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SUPPLY CHAIN INNOVATION THROUGH TRADE RECEIVABLES DISCOUNTING SYSTEM (TREDS) DRIVING MSMES GROWTH IN DEVELOPING INDIA.

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Abstract

Globalization has transformed the way businesses source and deliver products across the world. A Global Supply Chain includes a network of interconnected firms, suppliers, manufacturers, logistics providers, and distributors that operate across multiple countries to produce and deliver goods or services to end consumers. India, a developing country with a strong-growing industrial base, relies largely on Micro, Small, and Medium Enterprises (MSMEs) to promote employment, exports, and inclusive economic growth. Supply chain finance is a service that uses technology to manage financial flows within a supply chain, helping to improve working capital for both buyers and suppliers. Currently, it is a major issue for MSMEs that limitations on working capital have become a significant barrier for their growth. The Reserve Bank of India introduced the Trade Receivables Discounting System (TReDS), a digital supply chain finance innovation to improve MSMEs working capital, efficiency, and growth. This research investigates adoption of TReDS improves working capital of MSMEs, how this innovation has provided multiple business opportunities for the Startups. The study proposes a co-creation model developed by the researcher to explain value creation among stakeholders in the TReDS ecosystem. The model highlights the roles of MSMEs, buyers, financiers, and platform operators, and integrates AI and IoT to enhance real-time tracking, credit risk assessment, transparency, and working capital efficiency, resulting in economic growth of MSMEs and supporting the development of the Indian economy. The findings indicate that supply chain financing in India is undergoing a transition from traditional models to digitally enabled supply chains, thereby creating significant opportunities for emerging Startups.

Keywords:

Trade Receivables Discounting System (TReDS), Supply Chain Innovation, Working Capital, Micro, Small, and Medium Enterprises (MSMEs), Startups

1. Introduction

The Micro, Small, and Medium Enterprises are essential for India's economic progress, significantly assisting in job creation, and exports. MSMEs connect urban and rural areas, encourage entrepreneurship, support local supply chains, and promote economic inclusivity.

The MSME sector is a vital part of the government's 'Make in India' program and is recognized as major drivers of economic growth. Currently MSMEs are facing challenges in creating robust supply chains that balance cost, risk reduction, and market access. Late payments are the challenges for India's Micro, Small, and Medium Enterprises (MSMEs). It is hindering

their growth and operational efficiency. To solve these challenges, the Reserve Bank of India (RBI) introduced TReDS as an electronic platform that facilitates the financing of trade receivables of MSMEs from corporate buyers and government entities. The main objective was to create a transparent, competitive, and digital marketplace where multiple financiers could bid to discount approved invoices. This competitive bidding mechanism helps reduce financing costs for MSMEs. Supply chain finance has emerged as a disruptive approach, redefining the interaction between financial flows and physical supply chain operations (Abdelaziz et al., 2024). According to Atieh Ali et al. (2024), supply chain finance is a group of technologically based solutions that improve working capital and lower financial risks for suppliers, purchasers, and financial institutions. Using digital platforms, blockchain, and artificial intelligence enables real-time synchronization of financial and operational data, improving traditional trade finance processes (Ivanov, 2024). This study explores the supply chain finance startup Oxyzo using corporate and online sources.

2. Research Objectives

1) To understand supply chain finance innovations TReDS
2) To evaluate the impact of TReDS adoption on the cash flow and MSMEs growth
3) To identify startup opportunities in supply chain finance

3. Literature Review

3.1 Supply Chain Finance Definition and Working

Supply chain finance is a set of technology-based solutions that aim to lower financing costs and improve business efficiency for buyers and sellers linked in a sales transaction (Atieh Ali et al., 2024). Supply chain finance allows suppliers to use their accounts receivable as collateral, which gives them early access to payment of the invoices issued by buyers. Meanwhile, buyers can delay supplier delivery time and improve cash while benefiting from using financing tools like syndicated loans or securitization on discounting credit balances to reduce financing costs (Bai et al., 2024).

