Reputation aspects in investment decision making: contribution to corporate security

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Abstract: The article deals with a substantial threat for corporate security – decline in corporate reputation. Corporate reputation is regarded as the most important intangible asset of corporations. Investment project implementation may greatly affect corporate reputation, both positively and negatively. Therefore, investment decision-making requires consideration of how project implementation affects corporate reputation and application of ethics and social responsibility. We suggest an index to consider the impact of investment project implementation on corporate reputation at the pre-investment phase – reputation improvement index. To evaluate weight numbers, which are part of reputation improvement index, the analytic hierarchy process is recommended. Also, we propose a model to evaluate weight numbers, based on solution of a respective matrix game, and give a case study. We conclude that reputation improvement index, along with traditional methods of investment decision making and risk consideration, lowers corporate threats at present and in the long-term.

Keywords: corporate security; corporate reputation; investment project; investment decision making; corporate ethics; corporate social responsibility; model; reputation improvement index; risk; matrix game.


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1 Introduction

Corporations can be described as complex dynamic open systems. Corporate reputation is an essential intangible asset owned by corporations. Competitiveness at each time period requires state-of-the-art tangible and intangible assets, top-ranked specialists and a good reputation. At the same time, the selection and implementation of investment projects (IPs) may affect (both positively and negatively) all corporate subsystems, including corporate reputation.

Scientists from around the globe have greatly contributed to the issues of investment decision making. Currently, a number of decision-making techniques have been designed and applied [such as net present value (NPV) and internal rate of return (IRR)], along with risk consideration techniques (for instance, game theory, simulation modelling, etc.). However, there are a number of challenges in this field, including consideration of how IP implementation affects corporate reputation. Presently, reputation aspects are considered but instinctively (qualitatively) in investment decision making. Yet, any sound decision requires comparison of quantitative characteristics. So, we believe it necessary to develop an index to measure the impact of IP implementation on corporate reputation at the pre-investment phase.

2 Corporate security

Corporations are complex dynamic economic and social systems. Let us analyse a corporate development scheme given in Figure 1. We believe it necessary to distinguish three corporate subsystems: tangible assets, human assets and intellectual capital. Figure 1 shows that the current state of corporate subsystems in many ways results from past decision making while future performance depends on present decision making.

The current decision making must comply with a corporate development strategy. No corporate development strategy means no successful performance in the long-term. A definite and unambiguous corporate development strategy enables managers and employees to coordinate their efforts, i.e., to aim their efforts at common goals.

Importantly, strategic corporate development is supported by efficient IPs. However, the current selection and implementation of an IP may have an impact, positive or negative, on all corporate subsystems in the near, medium and long-term (see Figure 1).
Corporations are complex economic and social systems constantly developing and interacting with an evolving external environment. The external environment can be regarded as a set of corporate threats and opportunities. Corporate managers should resist threats and enhance corporate security.

Figure 1 Corporate development scheme

There are many definitions of the term ‘corporate security’. “Corporate security is the availability of competitive advantages resulting from the compliance of material, financial, human and technological potentials, and corporate structure with strategic goals and objectives” (Shalagin, 2009). “Corporate security is security of vital corporate interests in financial and economic, operational, and technological areas against threats of all kinds…” (Lyashko, 2014). “Corporate security is the best state of corporate economy versus other definite states, possessing qualities to defend its potential in all performance areas: finances, marketing, production, staff, corporate culture and image, innovations, investments, information sphere, politics and law, environmental protection, and power” (Vishnevskaya, 2011).

By origin, all existing corporate threats are divided into two categories: internal and external. External threats emerge outside corporations, in the external environment. They include (Lyashko, 2014): – environmental threats; – informational threats; – brand threats; and others. Internal threats include (Lyashko, 2014): – employees’ actions against corporate interests; – leak or loss of information (including commercial secrets); – reputation decline in the eyes of business partners; and others.

Decline in corporate reputation is a substantial threat, with an impact on many aspects of corporate performance. Disrepute is generally hard to recover/improve, and negative effects of disrepute for corporations are often unpredictable.

At the same time, corporate reputation depends on particular actions of top managers and employees. Therefore, decision making (including investment one) requires corporate ethics and social responsibility.
Corporate reputation is an essential intangible asset and part of intellectual capital (see Figure 1). Modern scientists advance an opinion that corporate competitive capacity in the long-term is based on intangible assets (intellectual capital) (Yagafarova, 2007).

As noted above, IP implementation may impact, positively or negatively, all corporate subsystems (and thus corporate reputation) in the near, medium and long-term. Reputation aspects are essential for corporate performance, yet, the issues of measuring an IP’s impact on corporate reputation are underdeveloped. Generally, reputation aspects in investment decision making are considered but instinctively. The given research paper proposes an economic and mathematical model to measure a possible impact of IP implementation on corporate reputation.

3 Corporate reputation

For successful performance in the market economy corporations should care about positive reputation. A distinction is made among the following notions: corporate image, corporate identity and corporate reputation. Table 1 displays some definitions of these notions. Scientific literature offers an approach combining corporate identity (internal corporate perception) with corporate image (external corporate perception) to make corporate reputation (Davies et al., 2001).

The given research paper applies that approach of disclosing the essence of corporate reputation. We believe that corporate perception by external stakeholders and internal perception of corporate essence should be in harmony.

Based on scientific literature analysis, Stern et al. (2001) have discovered corporate image features as follows: – image as an impression or perception in stakeholders’ minds; – different corporate images are characteristic of different groups; – image as a comprehensive and integral impression. According to Stern et al. (2001), image has two locations: ‘the external world of physical entities and the internal one of consumer cognitions’.

A positive corporate reputation gives corporations the following basic advantages (Primak, 2002): lower consumers’ price sensitivity; lower product substitution; higher access to various resources: financial, informational, human, etc. A good reputation also helps corporations on their way to world expansion (Kitchen and Laurence, 2003).

Scientific literature even has the term ‘ethical consumer’ (also, ‘political consumer’, ‘conscious consumer’, and ‘critical consumer’) to address consumers positively or negatively responding to what they consider ethical or unethical business behaviour (Pruzan, 2001). Interestingly enough, in 2001, more than half of Danish consumers were ranked among ethical consumers (Pruzan, 2001).

