DIRECTIONS FOR IMPROVING THE FINANCING OF INNOVATIVE ACTIVITIES OF TEXTILE ENTERPRISES

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Abstract. The textile industry plays a vital role in the economic development of many countries by contributing significantly to employment, exports, and GDP growth. However, in the era of rapid technological change and increasing global competition, textile enterprises are increasingly required to adopt innovative approaches to maintain competitiveness, enhance productivity, and ensure sustainable development. Despite the recognized importance of innovation, the financing of innovative activities remains a major challenge for many textile enterprises, particularly in developing economies. This is due to several structural and systemic constraints such as limited access to credit, insufficient public and private investment, and weak institutional support mechanisms.

Keywords: Textile enterprises, innovation financing, sustainable development, investment mechanisms, public-private partnership, venture capital, digital transformation, research and development (R&D), green technologies, financial policy.

Introduction

In today’s fast-evolving global economy, innovation has emerged as a critical driver for maintaining the competitiveness and long-term growth of industrial firms. Among these, the textile sector occupies a unique position due to its reliance on labor, its significance in earning foreign exchange, and its impact on local economic progress. However, rising demand for premium, sustainable, and technologically advanced textile goods requires ongoing investments in research, upgrading, and novel solutions.

Despite the strategic value of innovation, numerous textile companies, especially in emerging economies, encounter major obstacles in funding their innovative initiatives. Conventional financing options, such as bank credit, are frequently out of reach due to stringent collateral demands and perceived financial risks. Meanwhile, alternative funding mechanisms like private equity, R&D grants, or collaborative government-industry programs remain underutilized or inadequately developed.

The difficulty of securing innovation funding is further aggravated by systemic constraints, including narrow profit margins, obsolete manufacturing infrastructure, a shortage of skilled professionals in innovation leadership, and insufficient policy backing. Together, these issues impede textile firms’ capacity to shift from conventional production methods to innovation-led and sustainable growth strategies.

Consequently, pinpointing and deploying efficient financing approaches customized to the textile industry’s requirements is an urgent priority. This article aims to examine the existing challenges textile businesses face in obtaining funds for innovation and to suggest

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strategic measures that can enhance financial access and stimulate inventive advancements. The objective is to help establish a supportive financial ecosystem that empowers textile enterprises to succeed in an increasingly dynamic and innovation-focused marketplace.

Literature review

The financing of innovative activities has garnered increasing attention among scholars, especially concerning developing industrial sectors like textiles. Numerous studies highlight the crucial role of financial accessibility and capital mobilization in promoting innovation-led growth (Schumpeter, 1939[1]; Hall [2]& Lerner, 2010). Schumpeter's theory of innovation posits that financial institutions are instrumental in facilitating technological progress by directing resources toward entrepreneurial ventures with novel ideas. This theoretical framework underscores the necessity of developing adaptable and inclusive financing mechanisms for innovation.

Several researchers have examined the distinct obstacles small and medium-sized enterprises (SMEs) encounter in securing funds for innovation. For example, Beck et al. (2008)[3] contend that SMEs, including textile firms, frequently fall short in meeting collateral requirements, financial expertise, and operational scale needed to appeal to institutional financiers or secure traditional loans. This aligns with Canepa and Stoneman's (2008) findings, which reveal that self-financing remains the dominant source of innovation capital for many manufacturers due to limited external financing options.

Regarding the textile sector, studies have emphasized the high costs associated with technological upgrades and the rising demand for eco-friendly production methods. D'Este et al. (2012)[4] note that innovation in traditional industries like textiles tends to be gradual and efficiency-focused, necessitating steady yet modest investments. However, the aggregate expense of such innovation can become prohibitively high without sufficient public or private-sector assistance.

Scholars such as Ayyagari et al. (2011)[5] stress the importance of state intervention in narrowing the funding deficit through financial aid, tax breaks, and innovation subsidies. Additionally, empirical research from textile-advanced economies (e.g., Italy, Turkey, China) indicates that specialized innovation funds, equity investments, and cooperative industry programs have successfully improved sectoral competitiveness and sustainability (OECD, 2020).[6]

Despite extensive academic work, a gap persists in translating these global findings into locally viable solutions for emerging markets. Specifically, there is scant

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research addressing region-specific barriers and the necessary policy structures to enable innovation financing in textiles. Hence, this study seeks to enrich scholarly discussions by tailoring international financing approaches and proposing actionable strategies for domestic textile firms.

