



STRUCTURED MODELS FOR 'PRICE-QUALITY' CONSIDERATIONS AND BRAND CHOICE DECISIONS OF INDIAN TRUCK BUYERS

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ABSTRACT

This paper delves into the 'price' and 'quality' consideration of the Indian truck owners (largely small fleet) and evaluates as to how those considerations along with upwardly mobile aspirations, perceived workshop & service efficiency shape the brand choice in between the two predominant truck brands among the truck buyers and operators of India. The interactions of various pertinent manifest and latent variables are diagrammatically represented through the approach of Structured Equation Modelling. The primary data of this study has been gathered up from across key truck freight corridors of India. It was found that frugality has significant positive linkage with 'price' considerations whereas fleet performance has significant positive linkage with 'quality' considerations. Moving onto brand choice dynamics, we found that the aspirations of truck owners was a significant and direct trigger for perceptions on 'quality' and 'price' (indirectly) which ultimately contributes to the Brand Choice

KEYWORDS: Long haul Truck, Purchase Decision, SEM, Heavy Truck, Heavy Commercial Vehicle, Brand, truck operator, small truck fleet

INTRODUCTION

In a rapidly developing country like India (as a leading member of the BRICS group), it is natural to expect that heavy trucks would have a leading presence in the Indian road freight movement sector. This rising phenomenon has been well captured by (RITES Ltd., 2014) due to the operational efficiencies and economies of scale brought in by multi-axle trucks. As correctly noted by (Frost & Sullivan, 2012) certain conducive policy decisions by the Indian regulatory bodies have also contributed to this phenomenon that as economies get more industrialized and volume of economic activity increases, the required trip lengths of freight trucks also increase, such that due to requirement of operational effectiveness, medium rigid trucks (typical two axle trucks) lose out to larger trucks that (typical multi-axle trucks) that may carry much more freight, this trends have already been noticed in US by (Londoño-Kent, 2009). Thus, it is not very surprising to note that, (Jai, 2011) found large multi-axle trucks to have grown popular in the long haulage applications across the country. Talking about increase in overall sales volume of these multi axle trucks, various truck market specialists and industry leaders have expressed their optimism on growth front, even after taking into account the devastating economic effects of the global covid pandemic (Chaliawala, Shyam, & Thakkar, 2021).

LITERATURE REVIEW

In this segment, we would examine several key areas: the advantages of multi-axle heavy trucks observed in developed markets, the cost sensitivity within the Indian trucking industry, and the various perspectives towards procurement of a truck, both in developed markets and in India. This exploration aims to uncover potential gaps in existing literature.

Moreover, for Indian operators, the significant operational advantage of legally transporting heavier loads is underscored by the highly competitive freight rates (Dubey, 2015). In the context of a typical truck operator managing a small fleet (with nearly seventy-seven percent of owners overseeing fleets of fewer than ten trucks, as reported by Raghuram, 2015), the narrow profit margins emphasize the critical importance of profitability per truck (Gopal, et al., 2017).

Against this backdrop, it has been observed that various aspects of the transportation business, such as ownership patterns, fare and freight rate structures, financing options, technological advancements, legal regulations on axle loads, and stringent measures against overloading incidents, have gradually created an environment in the Indian trucking industry that is more conducive to the utilization of multi-axle trucks (AITD; CIRT, 2000). These trucks can accommodate larger cargo volumes with relatively lower additional costs, thereby enhancing the earnings of transport operators even in the face of highly competitive freight rates. This

study underscores the pivotal point that improved earnings result from the ability of transporters to legally transport more freight per truck.

As we further investigate the operational dynamics of the financially sensitive Indian truck market, there are indications that economic growth and the introduction of the Goods and Services Tax (GST) have enabled manufacturing units and logistics stakeholders to ensure the seamless distribution of freight through strategically positioned warehousing hubs that efficiently serve demand centers (Bhal, 2017). In the post-GST era, interstate freight travel encounters no additional taxation barriers, facilitating smoother operations. Consequently, an effective demand-driven warehousing strategy and significant infrastructure enhancements are shaping the purchasing patterns and preferences of financially cautious Indian transport operators (Bhattacharjya, 2010).

In light of these advancements and recognizing the significance and distinctiveness of industrial marketing (Cooke, 1986), as well as the imperative of conveying product value to customers (Lindgreen, Hingley, Grant, & Morgan, 2012), it becomes intriguing to delve into the considerations that truck owners weigh when purchasing their essential asset, namely the long-haulage truck. This understanding holds importance not only for manufacturers but also for their continuous efforts to differentiate themselves in a crowded and competitive market (Lorge, 1998).

2.1 the developed truck markets demonstrate the advantages of heavy multi axle trucks

Numerous scholars and experts have shared their insights and analyses of diverse documents, emphasizing the economic, operational, and social advantages of multi-axle trucks in various markets. The general economic advancement of developing economies such as India has bolstered the demand for accessible truck fleets to transport market goods. This trend has also positively influenced infrastructure development (Malhotra & Mishra, 2019). Consequently, the enhanced infrastructure and higher quality of trucks typically result in increased productivity (Hossein Rashidi, 2012).

It was noted by Lumsden (2004) in his research on European markets that increasing the load capacity of trucks by extending their length and weight could be a viable approach. He argues that in the context of road and transport conditions of Europe, larger and longer trucks could enhance efficiency of the truck's operations and ultimately improve fleet profitability. This study suggests a growing acceptance of larger trucks within the industry. This perspective appears to resonate in India as well, as evidenced by the Ministry of Road Transport and Highways (MORTH) raising the permissible gross vehicle weight across various weight classes by 20 to 25 percent (ET Bureau, 2018). Similarly, in a global context, Knight (2010), after

having examined the socio-economic effects, has expressed that the shift towards larger vehicles in the European road transport (freight) sector has yielded positive overall benefits for all stake holders.