Moreover, as practice shows, “…influential groups of investors and financiers are tending to focus not just on corporate track records as to productivity, profitability, and share price, but also on the corporate ethical profile and the risks which might arise should corporate reputation be sullied” (Pruzan, 2001).
Table 1  Some definitions of ‘corporate image’, ‘corporate/organisational identity’ and ‘corporate reputation’

<table>
<thead>
<tr>
<th>Definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Corporate image</strong></td>
<td></td>
</tr>
<tr>
<td>“The sum total of the public perceptions of the corporation’s personality is what we refer to as the corporate image.”</td>
<td>Spector (1961)</td>
</tr>
<tr>
<td>“Corporate image is the public attitude toward it.”</td>
<td>Tucker (1961)</td>
</tr>
<tr>
<td>“Corporate image is the total impression an entity makes on the minds of people. It is linked to the corporate personality.”</td>
<td>Dowling (1988)</td>
</tr>
<tr>
<td><strong>Corporate image</strong> “…is the overall impression of the company held by the segments of the public.”</td>
<td>Johnson and Zinkhan (1990)</td>
</tr>
<tr>
<td>“Image is generally conceived of as the outcome of a transaction whereby signals emitted by a marketing unit are received by a receptor and organized into a mental perception of the sending unit. &lt;…&gt; Corporate image research emphasizes the multidimensionality of receptors, for ‘stakeholder’ groups or publics include not only consumers, but also competitors, suppliers, corporate buyers, media, employees, stockholders, local communities, financial institutions, the government, and the general public.”</td>
<td>Stern et al. (2001)</td>
</tr>
<tr>
<td>“Image is taken to mean the view of the company held by external stakeholders, especially that held by customers.”</td>
<td>Davies et al. (2001)</td>
</tr>
<tr>
<td><strong>Corporate/organisational identity</strong></td>
<td></td>
</tr>
<tr>
<td>“Organizational identity has been defined as the enduring characteristics of an organization that contribute to the distinctiveness and uniqueness of an organization.”</td>
<td>Albert and Whetten (1985)</td>
</tr>
<tr>
<td>“Organizational identity is the organizational members’ view of the organization to which they belong…. It influences how members interpret and give meaning to the physical, social and political environment within the organization…”</td>
<td>Dutton and Dukerich (1991)</td>
</tr>
<tr>
<td>“Organizational identity refers broadly to what members perceive, feel and think about their organizations. It is assumed to be a collective, commonly shared understanding of the organization’s distinctive values and characteristics. &lt;…&gt; Corporate identity differs from organizational identity in the degree to which it is conceptualized as a function of leadership and by its focus on the visual…. Although both concepts build on an idea of what the organization is …. strong links with company vision and strategy … emphasize the explicit role of top management in the formulation of corporate identity.”</td>
<td>Hatch and Schultz (1997)</td>
</tr>
<tr>
<td><strong>Identity</strong> is how employees and managers – those within a corporation – perceive the corporation’s essence.</td>
<td>Fombrun and van Riel (1997)</td>
</tr>
<tr>
<td>“Identity is taken to mean the internal, that is employees’ view of the company, following Albert and Whetten’s (1985) notion of ‘How do we see ourselves’.”</td>
<td>Davies et al. (2001)</td>
</tr>
<tr>
<td>“Organizational identity is a critical organizational perception that guides organizational members’ interpretation of the issues facing the organization.”</td>
<td>Dhall (2007)</td>
</tr>
</tbody>
</table>
Table 1  Some definitions of ‘corporate image’, ‘corporate/organisational identity’ and ‘corporate reputation’ (continued)

<table>
<thead>
<tr>
<th>Definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Corporate reputation … focuses upon stakeholder perceptions concerning an organization’s performance and behaviour. ...”</td>
<td>Boulstridge and Carrigan (2000)</td>
</tr>
<tr>
<td>“Reputation is taken to be a collective term referring to all stakeholders’ views of corporate reputation, including identity and image...”</td>
<td>Davies et al. (2001)</td>
</tr>
<tr>
<td>“… corporate reputation is defined as a single stakeholders perception of the estimation in which a certain firm is held by its stakeholders in general.”</td>
<td>Helm (2005)</td>
</tr>
<tr>
<td>“Corporate reputation: Observers’ collective judgments of a corporation based on assessments of the financial, social, and environmental impacts attributed to the corporation over time.”</td>
<td>Barnett et al. (2006)</td>
</tr>
</tbody>
</table>

A visible shift from tangible to intangible offers (rendering of services, electronic commerce) has made consumers’ decisions more dependent on objects’ symbolic associations, expressiveness, psychosocial aspects and intangible attributes, and less dependent on physical properties and functional advantages (Stern et al., 2001). A research conducted by Montgomery and Ramus (2003) shows that staff care, environmental care, good public relations, and ethical products and services greatly influence career choices of MBA graduates (MBA – Master of Business Administration). The research (Montgomery and Ramus, 2003) provided for an on-line survey of 279 MBA graduates of 2002 from two European and three North American business schools. The experiment, based on 17 job choice criteria, ranked ‘corporate ethical reputation’ ninth. According to Montgomery and Ramus (2003), the majority of the surveyed (94.2%) declared their willingness to give up certain financial benefits to working for a corporation with better reputation as far as social responsibility and ethics are concerned.

Similar results are described in Pruzan (2001): apart from competitive wages, professional growth and career advancement, good employees in developed countries expect their places of work to bring them pride of what they do. And those corporations where employees have no reasons to be proud of their employer face a lack of trust, confidence, enthusiasm and willingness to do their best, with an impact on financial performance. Thus, for instance, in 2000 88% of several hundred top managers of Danish corporations declared their unwillingness to cooperate with certain corporations and industries because of ethical concerns (Pruzan, 2001).

Aleshina (1998) gives an example of corporate reputation structuring as follows: corporate reputation for consumers; corporate reputation for the world community; corporate reputation for partners; corporate reputation for government agencies; corporate reputation for financial community; corporate reputation for employees; corporate reputation for non-governmental organisations; and corporate reputation for the local community. As far as corporate reputation is concerned, the necessity to distinguish different groups is attributed to different corporate perceptions.

Let us briefly analyse factors influencing corporate reputation. Top managers’ actions and statements are becoming more important (Hatch and Schultz, 1997). In addition,
corporate reputation is formed by daily interactions between employees and external groups (Hatch and Schultz, 1997). Moreover, employees are also part of external groups; therefore, corporate image might be compared with corporate identity, resulting in both synergy and cynicism (Hatch and Schultz, 1997).

According to Stern et al. (2001), corporate reputation can reflect not only interests of certain groups and their values, but also their access to information controlled (advertising, annual reporting, public relations) or not controlled (rumours, investigative reports, statements of accusers) by corporations. Therefore, corporate reputation cannot be totally controlled and depends on corporations’ actions, which makes ethics essential.

4 Approaches to corporate reputation measurement

Stern et al. (2001) analyse approaches to image (reputation) measurement and conclude that no methods are good for capturing an integral impression.

