

Strategic Due Diligence for Human Rights in Cotton Supply Chains

Executive Summary

This memo analyzes the risks associated with importing cotton products from China under the UFLPA, which presumes any cotton products sourced in whole or in part from Xinjiang, China are sourced with forced labor and subject to seizure at the border by the U.S. Customs and Border Protection (CBP). Utilizing trade data visualization and risk analysis, the memo identifies low-risk and higher-risk countries based on their dependency on Chinese cotton exports and their contribution to US imports. Recommendations include short-term adjustments to reduce imports from high-risk countries and long-term strategies to partner with low-risk countries, seek reliable certifications, diversify supply chains, and build a comprehensive risk-management framework.

Introduction

The presumption of forced labor allowed by the Uyghur Forced Labor Prevention Act (UFLPA) imposes a substantial constraint on businesses importing cotton products from China. Given that approximately 90% of China's raw cotton originates from Xinjiang, and only about 20% of cotton used by Chinese textile manufacturers is imported, we can assume that any cotton products exported from China face significant risk of seizure at the US border by the CBP¹. This analysis examines aggregated trade data to trace where this cotton is being exported and identify “risky” cotton exporters as well as “safe” cotton exporters. These findings, combined with global trends in cotton trade, inform short and long-term recommendations for sourcing cotton imports.

Analytical Approach

Using data from the General Administration of Customs of the People’s Republic of China² as well as bilateral trade data from the CEPII³ filtered by all cotton related HS code⁴, we identify the top importers of Chinese cotton overall and analyze the distribution of types of cotton products exported by China⁵. We then order the top exporters of cotton products to the United States based on the percentage of all imported cotton goods that are imported from China⁶. Furthermore, we provide an analysis of the impact of risk on U.S. domestic firm profit functions to determine short-term adjustments to production quantities given firm-specific parameters. This indicates the optimal short-term solution which we combine with statistical trends of how the global cotton trade has evolved since the UFLPA to derive a sustainable long-term strategy as well.

Results and Risk Analysis

The primary cotton product exported from China to its top importers is processed cotton, mainly yarn and fabrics⁷. Thus, we can conclude that the main source of danger for US apparel companies is importing finished garments from large textile exporters that use inputs sourced from Xinjiang, China. Based on our analysis, India, Pakistan,

¹ Davis, E. C., & Gale, F. (2022, December 05).

² General Administration of Customs of the People’s Republic of China. 2024.

³ Gaulier, G. and Zignago, S. (2010) BACI: International Trade Database at the Product-Level.

⁴ See Table 3 in the Appendix.

⁵ See Figures 3, 4, and 5 in the Appendix.

⁶ See Table 1 and Figure 6 in the Appendix.

⁷ Figure 3, 4 and 5 in the Appendix

and Guatemala emerge as significant cotton exporters to the US with relatively *lower* dependency on Chinese cotton, making their supply chains less risky⁸. Since these countries have less dependence on Chinese cotton, with Chinese cotton imports comprising 10%, 8%, and 9% of their total cotton imports respectively, our econometric analysis shows that there is a smaller amplification of marginal costs facing US firms looking to import cotton products⁹. At the same time, cotton exporting countries with higher dependence such as Vietnam and Bangladesh carry a much larger probability of exporting risky cotton and therefore increase the marginal costs of production for apparel firms in the United States proportional to the likelihood of exporting risky cotton.

When viewing the level of dependence on China in the global cotton trade since the passage of the UFLPA, we find that Guatemala, India, and Pakistan have reduced imports of Chinese cotton by 11%, 27%, and 60% respectively¹⁰. All else being equal, this trend indicates a decreasing risk of importing from these countries and thus greatly increases their value as long-term partners for sourcing cotton apparel goods.

Policy Implications and Recommendations

Based on our analysis, in the short term, US apparel firms should:

- Adjust the Importing Country List
The start-up should shift the import of cotton apparel products away from high-risk countries like Vietnam, Bangladesh, Indonesia, and Mexico, while at the same time importing more from India, Pakistan, and Guatemala. Especially, the start-up can make full use of the trade agreements.
- Reduce production quantities
In accordance with our risk-adjusted profit function and firm-specific parameters, the firm will face distortedly higher marginal costs, thus will need to reduce production to raise marginal revenue in turn¹¹.