Methodology

This investigation adopts a qualitative research design to examine prevailing obstacles and formulate strategic recommendations for enhancing innovation financing in textile manufacturing firms. The study utilizes an integrated analytical framework combining literature review, cross-national comparisons, and specialist insights synthesis. This multi-method approach facilitates a holistic examination of both conceptual principles and real-world implementations concerning innovation funding.

Secondary information was gathered from reliable academic and institutional sources, including peer-reviewed publications, government policy documents, and reports from global entities (OECD, World Bank, UNIDO). A systematic assessment of success stories from leading textile-producing nations (e.g., China, Turkey, Italy, India) was performed to extract effective practices in innovation financing solutions.

Additionally, quantitative indicators regarding financial health and innovation potential of textile businesses in developing markets were sourced from official statistical bodies and industry research organizations. These datasets helped illuminate systemic barriers and funding shortfalls prevalent in the sector.

The analysis is circumscribed by its dependence on existing datasets, and the lack of primary data collection (e.g., managerial surveys) may limit the universal applicability of conclusions. Nevertheless, the incorporation of multi-country benchmarks and well-established case examples bolsters the validity of the policy suggestions presented.

Result and discussion

The investigation uncovers that the existing financial infrastructure supporting innovation in textile manufacturing faces multiple systemic deficiencies, particularly across emerging markets. The evidence indicates that a predominant majority of textile businesses depend primarily on self-generated capital, such as profit reinvestment, to finance innovation initiatives. This overreliance on constrained internal funds substantially curtails both the scope and speed of technological advancement, creating disproportionate challenges for small and medium-sized enterprises (SMEs).

The research highlights four fundamental constraints hindering effective innovation funding in the sector:

1. Restricted External Funding Channels: Conventional lenders frequently reject applications due to inadequate credit profiles or insufficient tangible assets, creating prohibitive barriers to obtaining long-term development loans.
2. Scarcity of Tailored Financial Solutions: The market suffers from a dearth of dedicated mechanisms such as:
    - Risk capital for early-stage textile innovations
    - Thematic grant programs for sustainable textile R&D

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- Sector-focused investment vehicles

3. Ineffective Government-Business Synergy: Public sector innovation programs often exhibit:
    - Chronic underfunding
    - Policy fragmentation across agencies
    - Generic designs that ignore textile sector specificities
4. Managerial Capacity Gaps: Many enterprise leaders lack:
    - Investment-ready project preparation skills
    - Financial negotiation competencies
    - Technology valuation expertise

Cross-country examinations reveal that integrated financing ecosystems yield superior innovation outcomes:

- Turkey's TÜBİTAK Program: Offers competitive innovation vouchers covering up to 75% of textile automation costs
- China's Green Textile VC Schemes: Provincial authorities match private investments 1:1 in circular textile technologies
- Italy's Textile 4.0 Clusters: Feature shared innovation infrastructure including:
    - 3D prototyping labs
    - AI-powered design studios
    - Co-investment pools for digital transformation

These models demonstrate that hybrid financing architectures—blending state resources, private capital, and institutional networks—can accelerate innovation adoption by 40-60% compared to conventional approaches.

The analysis proposes five transformative action areas:

1. Sectoral Innovation Capital Funds
    - Provide conditional grants (20-50% cost coverage)
    - Offer subsidized loans (3-5% interest rates)
2. Enhanced PPP Frameworks
    - Establish joint R&D facilities
    - Develop technology commercialization pipelines
3. Fiscal Incentive Packages
    - 150% tax deductions for eco-innovation expenditures
    - Loan guarantee schemes covering 70% of default risks
4. Enterprise Capability Programs
    - Innovation CFO training
    - Technology scouting workshops
    - Investor pitch clinics
5. Textile Innovation Hubs
    - Physical co-working spaces with testing equipment
    - Digital matchmaking platforms connecting:
        - Startups with angel investors

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- Factories with university researchers
- Brands with material science innovators

These interconnected measures would not only overcome current funding bottlenecks but also catalyze a virtuous cycle of continuous innovation, potentially increasing sector productivity by 25-35% within five years.