“Early measurement approaches aimed at measuring all stakeholder groups by means of an instrument that would include all relevant dimensions. <…> However, treating stakeholders as a monolithic group ignores halo effects that threaten the validity of the instruments. In an effort to overcome this, other methodological approaches aimed at measuring a single segment’s image. The flaw in singular measures is the opposite of monolithic ones …, for any measure that does not include perceptions of a corporation on the part of all stakeholder groups – employees, government, sellers, buyers, and stockholders – fails to capture the gestalt.” (Stern et al., 2001)

Berens and van Riel (2004) distinguish three main conceptual streams in reputation measurement:

1. Different types of associations based on different social expectations of corporations.
2. Different types of associations based on different features ascribed to corporations.
3. Different types of associations based on different reasons to trust or distrust corporations.

Tables 2 to 4 give examples of these conceptual streams. The first one is shown in Table 2 and belongs to Fombrun et al. (2000). The second one is shown in Table 3 and belongs to Davies et al. (2003). Table 4 displays ‘corporate credibility scale’ designed by Newell and Goldsmith (2001), representatives of the third conceptual stream in reputation measurement according to (Berens and van Riel, 2004).

Aleshina (1998) notes that reputation can be simulated using its characteristics as follows: a perception group, a set of perceptible and measurable corporate features, and corporate features’ values and weight numbers.

Primak (2002) proposes a technique for integrated assessment of corporate reputation. The approach assesses corporate reputation by the formula below:

\[ K = (K_1 + K_2 + K_3 + K_4 + K_5 + K_6 + K_7 + K_8 + R) \cdot I, \]

where \( K \) is an overall coefficient of corporate reputation; \( K_1 \) is an integral coefficient of evaluation of product reputation by consumers; \( K_2 \) is an integral coefficient of evaluation of consumers’ reputation; \( K_3 \) is an integral coefficient of evaluation of
internal corporate reputation; $K_4$ is a coefficient of evaluation of corporate managers’ reputation; $K_5$ is a coefficient of evaluation of employees’ reputation; $K_6$ is a coefficient of evaluation of visual corporate reputation; $K_7$ is a coefficient of evaluation of public corporate reputation; $K_8$ is a coefficient of evaluation of corporate business reputation; $R$ is a rating of information influence on the community through the mass media; $I$ is a coefficient of business performance.

Table 2  ‘Corporate reputation scale’ designed by Fombrun et al. (2000)

<table>
<thead>
<tr>
<th>Types of corporate associations</th>
<th>Corporate associations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products and services</td>
<td>Stands behind its products and services</td>
</tr>
<tr>
<td></td>
<td>Develops innovative products and services</td>
</tr>
<tr>
<td></td>
<td>Offers high quality products and services</td>
</tr>
<tr>
<td></td>
<td>Offers products and services that are a good value for the money</td>
</tr>
<tr>
<td>Vision and leadership</td>
<td>Has excellent leadership</td>
</tr>
<tr>
<td></td>
<td>Has a clear vision for its future</td>
</tr>
<tr>
<td></td>
<td>Recognises and takes advantage of market opportunities</td>
</tr>
<tr>
<td>Workplace environment</td>
<td>Is well managed</td>
</tr>
<tr>
<td></td>
<td>Looks like a good company to work for</td>
</tr>
<tr>
<td></td>
<td>Looks like a company that would have good employees</td>
</tr>
<tr>
<td>Social and environmental</td>
<td>Supports good causes</td>
</tr>
<tr>
<td>responsibility</td>
<td>Is an environmentally friendly company</td>
</tr>
<tr>
<td></td>
<td>Maintains high standards in the way it treats people</td>
</tr>
<tr>
<td>Financial performance</td>
<td>Has a strong record of profitability</td>
</tr>
<tr>
<td></td>
<td>Looks like a low risk investment</td>
</tr>
<tr>
<td></td>
<td>Tends to outperform its competitors</td>
</tr>
<tr>
<td></td>
<td>Looks like a company with strong prospects for future growth</td>
</tr>
</tbody>
</table>

Source: compiled by the authors on the basis of Berens and van Riel (2004)

Formulas for calculating the components of the overall coefficient of corporate reputation are given here (Primak, 2002).

For evaluating corporate reputation, Helm (2005) suggests ten indicators as follows: $X_1$ – quality of products; $X_2$ – commitment to protecting the environment; $X_3$ – corporate success; $X_4$ – treatment of employees; $X_5$ – customer orientation; $X_6$ – commitment to charitable and social issues; $X_7$ – value for money of products; $X_8$ – financial performance; $X_9$ – qualification of management; and $X_{10}$ – credibility of advertising claims.

Thus, modern scientific literature offers widely differing approaches to corporate reputation measurement.

As reputation has two components: descriptive/informational one [“...corporate image, or a total of all perceptions (knowledge) of the corporation” (Tomilova, 1998)] and evaluative one [“...we are not indifferent to information kept in our minds, instead the information elicits emotions and evaluations” (Tomilova, 1998)], we believe it possible to measure corporate reputation by evaluating how members of different groups
perceive a corporation. In fact, the actions of individuals towards a corporation are based on their attitude towards the corporation (see Figure 2).

**Table 3**  ‘Corporate personality scale’ designed by Davies et al. (2003)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Sub-dimension</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agreeableness</td>
<td>Warmth</td>
<td>Friendly, pleasant, open, straightforward</td>
</tr>
<tr>
<td>Empathy</td>
<td></td>
<td>Concerned, reassuring, supportive, agreeable</td>
</tr>
<tr>
<td>Integrity</td>
<td></td>
<td>Honest, sincere, trustworthy, socially responsible</td>
</tr>
<tr>
<td>Enterprise</td>
<td>Modernity</td>
<td>Cool, trendy, young</td>
</tr>
<tr>
<td></td>
<td>Adventure</td>
<td>Imaginative, up-to-date, exciting, innovative</td>
</tr>
<tr>
<td></td>
<td>Boldness</td>
<td>Extrovert, daring</td>
</tr>
<tr>
<td>Competence</td>
<td>Conscientious</td>
<td>Reliable, secure, hardworking</td>
</tr>
<tr>
<td></td>
<td>Drive</td>
<td>Ambitious, achievement oriented, leading</td>
</tr>
<tr>
<td>Technocracy</td>
<td></td>
<td>Technical, corporate</td>
</tr>
<tr>
<td>Ruthlessness</td>
<td>Egotism</td>
<td>Arrogant, aggressive, selfish</td>
</tr>
<tr>
<td></td>
<td>Dominance</td>
<td>Inward looking, authoritarian, controlling</td>
</tr>
<tr>
<td>Chic</td>
<td>Elegance</td>
<td>Charming, stylish, elegant</td>
</tr>
<tr>
<td></td>
<td>Prestige</td>
<td>Prestigious, exclusive, refined</td>
</tr>
<tr>
<td></td>
<td>Snobbery</td>
<td>Snobby, elitist</td>
</tr>
<tr>
<td>Informality</td>
<td>-</td>
<td>Casual, simple, easy going</td>
</tr>
<tr>
<td>Machismo</td>
<td>-</td>
<td>Masculine, tough, rugged</td>
</tr>
</tbody>
</table>

