Cotton Mixing for Stock Optimization

MIT Supply Chain MANAGEMENT

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MIT GLOBAL SCALE NETWORK

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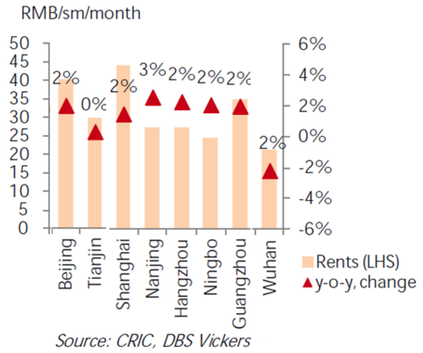
Motivation / Background

Seasonal Cotton Quality

39% of World Clothes Fiber

Short Lead-Time

Warehouse Rental Rate in Key Cities (2016)



Source: CRIC, DBS Vickers

- Average stock level (2016) : 49.8k tons of cotton
- Inventory cost : USD 1.06 million

Key Question / Hypothesis

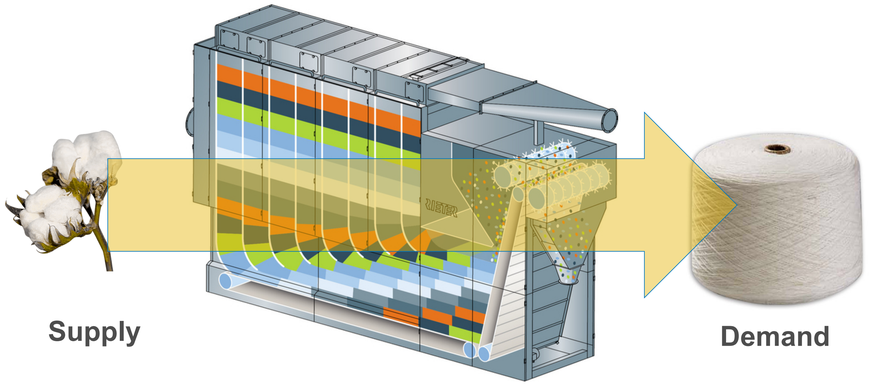
How can the demand driven strategy helps to minimize stock levels and logistics costs for spinning company?

Relevant Literature

Gholamian M.R., Taghanzadeh A.H. (2017). Integrated network design of wheat supply chain: A real case of Iran. Computers and Electronics in Agriculture 140. 139–147.

Keskin, G.A., Omurca, S.L., Aydın, N., Ekinci, E., (2015). A comparative study of production–inventory mode for determining effective production quantity and safety stock level. Applied Mathematical Modelling 39, 6359–6374.

Cotton Mixing/Blending

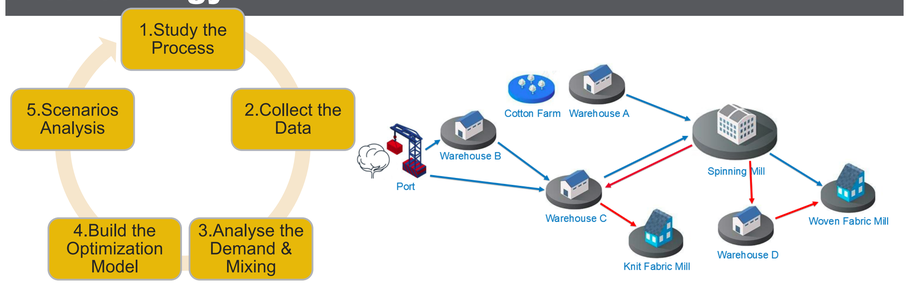


The Problem

Determining factors and opportunities along the vertical cotton supply chain to optimize:

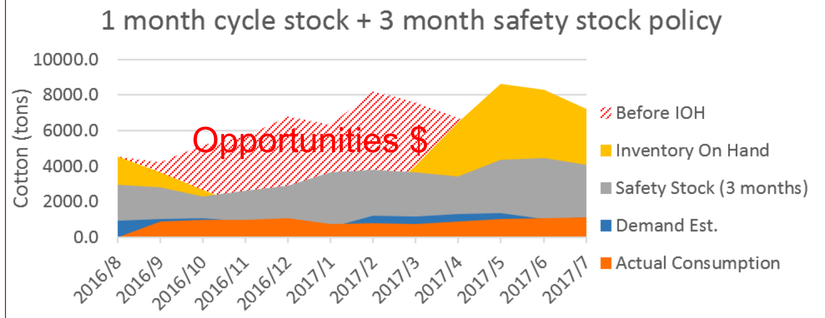
High Safety Volume | Over Production | Large Lot-Size | Unknown Demand

Methodology



Initial Results

Potential Benefits from Lot-Size Strategy:



Estimated saving:

Avg. Stock Level (Tons)	25305.0	
Holding Cost (USD)	538,239.2	
Cost Saving (USD)	**197,115.8**	**(-26.8%)**

Expected Contribution

By adjusting the material delivery schedule, a -26% cost could be saved:

(1) Maintain the same service level. i.e. no shortage of supply to production plant.

(2) Minimize the risk of keeping large amount of cotton inventory in warehouse.

Jeffrey Mak