Extensive research across numerous socio-economic aspects, operational considerations and safety related aspects related to heavy trucks have supported the shift towards upsizing of long haul trucks. Woodrooffe et al. (2010) offers evidence-based insights, demonstrating that with appropriate regulations and policy decisions, heavy trucks can reliably and safely deliver optimal freight transport performance. Conversely, in Mooren's literature review (2014), which focused on safety issues and specific considerations relevant to transportation using heavy vehicles, it was highlighted that driver engagement and the safety-orientation in the mindset of a truck driver are crucial factors for ensuring fleets operate profitably.

2.2 Cost sensitive nature of Indian trucking industry

With the operational viability of larger and heavier trucks (especially multi-axle ones) established both globally and within India, Raghuram (2015) underscores that over 70% of Indian freight is transported via road, the road freight transport sector contributes more than 4.9% to the country's GDP. He advocates for "speed with sustainability" in the Indian road transport sector by prioritizing security, safety and the well-being of drivers.

However, subsequent studies by Raghuram and Shah (2004) highlight the major challenge of achieving excellent logistics service quality in India, noting that the traditional focus has been on price rather than quality. The authors suggest that continuous cost pressures have led to a "supply and demand equilibrium" that has been a basis for the Indian transport sector being formed into a fragmented and semi-organized structure. Interestingly, there appears to be a disconnect between truck ownership and the marketing of the logistical services, even within relatively large trucking companies.

In a nationwide study conducted by RITES Ltd. (2014), road transportation was found to be competitively priced despite the challenging operating environment. The study detailed the cost structures of 2 axle, 3 axle, and 4 or 5 axle trucks across diverse road and terrain conditions, demonstrating that the multi-axle trucks exhibit greater operational practicality. Additionally, this study revealed that as truck tonnage increases, operational costs per tonne-km decrease in pace.

In a study conducted by Gopal et al. (2017), real-world tests were conducted using a fleet of multi-axle heavy vehicles in India to assess the positive impact and fuel/operational efficiency of heavy trucks. The study revealed substantial fuel consumption advantages for heavy trucks.

However, as highlighted by McKinsey & Company (2010), to ensure that the Indian trucking industry

becomes operationally sustainable and competitive, significant regulatory changes are necessary. These changes should focus on improving existing national expressways and constructing new expressways on high-traffic routes. Fortunately, according to governmental reports from the Ministry of Road Transport and Highways (MORTH) in 2011 and 2016, efforts to minimize truck stoppages for regulatory checks and payments at toll booths have been prioritized, and thus subsequent governmental actions such as the rolling out of the Goods and Services Tax (GST) and FASTag have had a positive impact.

2.3 Approaches to truck Purchase with reference to developed markets and India

Building on the previous section, Bhattacharjya (2010) underscores that transport operators in the freight transport industry, predominantly comprising small fleet operators with 1-5 trucks, operate on extremely narrow profit margins, making cost a paramount consideration in all operations. The author emphasizes that Indian economic growth over the past decade, in conjunction with the implementation of Goods and Services Tax (GST), has empowered the transport operators to strategically establish warehouses aligned with demand centers across different geographical locations. Consequently, goods manufacturing units are no longer compelled to maintain small warehouses in each state for tax optimization purposes.

Moreover, Frost & Sullivan (2012) have illustrated how the implementation of GST, along with favourable regulations, fuel-efficient vehicles, and technological advancements, can integrate state economies and bolster overall national economic growth. The report underscores that as India rapidly aligns with global pollutant emission regulation trends, such as the implementation of BS6.2 norms, and on the taxation policy front, the implementation of Goods and Services Tax (GST) facilitates the establishment of an efficient, unified tax system for the smooth and unrestricted movement of goods across the country.

Chakraborty (2016) rightly points out that GST can rationalize investment levels in logistical efforts and capacity, reduce the complexity of documents required for interstate movements, and streamline procedures by reducing inspection requirements. Similarly, Bhal (2017) echoes these sentiments, asserting that the logistics and supply chain industry in India has reaped significant benefits from the introduction of GST, leading to a 20 to 30 percent reduction in supply chain costs as warehouses are relocated closer to consumption zones.

Naturally, Saripalle (2018) asserts that the logistics sector stands out as a significant beneficiary of the new GST framework, particularly in terms of cost and time efficiency. Similarly, building on this perspective, the qualitative study conducted by Anand Shankar & Krishna (2018) emphasizes that despite potential initial challenges, this tax regime proves advantageous for the

transportation industry. It is noted that costs associated with transportation from plants to carrying and forwarding agents (CFAs), hub warehousing, and major outbound logistics have decreased, with further reductions anticipated. Additionally, the study highlights a reduction in idle time at interstate borders and an upward improvement in the average speed of trucks as well as distance covered per day compared to the pre-GST era. However, Malhotra & Mishra (2019) offer a word of caution, suggesting that while the introduction of GST has the potential to boost India's GDP and enhance the profitability of the transportation sector, its effectiveness largely depends on the implementation by the Indian government.

The establishment of numerous Mega Food Parks and Warehousing Zones has also occurred, which has further contributed to this transformation. Rathi, Bachkaniwala, & Bangera (2016) observed consistent year-on-year growth in warehousing clusters and the overall logistics sector in India prior to the COVID-19 pandemic. The redistribution of freight has been facilitated by significant transportation and inventory economies and the pragmatic taxation approach of the GST regime. Consequently, prominent demand centres like Delhi-NCR, Bengaluru, Ahmedabad, Pune, Mumbai and Chennai have evolved into effective clusters of warehousing hubs – which are primarily driven by the Make in India initiatives and introduction of GST. As a result of these developments, Sachitanand (2019) informs that the rationalization of warehousing capacity is proving to be efficient while meeting the rapid growth in demand within Indian markets. Thus there has been consistent year-on-year growth across the Grade A warehouses till the advent of the global COVID-19 pandemic (it is worth noting that domestic demand has bounced back and the growth in warehouses are expected to have returned).