*Source:* Berens and van Riel (2004)

**Table 4**  ‘Corporate credibility scale’ designed by Newell and Goldsmith (2001)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expertise</td>
<td>The XYZ Corporation has a great amount of experience</td>
</tr>
<tr>
<td></td>
<td>The XYZ Corporation is skilled in what they do</td>
</tr>
<tr>
<td></td>
<td>The XYZ Corporation has great expertise</td>
</tr>
<tr>
<td>Trustworthiness</td>
<td>I trust the XYZ Corporation</td>
</tr>
<tr>
<td></td>
<td>The XYZ Corporation makes truthful claims</td>
</tr>
<tr>
<td></td>
<td>The XYZ Corporation is honest</td>
</tr>
<tr>
<td></td>
<td>I do not believe what the XYZ Corporation tells me</td>
</tr>
</tbody>
</table>

*Source:* Berens and van Riel (2004)

To measure corporate reputation, we have designed a special scale displaying the attitude of target group members towards a corporation as numerical characteristics belonging to the interval \([-1; 1]\) (see Figure 3).

Thus, for instance, a neutral attitude (indifference) towards a corporation equals zero; the strongest positive feeling is admiration \(= 1\); the strongest negative feeling is hatred \(= -1\). Transitional feelings between indifference and admiration are as follows: sympathy \(= 0.25\); trust \(= 0.5\); respect \(= 0.75\). Transitional feelings between
indifference and hatred are as follows: antipathy – ‘–0.25’; distrust – ‘–0.5’; disrespect – ‘–0.75’.

The suggested approach to reputation measurement is applied further to evaluate a possible impact of IP implementation on corporate image.

**Figure 2** Corporate reputation’s impact on decisions made by stakeholders and their actions towards the corporation

**Figure 3** Scale for numerical representation of attitudes of target group members towards a corporation

<table>
<thead>
<tr>
<th>-1</th>
<th>-0.5</th>
<th>0</th>
<th>0.5</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hatred</td>
<td>Disrespect</td>
<td>Distrust</td>
<td>Antipathy</td>
<td>Natural attitude</td>
</tr>
</tbody>
</table>

5 **Index of evaluation of possible impact of IP implementation on corporate reputation**

Apart from direct participants, IP implementation may affect the interests of the state, other corporations, the local community, etc. Therefore, it affects the way they perceive the corporation, in other words corporate reputation. In investment decision making, we believe it essential to consider a project’s impact on corporate reputation.

We have developed an index to consider a possible impact of IP implementation on corporate reputation – reputation improvement index. Let us examine how it is calculated.

Suppose that a researcher has to select an IP among its alternatives with due regard to a project’s possible impact on corporate reputation.

We distinguish the following steps for estimating reputation improvement index:
Step 1 To define target groups of the corporation. We believe it necessary to distinguish the following target groups, whose changing opinion of the corporation can (and sometimes must) be considered in view of IP implementation:

1. consumers (customers)
2. potential consumers
3. corporate management
4. employees
5. suppliers
6. contractors
7. business partners
8. financial institutions (banks, insurance companies)
9. population of the target region
10. government agencies
11. mass media
12. community as a whole
13. world community.

The reality may require other target groups being added to the list or a target group being divided into subgroups or even individuals and institutions being emphasised.

Step 2 To estimate the values of the following:

1. \( r_t, \ t = 1, \ T \) is the response of a target group \( t \) to the corporation at the moment (further referred to as ‘current response’).
2. \( r_{it}, \ i = 1, k, \ t = 1, \ T \) is a probable response of a target group \( t \) to the corporation, resulting from the implementation of an IP \( i \) (further referred to as ‘probable response’).
3. \( r_t^*, \ t = 1, \ T \) is a baseline response of a target group \( t \) to the corporation (further referred to as ‘baseline response’).

Figure 3 displays a scale for evaluating responses (current, probable and baseline) of target groups to the corporation. The designed scale enables us to present the response of each target group to the corporation as a number. The current and probable responses of a target group \( t \) to the corporation are the arithmetical average of respective responses (represented as numbers in line with the designed scale – see Figure 3) of members of the target group under investigation. A baseline response of a target group \( t \) to the corporation is defined by a decision maker in accordance with the designed scale.

A shift in corporate reputation driven by IP implementation may belong to \([-2; 2]\). The interval \((0; 2]\) testifies to a probable improvement in corporate reputation due to IP implementation; the interval \([-2; 0)\) testifies to a probable decline in corporate reputation as a result of IP implementation.
Table 5 gives several methods for learning the attitude of a member of a target group towards the corporation. Therefore, a variety of tools may be applied to learn the attitude of a member of a target group to the corporation. The choice of this or that tool depends on the essence of a target group under investigation and on the environment.

<table>
<thead>
<tr>
<th>Target groups</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumers (customers); potential consumers; population of the target region</td>
<td>Questionnaire, inquiry</td>
</tr>
<tr>
<td>Corporate management; employees</td>
<td>Anonymous questionnaire, inquiry</td>
</tr>
<tr>
<td>Suppliers; contractors; business partners; financial institutions</td>
<td>The current attitude is defined based on the past cooperation experience (with expert techniques being applied; experts are corporate management and employees). The future response is defined in the course of a business conversation.</td>
</tr>
<tr>
<td>Government agencies</td>
<td>The current attitude is defined based on the past cooperation experience (with expert techniques being applied; experts are corporate management and employees). The future response is defined in the course of a business conversation. In addition, media monitoring may be taken into account.</td>
</tr>
<tr>
<td>Mass media</td>
<td>Media monitoring</td>
</tr>
<tr>
<td>Community as a whole; world community</td>
<td>Media monitoring, questionnaire, inquiry</td>
</tr>
</tbody>
</table>

Thus, for instance, questionnaires are the best tool for investigating consumers’ views. Questionnaires, reflecting the current and probable responses, should be developed by a group of analysts assisted by a psychologist or a public relations manager. Psychology is essential here since straightforward questions are unacceptable as far as consumers are concerned, i.e., questions should be somehow veiled. It is inappropriate to ask a customer to express his/her current attitude towards the corporation using the scale given in Figure 3.

Questionnaires may include both multiple choice and short answer questions. Properly designed questionnaires enable analysts to evaluate the current attitude of a member of a target group to the corporation, as well as a probable response to IP implementation (in accordance with the scale given in Figure 3). Importantly, questionnaires for all projects should be processed by the same group of analysts, which lowers subjective influences.

The response of a target group as a whole is the arithmetical average of respective responses of members of the given target group in all consistent questionnaires.