Fig. 1 provides the steps to be followed by the buyer, supplier, and financial institution in supply chain finance.

Fig 1: Supply Chain Finance Working

Supply Chain Finance Working - The process begins with a buyer placing an order with a supplier. The supplier delivers the items and issues invoices to the buyer. The buyer approves and sends the invoice to the financial institution. The banking institution validates it and offers to pay the supplier early at a discount. The supplier can accept the early payment offer, and the financer will pay the supplier under the agreed-upon terms. The buyer makes timely payments to the financier. This improves the cash flow and liquidity for buyers and suppliers. It is also known as reverse factoring. India has the greatest number of companies in Supply Chain Financing (Shoomal et al., 2024). Supplier finance applies to companies across diverse sectors, including automotive, electronics, manufacturing, retail, and others. It benefits organizations on both sides of the supply chain, allowing buying entities to extend their payment terms while suppliers can receive earlier payments (Zhang et al., 2021).

3.2 Micro, Small, and Medium Enterprises (MSMEs)

The Government of India revised the definition of Micro, Small, and Medium Enterprises (MSMEs) with effect from 1 April 2025, introducing a new composite classification based on both investment in plant and machinery (or equipment) and annual turnover. Under the updated criteria notified by the Ministry of Micro, Small & Medium Enterprises, an enterprise is classified as a micro enterprise if its investment does not exceed ₹2.5 crore and its annual turnover does not exceed ₹10 crore; a small enterprise if investment is up to ₹25 crore with turnover up to ₹100 crore; and a medium enterprise if investment is up to ₹125 crore with turnover up to ₹500 crore. Only enterprises meeting both the investment and turnover limits for a category qualify for that classification. This composite criterion replaces earlier norms where only investment and turnover were considered separately under different thresholds and unifies classification across manufacturing, services, and trade sectors.

These changes were announced as part of the Union Budget 2025 and were formalized through a government notification, with the intention of expanding the scope of the MSME sector, facilitating scaling-up, improving access to credit and government schemes, and aligning the classification with current business realities. The revised limits significantly broaden the ambit of MSMEs to include larger and more productive enterprises within the formal MSME

framework.

Type	Investment (Rs.)	Turnover (Rs.)
Micro	2.5 Cr	10 Cr
Small	25 Cr	100 Cr
Medium	125 Cr	500 Cr

Fig 2: Classification of MSME (Source: Press Information Bureau GoI)

Supply Chain Finance have significant importance for micro, small, and medium enterprises, as their cash flow is frequently impacted by late payments and extended periods for receivables. SCF provides support to close the gap between when an invoice is issued and cash receipt, allowing smaller suppliers to stabilize operations and meet their production commitments.

3.3 Trade Receivables Discounting System (TReDS)

In 2007, The TReDS platform was designed, under the Payment and Settlement System to facilitate the financing of MSME firms from corporate and other buyers, including government departments and Public Sector Undertakings, through multiple financiers. The objective was to enable a platform to bring MSMEs sellers, corporate buyers and financiers banks and non-banking financial companies together for facilitating uploading, accepting, discounting, trading, and settlement of the invoices of MSMEs. TReDS was designed to facilitate the discounting of both invoices as well as bills of exchange and could deal with both receivables factoring as well as reverse factoring so that higher transaction volumes come into the system and facilitate in better pricing. TReDS would develop the necessary ecosystem for this purpose by bringing together technology providers, system integrators and entities for providing its services. The bankers of MSMEs and corporate buyers would get access to the system, where necessary, for obtaining information on the portfolio of discounted invoices of respective clients.

TReDS would create Electronic Bill Factoring Exchanges which could electronically accept and settle bills so that MSMEs could encash their receivables without delay. TReDS will be the first attempt in the country to introduce factoring without recourse and help not only quick realization of receivables but also appropriate price discovery. The automated platforms were designed to benefit MSMEs by facilitating them to auction their trade receivables at competitive market rates through transparent bidding process on the platform by multiple financiers.