In the long run, US apparel firms should divert supply chains:

- Look for relatively low-risk, long-term partner countries
The start-up should identify low-risk cotton exporting countries that have demonstrated commitment to reducing the trade of cotton with China over time. We suggest India per our research¹².
- Seek partners with reliable certifications
The start-up should find suppliers that carry certifications by the Better Cotton Initiative¹³, an organization with branches in India and Pakistan that monitors and certifies standards of fair labor.
- Diversify supply chains based on risk assessment
The start-up should diversify its supply chains among those relatively low-risky partners according to the types of cotton products needed for its production to maintain the stability of the supply chain. It is important to assess risks across countries based on our dataset to avoid increased risks along the way.
- Create a risk-estimating framework for known risks
When the start-up has a certain amount of funds accumulated, it should invest in institutions and technologies that can catalog the full scope of risks including gray areas where it is hard for risks to be defined. Building a risk-management framework that determines which metrics are appropriate for measuring risks.

⁸ Figure 1 in the Appendix.

⁹ See the discussion of equations (1) and (2) in the Appendix.

¹⁰ Figure 2 in the Appendix along with Table 2.

¹¹ See the discussion of our formula in the Appendix.

¹² See Figure 2 in the Appendix.

¹³ Better Cotton. 2024. "Defining 'Better': The Better Cotton Principles and Criteria."

- Build strong defense layers and scenario modeling for unknown risks

The start-up should develop a risk-aware culture and ability to model different risk scenarios, which is helpful for increasing the response speed and profit optimization strategies for unknown risk factors. Learning from this analysis for future trade fluctuations is essential for a sustainable long term strategy.

Appendix

Risk Adjusted Profit Function: Given a probability p of importing risky cotton from a country, let $R(q)$ be the revenue function specific to a firm in the US looking to import q units of cotton. Additionally, let $C(q)$ be the cost function facing this firm which does not include the cost of importing. Then let $C^*(q)$ be the cost of importing the cotton goods. We then construct a profit function of the form:

$$f(q) = (1 - p)[R(q) - C(q) - C^*(q)] - pC^*(q) \quad (1)$$

Taking the derivative with respect to q gives us the following equation:

$$f'(q) = (1 - p)[MR - MC - MC^*] - pMC^*$$

Here the revenue and cost functions become marginal revenue and marginal cost functions. Setting this equation equal to zero then gives us that the optimal quantity to import is q^* such that

$$MR = MC + MC^* + (p/1 - p)MC^* \quad (2)$$

Therefore, we observe that the market distortion is equal to $(p/1 - p)MC^*$ which implies that as risk increases, the marginal costs of importing also increase, and so the marginal revenue must increase in turn to reach an optimal level of production. To increase marginal revenue, the firm must reduce the quantity of production as implied by microeconomic theory.

Figure 1. China’s Cotton Products Exported to the World (2023)

