Chapter 20
Programming Global Strategy to Maximize Net Income Modeling Legal Conditions and Corporate Values

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ABSTRACT

Planning has always been a challenge for managers and decision makers. In particular, if the manufacturing facilities are located in several countries, significant differences in tax and legal requirements have to be taken into consideration during the process. Corporate policies regarding profit sharing schemes will also play a role in final income. This work proposes a production planning systematic approach based on mathematical programming models applied to income statements in order to allocate production for the next operating period of time taking into account the mathematical modeling of corporate ethics, principles and values. Several manufacturing facilities located in different countries have to produce forecasted demand of a number of families of products, each of which can only be manufactured in a reduced subset of all the manufacturing plants. This production assignment process seeks to maximize corporate net income while complying with local regulations and corporate policies. Investors will find models useful for evaluating new plant and product allocation schemes.

INTRODUCTION

Managerial decision-making has always been a challenge. Finding the right course of action within a set of constraints constitutes one of the most important functions that a top executive must undertake. The level of complexity involved in decision-making increases substantially as globalization continues to develop worldwide. Corporate business schemes need to take into consideration regional conditions

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where manufacturing is performed; cross-country differences may influence overall decisions in terms of operations as well as financial results. Legal requirements and corporate policies play a key role when strategic planning points towards the economic well-being of the enterprise. The saying, "Think global, act local" (Geddes, 1915; Walter, 2004) is the rule to be followed today.

Data driven decision-making is being introduced in environments where intuition, common sense, and past experiences usually provide the basis for management alternatives to be chosen. Large amounts of data are stored in databases and data warehouses in order to be processed through the application of one or more scientific tools providing trends, confirming business hypotheses, and even presenting the most favorable scenarios of a company for top management from which to choose. The cycle that begins with Big Data (BD) then proceeding to Business Analytics (BA) and ending with a strategic decision as Business Intelligence (BI) is a common improvement procedure systematically applied by top business performers around the world and they make decisions based on rigorous analysis (MIT Sloan Management Review and IBM Institute of Business Value, 2010). Through such methodology, there is a continuous search for growth, efficiency, and competitive advantage. Business value is the reward obtained, but the primary focus is financial.

BA provides a rigorous, systematic, quantitative, and data driven approach to decision-making (Birnberg, 2009; Davenport & Kim, 2013). As a business enabler, BA has three types of analytics to be applied to the data collected: descriptive, predictive, and prescriptive (Bayrak, 2015). Prescriptive Analytics (PA) is the focus of interest with regards to planning. The question to be answered is: What is the best course of action to be taken, given a strategic economic objective to be achieved and subject to a set of operating constraints? Forecasting, cost estimation, and mathematical optimization are some of the tools that can help answer such question in a quantitative manner.

In fact, the application of powerful techniques of mathematical optimization from Operations Research (OR) is not new in business decision-making (Dechow & Mouritsen, 2005; Romanenko & Artamonov, 2014; Asllani, 2015). A comprehensive review is listed in Righetto et al. (2016). The need to incorporate financial aspects of a business enterprise into these tools has been indicated for more than half a century (Baumol, 1952; Vatter, 1967; Hartley, 1968); in particular, models that lead to optimization in policy and investment strategies have been recently proposed by Zhou et al. (2016) and Righetto et al. (2016).

Given a specific decision model, the likelihood of success of the solution suggested is always a function of the reliability of the data employed. The traditional algorithms that lead to a solution have been thoroughly tested and managers can depend on the use of OR tools constantly. However, frequent developments in the international business arena give rise to new problems with challenging objectives requiring extended models and methods (Merchant, 2012; Accenture, 2013; Kiron et al., 2014).

The work to be developed in this article is about production and financial planning, as well as resource allocation for the next taxable operating cycle with an objective of maximizing corporate net income. This task has always been difficult due to the different alternatives regarding manufacturing capacity, financial potential, geographic location, regional demand and other considerations. Like in Ramasesh and Jayakumar (1997) who proposed an optimization scheme to justify investments based on discounted cash flows in manufacturing companies, this article follows a similar approach in developing a mechanism for supporting corporate decision-making. In addition, legal constraints and some corporate policies also limit the alternatives to be considered and have to be incorporated in the analysis. As Dror and Trudeau (1996) stated, "optimization based on efficiency/cost criteria alone will generate inferior solutions than a wider perspective of the decision-making process".