the given set of stakeholders in terms of two domains as power and interest. In order to compare the balance power and interest in 28 dyadic relations, matrices were vertically separated into two main groups as A and B, and managers evaluated the power and interest in each dyad on a five-point Likert scale (Appendix).

3.2.2. Findings

As explained above, 59 decision makers (D₁, D₂,... D₅₉) compared the stakeholders in each dyad in the given set of alternative stakeholders (v₁, v₂, ..., v₇). The selection criteria are power (C₁) and interest (C₂). In Figure 2 shows the hierarchical structure of the problem.

Figure 2. Hierarchical Structure of Decision Problem



This problem is multi criteria decision making problem and TOPSIS method is applied to solve the problem. Firstly, 59 decision makers scored of each option with respect to each criterion and then we normalized the matrix. Both data are given in Table 1.

Table 1. The Average Score and Normalized Decision Option with Respect to Each Criterion

Stakeholders	Average Score		Normalized Score	
	Power	Benefit	Power	Benefit
v_1	2,75625	2,7075	0,36216	0,35565
v_2	2,68625	2,7325	0,35297	0,35893
v_3	2,7469	2,60805	0,36094	0,34259
v_4	2,70341	2,70955	0,35522	0,35592
v_5	2,7698	2,78379	0,36395	0,36567
v_6	2,78913	2,75629	0,36648	0,36206
v_7	2,67219	2,64025	0,35112	0,34682
v_8	2,37932	2,58776	0,31264	0,33992

Let us suppose that there are five different options to assign weights of each criterion.

- Both criteria are equally important, $w_1:0,5$ $w_2:0,5$
 - Power is the only one criterion and we ignore the benefit criteria, $w_1:1$ $w_2:0$
 - Benefit is the only one criteria and we ignore the power criteria, $w_1:0$ $w_2:1$
 - Power is more important than the benefit criteria, $w_1:0,75$ $w_2:0,25$
 - Benefit is more important than the power criteria, $w_1:0,25$ $w_2:0,75$
- Table 2 shows the results of the weighted normalized decision matrix.

Table 2. Weighted Normalized Decision Matrix

Weights	$w_1:0,5 \quad w_2:0,5$		$w_1:1 \quad w_2:0$		$w_1:0 \quad w_2:1$	
	Power	Benefit	Power	Benefit	Power	Benefit
v_1	0,181082	0,177825	0,362165	0	0	0,355651
v_2	0,176483	0,179467	0,352967	0	0	0,358935
v_3	0,180468	0,171294	0,360936	0	0	0,342587
v_4	0,177611	0,17796	0,355222	0	0	0,355921
v_5	0,181973	0,182836	0,363945	0	0	0,365672
v_6	0,183242	0,18103	0,366485	0	0	0,362059
v_7	0,17556	0,173409	0,351119	0	0	0,346818
v_8	0,156318	0,169961	0,312637	0	0	0,339922

And then, we calculate the ideal and negative ideal solution which is given in Table 3.

Table 3. Ideal and Negative Ideal Solutions

Weights	$w_1:0,5 \quad w_2:0,5$		$w_1:1 \quad w_2:0$		$w_1:0 \quad w_2:1$	
	Power	Benefit	Power	Benefit	Power	Benefit
A+	0,183242	0,182836	0,366485	0	0	0,365672
A-	0,156318	0,169961	0,312637	0	0	0,339922

Lastly we calculate the separation measures for each alternative with each weight in Table 4.

Table 4. Separation Measures for Each Weight

Weights		v_1	v_2	v_3	v_4	v_5	v_6	v_7	v_8
$w_1:0,5$	s+	0,005	0,008	0,012	0,007	0,001	0,002	0,012	0,030
	s-	0,026	0,022	0,024	0,023	0,029	0,029	0,020	0,000
$w_1:1 \quad w_2:0$	s+	0,004	0,014	0,006	0,011	0,003	0,000	0,015	0,054
	s-	0,050	0,040	0,048	0,043	0,051	0,054	0,038	0,000
$w_1:0 \quad w_2:1$	s+	0,010	0,007	0,023	0,010	0,000	0,004	0,019	0,026
	s-	0,016	0,019	0,003	0,016	0,026	0,022	0,007	0,000

According to the measures, we rank the alternatives. The ranking orders of the seven candidates with different weights are given in Table 5.

Table 5. Ranking Orders

Weights		Ordering
$w_1:0,5$	$w_2:0,5$	A5>A6>A1>A4>A2>A3>A7>A8
$w_1:1$	$w_2:0$	A6>A5>A1>A3>A4>A2>A7>A8
$w_1:0$	$w_2:1$	A5>A6>A2>A4>A1>A7>A3>A8

Conclusion

In this paper, we deal with the problem of stakeholder selection with using two important criteria. The findings of the survey revealed that public organizations (v_6) and banks & financial institutions (v_5) are among the most important stakeholders, in terms of power and interest, respectively. These results are in fact in line with the

current structure of most business sector in Turkey. Depending on the longstanding tradition of government institutions in Turkey since the Ottoman Empire, public organizations have obtained a significant amount of power over other actors almost all areas of social and economic life. Therefore, the organizational leaders should consider the legal and legitimate power of such institutions when making decisions. On the other hand, similar to other developing countries, banks and financial institutions are at the heart of business sector with providing a fundraising mechanism for them and possibly obtain the highest return and benefit in all exchange relations. Therefore, decision makers should be careful about this actor of the system. NGOs and universities (v_8) were obtained as the most invisible actor in the stakeholder set of a logistics firm, in terms of both power and interest criteria. This result clearly showed that the managers of logistics firms ignore this stakeholder group and overlook their possible contribution in their activities.

This study is subject to some limitations. Despite the chosen methodology of current study suggests anything, the size of the sample was relatively small. Besides the usual limitations of collecting data, the difficulty of filling questionnaire form might reduce the number of returned forms. Therefore, in the future studies, this limitation might be considered and researchers try to find more convenient ways of using these matrices. Moreover, since the data was collected from a sample which was drawn from only one country, the results can be generalized only in this country. Despite these limitations, it is believed that both the data collection and analysis method used in the current study can provide a basis for the further studies.

Appendix

The matrix used in the questionnaire was given in the following.

Power Matrix Question: Which organization in each dyad is more powerful in the relationship?

Interest Matrix Question: Which organization in each dyad capitalize more on their interest in the relationship?

Scale: 1=Always the organization in Group - A / 5=Always the organization in Group - B

Matrix*		Group - A						
		v_1	v_2	v_3	v_4	v_5	v_6	v_7
Group - B	v_2	<u>1.</u>						
	v_3	<u>2.</u>	<u>8.</u>					
	v_4	<u>3.</u>	<u>9.</u>	<u>14.</u>				
	v_5	<u>4.</u>	<u>10.</u>	<u>15.</u>	<u>19.</u>			
	v_6	<u>5.</u>	<u>11.</u>	<u>16.</u>	<u>20.</u>	<u>23.</u>		
	v_7	<u>6.</u>	<u>12.</u>	<u>17.</u>	<u>21.</u>	<u>24.</u>	<u>26.</u>	
	v_8	<u>7.</u>	<u>13.</u>	<u>18.</u>	<u>22.</u>	<u>25.</u>	<u>27.</u>	<u>28.</u>

* v_1 : focal organization; v_2 : customers; v_3 : competitors; v_4 : suppliers/outsourcers, v_5 : banks and financial institutions, v_6 : public organizations, v_7 : chamber of commerce and associations, and v_8 : non-governmental organizations/universities

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