

Systematic Model for Investment Risk Analysis: Reconciling Strategic Planning and Project Risk Management

Mahdi Rostami¹

¹Assistany Professor, Energy Economics and Management Department, Petroleum University of Technology, Tehran, Iran

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ABSTRACT

The process of Project Risk Management starts with a given list of projects. However, it seems that the risk of inappropriate project list is ignored in project risk management. Building on both the literature of Strategic Management and Project Risk Management, this paper introduces a practical systematic model for investment risk analysis. The basic idea behind the model is that well-crafted competitive and corporate strategies could be used as guideline to select appropriate projects. Applying the proposed model could help managers to prepare a list of projects with desired risk-return profiles within the company's strategies as a prerequisite for project risk management.

KEYWORDS: Strategic Planning, Project Risk Management, Investment Risk Analysis

1. INTRODUCTION

Project risk management standards such as PMBOK¹ [1] starts with a given list of projects. These standards do not provide any guideline how to manage the risk of selecting inappropriate projects that even if successfully implemented and managed from different risks perspectives, might not ultimately enhance organizational performance. Investment plan of a company in a form of different projects (such as construction projects, research and development projects, etc.) depends on international factors, general political economy of a country, industry factors and internal condition of a company. The frame of reference for the preparation of such a plan is reflected in company's strategies. Corporate strategies is about the domain selection, and growth path while competitive strategy shows how a company competes with the competitors in the market place [2]. In the meantime, implementation of those strategies, which are defined as projects, need appropriate financing. The financing could be through company's internal, external resources or combination of them. Building on both the literature of Strategic Management and Project Risk Management, this paper introduces a practical systematic model for investment risk analysis in which risks associated with the process of selecting investment projects are minimized.

Introduction of the concept of risk into the strategic management goes back to the late 1970's and the seminal paper "Prospect theory: an analysis of decision under risk" by Kahneman and Tversky [3]. According to the Prospect theory, there is negative relationship between risky strategic decisions and firm performance. Bowman [4], Bromiley [5], Sitkin and Pablo [6] developed and empirically tested the theory in different industries. In contrast, Staw et al., [7] proposed that according to "Threat- Rigidity" perspective, organizational decline makes organizations more conservative and risk averse due to fewer resources and limited cognitive capacity, thus there is a positive relationship between organizational performance and risky decision making. Empirical findings are also contradictory, some support Prospect theory [8,9] while others support Threat-Rigidity perspective [10]. To explain the puzzle, March and Shapira [11] presented a shifting focus model, in which argued that a manager's decision to undertake acquisitions may be best explained by paying sequential attention to a firm's survival and aspiration goals. Managers first decide whether their firm is at risk of survival. If it is, then according to threat rigidity theory they are unlikely to make a strategic change like an acquisition. If the firm is meeting its survival goal then managers turn their attention to their aspiration performance goal. In this paper, building on the risk and strategic management literature, I take different perspective to present a conceptual framework enables us to evaluate different risks and rewards associated with different strategic alternatives.

2. Investment risk analysis model

¹ Project Management Body of Knowledge (PMBOK)

* **Corresponding Author:** Mahdi Rostami, Energy Economics and Management Department, Petroleum University of Technology, Tehran, Iran, mrostami@put.ac.ir

Figure 1 portrays the Investment risk analysis model (IRA).