Therefore, with the availability of larger parcel sizes for intermediate and manufactured goods, and given the increasing demand for such goods (which is further evidenced by the rising transportation activities in India during the post-COVID recovery phase as of the 3rd Quarter of 2021, according to Swamy, 2021), it is expected that there will be a heightened preference for larger trucks among Indian transporters and various other third-party logistics operators. Additionally, the ease of freight movement, especially interstate, due to GST has contributed to reduced waiting and idle times at interstate borders, indicating the importance of faster turnaround times for long-haul truck operators.

2.4 Establishing Research-Gaps & Forming Hypotheses

After going through various academic papers, statutory as well as industry reports and various online sources, we were unable to find any structured model elaborating upon choices made while purchasing heavy truck brands in combination with price, quality and other attitudinal considerations.

We have thus arrived at some interesting research questions as put up hereunder:

1. How do operational expectations and fleet performance requirements affect the attitude of truck operators towards Price and Quality?
2. How do Price, Quality and other operational expectations affect the choices made between the two predominant truck brands in India?

To precisely address these research questions as put up above, we now put forward two hypothetical frameworks to be tested as per an appropriate methodology provided in Section 3. DATA & METHODOLOGY'

These two frameworks, the first one deals with the Price and Quality considerations in relation to 'Fleet Performance' that they expect or desire from their truck(s) and 'Operational frugality' that transport operators have to maintain.

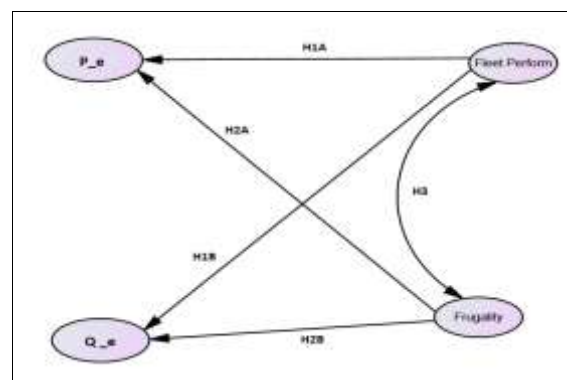


Figure 1: Framework 1

As in many other hyper competitive markets, truck operators have to run their businesses in very thin margins and all operational efficiency turn important (Gopal, et al., 2017), it is natural and reasonable that Operational Frugality and Truck Performance (in terms of freight delivery by the trucks in the fleet) would be important. So, it turns vital to find out how 'Operational Frugality' affect 'Price expectation' (P_e) considerations and 'Quality expectation' (Q_e) considerations for a truck owner.

Taking on 'Fleet Performance' aspect first, in Figure 1: Framework 1, we put up our first hypotheses set focused on operational frugality as provided below:

H_{1A}: Fleet Performance is negatively linked to Price expectations in India.

H_{1B}: Fleet Performance is positively linked to Quality expectations in India.

Moving on to 'Frugality' aspect in Figure 1: Framework 1, we put up our second set of hypotheses set focused on truck performance as provided below:

H_{2A}: Frugality is negatively linked to Quality expectations in India.

H_{2B}: Frugality is positively linked to Price expectations in India.

Furthermore, we also put up a hypothesis that both the aspects of operational frugality and truck performance are correlated in this Framework, as provided below:

H₃: Fleet Performance and Frugality expectations of trucks are correlated in India.

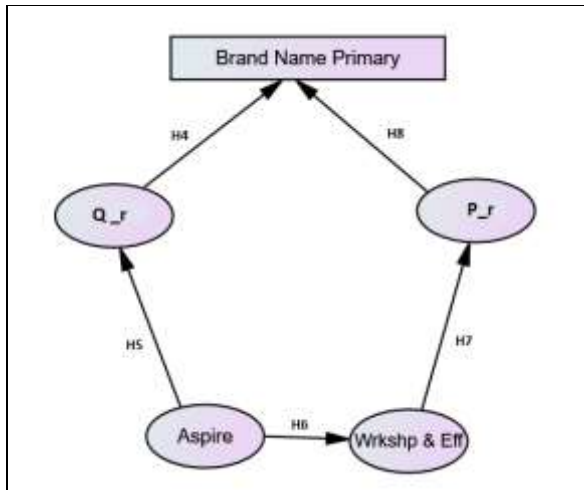


Figure 2: Framework 2

The second framework as provided in Figure 2: Framework 2 deals with brand choice and a combination of factors like ‘Quality-received’ (Q_r), ‘upwardly mobile Aspiration’, ‘Workshop ease & efficiency’ and the worth for ‘Price-received’ (P_r) are that lead a transporter to choose/prefer a particular brand of truck(s), in this case we have limited our brand options to only Tata and Ashok Leyland as they make up to 83% of the Indian truck market (Bajad, 2017).

Based on our second framework focused on Truck Brand choice, the hypothesis that we put up from the Quality perception aspect is as provided below:

H₄: Perception of Quality received is linked to Brand Choice of truck operators in India

Thereupon we put up the hypothesis on the premise of upwardly product aspirations of the truck owners linked to perception of Quality received, which is provided below, as:

H₅: Product Aspiration is linked to Perception of Quality received by truck operators in India

We further focus on the aspect of upwardly product aspirations in this framework and hypothesize that (given these are livelihood products) Product aspiration should be linked to ‘Workshop Ease & Product Efficiency’, this is provided below as hypothesis 6:

H₆: Product Aspiration is linked to perception of ‘Workshop Ease & Product Efficiency’ of truck operators in India.

Coming to the next aspect of this framework, it is hypothesized that ‘Workshop Ease & Product Efficiency’ is linked to value of Price received perceptions. This is put up in hypothesis 7, as given below:

H₇: Perception of ‘Workshop Ease & Product Efficiency’ is linked to Value received in terms of Price perception of truck operators in India.

Finally, it is also hypothesized that for a livelihood product like long haulage truck, that too in a highly competitive and low margin truck market of India, considerations for value of Price received considerations are linked to Brand Choice, this consideration has been put forth as:

H₈: Value in terms of Price received perception is linked to Brand Choice of truck operators in India.