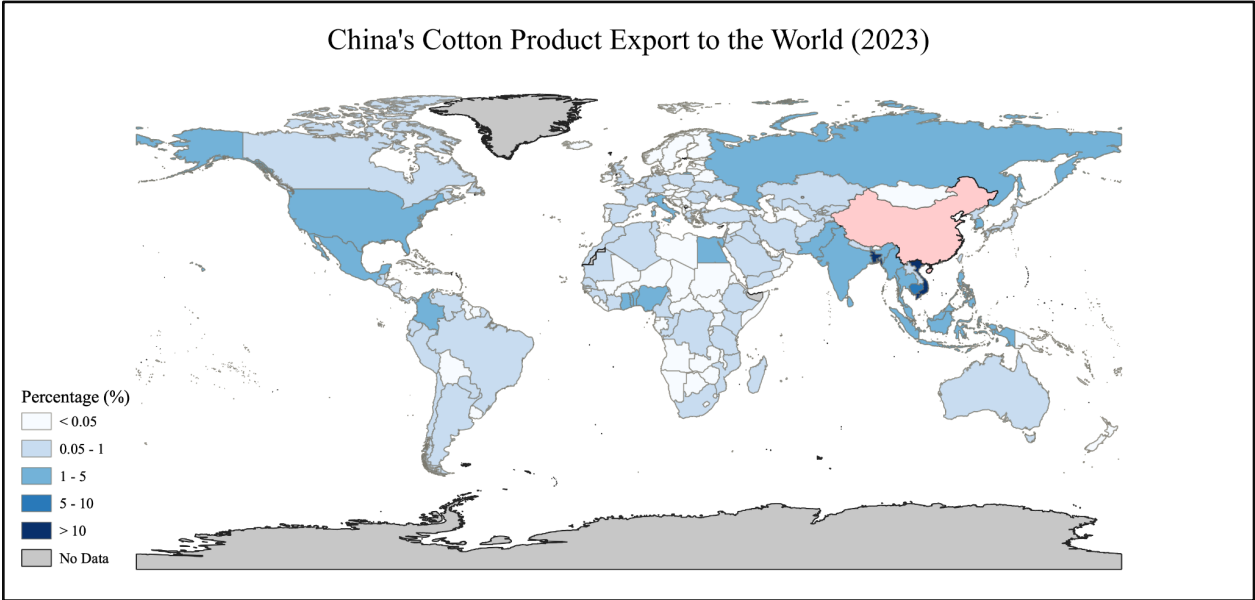


Figure 2. Change of China’s Cotton Products Exported to the World (2021-2023)

