Determinants of profitability in the Indian logistics industry

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Determinants of Profitability in the Indian Logistics Industry

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The Indian economy has one of the highest transportations and logistics cost as a percentage of gross domestic product (13%) globally. This paper analyzes trends in profitability and discusses some key macro and micro level factors influencing the Indian Logistics industry comprising road transport logistics, storage and distribution. It discusses the role of macroeconomic factors such as tax policy in influencing the logistics network complexity, which in turn increase logistics costs. At a micro level, the paper uses firm-level data of 201 companies from Prowess database and estimates an econometric model to analyze major determinants of profitability in the logistics sector. The study finds that liquidity, market share, debt-equity, and age are significant determinants of profitability in the logistics sector.

Key Words

Profitability, Transportation, Supply chain, Logistics, Third Party Logistics (3PL), India.

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I. Introduction

Transportation Industry is a crucial segment of an emerging economy and critical to the growth of the economy in general. In India, which is one of the fastest growing economies in the world, transportation contributes to 10 % of the GDP (measured at factor cost). As per the latest national account statistics, transportation sector broadly comprises of railways, transportation by other modes, storage, and communication, of which the share of transportation by other modes and storage is 50% of total transportation segment and 6% of overall GDP. It is also estimated that India has one of the highest logistics costs in the world, at 13% of GDP. In China, the share of logistics cost is 18%, mainly because of the size of the geographical area and a GDP five times that of India. However, Indian logistics is constrained by inefficiencies in road transport network and infrastructure; indicating that a lot of potential exists in terms of growth of the industry in India. Within the transportation sector, the market for third party logistics (3PL) has been steadily growing over the years as companies are increasingly outsourcing the non-core activities[2]. Third party logistics services consist primarily of integrated and organized activities within transportation, storage, warehousing and other value-added services within these activities.

Unlike the more mature markets like Europe and U.S, Indian logistics industry, especially road transportation sector was primarily fragmented and dominated by the unorganized sector consisting of many family owned enterprises. However, with increased outsourcing, services are increasingly getting more specialized and bundled to offer value to the customer, encouraging the growth of third-party logistics service providers. In this context, firms are increasingly faced with the challenge of managing complex supply chains in terms of range of activities to be managed and information to be processed. However, the complicated tax structure in India has contributed increasing distribution costs, preventing the achievement of economies of scale. This paper

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[2] Global revenues from 3PL are estimated at US $ 721 billion, while, the Indian market is valued at $20 billion in 2015 (Armstrong and Associates, 2016).

examines the post-recession trends in profitability in the transportation sector, primarily transport logistics, and the emerging models in terms of complexity of logistics network. Using a sample of 201 companies from Prowess database, the paper estimates an econometric model to analyze major determinants of profitability in the transportation sector and derives implications for future growth.

There is a rich literature on third party logistics and logistics in general. Conceptually, studies on logistics have been categorized under four dimensions (Alessandra Marasco, 2008). First is the *context* under which the logistics relationship is embedded; second is the *structure* of the relationship including the scope of activities performed, their complexity, etc.; third is the *development process* of the relationship including formal and informal contracts, and finally, the *outcomes* from general management and operations perspective such as the efficiency of logistics service providers. The methodology followed varies from qualitative case-based studies to more quantitative approaches. Some studies have also used transaction cost economics (TCE) and the resource-based view (RBV) of the firm to explain logistics outsourcing. Other approaches such as relationship marketing, network theory, agency theory and social exchange theory have also been used to study 3PL relations (Selvaridis and Spring, 2007).

There is a however, lack of a theoretical foundation to analyze the economic performance of the industry, from which policy implications can be drawn. From an economists' perspective, profitability is a function of both macro and micro level factors influencing the firms' decisions. The contribution of these factors has not been analyzed in detail at the firm level, from an economic perspective in the Logistics industry. The present paper attempts to fill these gaps in the following way. It illustrates the logistics network complexity using a case study and analyzes the impact of taxation policy on the logistics network in India. The study then attempts to understand the profitability of logistics industry from the broad lens of Industrial organization literature on structure-conduct –performance paradigm. Empirically, pricing power or profitability is seen as a

function of market structure variables such as size of the firm, number of firms and degree of concentration, in addition to firm's conduct in the market place.

