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CONTENTS

Sr. No.	TITLE & NAME OF THE AUTHOR (S)	Page No.
1.	CHANGING BUSINESS DYNAMICS IN ERA OF TECHNOLOGICAL DISRUPTIONS <i>MONICA GUPTA, Dr. SHASHI SHEKHAR & Dr. KAVITA AGGARWAL</i>	1
2.	INFLUENCE AND VALIDITY OF ONLINE REVIEWS ON CUSTOMERS PURCHASE DECISION – A STUDY <i>MONISHA D & Dr. S. GURUSAMY</i>	5
3.	FINANCIAL STRUCTURE OF SELECT BATTERY COMPANIES IN ANDHRA PRADESH – AN ANALYTICAL STUDY <i>Dr. KOMMINENI KALYANI & Dr. P. MOHAN REDDY</i>	10
4.	A STUDY ON THE IMPACT OF GST ON GOODS TRANSPORT AGENCIES (GTA) WITH REFERENCE TO TAMIL NADU <i>ANAND SHANKAR RAJA M & KRISHNA B</i>	17
5.	ENHANCED SPARSE SYSTEM FOR MULTI-CHANNEL MANAGEMENT USING REDUCED MONOTONE GEOMETRIC ALGEBRA <i>Dr. R. MARIMUTHU</i>	26
6.	THE STUDY OF CRYPTOCURRENCIES AROUND THE WORLD <i>GURUCHARAN SINGH BAGGA</i>	30
	REQUEST FOR FEEDBACK & DISCLAIMER	34

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CHANGING BUSINESS DYNAMICS IN ERA OF TECHNOLOGICAL DISRUPTIONS

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ABSTRACT

There is no doubt that digital business is changing the nature of competition. Today, it is not just traditional industry competitors we need to worry about, but new entrants from outside our industry, equipped with new digitally based business models and value propositions. This is often tech giants and startups that have envisioned and built a new business model from the ground up, powered by a new platform ecosystem for digital business. In effect, tomorrow's leader may not be someone we know. We often think of industry competition as a perpetual battle between the same set of incumbents, but in reality, things are far more dynamic and transitory. As an example, whereas 89% of the Fortune 500 went out of business between 1955 and 2014, in recent years, according to R "Ray" Wang of Constellation Research, 52% have been merged, acquired, gone bankrupt or fallen off the list solely since 2000. Why can new entrants move in so easily? Digital business changes the rules by lowering the traditional barriers to entry. A digitally based business model requires far less capital and can bring large economies of scale for example. In this research article, focus will be on Porter's model of the five forces of industry competition; Digital Transformation And Innovation In Today's Business World; Leadership in the Era of Digital Disruption; Changing Retail, Dynamics in the Face of Technology Disruption; How Disruptive Technology Is Changing Business for Good and The Coming Wave of Digital Disruption.

KEYWORDS

business dynamics, technological disruptions, substitutes, innovation.

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INTRODUCTION

Exactly why is digital business so disruptive to traditional business models and traditional notions of industry competition? A useful way to analyze the situation is by looking at Porter's model of the five forces of industry competition and exploring how digital business is impacting each of the various forces. According to Michael E. Porter, in one of his landmark books, titled *Competitive Strategy*, "In any industry, whether it is domestic or international or produces a product or a service, the rules of competition are embodied in five competitive forces: the entry of new competitors, the threat of substitutes, the bargaining power of buyers, the bargaining power of suppliers, and the rivalry among the existing competitors."

CHART 1

Let's look at each of these five forces and examine the role and impact of digital business:

The entry of new competitors

THE THREAT OF SUBSTITUTES

The threat of substitutes deals with the threat of substitute products or services. In terms of digital business, this can come from a purely digital substitute or a hybrid digital/physical substitute. Taxi services, such as Uber and EasyTaxi for example, provide a hybrid model via a digital app for consumers and taxi drivers, coupled with the physical taxis.

The threat of substitutes is high in many industries since switching costs are low and buyer propensity to substitute is high. In the taxi services example, customers can easily switch from traditional models to the new model simply by installing an app on their smartphone. Propensity to switch from the traditional model is high due to consumer wait times for taxis, lack of visibility into taxi location and so on.

THE BARGAINING POWER OF BUYERS

Perhaps the strongest of the five forces impacting industry competition is the bargaining power of buyers since the biggest driver of digital business comes from the needs and expectations of consumers and customers themselves.

This bargaining power lays out a new set of expectations for the digital customer experience and necessitates continual corporate innovation across business models, processes, operations, products and services.