3.4 Startup Opportunities in Supply Chain Finance

MSMEs struggle to get loans because they do not have strong credit histories. Startups can use AI and data from GST filings, e-invoices, bank transactions, and other digital records to better assess creditworthiness. Startups can develop blockchain solutions to securely record transactions and verify invoices in real time. This increases trust between buyers, suppliers, and lenders, and reduces fraud. Startups can focus on system integration such as ERP systems, GST platforms to access working capital for MSMEs. Industries are focusing on environmental

and social responsibility. Startups can offer better loan terms to suppliers who follow sustainable practices. This will encourage green business activities and opens new financing opportunities. Sector specific SCF solutions are another strong opportunity. Different industries like agriculture, textiles, pharmaceuticals, and e-commerce have different cash flow cycles and risks. Startups can design customized financing products for each sector. This targeted approach can better solve working capital problems and create a competitive advantage.

4. Gap Analysis

Previous research has discussed supply chain finance (SCF), fintech, and MSME financing, very few specifically examine startups that provide SCF services. There is limited empirical evidence on TReDS adoption in Indian MSMEs. Technologies such as artificial intelligence and blockchain are often mentioned in literature, there is not enough study on how startups actually use these technologies in real business situations. To address this research gaps the authors have conducted this research with details on supply chain finance innovations TReDS, impact of TReDS adoption on the cash flow and MSMEs growth, and supply chain startups in India.

5. Research Methodology

The study uses primary data collection, secondary data analysis, statistical hypothesis testing, and applied case study of supply chain finance startup Oxyzo.

5.1 Research Design

The study is descriptive and analytical in nature. It aims to understand how supply chain innovation TReDS contribute to improving working capital of MSMEs growth. Challenges faced by MSMEs and large companies to adopt TReDS digital platform.

5.1.1 Primary Data Collection

A structured questionnaire is used to collect primary data for the study. The survey is conducted among MSMEs. The questionnaire focuses on key variables such as TReDS awareness in MSMEs, Use of TReDS, working capital improvement and innovations in supply chain management. To measure perception-based responses, a five-point Likert scale (ranging from 1 = strongly disagree to 5 = strongly agree) is used. This structured approach helps in collecting standardized data that is statistically analyzed to test the research hypotheses.

5.1.2 Secondary Data Collection

Secondary data is collected from reliable and authentic sources to support and strengthen the research findings. These sources include Reserve Bank of India (RBI) reports, publications of the Ministry of MSME, annual reports of startups such as Oxyzo, industry reports from organizations like PwC.

5.1.3 Statistical Hypothesis Testing

Null Hypothesis (H_0):

H_0: There is no association between TReDS usage and working capital improvement of MSMEs

Alternative Hypothesis (H_1):

H_1: There is an association between TReDS usage and working capital improvement of MSMEs

6 Data Analysis

TReDS Awareness in MSME-

The survey results indicate that 72.9% of the participants are aware of TReDS. However, the awareness is not universal, highlighting the need for further outreach

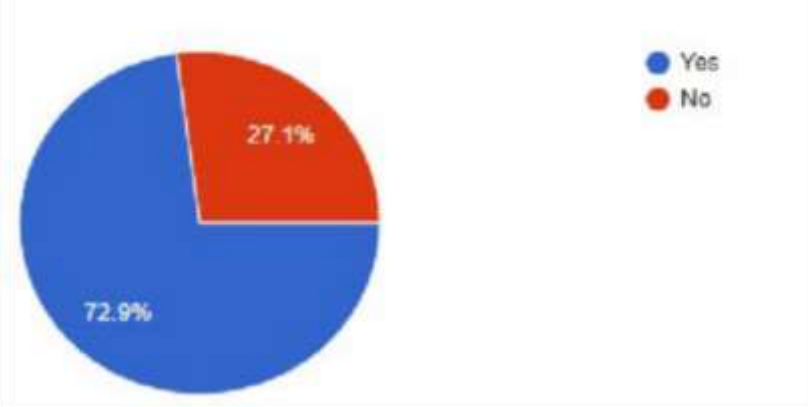

Fig 2: TReDS Awareness in MSMEs

Use of TReDS

73.2% of respondents have been using TReDS for less than six months, 14.6% for six to twelve months, and only 12.2% for over a year. This indicates that adoption of TReDS is still relatively recent for most users, reflecting a growing yet evolving ecosystem.