The paper is organized as follows. Section 2 provides literature review with respect to the evolution of the logistics industry, and more specifically the key players and profitability trends in the Indian Logistics industry. Section 3 analyzes the macro and micro level factors influencing the profitability of the industry with a case study example of a 3PL logistics service provider. Section 4 provides description of data and methodology for analyzing the profitability of the industry at the firm level. Section 5 presents the results of the econometric estimation and finally section 6 presents the conclusions.

2. Evolution of logistics industry

Logistics is broadly defined by the council of logistics management as the process of planning, implementing and controlling the efficient and effective flow of goods, services and information from the point of origin to the point of consumption. The concept used to be related to transportation and storage activities, but with globalization and outsourcing of core activities, the term logistics covers a number of value-added services and activities.

Third Party Logistics (3PL), the concept of a single professional logistics service provider managing the entire logistics functions of a company, had originated in the developed economies of Europe and America, to relieve industries from huge logistics costs apart from the hassles of dealing with multiple in-coherent logistics service providers (Frost and Sullivan 2006). According to some studies in the developed country context the logistics industry evolves through two contrasting phases. Initially the industry is driven by competition and specialization, where, cost reduction, market segmentation and service differentiation are the main ways of improving 3PL performance and profits (Panayides P.M, 2004; Sum, C.-C. and Teo, C.-B, 1999). However,

over time, with advances in information technology and communication, expanded geographical coverage and growth of e-commerce, there is need for integration of services resulting in consolidation through mergers and acquisitions. The evidence from the European industry follows the above trend (Hertz and Alfredsson, 2003; Regan and Song, 2000; Carbone and Stone, 2005).

The Indian transportation and logistics sector is in a nascent growth stage and faced with issues specific to the industrialization process itself. Specifically, the structure of logistics industry is characterized by a predominance of transportation cost issues because of regional concentration of manufacturing and geographically diversified distribution, large number of distributors and suppliers making coordination a complex task, a highly fragmented transportation industry and infrastructure bottlenecks (Chandra Pankaj and Nimit Jain, 2007). Location policies of the past have forced plants to locate away from each other, increasing coordination costs[3]. Some of the factors driving growth in the industry is the growth of retail and e-commerce, removal of entry barriers in multi modal transportation (a government monopoly till recently), entry of multinational and domestic players and consolidation in the logistics business, private equity[4], development of venture capital funds by banks and unbundling of logistics services that will add value to the customers.

The present study utilizes a sample of 201 firms from the Prowess IQ database that includes firms in the road transport sector, transport logistics and storage and warehousing. The size and scope of services offered by these firms ranges widely from point-to-point transportation to

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[3] Chandra and Sastry (2004) find in their sample survey that 67% of suppliers have facilities that are located more than 100 kilometers away from the plant.

[4] Indian Private equity went through a buoyant phase during 2000-2008 because of greater awareness on the role of private equity, rising borrowing costs and stock market volatility forcing family owned businesses to tap private equity sources. However, the recession of 2008 reversed the trend. Post 2013, there is a resurgence in private equity market once again (Kejriwal, Manish in Financial express, 2015)

offering a variety of value-added services including storage, invoicing, freight forwarding, inventory management, etc. Some of the key players in these segments are shown n table 1 below. While the top players in Road transport and Logistics sector are private sector and foreign owned firms, storage sector is dominated by the government (Table 1).

Table 1: Key players in the Logistics Industry

Key players		
Road	**Logistics**	**Storage & Distribution**
Siddhi Vinayak Logistic Ltd.	V R L Logistics Ltd.	Central Warehousing Corpn. (CWC)
North Eastern Carrying Corpn. Ltd	Transport Corporation of India Ltd.	Indian Oil Petronas Pvt. Ltd.
Associated Road Carriers Ltd.	Blue Dart Express Ltd.	S H V Energy South East Pvt. Ltd.
Union Roadways Ltd.	Om Logistics Ltd.	Aegis Logistics Ltd.
Agarwal Packers & Movers Ltd.	Mahindra Logistics Ltd.	H P C L-Mittal Pipelines Ltd.
Kandoi Transport Ltd.	Darcl Logistics Ltd.	Gujarat Water Infrastructure Ltd.
Leeway Logistics Ltd.	Kuehne & Nagel (India) Pvt. Ltd.	Indianoil Skytanking Pvt. Ltd.
Meru Cab Co. Pvt. Ltd.	Allcargo Logistics Ltd.	I M C Ltd.
Startrek Logistics Pvt. Ltd.	Arkay Logistics Ltd.	Adani Agri-Logistics Ltd.
Economic Transport Organisation Ltd.	Gati Ltd.	P S A Sical Terminals Ltd.