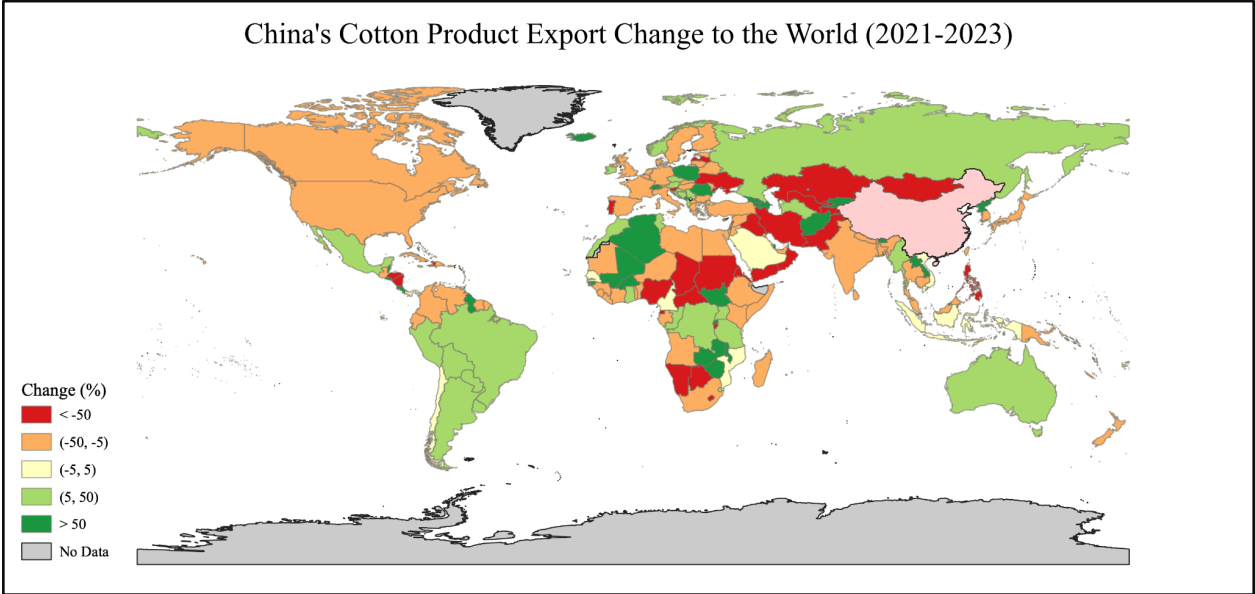


Figure 3. China’s Top 10 Cotton Products Exporting Trade Partners

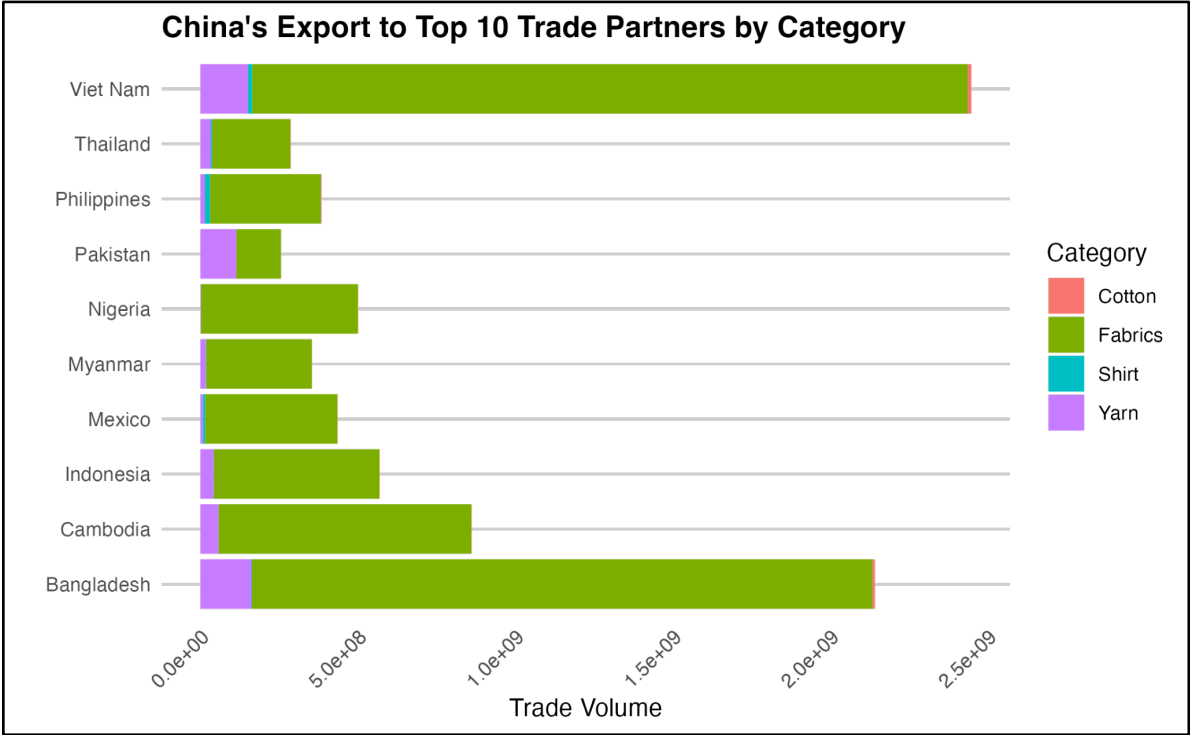


Figure 4. China’s Cotton Products Exported to the US