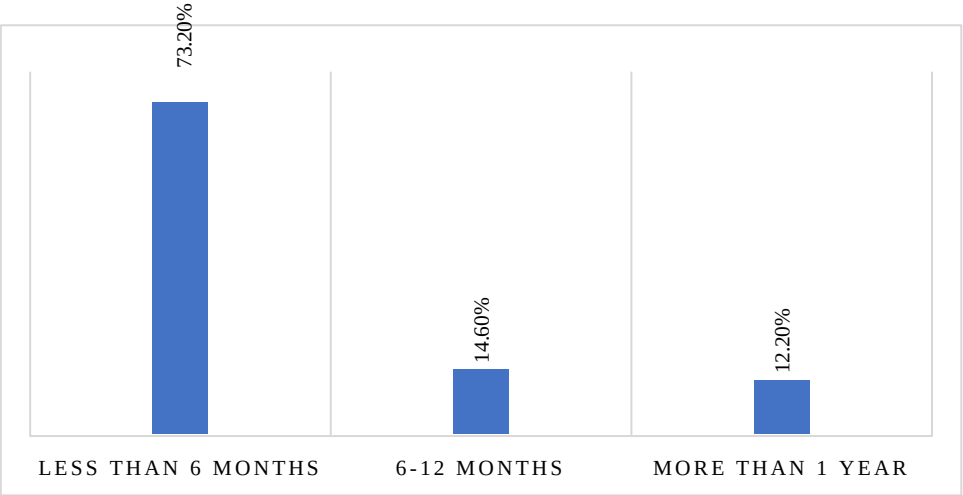

Fig 3: Use of TReDS

Working Capital Improvement after TReDS-

82.2% of respondents reported experiencing growth in working capital improvement after adopting TReDS. This indicates a positive relationship between the use of TReDS and improvements in working capital management.

Fig 4: Working Capital Improvement after Adopting TReDS

Challenges Faced for using TReDS-

75.6% of respondents identified lack of awareness as the major challenge. This highlights that insufficient knowledge and understanding of TReDS remains a significant barrier to wider adoption.

Fig 5: Challenges Faced for using TReDS

Hypothesis Testing Results

A Chi-square test of independence was conducted to examine the association between TReDS usage and working capital improvement among MSMEs. The results revealed a statistically significant association between the two variables, Chi-square test statistic is 22.57 with 1 degree of freedom, based on a sample of 48 observations. $\chi^2(1, N = 48) = 22.57$, which exceeded the critical value of 3.841 at the 5% level of significance. Therefore, the null hypothesis was rejected. This indicates that TReDS usage is significantly associated with improvement in working capital among MSME.