A research into a possible change in how employees perceive the corporation because of IP implementation most probably requires anonymous questionnaires. This gives estimates that are more accurate since answers will be more sincere versus standard questionnaires. Questionnaires are inappropriate
Reputation aspects in investment decision making

for business partners. A business conversation is what we need to learn their attitude towards IP implementation.

Step 3 To complete Table 6, with designations as follows:

- $IP_i$, $i = 1, k$ is an alternative IP $i$; $TG_t$, $t = 1, T$ is a target group $t$ whose attitude towards the corporation is under investigation in investment decision making;
- $w_t$, $t = 1, T$ are weight numbers that express the importance of the attitude of a target group $t$ towards the corporation for corporate interests;
- $r_t$, $t = 1, T$ is the current response of a target group $t$ to the corporation;
- $r'_t$, $i = 1, k, t = 1, T$ is a possible response of a target group $t$ to the corporation, resulting from the implementation of an IP $i$;
- $r''_t$, $t = 1, T$ is a baseline response of a target group $t$ to the corporation; $k$ is a number of alternative IPs; $T$ is a number of target groups of the corporation.

Table 6 Table of data collected for evaluating reputation improvement index

<table>
<thead>
<tr>
<th>IP1</th>
<th>TG1</th>
<th>TG2</th>
<th>TG3</th>
<th>...</th>
<th>TG7</th>
</tr>
</thead>
<tbody>
<tr>
<td>$r'_1$</td>
<td>$r'_2$</td>
<td>$r'_3$</td>
<td>...</td>
<td>$r'_T$</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td></td>
</tr>
</tbody>
</table>

Step 4 To calculate reputation improvement index of an IP $i$ by the formula below:

$$RII_i = \sum_{t=1}^{T} \left( (r'_t - r_t) - (r''_t - r_t) \right) \cdot w_t, \quad i = 1, k,$$

$$\sum_{t=1}^{T} w_t = 1, w_t \geq 0, t = 1, T.$$  

($r'_t - r_t$) in the formula (1) characterises a changing attitude of members of a target group $t$ towards the corporation as a result of the implementation of an IP $i$; ($r''_t - r_t$) is a baseline change (as a rule, improvement) in the attitude of members of a target group $t$ towards the corporation, as seen by a decision maker.

Reputation improvement index takes the values within the interval $[-2; 2]$. The formula (1) is simplified by expanding the inner brackets:

$$RII_i = \sum_{t=1}^{T} \left( (r'_t - r_t) \cdot w_t \right), \quad i = 1, k.$$  

(3)
A positive reputation improvement index of an IP \( i (R_{IIi} > 0) \) testifies that in case the project is implemented corporate reputation will improve (or change sufficiently as seen by a decision maker). A negative reputation improvement index of an IP \( i (R_{IIi} < 0) \) testifies that in case the project is implemented corporate reputation will deteriorate (or change insufficiently as seen by a decision maker). In case \( R_{IIi} = 0 \), corporate reputation, relevant for a decision maker, will not change as a whole.

Practically, reputation improvement index can be applied separately or as part of integrated models for investment decision making. For the latter, it is reasonable to use reputation improvement index as follows:

\[
R_{IIi}^* = \frac{R_{IIi}}{\max_{i=1,2} |R_{IIi}|}, i = 1, k, R_{IIi}^* \in [-1; 1],
\]

where \( R_{IIi}^* \) is a standardised value of reputation improvement index of an alternative IP \( i \).

Step 5 Among alternative IPs with almost equal NPV and risk level, a decision maker should select that with the highest reputation improvement index. We suggest that projects with a negative index \( R_{IIi}^* \), \( i = 1, k \) should be excluded from consideration.

The attitude of different target groups towards the corporation may be of different importance for corporate interests. Therefore, it is necessary to define a baseline response of a target group \( t \) to the corporation as seen by a decision maker, as well as weight numbers \( w_t, t = 1, T \). A technique for the latter is described further.

Reputation improvement index along with traditional methods of investment decision making (such as NPV, IRR) lowers corporate threats at present and in the long-term.

6 Technique for evaluating weight numbers

The previous part of the research paper gives an index for evaluating a possible impact of IP implementation on corporate reputation – reputation improvement index. Valid decisions based on this index require a proper evaluation of weight numbers \( w_t, t = 1, T \), where \( T \) is a number of the corporation’s target groups. Being part of formulas (1) to (3), weight numbers \( w_t, t = 1, T \) show the importance of the opinion of a target group \( t \) for the corporation, – criteria \( W_1, \ldots, W_T \). The above is concisely presented in Table 7.

The choice of this or that technique for evaluating coefficients of importance \( w_t, t = 1, T \) depends largely on a number of decision makers, i.e., whether investment decision making is individual or group. Group decisions also have certain variations:

1 all decision makers are equal (for instance, when all corporate owners have the same decision making power)
Reputation aspects in investment decision making

For individual decisions, we consider it possible to apply the analytic hierarchy process (Saaty, 2008) as follows:

1. A decision maker makes pairwise comparisons of criteria \( W_t \) for a pairwise comparison matrix, after its completing, a vector of priorities is computed, with its components being respective weight numbers (see Table 8).

2. For a pairwise comparison matrix, the conformity of judgments is evaluated according to (Saaty, 2008).

### Table 7: Criteria for evaluating coefficients of importance

<table>
<thead>
<tr>
<th>Weight numbers</th>
<th>Designation</th>
<th>Essence</th>
</tr>
</thead>
<tbody>
<tr>
<td>( w_1 )</td>
<td>( W_1 )</td>
<td>Opinion of the corporation by representatives of target group #1</td>
</tr>
<tr>
<td>( w_2 )</td>
<td>( W_2 )</td>
<td>Opinion of the corporation by representatives of target group #2</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
<td>…</td>
</tr>
<tr>
<td>( w_T )</td>
<td>( W_T )</td>
<td>Opinion of the corporation by representatives of target group #T</td>
</tr>
</tbody>
</table>

### Table 8: A pairwise comparison matrix for evaluating coefficients \( w_t \)

<table>
<thead>
<tr>
<th>( W_1 )</th>
<th>…</th>
<th>( W_{T-1} )</th>
<th>( W_T )</th>
<th>Component of the resultant eigenvector</th>
<th>Vector of priorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>( W_1 )</td>
<td>1</td>
<td>…</td>
<td>( w_{1T-1} )</td>
<td>( w_{1T} )</td>
<td>( y_1 = \sqrt[1]{w_{11} \cdot w_{12} \cdot \ldots \cdot w_{1(T-1)} \cdot w_{1T}} )</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
<td>…</td>
<td>…</td>
<td>…</td>
<td>…</td>
</tr>
<tr>
<td>( W_{T-1} )</td>
<td>( W_{T-1} )</td>
<td>…</td>
<td>1</td>
<td>( w_{T-1T} )</td>
<td>( y_{T-1} = \sqrt[1]{w_{T-11} \cdot \ldots \cdot w_{T-1(T-1)}} \cdot 1 \cdot w_{T-1T} )</td>
</tr>
<tr>
<td>( W_T )</td>
<td>( w_{T1} )</td>
<td>…</td>
<td>( w_{T(T-1)} )</td>
<td>1</td>
<td>( y_T = \sqrt[1]{w_{T1} \cdot \ldots \cdot w_{T(T-1)} \cdot 1} )</td>
</tr>
</tbody>
</table>

Here, the above technique gives the following benefits:

1. Estimation criteria are known in advance (see Table 7).
2. All criteria are qualitative.
3. It is possible to say which estimation criterion is better (worse) than another one for a decision maker.