3. DATA & METHODOLOGY

3.1 Data

Primary data has been collected from 171 unorganized transport operators across eleven cities of India. The cities covered in North Zone of India were New Delhi and Ghaziabad; in the Eastern Zone the cities covered were Bhubaneshwar, Cuttack, Guwahati & Kolkata; in the Southern Zone the cities covered were Bengaluru, Chennai and Hyderabad and in the Western zone the cities of Ahmedabad & Mumbai were covered.

The Kaiser-Mayo-Olkin sampling adequacy test (0.743) shows that the data is normally distributed, whereas the Bartlett’s Test of Sphericity shows that the null assumption: “the item to item correlation matrix was an identity matrix:” can be rejected. So, the chosen set of data for the structured equation modelling test can be taken to be suitable.

Table 1

KMO and Bartlett's Test			
	Value	df	Sig.
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.743	-	-
Bartlett's Test of Sphericity	673.653	153	0.000

3.2 Methodology for Structured Equation Modelling

In Structured Equation Models (SEM) the path model connections are usually first investigated and then substantiated. The relationships are visually established between exogenous and endogenous variables. In the current case we have constructed two Structural Models.

We first define the various individual constructs (relevant for each Structural Model; derived through Likert scale), then develop the overall measurement model through formative constraints (while ensuring uni-dimensionality of the paths and connecting the exogenous and endogenous variables; these variables can be latent or manifest as applicable), after this stage the study is planned to generate valid empirical results (while avoiding identification problems) and assess the measurement model validity by ensuring the goodness of fit is within acceptable levels and are statistically significant).

Once, the above mentioned procedures are conducted, a structural model is specified and the existence of hypothesized dependency relationships are identified in the same model. The structural model is finally considered for validity through estimated parameters for the given structural relationships while providing empirical evidence relating to hypothesized relationships as depicted in the model(s).

3.2.1 Sample Size Determination

Since the population of the highly fragmented and extremely large number of transporters have been taken up as infinite population. The respondent sample size (within acceptable error margins at 95% confidence level) the following equation (... Eq. 1), has been used to determine the sample size when estimating the percentage/proportion for infinite population, this equation is as provided in illustration 7 of (Kothari, 2004), page no. 180.

Thus, to determine the sample size of an infinite population, the required formula (Kothari, 2004) that has been put up is:

$$n = \frac{z^2 * p * q}{e^2}$$

... Eq. 1

Where,

n = sample size

$z = 1.96$ (the value of the standard variate at a given confidence level)

For 95% confidence level $z = 1.96$

e = acceptable error

for $p = 0.5$ in which case 'n' will be the maximum and the sample will yield at least the desired precision. The e is determined by putting value of n in ... Eq. 1 structure.

$$n = \frac{1.96^2 * 0.5 * 0.5}{0.074^2}$$

Similarly, with $n = 171$; $e = 0.074$; the error for Transporters is found to be ± 7.4

3.2.2 Sampling Method

The collection of primary data employed Stratified Random Sampling methodology, which involved dividing the country into four zones (North, South, East, and West), each forming a distinct stratum. Within each stratum, cities situated along or in close proximity to the major freight movement corridors¹ were selected. These cities are prominent for their high commercial/trading activity, thus ensuring significant road freight movement. Transporters were then chosen within each selected city based on convenience and availability across the eleven cities of India. The data collection process was conducted by a reputable market research agency, which implemented limited randomization in selecting respondents. Special attention was given to ensuring adequate representation of suitable respondents (transporters) catering to both inter-zonal and intra-zonal freight routes.

4. Results and Discussion

As proposed in the conceptual frameworks (as provided in Figure 1: Framework 1 and Figure 2: Framework 2) put up in Section '2.4 Establishing Research-Gaps & Forming Hypotheses', the Price & Quality consideration and the Brand Choice aspects are discussed in greater detail in this section along with their respective hypotheses.

On considering the relevant manifest variables, it was found that a specific collection of these variables were able to explain the various hypothesized interactions that were put forward in the section 2.4 Establishing Research-Gaps & Forming Hypotheses

It was noticed that in the SEM for "Price" & "Quality" consideration, the latent variable "Opernl_Frugal" representing Operational Frugality is explained through manifest variables that measure the perception of the truck owners about: aftersales service, parts availability, maintenance cost, total cost of ownership, operating duration (tenure) of a truck, total number of trucks in the fleet. The latent variable "Performance" is explained by various manifest variables that similarly measure the perception of the truck owners/operators about: tyre life, mileage, turnaround time and technology in their truck(s).

The SEM for Brand Choice involved four latent variables, namely "Q", "Aspire", "Wrkshp & Eff" and "Price"; which represent Quality, Aspirational Aspects, Workshop Effectiveness & Product Efficiency and Price respectively. All of these four latent variables together explain the brand choice preference of a truck owner.

¹ Golden Quadrilateral Road Network, the North-South corridor and East-West Corridor

The latent variable for Quality is explained through various manifest variables that measure the perception of truck owners about: resale value, operating duration (tenure) of a truck, quality rating for their truck(s) and importance of quality as an attribute in the mind of the

truck owner. The latent variable for Aspirational Aspects is explained through the perception of truck owners about: rating about comfortable cabins and powerful engines.