THE BARGAINING POWER OF SUPPLIERS

Suppliers can accelerate or slow down the adoption of a digitally based business model based upon how it impacts their own situation. Those pursuing digital models themselves, such as the use of APIs to streamline their ability to form new partnerships and manage existing ones, may help accelerate our own model.

Those who are suppliers to the traditional models, and who question or are still determining their new role in the digital equivalent, may use their bargaining power to slow down or dispute the validity or legality of the new model.

Good examples are the legal and business issues surfacing around the digital-sharing economy (i.e. ride-sharing, room-sharing etc.) where suppliers and other constituents work to ensure the business model and process innovations still adhere to established rules, regulations, privacy, security and safety.

THE RIVALRY AMONG THE EXISTING COMPETITORS

Finally, existing competitors are all looking at digital business, trying to understand the disruptions occurring, and prepare their response. The responses can range all the way from defensive to offensive measures, and even a first-mover attack. This rivalry among competitors is always in play, but in recent years, digital business has added fuel to the fire, just as the e-business era did many years ago.

The rivalry is heating up because entry and exit barriers are going down due to the comparative low-cost of digital business models, and in many cases new entrants do not even need to own physical assets or infrastructure. In particular, the "platform" model is seeing considerable success in the marketplace by simply connecting stakeholders and applying a set of peripheral services to enhance the customer experience.

LITERATURE REVIEW

Many books have discussed the interplay between technology and business. For instance, Berkun (2010, p. 62), Isaacson (2014, p. 288), Lessig (2008, p. 143), Naim (2014, p. 71), Norman (1998, p. 235), Rogers (1962/2003, 5th ed., p. 247), and Varian (2004, p. 26) approvingly reference Christensen's original thesis about disruptions. Typically, the attitude in such technical papers is that "disruptive" is a desirable trait, because the choice of the term suggests that the paper is presenting something important and possibly highly valuable. The greater the effect or the more disruptive the innovation, the better.

Sood and Tellis (2011) state that technology disruption occurs when a new technology exceeds the performance of the dominant technology on the primary dimension of performance. Similar definitions can be found in Govindarajan and Kopalle (2006), Schmidt and Druehl (2008), and Utterback and Abee (2005). Linton (2002) refers to Abernathy and Clark (1985) and states that "Disruptive innovations are based on a different technology base than current practice, thereby destroying the value of existing technical competencies." Kasscieh et al. (2000), Kostoff et al. (2004), Rothaermel (2002), and Volberda et al. (2011) have provided similar definitions. According to Danneels (2004) "a disruptive technology is a technology that changes the bases of competition by changing the performance metrics along which firms compete." Similar definitions are presented by Obal (2013) and Nagy et al. (2016). According to Walsh et al. (2002), Geoffrey Moore has noted in 1991: "disruptive technologies generate discontinuous innovations that require users/adopters to change their behavior in order to make use of the innovation." Alborns-Garrigos and Hervás-Oliver (2014), Lyytinen and Rose (2003), Bessant et al. (2010), Paap and Katz (2004), and Urban et al. (1996) have presented similar kinds of definitions. Sometimes disruptions are initiated by a new business model rather than by new technology, as discussed in Ghezzi et al. (2015), Pisano (2015), Sabatier et al. (2012), and Sosna et al. (2010). Finally, many articles (e.g., Kasscieh et al., 2002; Laplante et al., 2013; Markides, 2006 and Yu and Hang, 2010) discuss several aspects of disruptions without giving one clear definition.

OBJECTIVE OF THE STUDY

The objective of the study is to bring forward the Porter's model of the five forces of industry competition; Digital Transformation and Innovation in Today's Business World; Leadership in the Era of Digital Disruption; Changing Retail, Dynamics in the Face of Technology Disruption; How Disruptive Technology Is Changing Business for Good and The Coming Wave of Digital Disruption.

METHODS OF DATA COLLECTION

Primary Data: Are those, which are, collected a fresh and for the first time and thus happen to be original in character and known as Primary data.

Secondary Data: Are those which have been collected by someone else and which have already been passed through the statistical process are known as Secondary data.

TYPE OF RESEARCH USED

The research will be conducted by means of descriptive research in which main data is taken from the internet and other journals or books. I.e. mainly secondary data will be used. These are already available i.e. they refer to the data which have already been collected and analyzed.

DIGITAL TRANSFORMATION AND INNOVATION IN TODAY'S BUSINESS WORLD

When businesses and the way they operate shift from their traditional mode of operation and management to the modern and technology oriented ways of operation, the transitions referred to as Digital Transformation or disruption.