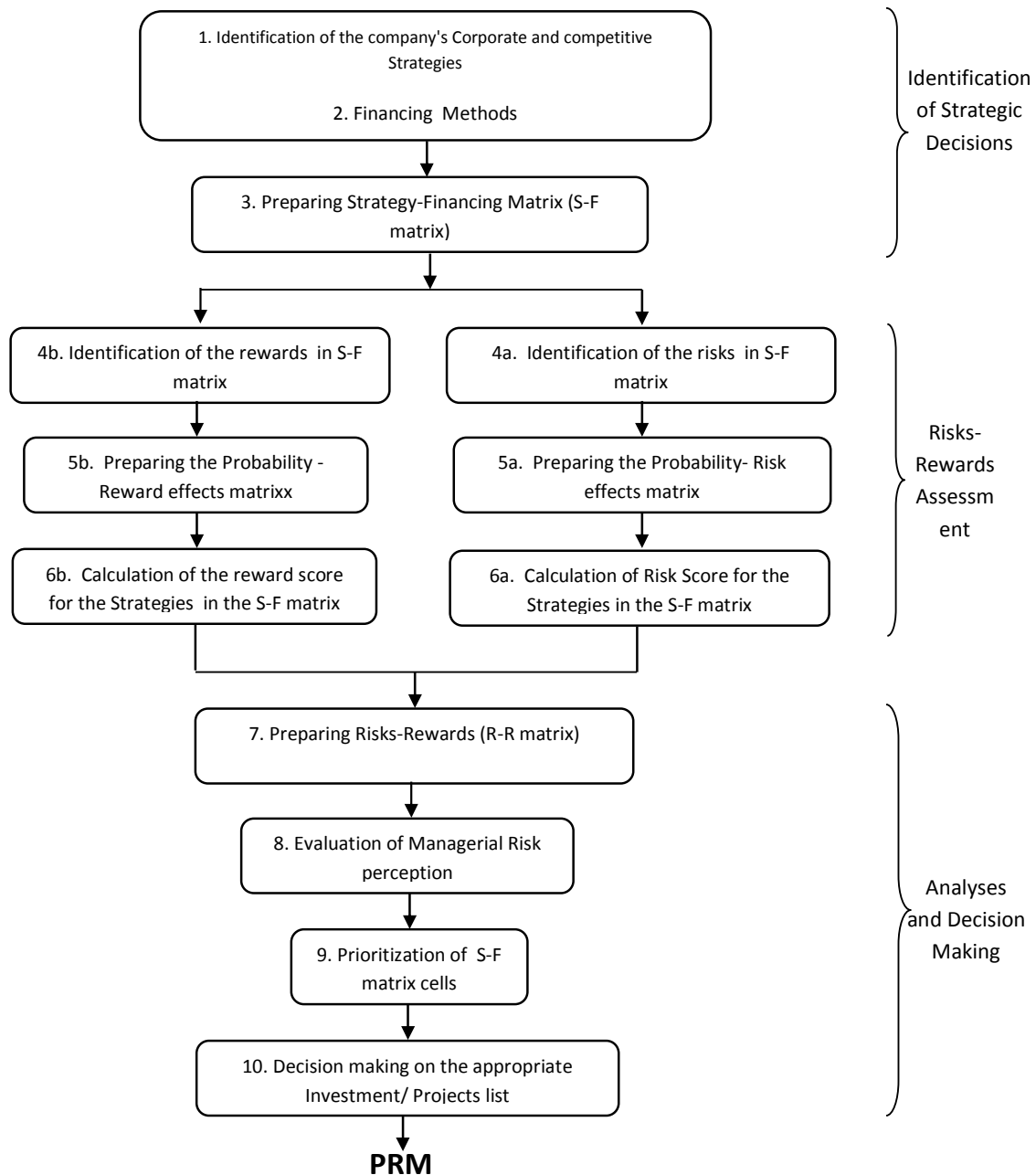


Figure 1: The Investment Risk Analysis (IRA) Model with focus on Risk -Rewards

The IRA model consists of three distinctive stages. In the stage one, different types of strategic decisions and their financing methods should be identified. In the second stage, risks and rewards need to be assessed. In the final stage, strategies should be ranked considering their relevant risks and rewards and consequently the list of appropriate projects list within the high priority strategies need to be prepared.

3. Identification of Strategic Decisions

According to the Figure 1, identification of a company's strategic decisions includes identification of the corporate and competitive strategies, financing methods form implementation of those strategies as well as preparing the Strategy-Finance (S-F) matrix. Therefore, it seems that a necessary condition to use the proposed model (i.e. IRA model) is the existence of the strategic plan in the company. Strategies are divided in to two major categories. Corporate strategies is about company's domain selection and growth path. Major corporate strategies are integrations, diversifications, intensive and defensive strategies [1]. Competitive strategies is on domain navigation which determines how a company

is to compete with the other companies. On the other hand a company should decide whether to finance the implementation of the strategies internally, externally or mixed. Figure 2 shows the strategy- financing matrix.