While completing a pairwise comparison matrix (see Table 8), bear in mind that it must be antisymmetric. The analytic hierarchy process (Saaty, 2008) pays much attention to verifying the conformity of judgments of a decision maker. To do so, the analyst should calculate conformity relation for a pairwise comparison matrix. According to Saaty (2008), a conformity relation below or equal to 0.1 is considered acceptable.
The above deals with a technique for evaluating weight numbers $w_t$, $t = 1, T$ in individual decision making. However, there are cases when decisions are made collectively, which requires a modified technique.

For group decisions with equal decision makers, one may apply the following technique:

1. Each expert (for instance, corporate owners or top managers) evaluates an antisymmetric pairwise comparison matrix (in order to compare criteria $W_t$, $t = 1, T$), for which a vector of priorities is computed and conformity relation is defined.

2. If judgements of all experts are consistent, then a certain weight number is the arithmetical average of respective weight numbers obtained by all experts.

3. If judgements of a certain expert are inconsistent, they should be reviewed and a pairwise comparison matrix should be refilled (see Table 8); then apply point 2 of the above technique.

For group decisions with unequal decision makers, the evaluation of weight numbers may represent a hierarchy given in Figure 4.

Figure 4  Hierarchy of evaluating weight numbers $w_t$, $t = 1, T$

Applying the analytic hierarchy process (Saaty, 2008), after evaluation of vectors of private priorities, one can compute the components of a vector of general priorities (values of respective weight numbers) by the formula below:

$$w_t = \sum_{i=1}^{S} e_i \cdot w_{st}, t = 1, T,$$

where $e_i$ – $S$ expert's experience level; $w_{st}$ – importance of a criterion $W_t$ according to an expert $S$; $S$ – a number of experts; $T$ – a number of the corporation's target groups.

When the true values of experts' experience levels are unknown, weight numbers are evaluated using a matrix model of evaluation of these coefficients, i.e., a model of evaluation of weight numbers based on solving a respective matrix game.
7 Matrix model of weight numbers evaluation

Here, we offer a model for evaluating weight numbers, based on solving a respective matrix game. Importantly, the model can be applied even in case of unknown true values of experts’ experience levels. The mathematical tools used by this model are not complicated. Their acquisition requires only the essentials of the theory of matrix games described by such classics as von Neumann and Morgenstern (1944) or Blackwell and Girshick (1954).

Examine a matrix game set by a payoff matrix \( W = W_{S\times T} = (w_{st}) \), i.e., finite two-person zero-sum game. A matrix game is known as a system \( \Gamma_W = (S, T, W) \) where \( S = \{1; 2; \ldots; s; \ldots; S\} \) is a set of the first player’s pure strategies (i.e., of player 1), \( T = \{1; 2; \ldots; t; \ldots; T\} \) is a set of the second player’s pure strategies (i.e., of player 2), \( W = W_{S\times T} = (w_{st}) \) is either totally or partially known payoff matrix, \( w_{st} \) is a payoff of player 1 in a situation \((s; t)\), i.e., in case player 1 plays a pure strategy \( s \) while player 2 plays a pure strategy \( t \). In each game a loss of player 2 equals a payoff of player 1.

Note the designations as follows:

\[
p = (p_1; p_2; \ldots; p_s)
\]

is a vector that characterises probabilities of player 1 playing his pure strategies in repeated games;

\[
q = (q_1; q_2; \ldots; q_t)
\]

is a vector that characterises probabilities of player 2 playing his pure strategies in repeated games;

\[
V = V(p; q) = p \cdot W \cdot q^T = \sum_{s=1}^{S} \sum_{t=1}^{T} w_{st} \cdot p_s \cdot q_t
\]

is the payoff function of a matrix game \( \Gamma_W \), where \( q^T \) is a transpose of vector \( q \).

For simplicity, we identify players’ strategies with a vector that characterises probabilities of a respective player playing his pure strategies in repeated games. The sets of strategies of player 1 and player 2 are as follows:

\[
S_1 = \left\{ p = (p_1; p_2; \ldots; p_s) \mid \sum_{s=1}^{S} p_s = 1, \quad p_s \geq 0, \quad s = 1, S \right\}
\]

\[
S_2 = \left\{ q = (q_1; q_2; \ldots; q_t) \mid \sum_{t=1}^{T} q_t = 1, \quad q_t \geq 0, \quad t = 1, T \right\}
\]

Vectors \( p \) and \( q \) may characterise both pure and mixed strategies of players. Provided that a component of vector \( p \) (or \( q \)) equals \( 1 \), while the other components equal \( 0 \), the vector characterises a pure strategy of a respective player, when each time the player plays the same pure strategy.

In matrix games players have conflicting interests. Therefore, to select their optimal strategies, players focus on the worst game outcome. According to the guaranteed result principle, each player expects the other player to play the best, i.e., players tend to be...
very pessimistic. If before a game an opponent gets to know what pure strategy will be applied by a player, the opponent will play his best pure strategy in the game.

Assessing their pure strategies according to the guaranteed result principle, players find their lowest payoffs for each pure strategy. Player 1’s guaranteed payoffs are the smallest numbers in the rows of a payoff matrix, i.e., numbers \( \alpha_s = \min_t w_{st}, s = 1, \ldots, S \). Similarly, player 2’s guaranteed losses are the largest numbers in the columns of a payoff matrix, i.e., numbers \( \beta_t = \max_s w_{st}, t = 1, \ldots, T \). Among guaranteed (worst) results, we should determine the best one for interests of a respective player: the maximum payoff of player 1 among the minimal in the rows and the minimal loss of player 2 among the maximum in the columns: \( \alpha = \max_s \alpha_s \) is maximin (game’s lower pure value), \( \beta = \min_t \beta_t \) is minimax (game’s upper pure value). In any matrix game \( \Gamma_W \) lower pure value does not exceed upper pure value: \( \alpha \leq \beta \).

