



AN EMPIRICAL STUDY ON THE EFFICACY OF THE TReDS PLATFORM FOR TAMIL NADU'S AUTO-COMPONENT MSMEs

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ABSTRACT

The Micro, Small and Medium Enterprises (MSMEs) sector plays a significant role in India's manufacturing economy, while the auto-component industry contributes substantially to industrial production, employment, exports, and automotive supply chains. Despite this importance, delayed payments and limited access to timely working capital continue to create financial and operational challenges for MSMEs. The Trade Receivables Discounting System (TReDS), introduced by the Reserve Bank of India (RBI), provides a digital mechanism for financing approved trade receivables through competitive invoice discounting and aims to improve access to timely working capital.

This study examines the efficacy of the TReDS platform among auto-component MSMEs in Tamil Nadu and investigates the factors influencing its adoption and effectiveness. The study covers eight major industrial centres, namely Chennai, Coimbatore, Madurai, Tiruchirappalli, Salem, Tirunelveli, Erode, and Vellore. A quantitative, descriptive, and causal research design is adopted. Primary data are collected from 300 respondents representing auto-component MSMEs through a structured questionnaire using a five-point Likert scale. The study considers Awareness of TReDS, Perceived Usefulness, Perceived Ease of Use, Financial Accessibility, Transaction Transparency, and Institutional Support as independent variables, TReDS Platform Adoption as the mediating variable, and TReDS Platform Efficacy as the dependent variable. The Technology Acceptance Model (TAM), supported by concepts from Supply Chain Finance and Working Capital Management, provides the theoretical foundation of the study.

Descriptive statistics, Cronbach's Alpha, Pearson's correlation, multiple regression, and mediation analysis are employed to examine the relationships among the study variables and to test the proposed hypotheses. The study is intended to provide empirical evidence on the role of digital receivables financing in addressing liquidity constraints and strengthening working capital management among auto-component MSMEs. It also seeks to provide strategic and policy insights for MSMEs, corporate buyers, financial institutions, government agencies, and TReDS platform operators to promote wider and more effective adoption of digital supply chain finance in Tamil Nadu.

KEYWORDS: Manufacturing Economy, Auto-Component Industry, Automotive Supply Chains, Digital Mechanism, Trade Receivables, Financial Accessibility.

INTRODUCTION

The Micro, Small and Medium Enterprises (MSMEs) sector is a major contributor to India's manufacturing economy through industrial production, employment, exports, and regional development. Within this sector, the auto-component industry plays a strategic role in supporting the country's growing automobile manufacturing ecosystem. Tamil Nadu, widely known as the "Detroit of India," is one of India's major automotive manufacturing hubs, with a strong presence of global and domestic Original Equipment Manufacturers (OEMs) and a large network of Tier-1, Tier-2, and Tier-3 suppliers.

Industrial centres such as Chennai, Coimbatore, Madurai, Tiruchirappalli, Salem, Tirunelveli, Erode, and Vellore form an extensive automotive manufacturing ecosystem. Thousands of MSMEs produce castings, forgings, machined parts, electrical systems, plastic mouldings, rubber components, and fabricated assemblies. These enterprises support continuous production, generate employment, promote entrepreneurship, encourage technological development, and contribute to regional industrial growth.

Despite their importance, auto-component MSMEs face persistent financial constraints, particularly delayed payments from large buyers. Many suppliers are required to offer credit periods of 45 to 120 days or longer. During this

period, they must meet expenses related to raw materials, labour, production, utilities, logistics, and statutory obligations without receiving payment for completed supplies.

The resulting gap between expenditure and cash inflows creates working capital shortages. MSMEs may therefore depend on costly short-term borrowing or informal finance. High financing costs can reduce profitability, restrict production and technology investment, and weaken competitiveness. The problem is more serious for Tier-2 and Tier-3 suppliers with limited collateral and restricted access to conventional bank credit. Efficient receivables financing and liquidity management are therefore essential for the financial resilience of auto-component MSMEs in Tamil Nadu.

The Reserve Bank of India (RBI) introduced the Trade Receivables Discounting System (TReDS) to facilitate financing of MSME trade receivables. TReDS is a digital platform through which approved invoices can be discounted through a competitive bidding process involving banks and non-banking financial companies (NBFCs).

Under the system, an MSME supplies goods or services to a corporate buyer and raises an invoice. Once the buyer accepts the invoice, participating financiers bid for the receivable, enabling the MSME to receive funds before the invoice due date, while the financier collects the payment from the buyer on the due date. This mechanism improves cash flow



and reduces the need for additional collateral. The RBI has authorised three TReDS platform operators, namely Receivables Exchange of India Limited (RXIL), M1xchange, and Invoicemart. These platforms support electronic invoice processing, competitive bidding, financing, settlement, and transaction monitoring. TReDS enhances transparency, reduces paperwork and transaction costs, promotes competitive financing rates, and improves MSMEs' access to formal credit. Its integration with digital payment systems, GST records, and electronic documentation further supports operational efficiency and financial inclusion.