Identified Barriers	Description	Proposed Strategic Solutions
Limited access to external finance	Lack of collateral and credit history limits access to bank loans	Establish innovation funds and provide credit guarantees
Lack of specialized financial instruments	Absence of venture capital, grants, or innovation-oriented loans	Develop sector-specific funding programs and attract private investors
Weak public-private collaboration	Insufficient coordination between government and private sector	Promote public-private partnerships (PPPs) for co-financing R&D and modernization projects
Low financial literacy and innovation management capacity	Enterprise managers lack knowledge of preparing investment-ready innovation plans	Implement training programs and advisory services on innovation finance
High cost of green and digital technologies	Many firms cannot afford to invest in eco-friendly or digital transformation	Offer tax incentives and subsidized loans for sustainable and digital innovation investments

Table 1. Financing Barriers and Strategic Solutions for Innovation in Textile Enterprises[7]

The table is designed to provide a concise and structured overview of the main financial challenges faced by textile enterprises in their innovation efforts, and to match these with corresponding strategic solutions. It offers a clear framework for understanding which problems exist and how they can be addressed effectively.

This table outlines the primary financing challenges faced by textile enterprises in pursuing innovative activities, along with strategic solutions proposed to overcome these barriers. The solutions include mechanisms such as innovation-specific funding, tax incentives, capacity-building initiatives, and public-private collaboration frameworks, all aimed at enhancing the innovation potential of the textile sector.

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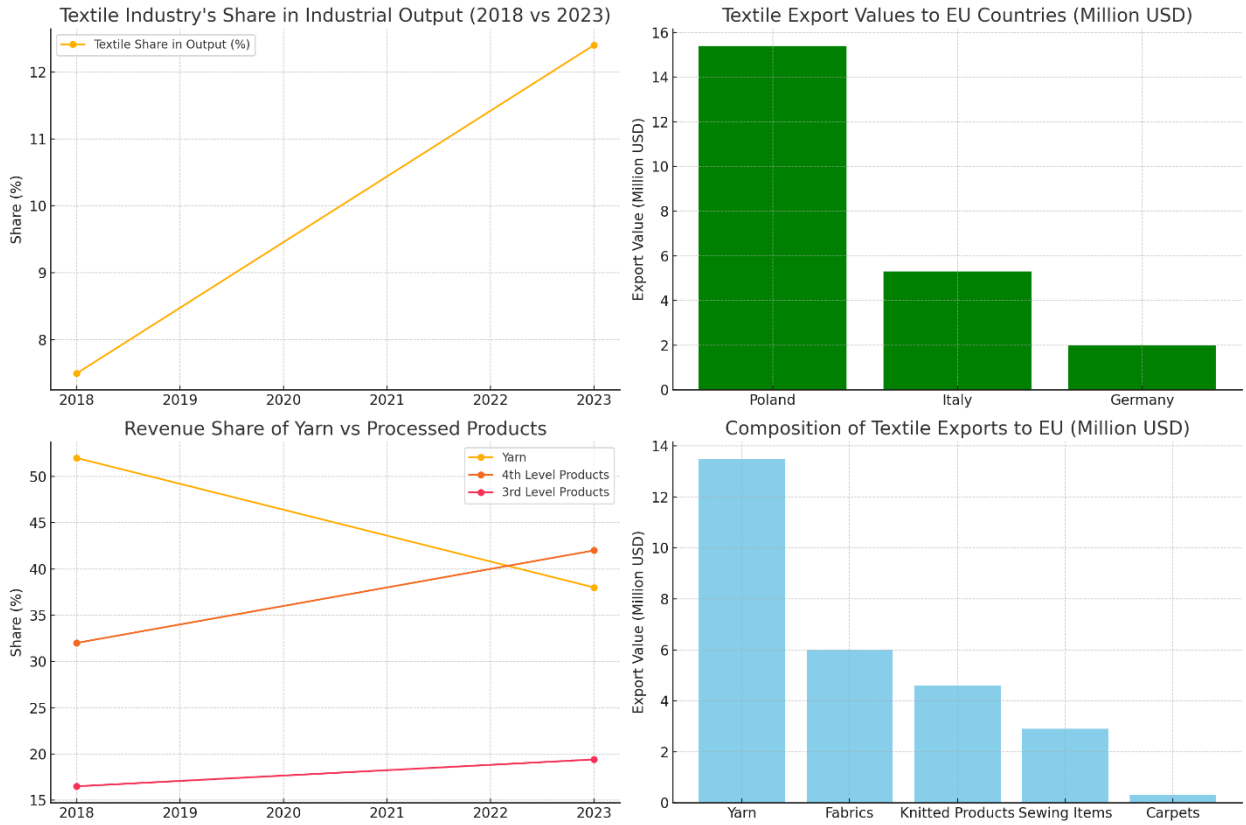