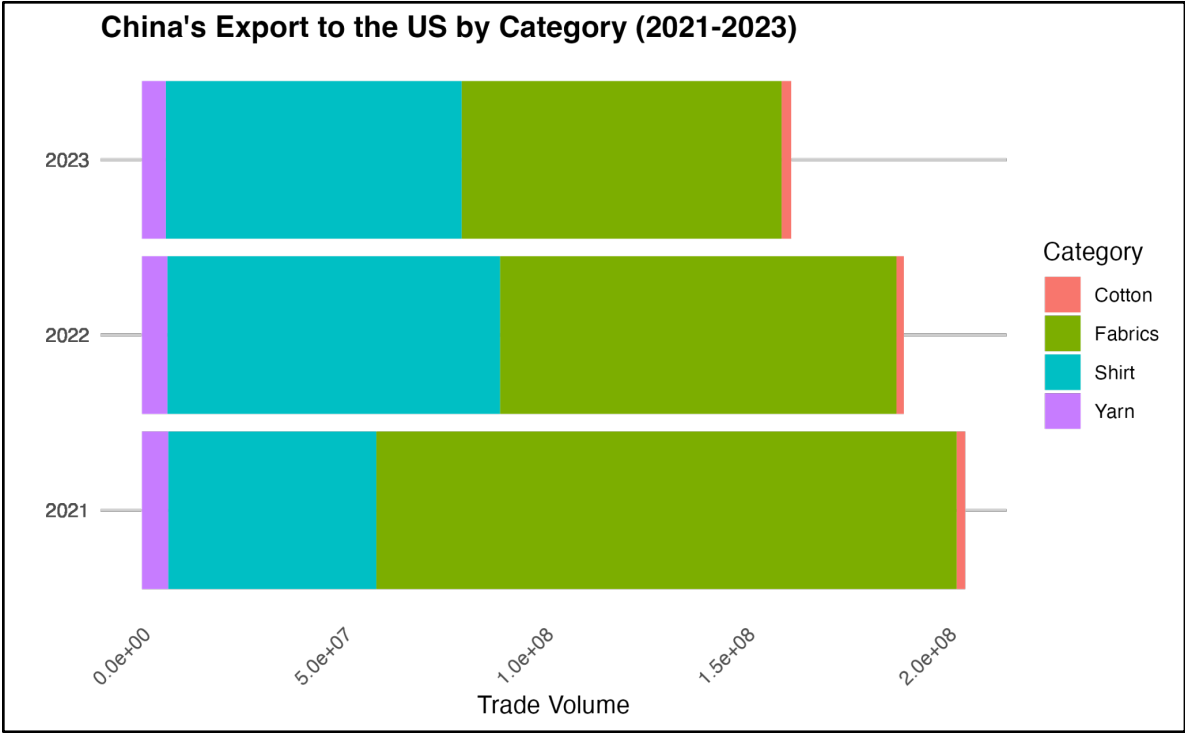


Figure 5. China’s Cotton Products Exported to the World

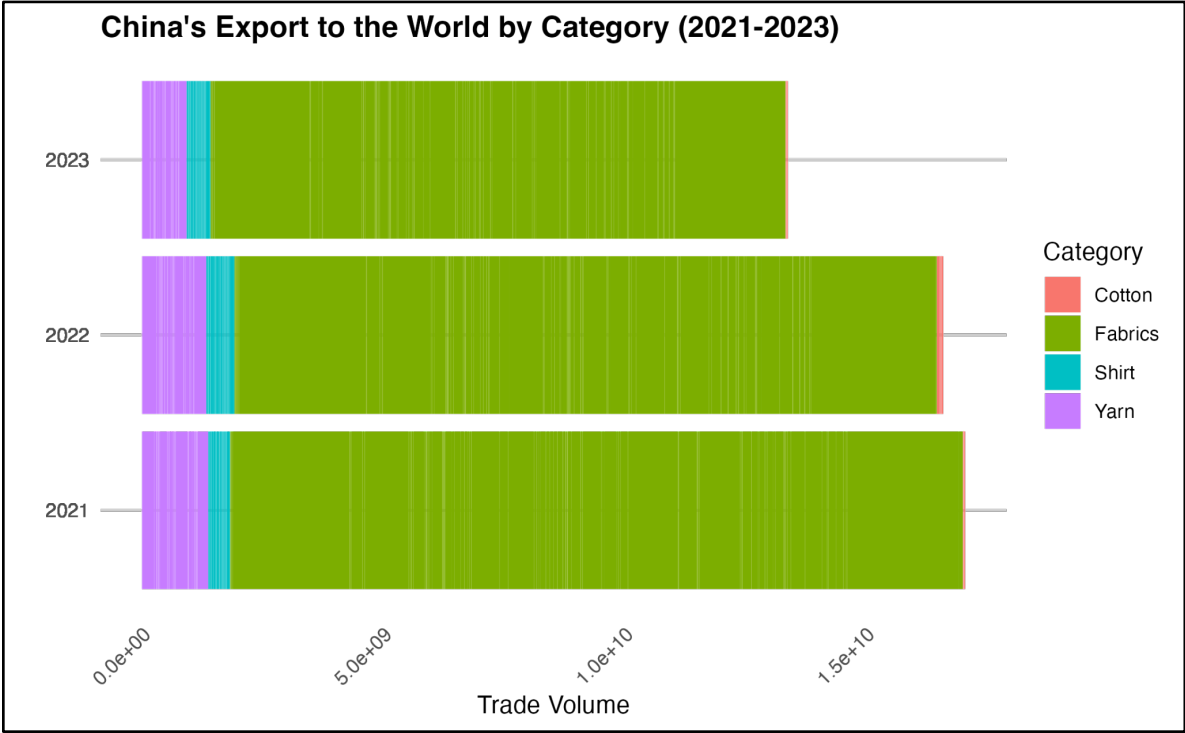


Figure 6. The US’s Top 10 Partners in Importing Cotton Products (Heat Map)

