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THE RAW-MATERIAL PARADOX IN TEXTILE VALUE-CHAIN DEVELOPMENT

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Abstract. This thesis examines why raw-material self-sufficiency, generally treated as an industrial advantage, is instead associated with a shallower value chain among leading textile-exporting countries. The purpose of the study is to document this raw-material paradox empirically and to argue that its resolution requires the kind of chain-compatible, position-weighted incentive redesign already formalised for the sequential textile chain, rather than a simple transfer of any single foreign model. A raw-material self-sufficiency coefficient and a chain-depth index were computed for four benchmark countries and compared with Uzbekistan, and a five-criterion adaptation filter was applied to assess the transferability of each country's model. The results show an inverse relationship between raw-material self-sufficiency and chain depth, with Uzbekistan combining the highest self-sufficiency coefficient (0.94) and the lowest chain-depth index (0.585) and export revenue per tonne of fibre (3.1 thousand dollars) among the countries compared, a gap of up to 8.7-fold relative to Vietnam. No single foreign model clears the threshold for systemic transfer, implying that escaping the raw-material paradox depends on redesigning incentives by chain position rather than on adopting a foreign template wholesale.

Keywords: textile industry, value chain, raw-material paradox, chain-depth index, model adaptation, resource curse.

Introduction

A country able to grow its own textile fibre is ordinarily assumed to hold a natural advantage in building a deep textile value chain, since it need not depend

on imported input. Benchmark data across leading textile exporters contradict this assumption directly: the country with the highest domestic fibre supply in the comparison performs worst on chain depth, while countries with almost no domestic fibre perform best. The purpose of this thesis is to document this raw-material paradox with cross-country evidence and to connect its resolution to the chain-compatible incentive-allocation logic developed for the sequential textile chain, in which the optimal share of support is set by chain position and marginal response rather than by the volume of any single link.

The two strands of this research programme meet at exactly this point. The chain-compatible allocation model shows that, once the physical sequencing of the chain is respected, the optimal incentive share concentrates on the link that constrains the whole chain rather than on the link with the largest current export volume. The present thesis asks a prior question: why raw-material abundance itself tends to produce an incentive structure that resists such reallocation, and which foreign experience, if any, offers a template for overcoming that resistance.

Methods

A raw-material self-sufficiency coefficient B was computed as domestic fibre production divided by domestic fibre consumption (production plus imports minus exports), and a chain-depth index d , developed elsewhere in this research programme from the position-weighted distribution of export composition across chain links, was computed for the same countries from 2025 trade data. An export-revenue-per-tonne-of-fibre indicator V_f (export value divided by fibre processed) was added to test whether the chain-depth ranking is confirmed by a value-based measure. Four benchmark countries — Vietnam, Bangladesh, Turkey and Uzbekistan — were selected to span the full range of raw-material self-sufficiency. A five-criterion adaptation filter (raw-material base, chain completeness, logistics access, unit labour cost, and trade regime) was then applied, with weights of 0.25, 0.25, 0.20, 0.15 and 0.15 respectively, to compute an adaptation index A_c for each comparator relative to Uzbekistan, using thresholds of 0.70 for systemic transferability and 0.45 for theoretical interest only.

Results

The relationship between raw-material self-sufficiency and chain depth is shown in Figure 1 and summarised in Table 1.

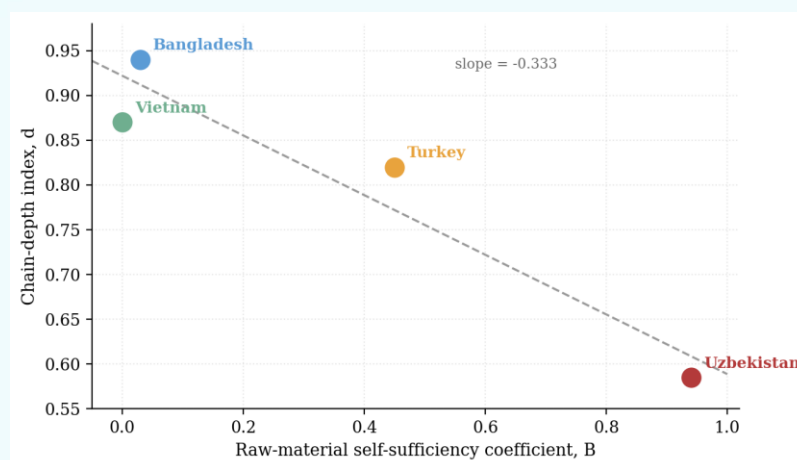


Figure 1. Raw-material self-sufficiency and chain-depth index across benchmark countries, 2025

Source: author's calculations.

Table 1

Comparative textile-industry indicators, 2025

Country	B coeff.	Exports, \$bn	Vf, '\$000/t	Chain-depth, d
Vietnam	0.00	46.00	27.1	0.870
Bangladesh	0.03	39.35	22.6	0.940
Turkey	0.45	26.18	17.7	0.820
Uzbekistan	0.94	2.50	3.1	0.585

Source: author's calculations based on national and industry statistics.

