Chapter 48
Modern Risk Management Techniques in Banking Sector

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ABSTRACT
Risk management as a very rapid emerging subject has been affected by several happenings in the world. There are many studies covering risk definition, risk types, and risk management, plus there are many contemporary approaches in order to calculate the risk incurred by the companies due to their transactions. In the modern business life, since the transactions have become very fast and their risk exposure increases, the companies, especially the financial institutions, started to use new techniques to measure the probable effects of the risks that they have taken while undertaking the transactions. In this chapter, the authors show two techniques as the contemporary approaches to risk management. These are operations research and statistics. They know that these two concepts are very detailed and sophisticated tools, which require software for better results. The banks have been investing in these solutions, and they are designing new organizations to handle these issues. Thus, the authors introduce these techniques very briefly with using some banking practices for better understanding.

INTRODUCTION
The Chinese word for “crisis” represents “danger” and “opportunity,” which shows “risk” and “gain” are sisters.

As the entire world becomes more united and many countries began to be the part of international trade, they have enacted many laws in order to sustain the continuity of these transactions. They have agreed on the financial deregulations which are the main milestone to open the local country for international transactions by allowing imports and exports. These happenings were firstly welcomed by the local people since the imported goods more easily provided and the public was benefiting from the competition due to the different brands in the same sector. This is the main advantage of financial deregulations and open market transactions.

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However, as the transactions become more fast, they became also uncontrollable. Due to this uncontrollable structure of the transactions, many speculators have invested into many emerging markets in order to benefit from the high interest gain. For instance US investors have converted their local currency to emerging countries’ currencies in order to buy their currencies which have a yield of 50-100% in the mid-1990s. This led to unbelievable profits which were impossible to be earned in US in one year period.

Not only the foreign investors but also the local individuals and also the banks have done the same in order to reach big profits. However, since the type of these investments were portfolio investments rather than direct investments such as real estate or project investments which reduce unemployment, they have not added value in the financial strength of the country. Thus, they did not increase the welfare of the public in that country. For example, the unemployment was very volatile and has not decreased to the accepted rates; the GDP per person has not reached the developed countries’ figures. These were the frequent sayings against financial deregulations and globalization. However, after any bad happening about the political or economic structure of the country it was seen that the portfolio investments have left the country. This shows that these funds may cause may financial disability if they are not ruled or managed in a clear way.

Therefore, many emerging countries like Argentina, Mexico, Brazil, Turkey etc. have entered into crises environments. This showed that the reserves of the central banks were not enough and the financial strengths of the local banks were not able to satisfy the needs of these portfolio investors. Furthermore, the banking sectors of many emerging markets had entered into a very tough competition which brings the financial weaknesses. The financial weaknesses of the banks were stemming from two main causes; insufficient liquidity and capital. This was the result of the aggressive growth strategies of the banks by ignoring risk management.

As it is mentioned in the below paragraphs, the need for risk management has been understood after the crises happened in several emerging countries. Therefore these countries started to pay more attention to risk management and they have implemented new techniques in order to prevent big losses of especially banking sector. They have realized that if banking sector goes under financial distress not only financial sector but also many sectors have been badly affected from these happenings. This put stress on the financial regulators of different countries to implement new acts and regulations involving different and modern risk management techniques to be imposed on the banks and other financial sector actors.

In this chapter we will try to show what these techniques are and how these techniques can be used by the banks. However before going forward that stage we need to show what risk is and how risk management should be defined in banking sector. Afterwards, we will be dealing with the risk types imposed on banking sector. The risk types will be purchase power risk, interest rate risk, market risk, politic risk, FX risk, liquidity risk, credit risk, operational risk, financial risk, management risk and company and industry risk. In order to manage risk by mitigating it, there would be several business tools relying on operations research and statistics. The definitions, theory and examples of these techniques will be clearly explained throughout the chapter.

**WHAT IS RISK AND RISK MANAGEMENT?**

Before going forward into the deep details of this study, we should define what risk is and what the usage of risk management is. Since we are living in a very complex world with a wide variety of transactions, we need more sophisticated decision making tools than before. Since the variety