Source: ProwessIQ Database (CMIE, 2010–2015)

Conceptually, the players in the logistics industry in India can be categorized into 3 levels based on whether they are local, domestic or international players in terms of their operation. These in turn segmented into small and large operators based on the investment in infrastructure and Information technology (Table 2).

**Table 2: Classification of Logistics players in India**

	First level	Intermediate	Top level
Small	Single, small fleet owners, Truck unions, asset driven and short of working capital, no use of IT	IATA agents, small freight forwarders, C&F agents; may or may not be asset based **Example: Union Roadways, Siddhi Vinayak Logistics**	Integrated multinational 3PL and 4PL companies; can operate with or without assets **Example: TCI, Blue Dart express, VRL Logistics**
Large	Shipping lines, Container Fright stations, Inland container depots, PE funded warehouses, heavy on assets, infrastructure and IT driven, supported by Government **Example: CWC, SVH Energy South East Pvt Ltd.,**	National IATA agents, freight forwarders, multimodal transport operators, contract logistics service providers (Multinational Corporations -MNC) and domestic), packers and movers **Associated Road Carriers, VRL Logistics, Agarwal Packers and Movers**	Integrated supply chain and logistics service providers, knowledge driven, high degree of service integration **Example: Kuehne & Nagel (India) Pvt. Ltd.**

Source: Logistics Management, Ganapathi S.L, S.K. Nandi, (2015); Author's own analysis

Recent trends in profitability show that post- recession, earnings of transport firms during 2011-12 have decreased because of increase in diesel cost and a lower freight movement (CRISIL, 2014). Within the transport sector, profitability of three sectors namely road transport, logistics, storage and distribution shows that average profit intensity (Profit after taxes / total income) during 2010-2015 for 201 firms was negative (Figure 1).

Figure 1: Profit Intensity in the Indian Logistics sector
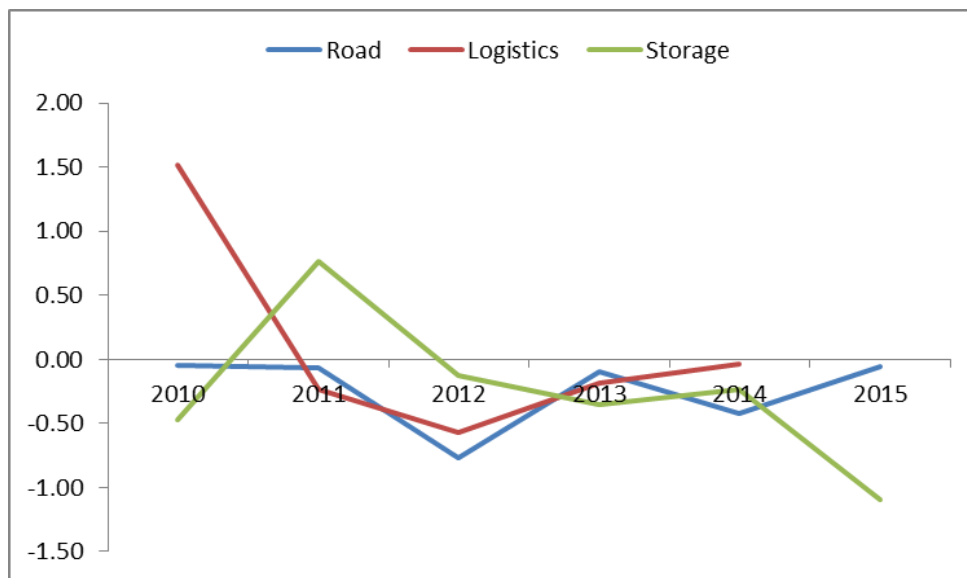
Source: ProwessIQ database, CMIE 2010-2015

To understand the reasons for the volatility in profitability, it is necessary to analyze some of the key macro and micro level factors impacting the logistics sector. At the macro level, the globalization of supply chain services and increasing in complexity of logistics networks affects the 3PL margins. Taxation policies of the government that have resulted in multiple taxation points have further impacted the profitability margins by increasing the network complexity and efficiency of logistics operations. At the micro level, there are several firm-level factors such as size, liquidity, market share, etc., that affect the profitability of the firms. The following section discusses each of these macro and micro level factors that influence the profitability of the industry.