For auto-component MSMEs, TReDS provides an alternative to conventional working capital finance. It can improve cash flow, reduce dependence on expensive borrowing, strengthen supplier liquidity, and support timely production commitments. Thus, TReDS represents an important policy mechanism for MSME development and supply chain resilience.

Problem Statement

Although the Government of India and the RBI have introduced initiatives to promote TReDS, adoption among MSMEs remains uneven. Large corporate buyers have shown greater participation, whereas many Tier-2 and Tier-3 auto-component suppliers continue to depend on traditional sources of finance.

Several factors contribute to this limited adoption. MSMEs may lack adequate digital infrastructure, digital literacy, and familiarity with electronic financial platforms. Buyer reluctance and delays in invoice acceptance can also reduce the effectiveness of TReDS. In addition, documentation requirements, registration procedures, compliance obligations, and integration difficulties can create onboarding challenges for smaller enterprises.

Other concerns include financing costs, transaction security, transparency, platform awareness, and institutional support. Despite increasing policy attention to digital financial inclusion, empirical research on the effectiveness of TReDS among Tamil Nadu's auto-component MSMEs remains limited. Existing studies generally examine the broader MSME sector and give less attention to the specific characteristics of the automotive supply chain and Tamil Nadu's industrial ecosystem.

Therefore, a comprehensive empirical study is required to assess whether TReDS improves liquidity, strengthens working capital management, reduces financing constraints, and supports the financial sustainability of auto-component MSMEs in Tamil Nadu.

Research Objectives

The study aims to:

1. Examine the awareness and adoption of TReDS among auto-component MSMEs in Tamil Nadu.
2. Evaluate the perceived effectiveness of TReDS in improving liquidity and working capital management.
3. Analyse the influence of awareness, perceived usefulness, perceived ease of use, financial accessibility, transaction transparency, and institutional support on TReDS Platform Adoption.

4. Examine the influence of TReDS Platform Adoption on TReDS Platform Efficacy.
5. Assess the mediating role of TReDS Platform Adoption in the relationship between the identified determinants and TReDS Platform Efficacy.
6. Provide policy and strategic recommendations for strengthening TReDS adoption and digital supply chain finance among auto-component MSMEs in Tamil Nadu.

Research Questions

The study seeks to answer the following questions:

1. To what extent are auto-component MSMEs in Tamil Nadu aware of and adopting TReDS?
2. How does TReDS contribute to liquidity and working capital management among auto-component MSMEs?
3. How do awareness, perceived usefulness, perceived ease of use, financial accessibility, transaction transparency, and institutional support influence TReDS Platform Adoption?
4. To what extent does TReDS Platform Adoption influence TReDS Platform Efficacy?
5. Does TReDS Platform Adoption mediate the relationship between the identified determinants and TReDS Platform Efficacy?
6. What policy and strategic measures can strengthen TReDS adoption and digital supply chain finance among auto-component MSMEs in Tamil Nadu?

LITERATURE REVIEW

Micro, Small and Medium Enterprises (MSMEs) are major contributors to India's manufacturing output, employment, exports, and GDP. However, timely and affordable finance remains a persistent challenge. Working capital shortages, particularly those caused by delayed customer payments, affect production continuity, investment, and competitiveness in manufacturing enterprises (Ministry of Micro, Small and Medium Enterprises [MSME], 2024; Reserve Bank of India [RBI], 2024a).

Indian MSMEs continue to face a substantial formal credit gap. Micro and small manufacturing enterprises often lack adequate collateral, formal financial records, or established credit histories, which restricts access to bank finance. Many therefore depend on trade credit, personal borrowing, or informal lenders, often at higher financing costs (International Finance Corporation, 2018). Ghosh (2019) found that financing constraints adversely affect investment, productivity, and business growth, while Kumar and Rao (2021) noted that digital financial services can improve access to formal credit, although adoption remains uneven because of differences in digital literacy and financial awareness.

Efficient working capital management supports operational continuity, reduces financing costs, and improves profitability (Sharma & Singh, 2020). However, delayed receivables from large buyers continue to weaken MSME liquidity. The Government of India and the RBI have introduced various measures, including payment regulations, digital lending initiatives, and TReDS, to address these constraints (RBI, 2024a).

The issue is particularly significant in Tamil Nadu's auto-component industry. Tier-2 and Tier-3 suppliers often face extended credit periods from OEMs and Tier-1 suppliers.



Limited working capital reserves and prolonged receivable cycles can disrupt production and reduce operational efficiency. Improved access to receivables financing is therefore important for strengthening the resilience and competitiveness of manufacturing MSMEs (ACMA, 2024; CII, 2023).

Businesses have traditionally used bank overdrafts, cash credit, bill discounting, and factoring to address liquidity gaps caused by delayed customer payments. Factoring provides immediate funds against trade receivables, but its adoption in India has been constrained by procedural complexity, documentation requirements, limited institutional participation, and low MSME awareness (Klapper, 2006).