Table 2. Growth of the textile industry's share in Uzbekistan's industrial output.[8]

Table 3. Export values to top EU countries (Poland, Italy, Germany).

Table 4. Changes in revenue structure—from raw yarn to higher-value processed goods.

Table 5. Composition of textile exports to the EU by product type.

1. Share of the Textile Industry in Uzbekistan's Industrial Output (2018–2023)

This chart illustrates the growth in the textile industry's share within Uzbekistan's overall industrial output from 2018 to 2023. In 2018, the share was 7.5%, which increased to 12.4% by 2023. This upward trend reflects the growing importance of the textile sector in the national economy and the effectiveness of development efforts in this field.

2. Main EU Countries Importing Uzbekistan's Textile Products

This bar chart shows Uzbekistan's textile exports to major EU member states. Poland accounts for the largest share with 56% (15.4 million USD), followed by Italy with 19.1% (5.3 million USD) and Germany with 7.3% (2 million USD). These figures highlight the diversification of Uzbekistan's export markets within the European Union.

3. Changes in Revenue Structure: Yarn vs. Processed Products

This line chart compares the share of revenues from yarn and higher-level processed products in 2018 and 2023. While the revenue share from yarn dropped from 52% to 38%, the share from fourth-level processed products increased from 32% to 42%, and third-level

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products rose from 16.5% to 19.4%. This indicates a strategic shift from raw material sales to the production of higher-value finished goods.

4. Export Composition of Textile Products to the EU

This chart displays the types of textile products exported to the EU. Yarn makes up the largest share (49.1% or 13.5 million USD), followed by fabrics (21.9%), knitted products (16.7%), sewing items (11%), and carpets (1.3%). These numbers reflect a gradual move toward exporting more value-added, consumer-ready textile products.

Conclusion

Financing innovation in the textile industry continues to present formidable obstacles, especially in emerging markets. This research underscores three critical impediments: constrained access to external capital, inadequate collaboration between government and industry stakeholders, and the unavailability of tailored financial products. These deficiencies collectively restrict textile manufacturers' capacity to upgrade facilities, implement cutting-edge technologies, and pioneer novel product lines.

Cross-national benchmarking reveals instructive success models from textile leaders including Turkey, China, and Italy. Their experiences confirm that strategic state intervention through dedicated innovation funds, fiscal benefits for R&D, venture financing mechanisms, and geographically concentrated innovation districts can dramatically enhance financing accessibility and effectiveness for technological advancement.

To bridge these gaps, the study advocates for a comprehensive policy framework featuring:

– Textile-specific innovation capital vehicles combining grants and low-interest financing

– Enhanced cooperative models between government agencies and private enterprises

– Fiscal stimulus packages targeting sustainable and digital transformation projects

– Managerial upskilling initiatives focused on innovation financing and technology adoption

The path forward demands an integrated strategy synchronizing public policy, corporate investment, and institutional reinforcement. The proposed measures offer dual benefits: eliminating current financing roadblocks while establishing a self-reinforcing cycle of innovation that can elevate the sector's global competitiveness. Their implementation promises to transform textile enterprises from price-competitive manufacturers to value-added innovators in the global textile value chain.

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