3. Profitability of the Logistics Sector

Although initially logistics sector started by provision of transportation services, logistics services are increasingly becoming more complex in scope as firms begin to offload non-core services, to improve their profitability. According to the 18th annual third-party logistics study by Capgemini, the most frequently outsourced activities are domestic and international

transportation (81% and 78%, respectively), warehousing (73%), freight forwarding (62%), and customs brokerage (57%). As the activities get expanded in scope, there is need to understand the broader concept of how logistics has evolved in the context of managing the entire supply chain which includes not just flow of goods and services, but also value being added at each stage of supply chain.

3.1 Logistics network complexity and interstate taxation

Logistics network complexity cannot be understood in totality without understanding the broader concept of supply chain complexity. A supply chain is a complex network of facilities designed to procure, produce and distribute goods to customers at right quantities, to the right locations and at the right time (Kavilal et al, 2017). From a structural point of view, supply chain complexity can be defined in terms of the size of the network, its elements and the linkages between them. Elements (e.g. factories, warehouses, points of delivery) of the chains / networks can be represented by the vertices / nodes of the graph, while the connection of two elements (e.g. a supplier-buyer relationship) by its edges (Monostori, 2016).

In the context of logistics, several authors have tried to relate complexity to the level, quantity and type of interactions in the given system (Wanke and H. Correa, 2012); it has been defined more specifically as a deterministic component related to the number and variety of interacting elements in a system (Milgate, 2001). With the outsourcing of non-core activities such as reverse logistics, freight forwarding, etc., more network points are interconnected, and it may increase the costs of the industry, unless the firms employ management techniques to achieve scale efficiencies. A recent study analyzed the reverse logistics operations of a company and its impact on the profitability and found that the operations management strategy of product route efficiency and resource commitment has a positive impact on profitability (Kelly Weeks, 2016). Another

recent study (Adenso-Diaz et al. 2011) has found a strong negative relationship between the number of the nodes in the logistics network and its reliability.

In India, one of the major components of logistics cost is the sales tax imposed by different states. Under the current regime, goods transported from one state to another attract both central sales tax as well as local taxes; whereas, they do not have to pay central sales tax if they have their own distribution center in the destination state. For example, state-level VAT may vary from 4% to 15%, while inter-state sales of goods are subject to Central Sales Tax (CST), which varies from 2% to 15%. However, stock movements between inter-state branches or stocking locations are not subject to VAT/CST[5]. In addition, there are other taxes such as entry and octroi at the entry points of the states, with the added complication of each state having its own compliance standards and documentation process.

This has led to manufacturing companies setting up distribution centers and hubs in almost all states of India, increasing the logistics network complexity as well as costs. A study by Balram, A., Shah, J. and Gupta, O.K. (2005) develops a model for determining distribution centres (DCs) locations considering the impact of CST and find that CST largely contributes to the high logistics cost by increasing the need for a greater number of distribution centers. In this context, the hub and spoke model is used to reduce operational costs and smoothen the process of coordination between various nodes by having a centralized distribution hub; more number of hubs resulting in a more complex functionality (Minculete.G, 2014). In the Indian context, mapping of network points and codification of logistics models can help understand the complexity involved in the flow of information, goods and services (case study, Box 1).

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[5]See report by Ernst and Young and Retailers Association of India, 2013

<div align="center">CASE STUDY: Codifying Third Party Logistics (3PL) Models</div>

- ABC Logistics (the real name of the firm is not revealed for confidentiality purposes) is a major player in the third-party logistics industry catering to the automobile vertical. It started as a provider of Milk run (local collection from many suppliers and distribution to manufacturer) and Line Haul services (inter-state transportation from suppliers to manufacturers), which required point to point transportation of goods. With the growth of automobile industry, it emerged into a Multi-hub and spoke model (or, M-form network).

- 3PL activities range from purely manual loading/unloading of cargo to transportation and transfer of cargo between hubs, to storage and management of products in warehouses provided by the clients or in own warehouses. As movement of goods expanded into various states, hubs were located in each state close to the origin and destination points. Transit hubs were also located in locations bordering between two states. Thus, logistics network expanded to include multiple origin points, origin hubs, transit hubs, destination hubs and destination points. At each network point, various value-added activities were carried out depending upon the scope of work.