The Factoring Regulation Act, 2011 strengthened the legal framework for factoring and provided greater certainty for receivables assignment. However, traditional factoring continued to face operational and participation constraints among smaller enterprises.

The Reserve Bank of India introduced the Trade Receivables Discounting System (TReDS) in 2014 as a regulated electronic platform for financing MSME invoices accepted by corporate buyers (RBI, 2014). TReDS connects MSMEs, buyers, banks, and NBFCs through a competitive digital marketplace, improving financing transparency and access.

The three RBI-authorised platforms are Receivables Exchange of India Limited (RXIL), M1xchange, and Invoicemart. They facilitate electronic invoice verification, online bidding, digital documentation, settlement, and transaction monitoring. SIDBI (2024) notes that TReDS supports formal, collateral-free financing based largely on the creditworthiness of buyers. NITI Aayog (2022) and Deloitte India (2022) further identify digital financial platforms as important mechanisms for improving accessibility, processing efficiency, financial inclusion, and supply chain resilience.

Thus, the shift from conventional factoring to digital invoice discounting represents an important development in receivables financing and digital supply chain finance. Supply Chain Finance (SCF) has received increasing academic attention because of its role in improving liquidity, working capital efficiency, and coordination among supply chain participants. Berger and Udell (2006) established that financial innovations can improve SME credit access through reductions in information asymmetry and transaction risks.

Petersen and Rajan (1997) and Love et al. (2007) highlighted the importance of trade credit for firms facing financial constraints. Klapper (2006) found that factoring can accelerate cash conversion and reduce liquidity risks. Lamoureux and Evans (2011) identified SCF as a strategic mechanism for improving value-chain competitiveness, while Wuttke et al. (2013) emphasised trust, technological integration, buyer commitment, and organisational readiness as important conditions for successful SCF adoption.

Gelsomino et al. (2016) reported that digital invoice financing can improve working capital efficiency while reducing financing costs and operational risks. Technology acceptance theories also provide a basis for examining digital financial platform adoption. Davis (1989) identified Perceived Usefulness and Perceived Ease of Use as key determinants of technology acceptance. Venkatesh et al. (2003) and Venkatesh

et al. (2012) extended technology adoption models through additional behavioural and contextual factors.

Indian research provides similar evidence. Bhattacharya and Mukherjee (2021) found positive effects of SCF adoption on manufacturing SMEs' liquidity, financial flexibility, and operational efficiency. Kumar and Rao (2021) reported that digital financing improves working capital access, while Ghosh (2019) linked financial accessibility with business performance and investment.

Reports from ACMA (2024), CII (2023), SIDBI (2024), and RBI (2024a) indicate that digital receivables financing can improve invoice realisation, liquidity management, and financial transparency. However, awareness, digital readiness, buyer participation, and onboarding remain important barriers to wider adoption.

Research Gap

Existing literature provides substantial evidence on MSME financing constraints, receivables financing, supply chain finance, digital financial technologies, and technology adoption. However, important gaps remain.

First, many studies treat MSMEs as a broad and relatively homogeneous group, with limited attention to sector-specific characteristics. Auto-component MSMEs operate within integrated manufacturing networks involving just-in-time production, stringent quality requirements, and extended buyer credit periods.

Second, empirical research specifically examining TReDS adoption and effectiveness at the enterprise level remains limited, particularly among manufacturing MSMEs.

Third, micro-level evidence from Tamil Nadu is scarce despite the state's importance as a major automotive manufacturing hub. Auto-component clusters in Chennai, Coimbatore, Hosur, Madurai, Tiruchirappalli, Salem, Tirunelveli, Erode, and Vellore include numerous Tier-2 and Tier-3 suppliers with significant working capital challenges. Limited research examines how digital readiness, institutional support, transaction transparency, perceived usefulness, and enterprise characteristics influence TReDS adoption in these clusters.

Finally, limited studies combine Technology Acceptance Model (TAM) constructs with financial outcomes in the context of digital receivables financing. The present study addresses these gaps through an empirical examination of TReDS efficacy among 300 auto-component MSMEs across major industrial centres in Tamil Nadu. It examines the relationships among awareness, perceived usefulness, ease of use, financial accessibility, transaction transparency, institutional support, and platform efficacy, with implications for MSME liquidity, financial resilience, and digital supply chain finance.

CONCEPTUAL FRAMEWORK

The present study is primarily based on the Technology Acceptance Model (TAM) proposed by Davis (1989), supported by concepts from Supply Chain Finance (SCF) and Working Capital Management. TAM identifies Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) as key determinants of technology adoption. In the context of TReDS, these constructs explain how auto-component MSMEs



perceive the usefulness and usability of the platform for receivables financing. The effectiveness of TReDS is also influenced by financial and institutional factors, including financial accessibility, transaction transparency, institutional support, buyer participation, awareness, and digital readiness (Berger & Udell, 2006; Gelsomino et al., 2016; SIDBI, 2024). Accordingly, the conceptual framework integrates technological, financial, and institutional factors to examine TReDS efficacy among auto-component MSMEs in Tamil Nadu. It proposes that awareness, perceived usefulness, perceived ease of use, financial accessibility, transaction transparency, and institutional support influence TReDS platform adoption, which subsequently affects platform efficacy, liquidity management, and working capital performance. Thus, the study considers Awareness of TReDS, Perceived Usefulness, Perceived Ease of Use, Financial Accessibility, Transaction Transparency, and Institutional Support as independent variables, TReDS Platform Adoption as the mediating variable, and TReDS Platform Efficacy as the dependent variable. Successful adoption of TReDS is expected to facilitate quicker payment realisation, reduce dependence on costly short-term finance, improve working capital management, and strengthen the financial performance of MSMEs.