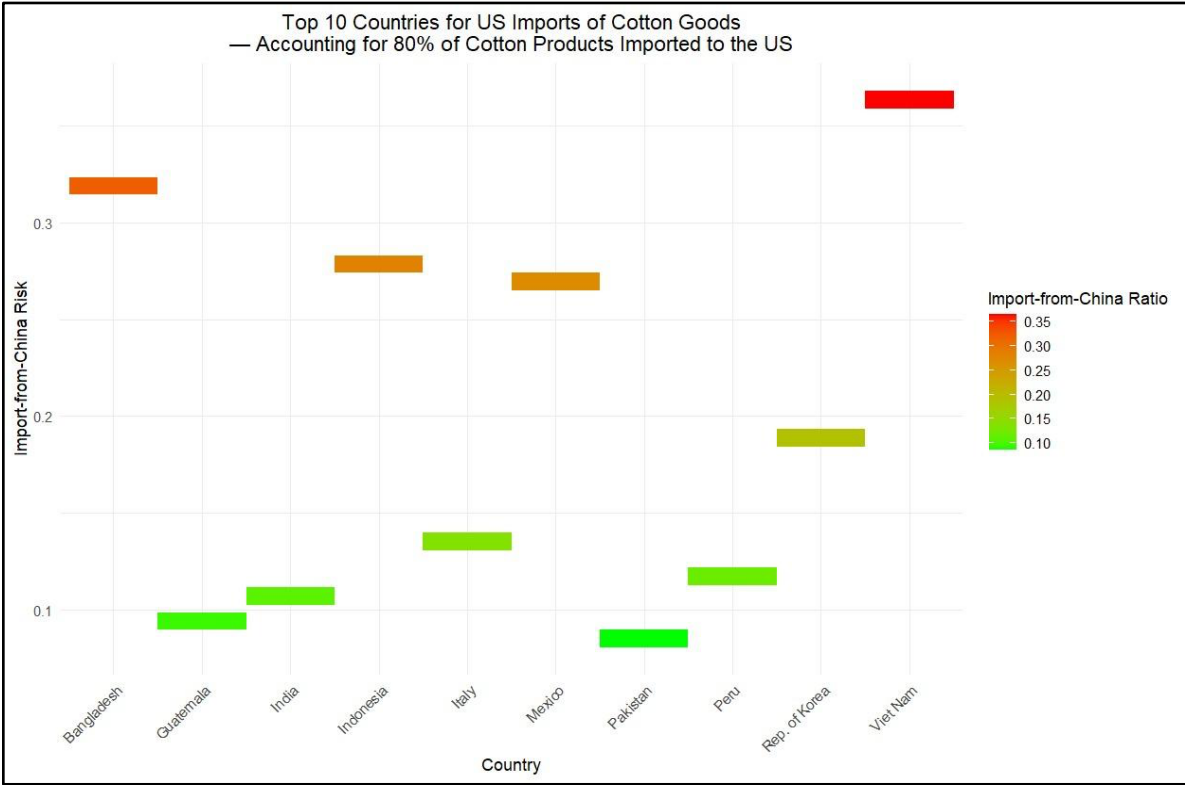


Table 1. The US’s Top 10 Partners in Importing Cotton Products (Table)

Country_Name	Rank (Higher rank, higher risk)	Percentage of Cotton Imports Sourced from China	Share of US Cotton Imports Held by Each Country
Viet Nam	1	36.36%	6.09%
Bangladesh	2	31.90%	6.73%
Indonesia	3	27.86%	5.45%
Mexico	4	26.94%	3.05%
Rep. of Korea	5	18.87%	8.89%
Italy	6	13.53%	3.48%
Peru	7	11.72%	5.28%
India	8	10.70%	21.11%
Guatemala	9	9.40%	6.47%
Pakistan	10	8.50%	12.57%

Table 2. (viewable through Google Docs or per request): Change on countries' cotton imports from China [trade change](#)

Table 3. (viewable through Google Docs or per request): Cotton products and category by HS Code [HS Category](#)

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