Financing Methods	Internal resources						
	External resources						
	Joint Ext-Internal resources						
		Cost leadership	Differentiation	Diversification	Intensive	Defensive	Integration
Corporate and Competitive Strategies							

Figure 2. The Strategy- Financing Matrix

4. Risks –Rewards Assessment

In this stage, different risks related to every choice in the S-F matrix need to be documented and then the probability and the impact of the risks should be assessed. The result is the risk probability- Impact (P-I) Matrix [12]. Figure3 shows the P-I matrix in which the letter S, stands for strategy, the first digit is the code for the strategy and following digits is the risk code. Measurement scales for risk probability and the risk impact are 5 point scale which are assessed by the experts.

Risk Probability	Very high	S51		S21	S23	
	High	S61	S41, S62, S63	S11, S52	S34, S64	S22
	Medium	S57, S13, S14, S37	S12, S31, S32, S46, S610	S36, S42, S68, S69		S65, S66
	Low	S35, S38	S26, S27, S39	S25	S611	S24, S43
	Very low		S33, S53	S44, S45	S56, S67	S54, S55
		Very low	Low	Medium	High	Very high
Risk Impact						

Figure 3. Risk Probability-Impact Matrix

If we consider a relevant weight (APRA, 2012) for each points of the mentioned scale (i.e. Very Low=0.05, Low=0.1, Medium=0.2, High= 0.4, Very high=0.8), then we can simply calculate the risk score for each strategic choice (cell) in the Figure 4- P-I matrix as follows:

Risk Probability	0.8	0.04	0.08	0.16	0.32	0.64
	0.4	0.02	0.04	0.08	0.16	0.32
	0.2	0.01	0.02	0.04	0.08	0.16
	0.1	0.005	0.01	0.02	0.04	0.08
	0.05	0.0025	0.005	0.01	0.02	0.04
		0.05	0.1	0.2	0.4	0.8
Risk Impact						

Figure 4. Risk Probability-Impact Scores Matrix

As it is shown in risk P-I score matrix, total score for every cell depends on the risk probability and impact. If a strategic choice such as differentiation has a high probability and high impact score (up right corner with score greater than 0.32), then it would be high risk strategy.

Similarly, Return Probability- Impact matrix and Return Probability- Impact Score should be designed and calculated. The later matrix helps manager to identify low return and high return strategies.

5. Analyses and Decision Making

This stage starts with the analysis of total risk and reward scores in a form of Risk-Reward matrix (R-R matrix) as follows:

		Reward Scores	
		Low	High
Risk Scores	Low	Conservative	Superior
	High	Inefficient	Risky

Figure 5. Risk – Reward Scores Matrix

As Figure 5 Depicts, the Risk-Reward scores matrix illustrates the joint result of risk and reward of strategic decisions within a company. Strategies with high reward and low risk scores are the superior ones, strategies with low rewards and high risk scores are definitely "inefficient" and should be avoided. Selection of other choices (i.e. low risk-low reward, high risk- high reward) depends on the managerial philosophy and perception toward risk, company's performance, managerial authorities and other contingency factors. Using the R-R matrix helps managers to ranks the strategic decisions and consequently prepare a list of projects to implement the desired strategies.

6. Conclusions and Implications

The present study aims to investigate the questions " Does the process of decision making on a company's projects list face any risk?" and "Is there a prerequisite for the project risk management? In this paper we provided a practical systematic model for investment risk analysis as a guideline how to manage the risk of selecting inappropriate projects that even if successfully implemented and managed their relevant risks, might not ultimately enhance organizational performance. Our three stage IRA model consists of three distinctive stages; identification of strategic decisions and their financing methods, assessment of risks and rewards associated with the strategies, and ranking strategies considering their relevant risks and rewards. The main result of the proposed model will be the list of appropriate projects list within the high priority strategies.

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