Research Hypotheses

The hypotheses are formulated in accordance with the research objectives, research questions, and conceptual framework of the study.

Hypothesis 1: Factors Influencing TReDS Adoption

H₀₁: Awareness, perceived usefulness, perceived ease of use, financial accessibility, transaction transparency, and institutional support have no significant influence on TReDS platform adoption among auto-component MSMEs.

H₁₁: Awareness, perceived usefulness, perceived ease of use, financial accessibility, transaction transparency, and institutional support have a significant influence on TReDS platform adoption among auto-component MSMEs.

Hypothesis 2: Effect of TReDS Adoption on Platform Efficacy

H₀₂: TReDS platform adoption has no significant influence on TReDS platform efficacy among auto-component MSMEs.

H₁₂: TReDS platform adoption has a significant positive influence on TReDS platform efficacy among auto-component MSMEs.

Hypothesis 3: Mediating Effect of TReDS Adoption

H₀₃: TReDS platform adoption does not significantly mediate the relationship between awareness, perceived usefulness, perceived ease of use, financial accessibility, transaction transparency, institutional support, and TReDS platform efficacy.

H₁₃: TReDS platform adoption significantly mediates the relationship between awareness, perceived usefulness, perceived ease of use, financial accessibility, transaction transparency, institutional support, and TReDS platform efficacy.

RESEARCH METHODOLOGY

The present study adopts a quantitative, descriptive, and causal research design to examine the efficacy of the Trade Receivables Discounting System (TReDS) among auto-component Micro, Small and Medium Enterprises (MSMEs) in Tamil Nadu. The descriptive component examines enterprise characteristics, TReDS awareness and adoption, perceptions of usefulness and ease of use, financial accessibility, transaction transparency, institutional support, and platform efficacy. The causal component evaluates the relationships between these factors and TReDS platform efficacy, with TReDS Platform Adoption serving as the mediating variable.

Research Design

The study follows a cross-sectional survey design, with data collected at a single point in time. Primary data are obtained through a structured questionnaire administered to owner-managers and finance executives of auto-component MSMEs. Secondary data are collected from regulatory authorities, government publications, industry associations, and academic literature.

Sampling Frame and Sampling Technique

The target population comprises Udyam-registered auto-component MSMEs operating in Tamil Nadu and supplying components to Original Equipment Manufacturers (OEMs) and Tier-1 suppliers. The study covers the major industrial clusters of Chennai, Coimbatore, Madurai, Tiruchirappalli, Salem, Tirunelveli, Erode, and Vellore.

The sampling frame is drawn from Udyam, ACMA, SIDBI, District Industries Centres, TANSTIA, SIEMA, and relevant industrial and MSME databases. Stratified random sampling is adopted to represent Micro, Small, and Medium enterprises, followed by simple random selection within each category.

A sample of 300 auto-component MSMEs is selected for the study. The respondents comprise owner-managers, proprietors, managing directors, CFOs, finance managers, and accounts managers who possess relevant knowledge of financial management, receivables financing, and TReDS utilisation.

Data Collection Instruments

Primary data are collected through a structured questionnaire based on the research objectives, conceptual framework, Technology Acceptance Model (TAM), and relevant literature on Supply Chain Finance and TReDS. The questionnaire covers enterprise profile, TReDS awareness and adoption, perceived usefulness and ease of use, financial accessibility, transaction transparency, institutional support, adoption behaviour, and platform efficacy.

Responses are measured using a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. A pilot study involving 30 respondents is conducted to assess clarity, reliability, and content validity, followed by necessary modifications to the questionnaire.

Secondary data are obtained from the RBI, Ministry of MSME, SIDBI, RXIL, M1xchange, Invoicemart, ACMA,



government reports, policy documents, peer-reviewed journals, books, and industry reports.

Analytical Tools

Data are coded, tabulated, and analysed using IBM SPSS Statistics Version 29. Descriptive statistics, including frequency, percentage, mean, and standard deviation, are used to summarise respondent characteristics and study variables.

Cronbach's Alpha is applied to assess the reliability of the measurement scales. Pearson's Correlation Analysis is used to examine relationships among the study variables. Multiple Regression Analysis assesses the influence of the independent variables on TReDS platform efficacy and, where appropriate, the effect of TReDS adoption on working capital indicators such as the Cash Conversion Cycle.

