

Sawmill Production Planning – Finding the Right Balance Between Push and Pull

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Balancing efficiency and flexibility is a major challenge in a sawmill production system. Producing too much creates unnecessary inventory, while producing too little makes it difficult to respond quickly to customer needs.

Imagine baking cookies from one batch of dough. From the same dough, you can make large, small, round, or rectangular cookies. However, different cookies may require different baking times, meaning they cannot always be baked together without affecting quality.

A sawmill works in a very similar way. From one log, many products can be created, such as boards of different dimensions. At the same time, these products pass through several production stages that must be carefully coordinated. This combination creates both **divergent** and **convergent** production flows, making production planning in sawmills especially challenging.

How should a sawmill decide what to produce and when to produce it? Producing too much can lead to large inventories and quality degradation, while producing too little can make it difficult to fulfil customer demand. Finding the right balance is therefore essential.

This study investigated different production planning and scheduling approaches for sawmills. The focus was on the position of the **decoupling point**, where production shifts between push and pull strategies. A push strategy means products are produced before customer demand is known, while a

pull strategy means production is based on actual customer orders.

To analyze this, a simulation model of the sawmill process was developed, including sawing, drying, and after-treatment stages. Four scenarios with different decoupling-point positions were tested.

The results showed that combining push and pull strategies is beneficial for sawmills because of their unique production characteristics. The best performance was achieved when the decoupling point was placed before the after-treatment stage. In this setup, the earlier production stages use a push strategy to maintain production flow, while the later stages apply a pull strategy to adapt to customer demand.

This combination improves production flexibility while reducing unnecessary inventory buildup and quality degradation. The findings from this study can therefore support sawmill companies in making better decisions regarding production strategy and inventory placement. By balancing push and pull production strategies, companies can improve efficiency, reduce waste, maintain product quality, and better respond to customer demand.