Growth of TReDS Platform

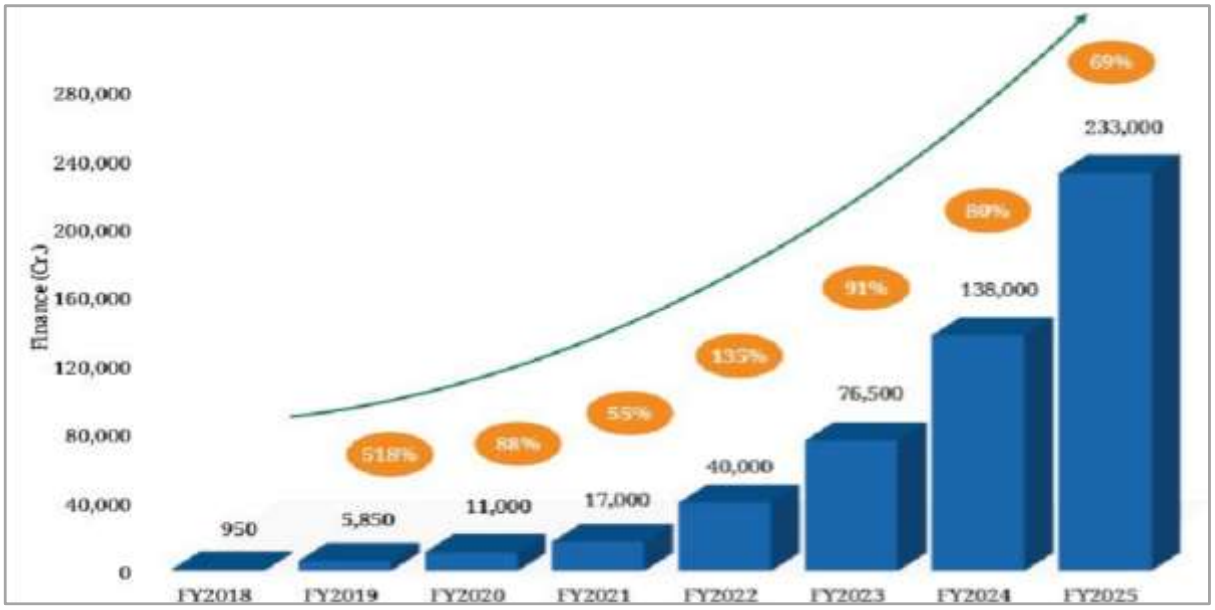

Fig 6: Total Amount Financed on TReDS (Source: RXIL)

6. Research Framework

Cocreation Model

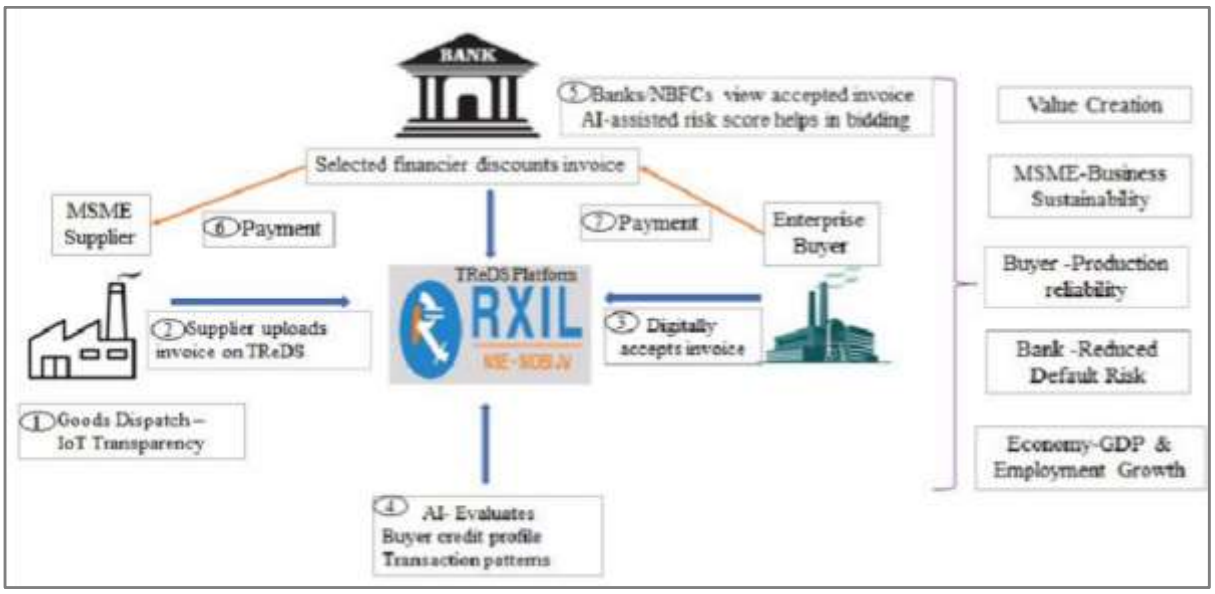

Fig 7: Cocreation Model

Supply Chain Finance has traditionally been viewed as a financial optimization mechanism aimed at improving working capital efficiency. However, contemporary theoretical developments suggest that SCF should be understood through a co-creation lens, where value emerges through collaborative interaction among supply chain companies.