Since change is the only thing constant, digital transformation has become imperative for all businesses, small, medium large. Be it automation, logistics, software, retail or medical — digital disruptions is omnipresent. Delivering a good digital business experience to customers and employees requires the use of-of new innovative business application.

Digital transformation is not just about embracing new technology; it is about a change in thought and organization culture. There is a need for organizations to address the change in business scenarios, dynamic business demands and innovate ways to quickly cater to these changing needs.

Digital business transformations are driven by key factors like Innovative Technology, consumer customer behavior and market demand, and also environmental factors.

Technological innovations lead to technology disruptions. The business process moves away from legacy systems to adopt modern technology like a cloud. Big data, IoT, RAD etc.

Then comes the next factor: customer behavior. What are the customer demands and expectations on the business (and the demands on technology to meet business needs)? Customers demand increased technological capabilities combined with the desire for ease of use.

LEADERSHIP IN THE ERA OF DIGITAL DISRUPTION

In this era of “digital disruption” — which refers to how technology can transform everything about the way businesses are run and interact with customers — leaders who don’t transform to master the digital era to disrupt will get disrupted. And it will be a brutal disruption, where the majority of companies will not exist in a meaningful way 10 to 15 years from now.

Those in leadership positions can guide their organizations through the new digital era by following a simple five-step operational blueprint:

- Build and execute a compelling vision.
- Adopt a partner-centric model to deliver.
- Reinvent yourself.
- Turn people into the business’s secret weapon.
- Accelerate the speed of innovation.

Digital disruption is bound to propel the rise of new companies that master the digital transformation, and bring about the demise of those that fail to do so. Business leaders can either take the steps to embrace it or risk being left behind.

CHANGING RETAIL, DYNAMICS IN THE FACE OF TECHNOLOGY DISRUPTION

The Indian retail landscape is going through a major shake-up and becoming intensely competitive. Consequently, retail brands are adopting various winning strategies to enhance customer experience, which in turn helps acquire new customers and retain the existing ones.

TECHNOLOGY DISRUPTION

With the advent of the digital era, conventional models of customer service are getting disrupted. Technological advancements have been transforming the way a customer shops or share his/ her shopping experiences. Presently, websites, social media, blogs and vlogs play a key role in propelling customers’ process of buying.

SOCIAL MEDIA

Good customer experience comes with flawless customer service. Retailers are already aware of this and have been sprucing up their customer service so as to gain a competitive edge in the market. Digitalization is playing a crucial role on this shift, thereby making it imperative for retailers to perk up their customer service. In the olden times, customers used to share their poor customer experience with their friends and family, and currently, customers’ share their good and bad experiences via a simple tweet or a post on Facebook that reaches millions of people worldwide.

THE IoT Movement

Connected devices are also reshaping experiences by adding more connectivity and intelligence to objects, thereby revolutionising the retail sector. For example, the Internet of Things is not only propelling digital transformation but also bringing fresh opportunities by bringing everything including consumers’ activity into the digital sphere. This is compelling retailers to use intelligent devices for digitizing their offerings, processes as well as employees.

DATA ANALYTICS

Retailers are increasingly leveraging the power of Big Data for making precise strategic decisions besides enhancing customers’ shopping experience. Big Data enables retailers to comprehend what their customers are looking for throughout their buying journey. It also helps retailers to predict the demand of customers so that they can adapt to the market changes accordingly.

GLOBAL INFLUX OF BRANDS

The Millennial customers put a strong emphasis on global brands; thus, the latter is taking centre stage in shopping malls. Mall owners today are embracing global brands as they bring in a new set of customers and also yield better returns per square ft. compared to the domestic retail brands. For example, Indian malls having retail outlets of brands like Forever 21, Zara, Massimo Dutti, H&M, Armani or Starbucks attract good number of customers. Thus, to enhance customer experience, shopping malls are increasingly accommodating global brands by expelling domestic brands altogether or by reducing the size of domestic stores.

FOOTFALLS

Footfall is a crucial factor for retailers. Decent footfalls not only help drive sales but also enhance conversion rates. Footfall analytics can provide crucial insights for enhancing customer service, boosting sales and optimizing staff. Footfall analytics tracks the pattern of visitor traffic to reveal when the levels of footfalls in a retail store rise and fall, and how many people visiting the store are actually buying its products or services. Improved customer experience is the only factor that motivates shoppers to spend more with a brand. Thus, retailers have been taking measures to convert footfalls into sales by offering visitors more than just a transaction in their stores so as to improve customer experience.