Figure 2: M-form logistics network
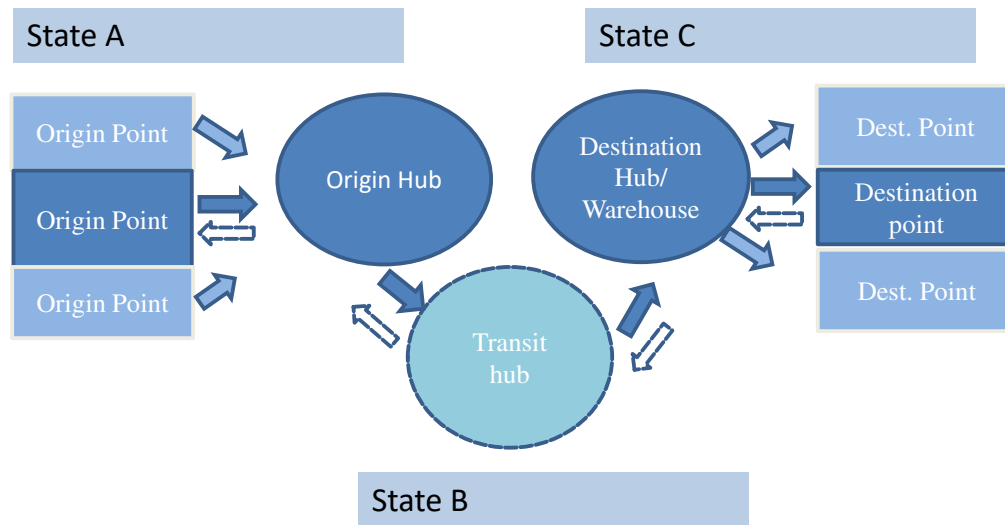
The multitude of logistics models could now be expressed as a combination of number of origins, destinations, origin hubs, destination hubs and transit hubs. The figure shows multiple origin-single origin hub, single destination hub, transit hub and multiple destination points.

The complexity of the network could be captured by assigning three-digit codes to the network points-- 0 would indicate the absence of a network point, 1 would indicate the presence of a single network point and 2 would indicate multiple network points. For example, a model codified as 21112 would mean multiple origin points, single origin hub, single transit hub, single delivery hub and multiple destination points. Models falling in this category would be ones where material is collected from multiple suppliers, consolidated at origin hub, sorted at the transit hub to be delivered to the destination hub for redelivery to final destination points. The dotted arrow marks represent reverse flow of services or reverse logistics if any. Codifying thus helped in mapping the number of network points and the scope of value-added services being offered at each network point.

Macro level factors such as taxation policy have a huge impact on cost of delivering goods, which in turn influences the location choice of hubs nearer to the destination points. To mitigate these logistics costs, the government of India is introducing a unified Goods and Services Tax (GST). This is discussed next.

Uniform Goods and Services Taxes (GST)

The Goods and Services Tax (GST) is a major tax reform that will be implemented in India this year. Under this tax regime, many center and state level taxes such as central sales tax, octroy and entry tax will be eliminated to allow seamless flow of goods and services. The logistics network can then evolve from an M-form to hybrid network (H-form) that integrates peoples, processes and technologies under a single consolidated hub, with lesser coordination costs (figure 3). This will result in consolidation of hubs and warehouses across the country and allow firms to use optimizing techniques such as bulk breaking to reduce logistics costs through scale efficiencies. Movement of goods between states will be easier in case of seasonal demand fluctuations and firms can take advantage of demand –supply fluctuations across the country. Entry taxes resulting in huge waiting times and delays in the movement of goods will be abolished, reducing the logistics costs.

Figure 3: H-form Logistics network
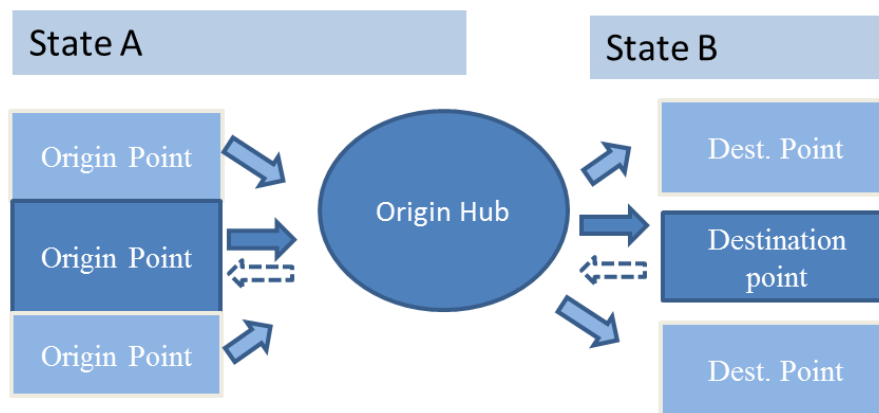
3.2 Firm level factors

Given the capital-intensive nature of the industry, liquidity and working capital management play an important role in profitability. Earlier studies on profitability have shown that market share, growth, liquidity, debt-equity, size and age are significant determinants of profitability (Macas Nunes and, Zélia Serrasqueiro, 2015; Sharma A.K and Satish Kumar, 2011; Goddard et al 2005).