Supplier dispatch goods with IoT devices such as RFID tags, GPS trackers, and smart sensors record real-time shipment details, delivery status, and environmental conditions. This creates transparency. After delivery, the MSME supplier generates the invoice and uploads it to the TReDS platform, attaching IoT-based proof of shipment and delivery. This helps reduce the risk of fake or duplicate invoices. The buyer then logs into TReDS, verifies the goods received using IoT data, and digitally accepts the invoice, making it a legally valid receivable. An AI system evaluates the buyer's credit profile, past payment behaviour, transaction history, and shipment authenticity to generate a risk score. Based on this score, banks and NBFCs bid competitively to finance the invoice, and a discount rate is finalized. The selected financier pays the MSME in advance, improving its working capital. On the due date, the buyer pays the financier, and the AI system updates the repayment record to improve future risk assessment.

The traditional supply chain finance functioned as a post-performance product, meaning banks only financed transactions after goods or services had been delivered. This approach ensured the receivables were reflected in the balance sheets of clients, providing a tangible basis for transactions. The industry has relied heavily on physical documents, such as contracts, bills of lading, and certificates, to validate transactions and often may require in global trade. During

this time, sellers wait for payment, banks lose potential interest revenue, and the economic cycle suffers delays.

In the context of digital supply chain finance, value is jointly created by:

- MSMEs (Suppliers)
- Buyers (Corporate anchors)
- Banks/NBFCs (Financiers)
- Digital platforms such as - Trade Receivables Discounting System
- Enabling Technologies (IoT and AI)

The paper-based trade finance solutions result in high costs and reduced competition, given the challenges associated with storing large volumes of paper-based data. Fig proposed

Case Study: Oxyzo Startup (2016) — A High-Growth Indian Supply Chain Finance Startup

Oxyzo Financial Services was founded in 2016 by Ruchi Kalra and Asish Mohapatra to assist SMEs in resolving their working capital needs. The vision of the company is to transform SMEs into large enterprises by bridging the working capital gap with faster, smarter, and lower-risk financing options. The mission is to provide intelligent and innovative financial solutions to the B2B sector, with a specific focus on empowering Small and Medium Enterprises (SMEs). The startup evolved into a Non-Banking Financial Company (NBFC), developed skills in the lending business. Oxyzo initially focused on purchase financing, providing working capital for SMEs to buy raw materials, and directly paying their suppliers. The company leveraged advanced technology to analyze data and provide loans based on cash flow, which was crucial for businesses struggling to access credit from traditional banks. Oxyzo expanded its offerings beyond just raw material financing to include a broader range of financial services for mid-sized corporates. It also provides opportunities for revenue and information on tenders. The startup was recognized as a "New Unicorn of the Year" in 2022, signifying its rapid growth and success.

Challenges, Limitations, and Future Directions

The adoption of AI and IoT in supply chain finance faces several challenges. High investment in digital infrastructure, data management systems, and cybersecurity is required. Ensuring data privacy and protection is critical, as IoT devices generate real-time operational data that

may be sensitive. Many MSMEs and SMEs may struggle to adopt these technologies due to limited financial resources and technical expertise. In addition, lack of standardization and poor integration between different technology platforms can restrict seamless data sharing and collaboration.

This study also has certain limitations. The sample size was limited to 48 respondents, which may restrict the generalization of the findings to a larger population. A broader sample across different regions and industries could provide more comprehensive insights.