DIGITAL DARWINISM: HOW DISRUPTIVE TECHNOLOGY IS CHANGING BUSINESS FOR GOOD

The real threat and opportunity in technology’s disruption lies in the evolution of customer and employee behavior, values, and expectations. Companies are faced with a quandary as they invest resources and budgets in current technology and business strategies (business as usual) versus that of the unknown in how those investments align, or don’t, with market and behavior shifts.

This is a time of digital Darwinism — an era where technology and society are evolving faster than businesses can naturally adapt. This sets the stage for a new era of leadership, a new generation of business models, charging behind a mantra of “adapt or die.”

Digital transformation is not a specifically about technology, its empowered by it. Without an end in mind, digital transformation continually seeks out how to use technology in ways that improve customer experiences and relationships. It also represents an effort that introduces new models for business and, equally, creates a way of staying in business as customers become increasingly digital.

THE COMING WAVE OF DIGITAL DISRUPTION

For the past 30 years, business has changed dramatically because of digital innovation — but only up to a point. Although many practices, products, and services have evolved, and a few sectors (such as media) have been fundamentally changed, very few enterprises have had their core businesses disrupted. But that is about to change, in a way that will — or should — affect the strategy of your company.

All disruption (digital or otherwise) takes place on an industry-wide scale, forcing a significant shift in profitability from one prevailing business model to another. The new model typically provides customers with the same or better value at a much lower cost. Companies wedded to the old business model lose ground, and some are even pushed out of business. A group of challengers that embrace the new business model gain advantage and take a dominant position in the market. The winners may be new entrants, as were Southwest Airlines in the 1980s, Google in the 1990s, and Netflix and Facebook more recently.

Business people have been worried about disruption at least since 1996, when Clayton M. Christensen popularized the word in his book *The Innovator’s Dilemma: When New Technologies Cause Great Firms to Fail*. But the degree of actual disruption in business over the past 15 years is much lower than you might expect. Our colleagues at PwC discovered that discrepancy in a research project published this year, in which they tracked the top 10 companies (by revenue) in 39 key sectors. On average, only 6 percent of company value shifted over a full 10-year period, except for the three most volatile sectors (Internet software and services, IT, and biotechnology), where the figure was 10 percent. In short, if you measure disruption by the degree of market share gain or loss in the dominant companies in each sector, most industries have not yet been affected.

Digital disruptions are different in several critical ways. They involve technologies that can reduce the need for physical assets; for example, streaming media took the place of compact discs, and algorithms that specify traffic routes for shared-vehicle enterprises can raise the efficiency of passenger travel and thus reduce the number of cars and vans needed in an area. Digital systems accumulate data and, through machine learning, they continually improve the performance of the new business models, thereby accelerating their impact. Digital disruptions reshape value chains and markets, rendering the old differences among sectors irrelevant; now one home device can be a music player, a thermostat, a security system, and a retail portal. They affect a broad number of sectors, and they encourage companies to add scale by creating platforms that make it cheaper to enter new geographies or launch new products and services. Another effect is the increased demand in a broad range of industries for people with software skills (which are more fungible than other forms of engineering prowess) and a Silicon Valley

sensibility. It's safe to say that no one from inside the aerospace and defense industry of the 1980s would have developed the remote-controlled military vehicles and drones emerging today, piloted from far away as if they were video games. Only those from the computer industry could accomplish that.

FINDINGS

Business Transformation is the real change that is causing a storm in the business world. Its impact is felt not only in operations but also in industry structures and also at all levels in the organization. Business leaders and CIOs are coming forward to ensure that digital transformation coupled with innovation is driving business and bringing in productive changes and delivering value. The future of our enterprise will depend on how well we understand these dynamics in our industry and in general. Focus on strategic changes that reflect and incorporate our own existing strengths, as opposed to those that may impress investors in the short run but not add to our sustained performance. For example, some retailers try to ramp up their digital prowess rapidly by outsourcing functions such as same-day delivery. This gives investors the impression they are proactive; but in the long run, the addition may not be profitable unless it gives the company a sustained advantage tied to their own innovation.