The traditional structure conduct performance paradigm posits a positive relationship between size, market share and profitability, as bigger firms with higher market share have sufficient economies of scale to create entry barriers in the industry and can command a higher margin because of their dominant status. Liquidity (defined as proportion of current assets to liabilities) has been found to have a significant impact on profitability as firms with a higher proportion of assets in liquid form are able to respond quickly to any economic shocks. Size and age also have a positive impact on profitability as bigger and older firms can take higher risks and have greater efficiency and economies of scale. Apart from firm level factors, there are industry level factors such as number of entrants, high product differentiation and high entry barriers that can determine profitability. The following section explains the methodology and econometric model estimated.

4. Data and Methodology

Based on a sample of 201 firms that belong to the road transport, storage and warehouse and transport logistics sectors, the paper analyzes determinants of profitability post-recession from 2010-2015. The data is taken from the Prowess database compiled by the center for monitoring Indian Economy (CMIE), consisting of more than 40000 listed and unlisted firms. The data is collated from the profit and loss, balance sheets and annual reports of the companies belonging to Indian industry. The transportation industry consists of Road, Railways and air transport sectors, including transport and infrastructure services. The study is limited to the Road transport, storage

and distribution, transport logistics. Railways, shipping and air transport was not included in the sample. The sample includes:

a. Road transport sector: This includes services that include bus passenger, road passenger, road freight, road transport, and taxi and truck services.

b. Transport Logistics sector: This includes cargo transport incidental to air, land and water transport, cargo handling, transport services and support systems.

c. Storage and Distribution: This includes mainly storage and warehouse services, bottling of LPG. Crude pipeline, storage and warehouse infrastructure and pipeline infrastructure.

Storage and distribution are included in miscellaneous services and not included as part of transportation. However, this was included in the present study because many logistics firms also provide storage and warehousing services. There are a total of 452 firms from 2010-2015 and after sorting out firms which did not report any data for consecutively more than 3 years, a total of 201 firms (1206 observations) were used for the analysis.

Table 2: Data Distribution

Industry group	Freq.
Road transport services	46
Storage & distribution	53
Transport logistics services	102
Total	201

Source: ProwessIQ database, CMIE 2010-2015

For the purpose of estimation, the study uses the standard methodology for analyzing panel datasets, namely fixed and random effects estimation. An equation of the following form is estimated:

Profitability$_{it}$= β$_0$ + β$_1$Size + β$_2$Market share+β$_3$ Age+ β$_4$Debt-Equity + β$_5$Liquidity + δ$_1$ Foreign + δ$_2$ Indian_pvt + δ$_3$ Logistics + δ$_4$ Storage + e$_{it}$, where,

- Profitability is Return over Assets defined as Profit after interest and taxes divided by total Assets;

- Size is defined as the three-year average of the total income and total assets of a company;

- Market share is firms' total income divided by industry income;

- Age is the difference between the year of study and incorporation year

- Debt-to-equity is defined as the difference between total assets and net-worth of a company, divided by its net worth;

- Liquidity is defined as current assets divided by current liabilities;

- Foreign is the dummy variable for foreign ownership and Indian_pvt is the dummy for Indian Privately-owned firms, with the base variable being government owned firm;

- Logistics is the dummy variable which takes the value 1 if the firm belongs to transport logistics sector and storage is a dummy variable for firm belonging to the storage and distribution sector, with the base being the road transportation sector.

- e_{it} is the error term which is assumed to follow a normal distribution.