Looking ahead, greater awareness, government support, training programs, and affordable digital solutions will be essential to increase adoption among MSMEs. Developing standardized frameworks and improving interoperability between systems can enhance transparency and efficiency. In the future, stronger collaboration among MSMEs, buyers, financiers, and technology providers will help create a more resilient and technology-driven supply chain finance ecosystem.

Conclusion

This study analyzed supply chain finance innovations with reference to the Trade Receivables Discounting System (TReDS) and its impact on MSMEs. TReDS enables MSMEs to receive payments within 24–48 hours after invoice approval improving working capital. The findings show that 72.9% of participants are aware of TReDS, 73.2% have used it for less than six months, and 82.2% reported improvement in working capital after adoption. However, 75.6% identified lack of awareness as a major challenge. These findings suggest strong benefits of the platform but also highlight the need for greater outreach and education.

The researcher's co-creation framework explains how MSMEs, buyers, financiers, and platform operators create value through digital collaboration supported by AI and IoT. The growth of fintech firms such as Oxyzo Financial Services highlights strong startup potential in this sector. Overall, TReDS strengthens MSMEs and supports the Indian economy.

References

1. Abdelaziz, F., Chen, Y., & Dey, P. (2024). Supply chain resilience, organizational well-being, and sustainable performance: A comparison between the UK and France. Journal of Cleaner Production.

2. Atieh Ali, A. A., Sharabati, A. A. A., Allahham, M., & Nasereddin, A. Y. (2024). The relationship between supply chain resilience and digital supply chain and the impact on sustainability: Supply chain dynamism as a moderator. Sustainability (Basel), 16(7), 3082.

3. Bai, H., Huang, L., & Wang, Z. (2024). Supply chain financing, digital financial inclusion, and enterprise innovation: Evidence from China. International Review of Financial Analysis, 91,

4. Ghosh, S. (2022), Geopolitical risk, economic growth, economic uncertainty, and international inbound tourism: an Indian Review of Economics and Political Science.

5. Haque, A., Haque, S., Rahman, M., Kumar, K., & Zeba, S. (2022). Potential applications of the Internet of Things in sustainable rural development in India. In Proceedings of the Third International Conference on Sustainable Computing (pp. 455–467). Springer.

6. Klapper, L. (2006). The role of factoring for financing small and medium enterprises. Journal of Banking & Finance, 30(11), 3111–3130.

7. Leena, S. (2024). The impact of supply chain financing (SCF) on MSME performance in India: With special reference to recent regulatory amendments to TReDS.

8. Liu and Zheng (2024), The impact of supply chain finance on supplier stability: The mediation role of corporate risk-taking, 65 Article 105606

9. Olan, F., Arakpogun, E. O., Jayawickrama, U., Suklan, J., & Liu, S. (2022). Sustainable supply chain finance and supply networks: The role of artificial intelligence. IEEE Transactions on Engineering Management.

10. Shoomal A, Jahanbakht M, P.J. Componation, D. Ozay (2024), Enhancing supply chain resilience and efficiency through IoT integration.

11. Udeh, E. O., Amajuoyi, P., Adeusi, K. B., & Scott, A. O. (2024). The role of IoT in boosting supply chain transparency and efficiency.

12. Vousinas, Georgios (2019), Supply chain finance: definition, modern aspects and research challenges ahead, Supply Chain Finance: Risk Management, Resilience and Supplier Management, Kogan Page, 63-95.

13. Wang, X., Kumar, V., Kumari, A., & Kuzmin, E. (2022). Impact of digital technology on supply chain efficiency in the manufacturing industry. In Digital transformation in industry: Digital twins and new business models (pp. 347–371). Springer.

14. Zhang H., Y. Shi, X. Yang, R. Zhou (2021), A firefly algorithm modified support vector machine for the credit risk assessment of supply chain finance. Research in International Business and Finance, 58

15. https://m.rbi.org.in/Scripts/TREDSStatisticsView.aspx?TREDSid=22

16. https://www.oxyzo.in/corporate-financing/supply-chain-financing