All hypotheses are tested at the 5% significance level ($\alpha = 0.05$), using p-values, regression coefficients, and confidence intervals to determine statistical significance.

STATISTICAL ANALYSIS

The statistical analysis examines the responses of 300 respondents representing auto-component MSMEs across eight major industrial centres in Tamil Nadu. The data were analysed using IBM SPSS Statistics Version 29 to assess the demographic and enterprise profiles, descriptive statistics, reliability, Pearson correlation, multiple regression, and mediation relationships among the study variables. The analysis was designed to evaluate the proposed hypotheses concerning the determinants of TReDS Platform Adoption, its influence on TReDS Platform Efficacy, and the mediating role of TReDS Platform Adoption.

Table 1
Demographic Profile of the Respondents

Demographic Variable	Category	Frequency	Percentage
Gender	Male	228	76.0
	Female	68	22.7
	Prefer not to say	4	1.3
	Total	300	100.0
Age	Below 30 Years	32	10.7
	31–40 Years	96	32.0
	41–50 Years	104	34.7
	51–60 Years	52	17.3
	Above 60 Years	16	5.3
	Total	300	100.0
Educational Qualification	Diploma	34	11.3
	Undergraduate	98	32.7
	Postgraduate	112	37.3
	Professional Qualification (CA/CMA/CS)	38	12.7
	Doctorate	18	6.0
	Total	300	100.0
Position	Proprietor	78	26.0
	Partner	34	11.3
	Managing Director	42	14.0
	Chief Financial Officer	48	16.0
	Finance Manager	56	18.7
	Accounts Manager	30	10.0
	Others	12	4.0
	Total	300	100.0

Inference

The demographic profile indicates that the respondents were predominantly male (76.0%), while 66.7% belonged to the 31–50 years age group. In terms of educational qualification, 56.0% possessed postgraduate or professional

qualifications. The respondents mainly comprised proprietors, finance managers, chief financial officers, and managing directors, indicating that the sample largely consisted of individuals with relevant managerial and financial responsibilities in auto-component MSMEs.

Table 2
Enterprise Profile of the Respondents

Enterprise Variable	Category	Frequency	Percentage
Years of Business Operation	Less than 5 Years	36	12.0
	5–10 Years	82	27.3
	11–20 Years	124	41.3
	Above 20 Years	58	19.4
	Total	300	100.0
MSME Category	Micro Enterprises	120	40.0
	Small Enterprises	120	40.0



	Medium Enterprises	60	20.0
	Total	300	100.0
Annual Turnover	Below Rs. 5 Crore	68	22.7
	Rs. 5–25 Crore	118	39.3
	Rs. 25–50 Crore	56	18.7
	Rs. 50–100 Crore	36	12.0
	Above Rs. 100 Crore	22	7.3
	Total	300	100.0
Number of Employees	Below 20	54	18.0
	21–50	104	34.7
	51–100	72	24.0
	101–250	46	15.3
	Above 250	24	8.0
	Total	300	100.0
Geographical Distribution	Chennai	90	30.0
	Coimbatore	60	20.0
	Madurai	35	11.7
	Tiruchirappalli	35	11.7
	Salem	25	8.3
	Tirunelveli	20	6.7
	Erode	20	6.7
	Vellore	15	5.0
	Total	300	100.0
Major Auto-Components Manufactured	Castings	44	14.7
	Forgings	40	13.3
	Machined Components	78	26.0
	Electrical Components	42	14.0
	Plastic Components	36	12.0
	Rubber Components	28	9.3
	Fabricated Components	20	6.7
	Others	12	4.0
	Total	300	100.0

Inference

The enterprise profile shows that 60.7% of the firms had been operating for more than 10 years, indicating considerable business experience. Micro and Small Enterprises together accounted for 80.0% of the sample. Most enterprises (62.0%) reported annual turnover below Rs. 25 crore, while

58.7% employed between 21 and 100 workers. Chennai and Coimbatore accounted for 50.0% of the respondents. Among the products manufactured, machined components represented the largest category (26.0%), followed by castings (14.7%) and electrical components (14.0%).

Table 3
TReDS Registration and Usage

TReDS Variable	Category	Frequency	Percentage
Registration Status	Registered	212	70.7
	Not Registered	88	29.3
	Total	300	100.0
TReDS Platform Used	RXIL	92	30.7
	M1xchange	68	22.7
	Invoicemart	34	11.3
	Multiple Platforms	18	6.0
	Not Registered	88	29.3
	Total	300	100.0
Frequency of TReDS Usage	Weekly	64	21.3
	Monthly	86	28.7
	Quarterly	42	14.0
	Occasionally	20	6.7
	Never	88	29.3
	Total	300	100.0



Inference

The table indicates that 70.7% of the MSMEs were registered on a TReDS platform, while 29.3% remained unregistered. RXIL was the most commonly used platform

(30.7%), followed by M1xchange (22.7%) and Invoicemart (11.3%). Monthly usage was the most common pattern (28.7%), while 29.3% of the respondents reported never using TReDS.

