



## **ACADEMIC YEAR 2011 – 2012**

### **TITLE OF DIPLOMA THESIS:**

Improvement of a Risk Based Decision-Making Methodology

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### **ABSTRACT**

Decision making constitutes an integral part both of human life and society, affecting thus its progress at every level and sector. For this reason, decision making concerns the scientific community over many years, resulting in numerous researches and in an equally large number of decision-making methods, each of which responds to different needs. The complexity characterizing the decision making problems, the risks involved in them and the variability of each system under consideration should be taken into account in the decision making process. All these can be accomplished applying the methodology suggested by Xenidis et al., (2011), which approaches the multicriteria problem comprehensively and tries to lead to more integrated and realistic results. This method is based on the risk and takes into account the preference of the decision maker. In the present study, the improvement of the mathematical documentation of the already improved risk-based decision making methodology is attempted. To this task, an appropriate mathematical model and an alternative method of calculation and presentation of the decision maker's preference are implemented. Eventually, an improved risk-based decision making methodology is developed, the main characteristic of which is the adaptability, as with any incoming future risk value, it can provide the optimal decision.

### **KEYWORDS**

Decision making theory, Risk, Time series data, Forecasting models, ARIMA