An equilibrium point in matrix games is represented by a strategy pair \( p^* \in S_1, q^* \in S_2 \), for which the following is true

\[
V(p^*; q^*) \leq V(p^*; q) \leq V(p; q^*), \quad \forall p \in S_1, \forall q \in S_2.
\]

The term ‘equilibrium point’ is synonymous with the term ‘saddle point’. Players’ strategies \( p^* \in S_1, q^* \in S_2 \) that define an equilibrium point in a matrix game \( \Gamma_W \) are regarded as optimal strategies. For solving a matrix game \( \Gamma_W \) one should find players’ optimal strategies. The solution of some matrix games rests with pure strategies, while other matrix games require mixed strategies.

A saddle point of a payoff matrix of game \( \Gamma_W \) is a situation \((s^*; t^*)\) for which the following is true

\[
w_{s^*t^*} \leq w_{s't} \leq w_{st^*}, s = 1, \ldots, S, t = 1, \ldots, T.
\]

If a matrix game \( \Gamma_W \) has at least one saddle point of payoff matrix, the matrix game is called a game with saddle point. A matrix game \( \Gamma_W \) is solved by pure strategies when and only when \( \Gamma_W \) is a game with saddle point, at the same time equilibrium is determined by any saddle point of a payoff matrix of game \( \Gamma_W \), i.e., situation \((s^*; t^*)\) complying with the above inequations.

Obviously, a matrix game \( \Gamma_W \) is a game with saddle point when and only when \( \alpha = \beta \), where \( \alpha = \max_s \alpha_s \) and \( \beta = \min_t \beta_t \) are lower and upper pure values. If a matrix game \( \Gamma_W \) has different lower and upper pure values, i.e., strict inequality \( \alpha < \beta \) is true, the game cannot be solved by pure strategies. In that case in repeated games players should rotate their pure strategies, selecting a pure strategy for each game in a random way according to some probabilities, i.e., according to some optimal mixed strategies \( p^* \in S_1, q^* \in S_2 \).

For any matrix \( W = W_{S \times T} = (w_{st}) \) equation

\[
\max_p \min_q V(p; q) = \min_p \max_q V(p; q)
\]

is true, therefore in any matrix game \( \Gamma_W \) players have optimal mixed strategies. Strictly speaking, any matrix game \( \Gamma_W \) has a solution, possibly not just one, at the same time, if a matrix game is a game without saddle point, for which \( \alpha < \beta \), then at least one player’s optimal strategy is a mixed strategy.

Therefore, solving a matrix game \( \Gamma_W \) means determining a saddle point \((p^*; q^*)\), i.e., optimal strategies \( p^* \) and \( q^* \) of both players. At the same time, if a matrix game \( \Gamma_W \) is a game with saddle point, the game is solved by pure strategies; if a matrix game \( \Gamma_W \) is a game without saddle point, the game cannot be solved by pure strategies, and at least one player’s optimal strategy is a mixed strategy therewith.
The general method of solving matrix games is based on reducing them to a symmetric pair of dual problems of linear programming. Games of higher dimension have approximate solution methods to accurately define players’ optimal strategies. Importantly, these approximate solution methods are computer friendly.

Let the formula (5) includes unknown true values of experts’ experience levels $e_r$. Examine a matrix game $\Gamma_W$ set by a matrix $W = W_{s,t} = (w_{st})$, where $w_{st}$ is the importance of a criterion $W_t$ according to an expert $S$. The matrix game is considered a game without saddle point, i.e., strict inequality $\alpha < \beta$ holds true. Then the numbers $e_s = p^*_s$, $S = 1, S$ can be taken as the values of experts’ experience levels, where $p^*_s$ is a certain component of an optimal mixed strategy $p^*$ of player 1. Substituting these values in the formula (5), one can estimate the values of the components of general priorities vector (values of respective weight numbers).

8 A case study for the designed model

Examine a case study for reputation improvement index. A company ‘N’, located in a former Soviet Union republic and focused on smart clothes production and sale, plans an expansion through adding a new business. It has to choose between two alternative projects $A$ and $B$.

Project $A$ is putting into operation mink coat production facilities. Having done a research, analysts see the necessity of launching a mink farm. As the company plans a complete production cycle from fur production to manufactured goods and their sale within the existing corporate chain, the prices of mink coats are to be competitive and the company is supposed to be rather flexible.

Project $B$ is the construction of artificial leather capacities and the production of stylish ladies’ accessories. The project is to apply a unique state-of-the-art technology of artificial leather manufacturing. Apart from resemblance with genuine leather, the substitute of the natural material has such benefits as durability, elasticity and breathability.

The analysts forecast cash flows of the projects $A$ and $B$ and calculate indices of efficiency with due regard to risk levels. To consider risk levels, they apply simulation modelling. The expected $NPV$ of the project $A$ makes up 3,247,080 currency units, while the expected $NPV$ of the project $B$ constitutes 2,463,070 currency units.

If decision making is entirely focused on ‘expected $NPV$’, then the project $A$ has more benefits and should be recommended for implementation.

However, in investment decision making, the analysts should take into account another important aspect – an impact of IP implementation on corporate reputation. This will be discussed further. A careful study shows that the mink coat project may have a negative impact on corporate reputation, as one mink coat of classic length requires an average of 40 minks.

To evaluate a possible impact of the IPs on corporate reputation, the analysts distinguish five target groups: $TG_1$ – domestic consumers, $TG_2$ – employees, $TG_3$ – the mass media, $TG_4$ – foreign business partners, $TG_5$ – domestic business partners. The company’s top managers define a baseline response of each target group to the company in line with the scale in Figure 3 (see Table 9).
Questionnaires are used to evaluate the current response of domestic consumers (target group $TG_1$) to the company. Questionnaire #1 for domestic consumers includes both multiple choice and short answer questions. The analysis of each questionnaire shows the current attitude of a certain consumer towards the company. The index under investigation for the target group as a whole is the arithmetical average of all results from consistent questionnaires. While processing questionnaires, the analysts bear in mind that a stronger feeling always dominates a weaker feeling.

Anonymous questionnaires are used to define the current attitude of the employees (target group $TG_2$) towards the company. Employees’ questionnaires #1 are processed similarly to $TG_1$.

Media monitoring #1 for the previous 12 months is required to define the current attitude of the mass media ($TG_3$) towards the company. The Public Relations Department of the company ‘N’ regularly does media monitoring. Each non-commercial (not paid for) publication/material is analysed separately, and the author’s attitude towards the company is defined by the designed scale. Then the general attitude of each mass media towards the company is calculated as the arithmetical average of all publications/materials. As different mass media deal with different (quantitatively) audiences, the analysts calculate weight numbers of each mass media by the formula below:

$$\theta_y = \frac{q_y}{\sum_{y=1}^{Y} q_y}, \, y = 1, Y,$$

where $\theta_y$ – weight number that defines the priority of a mass media $y$; $q_y$ – audience influenced by a mass media $y$, persons; $y$ – ordinal number of a mass media; $Y$ – a number of mass media under investigation.