4.1 The Price and Quality Structured Equation Model:

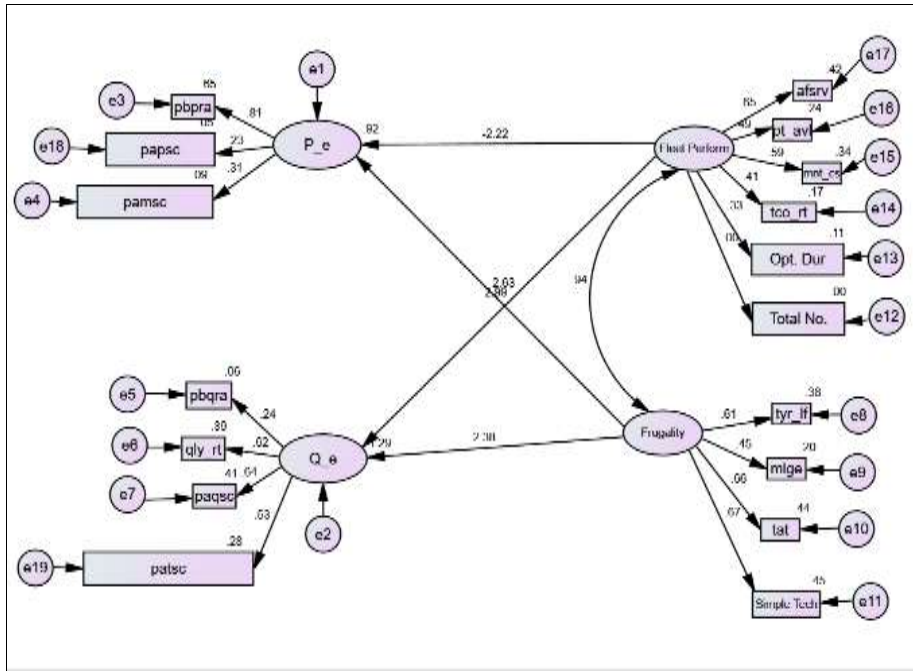


Figure 3

4.1.1 Price-Quality SEM Estimates & Discussion:

The Cronbach Alpha value for the above observed variables in the Price and Quality model put forward here was found to be **0.669**, proving the model to be reliable.

The Measurement model for the Price-Quality model was:

Model Fit Index	Value	Acceptable Value
Normed Chi Sq.	2.950	≤ 3
RMSEA	0.109	0.095 – 0.122
NCP	220.340	169.377 – 278.940
CFI	0.611	

The model fit statistics for the measurement model of the SEM for the ‘Price and Quality’ model is provided in the table above, it may be noted here that we have used Normalised Chi Square fit, in addition to the normed chi square (minimum sample discrepancy function), three more measures of fit based on population discrepancy i.e., root mean square error of approximation (RMSEA), non-centrality parameter (NCP) and comparative fit index (CFI) .

As can be seen in the following diagram for Model Fit Statistic, in terms of all the given parameters the model fit estimates are acceptable.

The model fit statistics of the SEM for Price and Quality are provided below, it may be noted here that in addition to the Normalised Chi Square fit as suggested by (Hair, Black, Babin, & Anderson, p. 641), two more measures of fit based on population discrepancy i.e., root mean square error of approximation (RMSEA) and non-centrality parameter (NCP). As can be seen in the following diagram for Model Fit Statistic, in terms of all

the given parameters the model fit estimates are acceptable.

Model Fit (Quality Price Path Diagram):

Model Fit Index	Value	Acceptable Value
Normed Chi Sq.	2.926	≤ 3
RMSEA	0.108	0.095 – 0.122
NCP	219.566	168.632 – 278.140
CFI	0.613	

Also, the parameter estimates, and standardised parameter estimates are provided in the **Error! Reference source not found.** section. It should be noted here that the (IBM SPSS Amos 22: User's Guide, 2013, pp. 91-92) states that since unstandardised parameter estimates² are affected by identification constraints, standardised regression parameters should be considered instead as they are not affected by the identification constraints. Also, the hypothesis that a given model is correct should be accepted not on the basis of Chi Square statistics alone but on the Normalised Chi Square as mentioned in (Hair, Black, Babin, & Anderson, 2009). This norm is also followed for the Brand Choice based structured equation model discussed later.

Coming back to the Price-Quality structured equation model, this model demonstrates that the "Fleet Performance" is negatively linked to "Price Consciousness" (P_e) (-2.22) and positively linked to "Quality Consciousness" (2.63) while "Operational Frugality" is positively linked to "Price Consciousness" (2.99) and negatively linked to "Quality Consciousness" (Q_e) (-2.38).

This apparent divergent reaction towards "Price Consciousness" and "Quality Consciousness" by the two different parameters of the trucking business are quite natural although might seem to be at odds when viewed at the surface. In fact, there is that almost perennial tussle between how much of quality for what price should be acceptable to the purchaser. This is also pertinent even for a livelihood product like truck (for the truck operator).

The transporter when trying to ensure the fleet performance, wants to make sure that he gets the maximum value out of the 'after sales service' (afsrv; 0.42, 0.65), 'general maintenance' (mnt_cs; 0.34, 0.59), while counting on 'easy availability of parts' (pt_avl; 0.24, 0.49), the 'total cost of ownership' (tco_rt; 0.17, 0.41) over the given operational lifetime - or 'duration of time' (opt_dur; 0.11, 0.33), so that the long haul

trucks in the fleet are able to ensure maximum operational performance without break-downs (or with minimum downtime). This could ensure maximised on-time delivery performance which in helps the transport operator to reliably match-up to its client's freight delivery expectations.

Thus, conceptually, above mentioned aspects are important consideration for the operational frugality of the trucking operations.

On the other hand, when the transporter is trying to ensure that 'Frugality' is maximised in terms of major operational parameters of his livelihood product it is inevitable that the consumable and delivery aspects are given high priority so that the cost of acquisition and cost of operation is justified. Thus, the truck operator tries to ensure that 'tyre life' is maximised (tyr_lf; 0.38, 0.61) and. Also, engine performance of a livelihood product like a truck is adjudged by not the power output alone but by the mileage that it can return consistently under fully laden state (up to its legal GVW) across various road conditions with acceptable operating speeds. So, 'mileage' is literally one of the benchmarks for frugal fleet operation consideration for trucks (mlge; 0.20, 0.45) while ensuring an acceptable Turnaround-Time (tat; 0.44, 0.66) that would help contributing to an acceptable reputation for operational viability of a fleet owner and lead to more business by satisfied customers. To ensure maximised product performance it is also important that the trucks are 'technologically simple' (Simple Tech; 0.45, 0.67) and have capabilities that improve overall quality further while ensuring that they stay relevant and productive over its commercially viable lifetime.