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INFLUENCE AND VALIDITY OF ONLINE REVIEWS ON CUSTOMERS PURCHASE DECISION – A STUDY

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ABSTRACT

India is under a transition period with emerging digitalization; hence, there is wide change over in shopping behaviour. Nowadays many customers prefer online shopping to the traditional shopping. In this scenario, it is essential that to make this study on impact of online reviews because online reviews are the major significant reason in making online shopping. This research paper were also made in relating the AIDA model with online reviews. In this study, an attempt has been made to identify the products purchased online based on reviews, to explore the preferred website for online reviews and to examine the impact of online reviews in the customers purchasing behaviour. The study has revealed that the purchase decision based on good reviews and good rating is quite strong and positive to shop in online. Overall, the study is benefits of the modern marketing towards the digitalization.

KEYWORDS

online shopping, digitalization, online reviews, purchase decision.

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M 31

INTRODUCTION

Online shopping allows customers to find a product by visiting the online shopping applications of the store directly by searching alternative sellers using a shopping search the same products availability and pricing at different e-shopping. Online shopping applications enable the customers to look through the several ranges of products and services, view photo or images of the products, along with information about the product specifications, feature and prices.

ONLINE REVIEWS

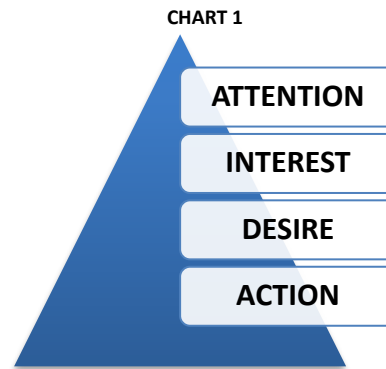
Online reviews express the opinions of product purchasers and/or service users and are posted on web sites that are hosted either by a selling company or a third-party virtual platform; these reviews usually contain a written open comment section, often accompanied by a numerical rating. Such reviews provide different types of information not presented in traditional online shopping settings because they give consumers the opportunity to share their previous experiences of products, services, and companies with other potential consumers. Opinions posted by peers have been recognized as more trustworthy than company-sponsored advertising they are also considered a more valuable and sought after source of information. Online reviews can benefit both the consumers and the companies that choose to use them. On the other hand, online reviews could potentially have negative effects on decision making if the amount of information presented in reviews is too overwhelming to process or the opinions stated in the reviews are inconsistent. The Internet, electronic communication has become a major source of information for consumers planning to purchase new products. In fact, online product review Websites outranks all other media in influencing customer decisions. User-generated content, especially online product reviews, helps consumers make informed decisions about purchasing new products and has become a major driving force in new product sales, making effective e-marketing a critical success factor for new product launch. An increasing number of studies have found a positive relationship between online consumer reviews and product sales, including books, movies, and video games. In the online market, three metrics of consumer product reviews have been under close examination: volume, valence, and dispersion. The measuring the volume of product reviews is straight forward discussions about a product in online forums lead to increased awareness among consumers to buy the products from online.

CUSTOMER BUYING BEHAVIOUR IN ONLINE SHOPPING

The marketing around the online shopping, customer's buying behaviour may not be influenced and controlled by the brand and firm, when they make a buying decision that might concern the interactions with search engine, recommendations, online reviews and other information. With the quickly separate of the digital devices environment, people are more likely to use their mobile phones, computers, tablets and other digital devices to gather information. The online shopping has a growing effect on consumer's mind and buying behaviour. In an online shopping environment, interactive decision may have an influence on aid customer decision making. Each customer is becoming more interactive, and though online reviews customers can influence other potential buyers' behaviours. Subsequently, risk and trust would also are two important factors affecting people's' behaviour in digital environments. Customer considers switching between e-channels, because they are mainly influence by the comparison with offline shopping, involving growth of security, financial and performance. There are three factors may influence people to do the buying decision, first, people cannot examine whether the product satisfy their needs and wants before they receive it. Second, customer may concern at after-sale services. Finally, customer may afraid that they cannot fully understand the language used in e-sales. Based on those factors customer perceive risk may as a significantly reason influence the online purchasing behaviour.

Online retailers have placed much emphasis on customer trust aspect; trust is another way driving customer's behaviour in digital environment, which can depend on customer's attitude and expectation. Indeed, the company's products design or ideas cannot met customer's expectations. Customer's purchase intention based on rational expectations, and additionally impacts on emotional trust.

AIDA MODEL



Attention: The consumer becomes aware of a category, product or brand (usually through advertising).

Interest: The consumer becomes interested by learning about brand benefits & how the brand fits with lifestyle.

Desire: The consumer develops a favourable disposition towards the brand.

Action: The consumer forms a purchase intention, shops around, engages in trial or makes a purchase.