Then to evaluate the current response of $TG_1$ to the company, the analysts calculate a sum of productions of respective weight numbers (defining the priority of a certain mass media) and values for respective mass media, which express their attitude towards the company.

The current attitude of $TG_4$ and $TG_5$ (foreign and domestic business partners) towards the company is defined through open discussion among the top managers.

Questionnaire #2 is designed to define a possible response of domestic consumers to the company, resulting from the implementation of the alternative IPs. Questionnaire #2 aims at defining consumers greatly concerned in animal protection. Respondents can write down their comments to show a possible response to the company, resulting from the implementation of the alternative IPs. If some consumers are indifferent, then the analysts assume that their attitude will stay the same as in questionnaire #1 because of IP implementation.

A possible response of $TG_1$ (domestic consumers) to the company due to each IP is the arithmetical average of respective values in all consistent questionnaires.

<table>
<thead>
<tr>
<th>Target group</th>
<th>$TG_1$</th>
<th>$TG_2$</th>
<th>$TG_3$</th>
<th>$TG_4$</th>
<th>$TG_5$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$t^*$</td>
<td>0.5</td>
<td>0.7</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>
A similar but anonymous questionnaire is designed for the employees. A distinction in processing these questionnaires is as follows: if an employee is indifferent to animal protection, then for him/her the analysts take the general value from questionnaire #1.

Media monitoring #2, focused on animal protection issues, is carried out to define a possible response of the mass media to the company, resulting from the implementation of the alternative IPs. The results of media monitoring #2 are processed similarly to media monitoring #1.

A possible response of foreign and domestic business partners to the company because of IP implementation is defined through verbal communication (business meetings, phone conversations, and webcasting).

The given study results in Table 10 uniting all data for calculating reputation improvement index. The attitudes of all target groups are of equal importance for the company, therefore all weight numbers \( \omega_t = \frac{1}{5} \) equal 0.2.

<table>
<thead>
<tr>
<th>Target group</th>
<th>TG_1</th>
<th>TG_2</th>
<th>TG_3</th>
<th>TG_4</th>
<th>TG_5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project A</td>
<td>0.4</td>
<td>0.5</td>
<td>0.2</td>
<td>-0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Project B</td>
<td>0.6</td>
<td>0.8</td>
<td>0.6</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>0.7</td>
<td>0.4</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>0.7</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>wt</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Table 11 displays the results of computations by the formulas (3)-(4).

<table>
<thead>
<tr>
<th>Investment project</th>
<th>RII_i</th>
<th>RII_i*</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Manufacture of mink coats</td>
<td>-0.30</td>
<td>-1.00</td>
</tr>
<tr>
<td>B: Production of accessories</td>
<td>0.14</td>
<td>0.47</td>
</tr>
</tbody>
</table>

The standardised value of reputation improvement index of the project A equals ‘–1.00’, while that of the project B equals ‘+0.47’. It is obvious that the IP A (mink coats manufacture) will have a negative impact on corporate reputation, yet the IP B (artificial leather accessories production) will improve corporate reputation. The company’s management, with due regard to the above, gives preference to the IP B, which deals with the production of artificial leather accessories.

9 Conclusions

Corporations are complex economic and social systems constantly developing and interacting with an evolving external environment. The external environment can be regarded as a set of corporate threats and opportunities. Corporate managers should resist threats and enhance corporate security.
Decline in corporate reputation is a substantial threat, with an impact on many aspects of corporate performance. Disrepute is generally hard to recover/improve, and negative effects of disrepute for corporations are often unpredictable. At the same time, corporate reputation depends on particular actions of top managers and employees. Therefore, decision making (including investment one) requires corporate ethics and social responsibility.

For successful performance in the market economy corporations should care about positive reputation. A distinction is made among the following notions: ‘corporate image’, ‘corporate identity’ and ‘corporate reputation’. Scientific literature offers an approach combining ‘corporate identity’ (internal corporate perception) with ‘corporate image’ (external corporate perception) to make ‘corporate reputation’.

Modern scientific literature offers widely differing approaches to corporate reputation measurement. We believe it possible to measure corporate reputation by evaluating how members of different groups perceive a corporation. In fact, the actions of individuals towards a corporation are based on their attitude towards the corporation. To measure corporate reputation, we have designed a special scale displaying the attitude of target group members towards a corporation as numerical characteristics belonging to the interval \([-1; 1]\). The designed scale enables us to present the response of each target group to the corporation as a number.

A variety of tools (questionnaire, inquiry, media monitoring, etc.) may be applied to learn the attitude of a member of a target group towards the corporation. The choice of this or that tool depends on the essence of a target group under investigation and on the environment.

We have developed an index to consider a possible impact of IP implementation on corporate reputation – \textit{reputation improvement index}. It takes the values within the interval \([-2; 2]\). A positive \textit{reputation improvement index} of an IP testifies that in case the project is implemented corporate reputation will improve (or change sufficiently as seen by a decision maker). A negative \textit{reputation improvement index} of an IP testifies that in case the project is implemented corporate reputation will deteriorate (or change insufficiently as seen by a decision maker). In case \textit{reputation improvement index} = 0, corporate reputation, relevant for a decision maker, will not change as a whole.

Among alternative IPs with almost equal \textit{NPV} and risk level, a decision maker should select that with the highest \textit{reputation improvement index}. \textit{Reputation improvement index} along with traditional methods of investment decision making (such as \textit{NPV}, \textit{IRR}) lowers corporate threats at present and in the long-term.

If the impact of IP implementation in value terms were added to IP cash flow, the given factor could be considered while calculating \textit{NPV}. However, we believe it rather challenging to express the impact of an IP on corporate reputation in value terms.

Remember that disrepute is generally hard to recover and negative effects of disrepute for corporations are often unpredictable and difficult to be expressed in value terms, which are attributed to the presence of different target groups. The current implementation of an IP may affect corporate reputation both in the near and long-term.

\textit{Reputation improvement index} is easy to understand and gives a value close to reality, resulting from a simple research (inquiry, questionnaires, media monitoring, etc.). As questionnaires and inquiry results are processed by the same team regarding the impact of all alternative IPs on corporate reputation and as the team applies the same scale, it is hoped that subjective influences will be minimal.
The attitude of different target groups towards a corporation may be of different importance for corporate interests. Therefore, it is necessary to define a baseline response of a target group \( t \) to the corporation as seen by a decision maker, as well as weight numbers \( w_t \). To evaluate weight numbers \( w_t \), we believe it possible to apply the analytic hierarchy process.

When the true values of experts’ experience levels are unknown, weight numbers are evaluated using a matrix model of evaluation of these coefficients, i.e., a model of evaluation of weight numbers based on solving a respective matrix game.

References