5. Results

The study uses a panel data of 201 firms in the transportation sector to estimate the determinants of profitability during 2010-2015. In Panel data models, error term consists of the time invariant fixed effect and a stochastic error component assumed to be serially uncorrelated. If the fixed effect is also assumed to be uncorrelated to the explanatory variables, then the Random effects model is the appropriate model. However, if the fixed effects are correlated to the other variables, ignoring them would result in biased results and hence a fixed effects model is used which resolves this problem by eliminating the time invariant effect from the model by time-demeaning the data and obtaining the within-effects estimator. Table 3 shows the descriptive statistics of the variables used. The correlation matrix shows a high correlation between net fixed assets, size and market share, which might pose a problem of multicollinearity. Hence, net fixed assets was dropped from the estimation, since assets was already captured in the size variable.

Table 3: Descriptive statistics

Variable	Mean	Std.	Dev.	Min	Max	Observations	
lROA	overall	0.22	2.02	-5.48	5.12	N	979
	between		1.77	-5.21	3.44	n	201
	within		1.02	-3.35	5.84	T-bar	5
lSize	overall	6.30	2.10	-2.30	11.11	N	1008
	between		1.73	-0.93	10.64	n	201
	within		1.22	-1.55	9.45	T-bar	5
logLiq	overall	0.56	1.45	-5.40	7.36	N	1018
	between		1.28	-4.00	6.08	n	200
	within		0.77	-3.76	7.14	T-bar	5
lAge	overall	2.72	0.85	0.00	4.55	N	1156
	between		0.84	0.79	4.53	n	195
	within		0.21	1.62	3.42	T-bar	6
lNFA	overall	5.12	2.49	-2.30	10.56	N	1013
	between		2.46	-2.30	10.17	n	200
	within		0.64	1.12	10.53	T-bar	5
lDebt	overall	-0.28	1.40	-4.61	5.38	N	912
	between		1.24	-4.61	4.79	n	184
	within		0.78	-4.18	4.21	T-bar	5
lMS	overall	-1.02	2.31	-10.41	3.53	N	1028
	between		2.19	-10.22	3.17	n	201
	within		0.81	-8.26	3.19	T-bar	5

Table 4: Correlation Matrix

	lROA	lSize	logLiq	lAge	lNFA	lDebt	lMS
lROA	1						
lSize	0.16***	1.00					
logLiq	0.31***	-0.081***	1.00				
lAge	0.01	0.07**	0.14***	1.00			
lNFA	0.05	0.67***	-0.24***	0.02	1.00		
lDebt	-0.13***	-0.02	-0.35***	-0.16***	0.11***	1.00	
lMS	0.21***	0.65***	-0.03	0.15***	0.64***	0.00	1.00

***, **, * represent significance at 1%, 5% and 10% level respectively.

The return of assets for the total sample is negative, but when seen across the subsectors, it shows that storage had logistics had positive return on assets whereas Road transportation sector suffered losses for all the years (Figure 4), primarily because of government owned, loss making

road transport companies in the sample. If one excludes the loss-making public-sector roadways, the overall profitability and ROA goes up.

Figure 4: Return on assets
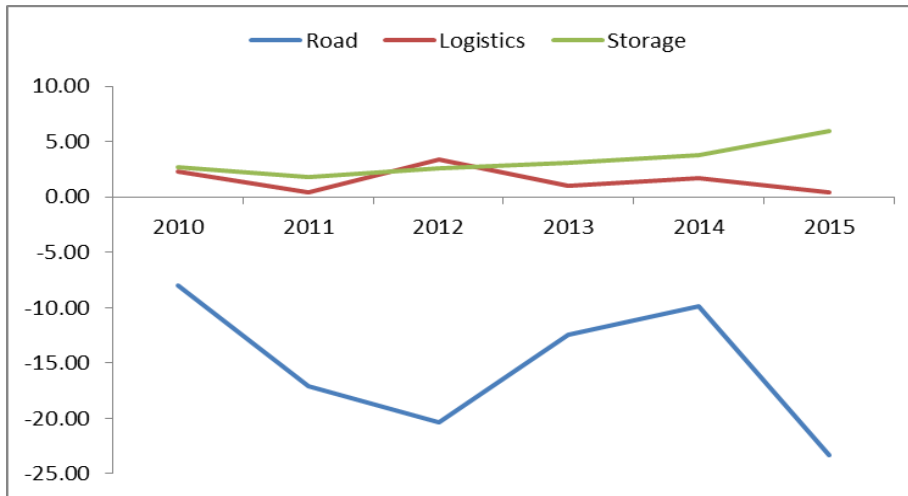
Source: Prowess database, CMIE

The average profit intensity (Profit after tax divided by Income) is also negative across all three sectors (Table 5).