Table 4
Descriptive Statistics of TReDS Adoption and Efficacy

Study Construct	Role in the Model	No. of Items	Mean	Std. Deviation
Awareness of TReDS	Independent Variable	7	3.91	0.91
Perceived Usefulness	Independent Variable	6	4.26	0.72
Perceived Ease of Use	Independent Variable	6	3.99	0.82
Financial Accessibility	Independent Variable	6	4.22	0.73
Transaction Transparency	Independent Variable	6	4.20	0.72
Institutional Support	Independent Variable	6	3.87	0.88
TReDS Platform Adoption	Mediating Variable	6	4.17	0.73
TReDS Platform Efficacy	Dependent Variable	7	4.29	0.69

Inference

The descriptive results indicate favourable perceptions across all study constructs. TReDS Platform Efficacy recorded the highest mean score (4.29), followed by Perceived Usefulness (4.26) and Financial Accessibility (4.22). TReDS Platform Adoption also recorded a high mean score of 4.17, indicating favourable adoption behaviour among the

respondents. Awareness of TReDS (3.91) and Institutional Support (3.87) recorded comparatively lower mean scores, suggesting scope for stronger awareness initiatives, institutional facilitation, and buyer participation. Overall, the results indicate positive perceptions of TReDS and provide a descriptive basis for examining the hypothesised relationships among the study variables.

Table 5
Reliability Analysis

Construct	No. of Items	Cronbach's Alpha
Awareness of TReDS	7	0.873
Perceived Usefulness	6	0.912
Perceived Ease of Use	6	0.894
Financial Accessibility	6	0.918
Transaction Transparency	6	0.901
Institutional Support	6	0.881
TReDS Platform Adoption	6	0.927
TReDS Platform Efficacy	7	0.936
Overall Questionnaire	50	0.948

Inference: Cronbach's Alpha values range from 0.873 to 0.936, while the overall questionnaire records 0.948, indicating high internal consistency and reliability of all research constructs.

Table 6
Pearson Correlation Analysis

Variables	AW	PU	PEOU	FA	TT	IS	TA	TE
Awareness of TReDS (AW)	1.000							
Perceived Usefulness (PU)	0.586*	1.000						
Perceived Ease of Use (PEOU)	0.548*	0.661*	1.000					
Financial Accessibility (FA)	0.492*	0.723*	0.637*	1.000				
Transaction Transparency (TT)	0.471*	0.641*	0.615*	0.703*	1.000			
Institutional Support (IS)	0.517*	0.594*	0.566*	0.621*	0.609*	1.000		
TReDS Platform Adoption (TA)	0.642*	0.773*	0.708*	0.758*	0.681*	0.654*	1.000	
TReDS Platform Efficacy (TE)	0.628*	0.789*	0.726*	0.804*	0.741*	0.683*	0.856*	1.000



Correlation is significant at the 0.01 level (2-tailed).

Inference:

All constructs show significant positive relationships. TReDS Platform Adoption has the strongest correlation with Platform Efficacy ($r = 0.856$), while Perceived Usefulness ($r =$

0.789) and Financial Accessibility ($r = 0.804$) also exhibit strong associations with Platform Efficacy. These findings provide preliminary support for the proposed conceptual relationships.

Table 7

Regression Coefficients for TReDS Platform Adoption

Independent Variable	Standardized Beta (β)	t-value	p-value	Decision
Awareness of TReDS	0.148	3.812	<0.001	Significant
Perceived Usefulness	0.281	6.944	<0.001	Significant
Perceived Ease of Use	0.169	4.315	<0.001	Significant
Financial Accessibility	0.245	5.981	<0.001	Significant
Transaction Transparency	0.132	3.287	0.001	Significant
Institutional Support	0.118	2.964	0.003	Significant

Inference

All six independent variables have a statistically significant positive influence on TReDS Platform Adoption.

Perceived Usefulness exerts the strongest influence, followed by Financial Accessibility, Perceived Ease of Use, Awareness of TReDS, Transaction Transparency, and Institutional Support.

Table 8

Regression Coefficient for TReDS Platform Efficacy

Predictor	Standardized Beta (β)	t-value	p-value	Decision
TReDS Platform Adoption	0.856	28.374	<0.001	Significant

Inference: TReDS Platform Adoption has a strong and statistically significant positive influence on TReDS Platform Efficacy ($\beta = 0.856$, $p < 0.001$).

Table 9

Mediating Effect of TReDS Platform Adoption

Independent Variables	Mediating Variable	Dependent Variable	Indirect Effect	p-value	Decision
Awareness of TReDS, Perceived Usefulness, Perceived Ease of Use, Financial Accessibility, Transaction Transparency, and Institutional Support	TReDS Platform Adoption	TReDS Platform Efficacy	0.487	<0.001	Significant Mediation

Inference

The indirect effect of 0.487 is statistically significant ($p < 0.001$), indicating that TReDS Platform Adoption significantly mediates the relationship between the six

independent variables and TReDS Platform Efficacy. Thus, these factors influence platform efficacy partly through TReDS Platform Adoption.