The fitted relationship between B and d is negative, with Uzbekistan combining the highest self-sufficiency coefficient (0.94) and the lowest chain-depth index (0.585) in the comparison. The value-based indicator confirms the pattern independently: export revenue per tonne of fibre ranges from 27.1 thousand dollars in Vietnam to 3.1 thousand dollars in Uzbekistan, an 8.7-fold gap. Uzbekistan's own history reinforces the point — the country was among the world's largest raw-cotton exporters in 1988/89 and 1992/93, yet nearly four

decades of raw-material abundance did not by itself produce a deep processing chain, while Bangladesh built a leading position from essentially no domestic fibre base over the same period.

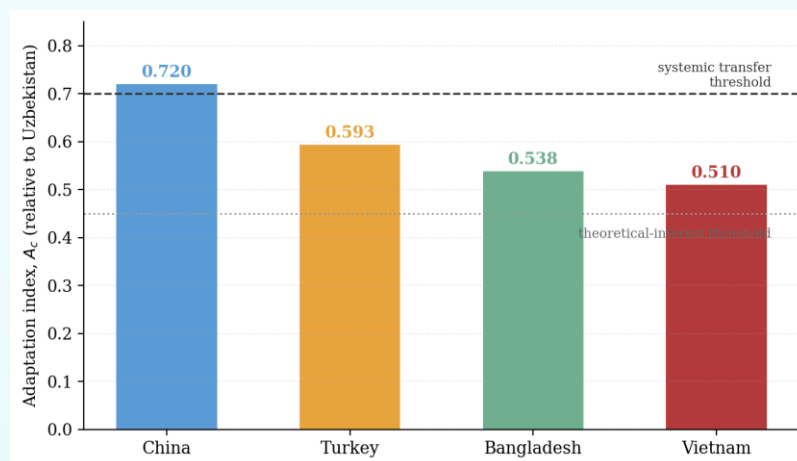
The transferability of each comparator's model was assessed using the five-criterion adaptation filter; results are summarised in Table 2 and Figure 2.

Table 2

Adaptation-index components by comparator country

Country	M1 (0.25)	M2 (0.25)	M3 (0.20)	M4/M5 (0.30)	Ac
China	0.75	1.00	0.80	0.45/0.60	0.720
Turkey	0.45	0.95	0.90	0.40/0.85	0.593
Bangladesh	0.03	0.55	0.80	0.90/0.75	0.538
Vietnam	0.00	0.90	0.85	0.55/0.95	0.510

Source: author's calculations.

**Figure 2. Adaptation index by comparator country relative to Uzbekistan**

Source: author's calculations.

No comparator clears the 0.70 threshold for systemic model transfer; China comes closest at 0.720, just above the threshold, while Turkey, Bangladesh and Vietnam fall in the 0.51-0.59 range, indicating that only selected elements, not the whole model, are transferable from any single country.

Discussion

The paradox is explained by the incentive structure that raw-material abundance creates rather than by the resource itself: where domestic fibre exists, exporting it or the yarn made from it is the fastest, least capital-intensive route to revenue, requiring no design, brand or certification infrastructure, so that short-run returns from the existing resource crowd out the incentive for long-run structural change. Where no domestic fibre exists, this low-effort route is unavailable, and the chain is pushed toward finished-goods production from the outset. This mechanism is the textile-industry counterpart of the resource-curse literature on extractive sectors, softened here because fibre is a renewable rather than a depletable resource, but operating through the same channel of foreclosed incentive.

Turkey and China both show that the paradox is not fixed: both restrict low-value fibre and yarn exports administratively while directing targeted support to finished-goods production, which is exactly the differentiated, chain-position-weighted allocation rule formalised elsewhere in this research programme. Uzbekistan has taken the restrictive half of this policy by curbing fibre exports, but has not yet built the corresponding incentive structure that makes upgrading to higher chain links the more attractive option — the escape from the raw-material paradox therefore depends on completing that redesign, not merely on restricting the low-value exit.

Because no single comparator clears the systemic-transfer threshold, the practical implication is that Uzbekistan's model must combine selected elements rather than adopt one country's template: forward integration within the existing cluster structure and design-and-brand-centre investment transfer well from Turkey and China, given similar raw-material conditions, while Vietnam's logistics- and certification-based competitiveness does not transfer directly, since it rests on coastal access that Uzbekistan's landlocked geography cannot replicate.

This selective-combination conclusion also explains why restricting fibre exports alone, the step Uzbekistan has already taken, cannot by itself close the chain-depth gap: removing the low-effort exit raises the relative attractiveness of

upgrading only if a matching set of positive incentives, allocated by chain position rather than volume, is put in place at the same time. Absent that redesign, the restriction risks compressing activity into the yarn link rather than pushing it toward finished goods.

Conclusion

This thesis has documented an inverse relationship between raw-material self-sufficiency and value-chain depth among leading textile exporters, confirmed it with an independent value-based indicator, and shown that no single foreign development model clears the threshold for systemic transfer to Uzbekistan. The paradox reflects an incentive mechanism rather than an inherent property of the resource, and its resolution requires the chain-compatible, position-weighted incentive redesign already formalised for the sequential textile chain, combined selectively with transferable elements — forward integration and design-brand investment — from Turkey and China. Future research should extend the adaptation filter with directly estimated rather than expert-normalised criteria and test the model combination empirically at firm level.

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