But, although the perspective and orientation of "Operational Frugality" and "Fleet Performance" of the product are different, the relationship of these two parameters of trucking business are also symbiotic (corr. 0.94) in nature.

² Especially Latent Variable estimates

It is important to note here that overall, it is ‘Quality Consciousness’ (1.29) that accounts for a greater degree of explanation to this overall interaction of the two parameters of trucking business as compared to ‘Price Consciousness’ (0.92) in an extremely price-elastic freight rate structure. This aspect of greater focus on

quality has led to higher focus on quality aspects in BS6 truck models along with a varied range of factory-built cabins across different manufacturers.

4.2 Brand Choice Structured Equation Model:

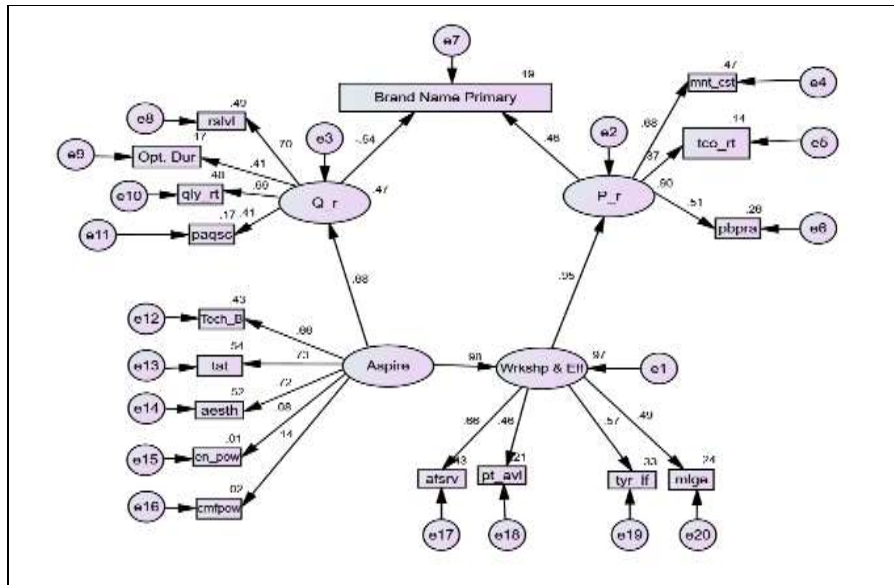


Figure 4

4.2.1 Brand Choice SEM Estimates & Discussion:

The Chronbach Alpha value for the above observed variables in the Price and Quality model put forward here was found to be reliable (at a value of 0.745).

The Measurement model for the Brand Choice is provided in Table 2 given below:

Table 2: Measurement model (Brand Choice)

Model Index	Fit	Value	Acceptable Value
Normed Chi Sq.		2.599	≤ 3
RMSEA		0.109	0.095 – 0.122
NCP		156.702	113.307 – 207.773
CFI		0.722	

Below are the model fit statistics for the Structural Equation Model (SEM) regarding Brand Choice, as detailed in Section 4.1.1. It may be noted here, as mentioned earlier, that the utilization of Chi-Square

goodness of fit has been avoided. Instead, the Normalized Chi-Square fit, as recommended by Hair, Black, Babin, & Anderson (p. 641), has been employed. Additionally, two other measures of fit based on

population discrepancy, namely the Root Mean Square Error of Approximation (RMSEA) and the Non-Centrality Parameter (NCP), have been utilized. As

illustrated in Table 3, the model fit statistics indicate that the model fit estimates are deemed acceptable based on the provided parameters

Table 3: Model FIT READINGS (Brand Choice Model)

Model Fit Index	Value	Acceptable Value
Normed Chi	2.836	≤ 3
RMSEA	0.105	0.092 – 0.119
NCP	211.183	161.037 – 268.976
CFI	0.652	

The parameter estimates and the standardised parameter estimates are provided in the **Error! Reference source not found.** section. It is worth noting here that the (IBM SPSS Amos 22: User's Guide, 2013, pp. 91-92) provides that; since unstandardised parameter estimates³ are affected by identification constraints in Amos, instead, standardised regression parameters should be considered as they are not affected by the identification constraints.

Reaffirming our concluding observations of Section 4.2, in the Brand Choice structured equation model, it is found that Quality is a vital consideration for purchasers, which is a livelihood product for them, it is also important to note that there is a strong aspirational pull among the transporters, provided that such products are qualitatively sound and put forward a distinct value proposition. Owing to the truck buyer's upward aspirational pull, high volume manufacturers like Tata have launched the Prima and Signa series of trucks, Ashok Leyland has launched 'N' and 'U' cabins in their AVTR series of trucks and VECV⁴ has launched their 'Pro' series of trucks. In fact, manufacturers like Daimler Trucks (across Mercedes Benz and the more mainstream brand - Bharat Benz) have their value proposition centred around aspirational aspects and have their entire truck range built on company built air-conditioned cabins only. But this, apparent focus on upward mobility (in terms of customer value proposition) would hold true only when the products are of sound quality and provide service ease in the workshop, so that downtime is minimised and major consumables like fuel and tyre is at minimum possible levels. Before deliberating further on aspects of "General Quality", it may be noted here that, in this Brand Choice based SEM, quality has been defined as an attribute that ensures fulfilling of all generally accepted performance criterion for the product purchased. This latent variable "Q" (representing Quality, as provided in the figure) is formed by manifest

variables like perceived resale value that operators generally get for a particular brand and model of product (rslvl; 0.49, 0.70), the operating duration (0.17, 0.41), the perception about importance of quality in the mind of the transporter (0.48, 0.69) and quality rating provided for the primary brand (0.17, 0.41).