Table 5: Average profitability across three sectors during 2010-2015

Storage	ROA	PATint
Road	-15.2	-0.24
Storage	3.3	-0.25
Logistics	1.5	0.05

Source: Prowess database, CMIE

Table 6 reports the results from pooled regression, random and fixed effects estimation. The results of pooled ordinary least square are compared with the random effects model and the study finds evidence of the presence of firm-specific effects rejecting pooled OLS over random effects. Between random and fixed effects, Hausman test fails to reject the null hypothesis, favoring random effects model.

Table 6 Results

Dependent Var=Log ROA	Pooled OLS	Random Effects	Fixed Effects
Log Size	-0.02 (0.04)	0.05 (0.04)	0.07 *(0.04)
Log Liquidity (Current assets/current liabilities)	0.17*** (0.05)	0.15*** (0.05)	0.13** (0.05)
Log Age	0.06 (0.08)	0.20* (0.12)	0.19 (0.28)
Log Debt_equity	-0.13 **(0.04)	-0.11** (0.05)	-0.11** (0.05)
Log Market share %	0.26 *** (0.03)	0.21*** (0.05)	0.18 *** (0.05)
Dummy_Foreign	-0.27 (0.31)	-0.21 (0.6)	
Dummy_Pvt_Indian	-0.63*** (0.23)	-0.61 (0.45)	
Dummy_ logistics	0.34**(0.16)	0.42* (0.26)	
Dummy_ Storage and Distribution	0.22 (0.19)	0.25 (0.33)	
Constant	0.96** (0.43)	0.02 (0.7)	-0.36 (0.7)
N	701	706	706
Rsq	0.17	0.16	0.15
Hausman Test: Prob>chi2 =0.64			
Breusch and Pagan Lagrangian multiplier test for random effects: Prob > chibar2 = 0.00			
***, **, * represent significance at 1%, 5% and 10% level respectively.			

The variables that emerge significant are liquidity, debt-equity, and market share. Age is weakly significant at 10% level of significance. Higher market share is indicative of the fact that it may be efficiencies (through scale economies), rather than pricing power that is driving profitability. The results indicate that firms that have higher market share, have more liquidity, and lesser debt-equity, are more profitable. A ten percent increase in market share increases return on assets by 2 percent. A ten percent increase in liquidity increases ROA by 1.5 per cent, whereas, a ten percent increase in debt-equity decreases ROA by 1.1 percent. Capital structure of the firm has a significant influence on firm profitability. Size which is indicative of asset-heavy firms does not appear to be significant in the random effects model. The results are broadly in consensus with the industrial organization literature which suggests that profitability is determined by higher market share, indicative of higher pricing power or higher efficiencies. The study also shows that the logistics dummy variable is positive and significant implying that logistics firms have a higher profitability compared to storage and road transportation.

VI. Summary and Conclusions

Indian Logistics industry is an important lead indicator for the economic growth and contributes to 10 % of the GDP measured at factor cost. However, in the past few years, the performance of the industry has been deteriorating with falling profitability. The paper explores the reasons for the same. It studies the impact of macro and micro level factors influencing the profitability of the Indian logistics Industry and discusses the role of logistics network complexity, taxation policies that influence the profitability of the industry at a macro level. At a micro level, from the industrial organization perspective, firm profitability is modeled as a function of structure and conduct variables, using a panel data of firms across five years. Capital structure of firms (debt-equity), working capital management (liquidity) and market share have a significant impact on the profitability of the firms. Firms that resort to higher debt financing have higher interest costs, indicating that capital is a major constraint for the Indian logistics industry.

From the managerial perspective, the results suggest that in order to be profitable and achieve efficiency, Indian logistics sector requires consolidation. Better financial management and higher liquidity will contribute greatly to the profitability at the firm level. At the macro level, the logistics sector is also deeply impacted by movements in key input prices such as fuel and policies related to taxes on inter-state movement of goods and services. With the implementation of a unified GST, firms have to quickly develop strategies to reconfigure and optimize their logistics network in order to achieve cost efficiencies. Logistics sector is one of the key beneficiaries of the GST policy, with a reduction and consolidation of network points in the hub and spoke system. There will be greater scope to invest in capital intensive technology and make a paradigm shift from labor intensive processes to more capital intensive and automated systems. Firms that are able to make the shift will be able to survive and grow organically. Regulatory regimes that can facilitate the process of consolidation of the Industry will pave the way forward for the industry.

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