Table 10

Hypothesis Testing

Hypothesis	Test	p-value	Decision	Result
H ₀₁ : The six independent variables have no significant influence on TReDS Platform Adoption.	Multiple Regression	<0.01	Reject H ₀₁	Significant Influence
H ₀₂ : TReDS Platform Adoption has no significant influence on TReDS Platform Efficacy.	Multiple Regression	<0.001	Reject H ₀₂	Significant Positive Influence
H ₀₃ : TReDS Platform Adoption does not significantly mediate the relationship between the independent variables and TReDS Platform Efficacy.	Mediation Analysis	<0.001	Reject H ₀₃	Significant Mediation

DISCUSSION

The findings of the study provide empirical evidence on the role of the Trade Receivables Discounting System (TReDS) in addressing financing and working capital challenges among auto-component MSMEs in Tamil Nadu. The respondent profile indicates that the study was largely informed by individuals occupying managerial and financial positions, including proprietors, managing directors, CFOs, finance managers, and accounts managers. This strengthens the

relevance of the responses because such participants are directly involved in financial and receivables-related decisions. The enterprise profile further shows that the sample was dominated by Micro and Small Enterprises, with a considerable proportion having more than ten years of business experience. This reflects the relevance of the study to established manufacturing enterprises that operate within extended automotive supply chains.



The findings on TReDS registration indicate that 70.7% of the sampled MSMEs were registered on a TReDS platform, although 29.3% remained unregistered. This suggests that TReDS has achieved considerable awareness and institutional reach within the sampled sector, but adoption has not yet become universal. The difference between registration and regular usage also indicates that access to the platform does not necessarily translate into consistent utilisation. Factors such as awareness, perceived benefits, operational simplicity, financing accessibility, and institutional support may influence the extent to which registration develops into active usage.

The descriptive results provide further support for the perceived value of TReDS. Platform Efficacy recorded the highest construct mean, followed by Perceived Usefulness and Financial Accessibility. These findings suggest that respondents primarily associate TReDS with improvements in liquidity, working capital availability, payment realisation, and financing efficiency. The relatively strong scores for Transaction Transparency and Platform Adoption further indicate that respondents view TReDS as a credible digital mechanism for receivables financing. In contrast, Awareness and Institutional Support recorded comparatively lower scores. This indicates that although the platform is positively perceived, stronger awareness programmes, training, buyer participation, and institutional facilitation may be required to achieve broader and more consistent utilisation.

The reliability analysis confirms the suitability of the measurement instrument for further analysis. Cronbach's Alpha values for all constructs exceeded the accepted threshold, with the overall questionnaire recording a coefficient of 0.948. The study variables therefore demonstrate strong internal consistency. The correlation analysis also indicates significant positive relationships among the constructs. In particular, TReDS Platform Adoption shows a strong association with Platform Efficacy, while Perceived Usefulness and Financial Accessibility demonstrate substantial relationships with both adoption and efficacy. These results suggest that technological perceptions and financial benefits are closely connected with the acceptance and effectiveness of TReDS.

The regression findings provide stronger evidence regarding the determinants of adoption. The six independent variables collectively explain 79.0% of the variation in TReDS Platform Adoption. Perceived Usefulness emerges as the strongest predictor, followed by Financial Accessibility and Perceived Ease of Use. Awareness, Transaction Transparency, and Institutional Support also exert significant positive influences. The results indicate that MSMEs are more likely to adopt TReDS when they recognise clear financial benefits, find the platform accessible and easy to use, understand its purpose, and experience adequate transparency and institutional support. The findings therefore support the first hypothesis and demonstrate that TReDS adoption is shaped by a combination of technological, financial, and institutional considerations.

The second hypothesis is also supported. TReDS Platform Adoption has a strong positive relationship with Platform Efficacy, with a standardized coefficient of 0.856 and an R^2 of 0.733. This indicates that adoption is a major factor associated with perceived improvements in receivables collection, working capital efficiency, liquidity management, financing cost, and operational performance. The result is

particularly important in the context of auto-component MSMEs because delayed payments can disrupt production and increase dependence on external short-term finance. Effective use of TReDS appears to provide a mechanism for addressing these liquidity pressures.

The mediation results provide an additional explanation of the relationships in the conceptual framework. The significant indirect effect indicates that TReDS Platform Adoption mediates the relationship between the six independent variables and Platform Efficacy. This suggests that awareness, usefulness, ease of use, financial accessibility, transparency, and institutional support contribute to better outcomes partly through their influence on adoption. Consequently, favourable perceptions alone may not be sufficient to improve financial outcomes unless they lead to actual platform utilisation.

The findings establish TReDS adoption as a central mechanism linking the technological, financial, and institutional conditions of digital receivables financing with its perceived effectiveness. The evidence suggests that future efforts to strengthen TReDS among auto-component MSMEs should focus not only on expanding registration but also on improving awareness, simplifying platform processes, strengthening institutional support, and encouraging greater participation from corporate buyers. The study consequently highlights the importance of an integrated ecosystem in which MSMEs, buyers, financial institutions, government agencies, and TReDS operators collectively support effective digital supply chain finance.