So, it is found that resale value commanded by a particular product is the most important attribute that forms 'General Quality', beyond that it is about the trucker's perception about the importance of quality as a parameter in truck operations and also the perception of quality derived from a particular brand of truck. It was also found that the number of years for which the truck can effectively be made to operate in the fleet of the truck operator was also an important contributor to perception of general 'Quality Received'.

Beyond Quality, the upwardly aspirations of the transporter, portrayed through the latent variable "Aspire", is primarily formed through rating about technological state-of-the-art nature and robustness of the products used by them (Tech_B; 0.43, 0.66), also the turnaround time (tat; 0.54, 0.73) is an important contributing factor to the latent variable, the variable representing aesthetics of the truck including the ergonomics was also found to be contributing to the latent variable (aesth; 0.52, 0.72). Although marginally, but still it was found that engine power (en_pow; 0.1, 0.14) and comfortable cabin and powerful engine (cmfpow; 0.02, 0.14) also contributed to the latent variable "Aspire".

Thus, in terms of the latent variable "Aspire", the most important contributing factor was the turnaround time (TAT). This is quite expected as, it is but natural that a livelihood product like a truck to be aspired for should ensure a good earning potential, in this case when a truck can maintain good average speed and complete its trip within acceptable time limits it does earn more per

³ Especially Latent Variable estimates

⁴ Volvo Eicher Commercial Vehicles

truck over a given period of time. Interestingly, aesthetics was also found to be a very important contributing element in this latent variable. It shows that there is strong awareness/urge among the surveyed customers about ergonomically improved and visually pleasing trucks that could reduce fatigue for drivers and also contribute to a sense of pride among small fleet operators and owner operators. Another important aspect of this latent variable (“Aspire”) is the mindset and expectation of transporters in their attitude towards new/cutting edge technology in their trucks which could improve performance or makes them a better livelihood product.

Thus, it was observed that the upwardly mobile aspiration of the operator is quite strong even in owner operators and small fleet owners and has a very strong impact on choosing a particular brand. But that market sentiment is tempered with emphasis on Quality and Service ease/Operational Ease coupled with Price validity of the product choices made. But overall, when a trucker aspires to own a particular brand of truck (for the given set of preferred attributes or characteristics) it also adds to the customer loyalty, as (Bradley & Wood, 1994) it ensures the customers recognize relevant value in their intended product/purchased product and look forward to acquire/continue using the given product.

As a livelihood product it is very important for a truck to have maximum uptime and ensure that it continues to operate (and earn profits for the operator). In order for this to happen consistently, it is required that scheduled maintenance is hassle free and done with minimum downtime. Operational ease should also be ensured through consistent mileage in loaded conditions and extended tyre life over operational schedule. In this light, we find that the latent variable, “Wrkshp & Eff” is formed by rating for after-sales-service (afsrv; 0.66, 0.43), tyre life (tyr_lf; 0.33, 0.57) and mileage (mlge; 0.24, 0.49) and parts availability (pt_avl; 0.21, 0.46).

After sales service is quite expectedly most strongly related to the latent variable “Wrkshp & Eff”, as the quality and effectiveness of a good aftersales service and service network directly ensures that the down time for

scheduled and unscheduled maintenance is minimised. Customer perception about availability of parts in the workshop (and in open markets) further contributes to a good after sales service experience. On the other hand, in terms of efficiency aspects, durability of tyres and fuel efficiency (mileage) were also found to be strongly linked to this given latent variable. The efficiency of fuel consumption and tyre life ensure that the major cost chunks in truck operations are taken into account along with periodic maintenance (which would be discussed in detail under “Price”).

It is important to note here that, as freight price margins are slim, the market in general is price sensitive, so the price factor is important. The latent variable “Price” includes the rating perception about the purchase cost appropriateness for a given truck – (pbpra; 0.26, 0.51), rating on perception about maintenance cost (mnt_cst; 0.47, 0.68) and perception rating about cost of ownership (tco_rt; 0.14, 0.37).

The variables ‘pbpra’ along with ‘mnt_cst’ and ‘tco_rt’ represent the product life cycle cost of a truck which is portrayed by the latent variable “Price”. However, it should be noted here that “Price” alone by itself did not play very strong role in determining the brand that a transport operator would go on to purchase/prefer to operate.

Ultimately, the latent variables “General Quality”, “Aspire”, “Wrkshp & Eff” and “Price” directly and substantially affect the affect the Brand Choice, where “Aspire” also affects the latent variables “General Quality” and “Wrkshp & Eff”. Also, the latent variable “Wrkshp & Eff” affects “Price”. It is worth noting here that (Aaker, 1996) had asserted that in order to ensure that brands evolve and acquire distinct identity, it is imperative that they move beyond price considerations alone and develop a unique set of traits and characteristics.

The hypotheses as put forward in Section 2.4 all proved to be true as can be observed in the composite table provided below:

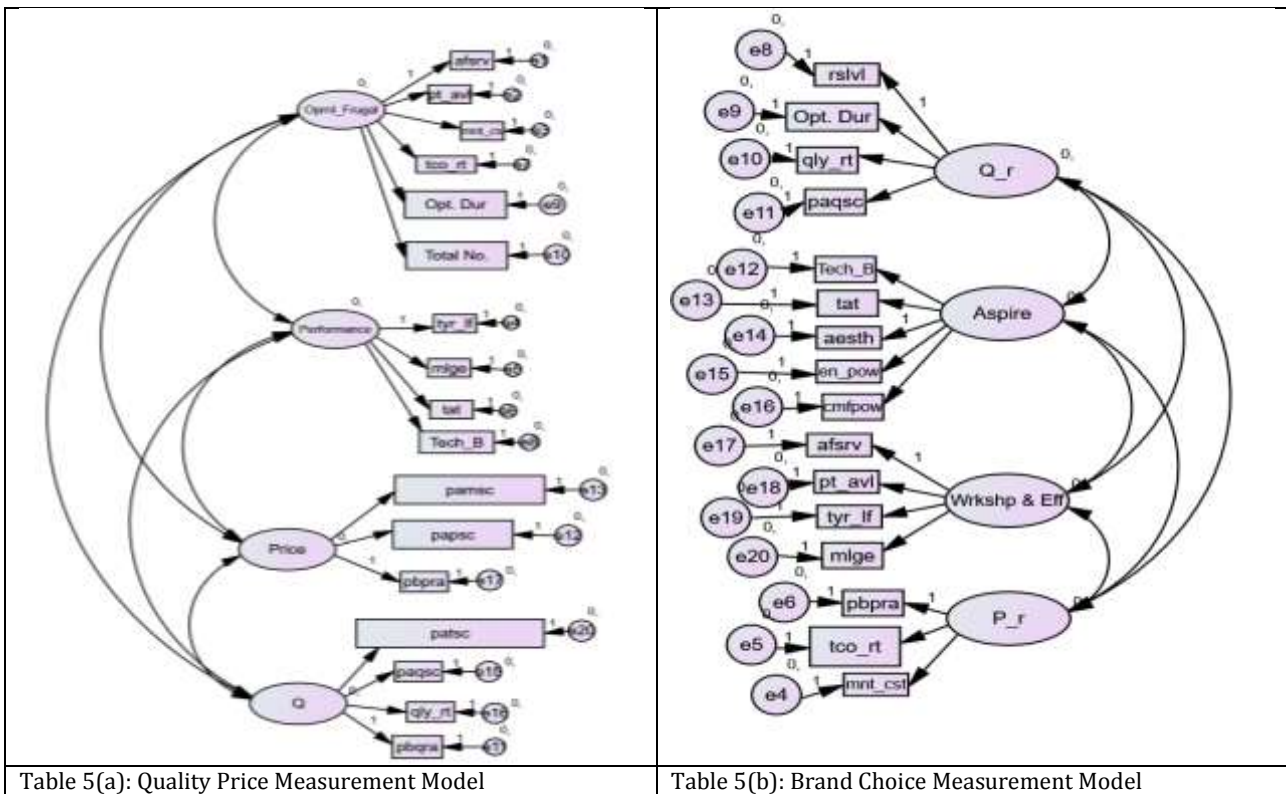
Table 4: Hypothesis And Path Estimate Details

Hypotheses	Path	Path Coeff.	Sig.	Decision
H _{1A}	Fleet Perform → (-) P _e	-2.948	0.002	Supported
H _{1B}	Fleet Performance → Q _e	0.0688	0.032	Supported
H _{2A}	Frugal → P _e	3.832	0.000	Supported
H _{2B}	Frugal → (-) Q _e	-0.604	0.050	Supported
H ₃	Fleet Performance ↔ Frugal	0.94	-	Supported
H ₄	Q _r → Brand	-0.245	0.001	Supported
H ₅	Aspire → Q _r	0.784	0.000	Supported
H ₆	Aspire → Wrkshp & Eff	0.939	0.000	Supported

H ₇	Wrkshp & Eff → P _r	0.775	0.000	Supported
H ₈	P _r → Brand	0.305	0.007	Supported

5. Conclusion & Future Scope

Table 5: Measurement Models (Quality Price Model & Brand Choice Model)



On successfully proving the hypotheses H₁, H_{2A}, H_{2B} and H₃ the first research question put up in Section 2.4 on effects of operational expectations and fleet performance requirements upon attitude of truck operators towards Price and Quality has been effectively dealt with. Also, the dynamics of Price-Quality framework has been duly discussed in Section 4.1.

It may also be noted here that through the successful proving of the hypotheses H₄, H₅, H₆, H₇ and H₈ the second research question put up in Section 2.4 on how brand choices are made between the two predominant truck brands (Tata and Ashok Leyland) of India has been explored. The Brand choice related model effectively explains the interactions of Price, Quality, Aspirations and other Operational Expectations leading to a particular Brand Choice, this phenomenon has been discussed in Section 4.2.

To recapitulate, the expectations for ‘frugality’ in fleet operations and fleet ‘performance’ (in terms of on time delivery of consignments) are of substantial and significant deliberation for the average small

transporters of India. These deliberations are significantly linked to the ‘price’ and ‘quality’ consideration of the transporter while purchasing trucks for their fleet. As we have observed in the previous sections (section 4.1), ‘price’ and ‘quality’ considerations are strongly correlated but have inverse

relationships with fleet ‘performance’ and ‘frugality’ in respective order. However, ‘frugality’ has a substantially positive and significant connection with ‘price’ whereas ‘performance’ has a positive and significant connection with ‘quality’.

Coming to the aspect of ultimately purchasing a particular brand of truck (out of the predominant choice of Tata or Ashok Leyland), the attribute of aspirational purchase does play a significant role in driving considerations for perception of product quality received and expected price expectations.

Thereafter as put up in the model dealing with the model for choosing a brand, quality consideration is found to be one of the direct contributors to brand choice. Which is triggered by upwardly mobile aspirational

inclinations (leading to more creature comforts, features and product capabilities) among target truck purchasers, this tendency is however tempered with an expectation of Workshop efficiency. The recognition of this expectation for workshop efficiency is manifested on the ground through the elaborately extensive service and workshop network of the market leader, Tata Motors on one hand and the market challenger, Ashok Leyland's existing service network and supplementing it further with third party based networked digital platform service initiative like 'Service Mandi' and ensuring genuine parts availability through brick and mortar stores as well as online stores for LeyParts.

The attribute of Workshop efficiency leads to creation of value perceived in terms of Price of a given truck in terms of price paid for the product upfront, maintenance cost and overall cost of ownership. Finally, the Price perception also contributes directly to brand choice.

It is important to note here that Aspiration is a key trigger in truck brand consideration, and of the two direct contributors to brand choice, Quality has a bigger linkage to Brand Choice over Price, in this light the importance of pursuing psychographic segmenting approaches across various tonnage categories, for a truck marketer is substantial

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