

Evaluating tactical planning and control policies for a softwood lumber supply chain through agent-based simulations

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Abstract

The softwood lumber industry in Canada is under great pressure and is compelled to respond to a new set of market requirements. Today, scholars and practitioners are trying to identify different strategies and tactics for this industry sector to improve its business performance. Deployed from strategic plans, supply chain tactics are relevant since they define mid-term plans that will guide operations planning and execution. We know from practice that testing efficient and effective supply chain tactics is a difficult task, since it includes many parameters, possible interactions among them and several uncertainties that disturb the supply chain. In addition, testing different planning and control tactics in practice can be quite costly and sometimes impracticable. In order to cope with these problems, we perform a simulation study using an agent-based simulation environment, making it possible to understand the dynamic relations among factors related to control level, planning method and planning horizon length. In addition, it provides indications on how to obtain an optimum robust configuration of the planning and control system at the tactical level so as to minimize the impact of uncertainties related to supply, manufacturing and demand.

Key words: supply chain management, tactical planning, softwood lumber industry, agent-based simulation, robust design

1 Introduction

The softwood lumber supply chain in Canada is experiencing one of the most difficult times in its history. It is under great pressure and is compelled to respond to a new set of market requirements in terms of lower operational costs and improved service levels. It is also experiencing a set of new supply and manufacturing constraints, such as reduced cutting rights and aging machinery, which impact productivity.