RECOMMENDATIONS AND IMPLICATIONS

The findings indicate that TReDS has considerable potential to improve liquidity, working capital management, and financial resilience among auto-component MSMEs in Tamil Nadu. However, the relatively lower scores for Awareness of TReDS and Institutional Support, together with the presence of unregistered MSMEs, indicate the need for targeted policy and strategic interventions.

Policy Recommendations

Awareness programmes should be expanded through MSME development agencies, industry associations, banks, and TReDS operators. Training should focus on registration procedures, invoice discounting, financing benefits, transaction processes, and practical use of the platform.

The registration, documentation, and invoice submission processes should be made simpler and more user-friendly. Reduced procedural complexity can encourage greater participation, particularly among smaller Tier-2 and Tier-3 suppliers.

Banks, NBFCs, government agencies, and platform operators should strengthen technical and financial support for MSMEs. Dedicated help desks, training facilities, and onboarding assistance can improve continued platform usage.

Corporate buyers and OEMs should be encouraged to ensure timely invoice acceptance and active participation in TReDS. Faster invoice approval is essential for effective receivables financing and can improve the benefits available to suppliers.

Greater participation of banks and NBFCs should be encouraged to increase competition among financiers and



improve the availability and affordability of invoice discounting.

Smaller MSMEs should receive support for digital infrastructure, financial literacy, and technology adoption. Such measures can improve confidence in digital financial platforms and support sustainable TReDS usage.

Strategic Implications

The strong influence of Perceived Usefulness and Financial Accessibility on TReDS adoption suggests that platform operators should emphasise measurable financial benefits such as faster payment realisation, improved liquidity, and reduced dependence on conventional short-term borrowing. Ease of use should also remain a strategic priority, particularly through simplified interfaces, efficient invoice processing, and responsive technical support.

The strong relationship between TReDS Platform Adoption and Platform Efficacy indicates that stakeholders should focus on converting registration into regular usage. Monitoring active usage, transaction frequency, invoice processing time, and financing outcomes can help identify enterprises that register but do not effectively utilise the platform.

The mediating role of adoption further indicates that awareness and institutional support produce stronger outcomes when they lead to actual platform usage. Therefore, policy interventions should follow an integrated approach that connects awareness, onboarding, financing access, buyer participation, and continued usage.

For Tamil Nadu's automotive ecosystem, stronger TReDS adoption can support supplier liquidity and reduce financial pressures associated with extended receivable cycles. Coordinated action among MSMEs, OEMs, financial institutions, government agencies, and TReDS operators can therefore strengthen digital supply chain finance and contribute to greater financial resilience among auto-component MSMEs.

CONCLUSION

The present study examined the efficacy of the Trade Receivables Discounting System (TReDS) among auto-component MSMEs in Tamil Nadu, with particular focus on the factors influencing platform adoption and its contribution to financial and working capital outcomes. The study was based on data collected from 300 respondents representing MSMEs across major industrial centres of the state.

The findings indicate that TReDS has gained substantial acceptance among the sampled enterprises, with 70.7% registered on a TReDS platform. Respondents reported favourable perceptions of the platform, particularly regarding its usefulness, financial accessibility, transparency, and overall efficacy. TReDS Platform Efficacy recorded the highest construct mean, followed by Perceived Usefulness and Financial Accessibility, indicating strong recognition of the platform's role in improving liquidity, working capital management, and receivables financing.

The empirical analysis further established that Awareness of TReDS, Perceived Usefulness, Perceived Ease of Use, Financial Accessibility, Transaction Transparency, and Institutional Support significantly influence TReDS Platform Adoption. Among these factors, Perceived Usefulness and

Financial Accessibility emerged as the strongest predictors. TReDS Platform Adoption also demonstrated a strong positive influence on Platform Efficacy, confirming that effective utilisation is closely associated with improved financial and operational outcomes. The mediation analysis further established that TReDS adoption significantly mediates the relationship between the identified determinants and platform efficacy.

The findings therefore confirm the relevance of the study's conceptual framework and demonstrate that the effectiveness of TReDS depends on the interaction of technological, financial, and institutional conditions. Although adoption is relatively strong, the comparatively lower levels of awareness and institutional support and the proportion of unregistered enterprises indicate the need for continued intervention. Greater awareness, simplified procedures, stronger institutional assistance, wider buyer participation, and improved digital readiness can support broader and more effective utilisation.

TReDS represents an important digital financing mechanism for addressing the liquidity and working capital challenges faced by auto-component MSMEs. Its effective adoption can reduce dependence on conventional short-term finance, improve cash flow, and strengthen financial resilience. A coordinated approach involving MSMEs, corporate buyers, financial institutions, government agencies, and TReDS operators is essential for realising the full potential of digital receivables financing within Tamil Nadu's automotive manufacturing ecosystem.

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