SCOPE OF THE STUDY

An attempt has been made to study the impact of online reviews in various aspects of buying behavior. This study also helps in understanding the consumer's preference on various online reviews in choosing products /services. In addition, this study enables to capture the opinion on online reviews, which create decision-making process. This study was also made in linking the AIDA model with online reviews.

REVIEW OF LITERATURE

Chakraborty & Bhat (2018)¹ study brand image which was considered as a signaling phenomenon because high brand image ensures quality product that can reduce consumer's uncertainty. that the effects of online reviews on functional and hedonic brand images in the context of consumer electronic products in India. Lee (2017)² analysed on social shopping deals and their impacts on review metrics at an online review site, Yelp and compared the review metrics of the restaurant businesses and the health and wellness businesses. online review score on the growth rate of the reviews and consequently on the sale growth. Wu He et.al (2017)³ examined on online customer reviews which could light into their experience, opinions, feelings, and concerns it is important for businesses to collect, monitor, analyze, summarize, and visualize online customer reviews posted on social media platforms such as online forums. Simeon et.al (2017)⁴ asserts that online reviews to explore the experiences of tourists related to cultural attractions, identifies similarities, differences between cultural attractions and identifies tourists' preferences. Authors find five critical components of tourists' experience related to wonder, authenticity, relaxation, discovery and knowledge. Cezar & Ogut (2016)⁵ examined on the impact of three main technologies on converting browsers into customers: that a high rank in search listings, a high number of recommendations and location rating has a significant and positive impact on conversion rates. Yang, Sarathy & Walsh (2016)⁶ analyzed on the psychological mechanism through which consumer reviews affect people's purchasing decisions and behavior that negative reviews induce higher risk perception and a less favorable attitude toward purchases compared to positive reviews. Zhu, David K.C. & Fei (2016)⁷ showed that online consumer reviews mitigate the effectiveness of the other two information sources in driving brand sales. Bona Kim, Seongseop Kim & Cindy Y. Heo (2016)⁸ evaluated the online hotel reviews produced by customers to identify that satisfiers and dissatisfiers in full-service hotels were distinct, with the exception of two common service-related factors, namely, staff and their attitude and service. Geng Cui, Hon-Kwong Lui, and Xiaoning Guo (2016)⁹ examined the effect of online reviews on new product sales for consumer electronics and video games. Found that a some light on the effects of eWOM on new product sales and offer interesting revelations for marketing professionals.

OBJECTIVES OF THE STUDY

1. To identify the products purchased online based on reviews
2. To explore the preferred website for online reviews
3. To examine the impact of online reviews in the customers purchasing behaviour.

RESEARCH METHODOLOGY

This study is descriptive in nature and uses primary data. The primary data were collected through the questionnaire. Convenient sampling was adopted in the collection of the data. The sample size is 105 for the study. Data was collected from the consumers who purchased goods online. The questionnaire was structured and questions were closed ended in nature. The questionnaire had 3 parts. The first part of the questionnaire was designed to collect demographic information of the respondents. This covers age, gender, occupation, educational qualification, and family monthly income. The second part of questionnaire was prepared to elicit information about online reviews on the purchasing behavior of customers. The last part of the questionnaire was aimed at elicity information about the online review regarding purchasing products. Statistical tools like Frequency Distribution, Ranking, Chi-square test, Multiple Regression were used to get conclusive results with the help of SPSS V21 and MSExcel software.

LIMITATIONS OF THE STUDY

1. The study was confined only to the consumers in Chennai City.
2. Only samples of 105 respondents were taken for the study.
3. The duration of the study is 3 months so an in-depth study could not be carried.

TABLE 1: DEMOGRAPHIC PROFILES OF THE RESPONDENTS

DEMOGRAPHIC PROFILE		FREQUENCY	PERCENTAGE	TOTAL
GENDER	Male	69	65.7	105 [100.0]
	Female	36	34.3	
AGE	Below 27 Years	46	43.8	105 [100.0]
	28 To 37 Years	22	21.0	
	38 To 47 Years	18	17.1	
	Above 48 Years	19	18.1	
EDUCATIONAL QUALIFICATIONS	UG	64	61.0	105 [100.0]
	PG	27	25.70	
	Other (Diploma)	14	13.30	
MONTHLY FAMILY INCOME	Rs.10,000 –Rs.20,000	23	21.8	105 [100.0]
	Rs.21,000 – Rs.30,000	28	26.7	
	Rs.31,000 – Rs.40,000	30	28.6	
	Above Rs. 41,000	24	22.9	
OCCUPATIONS	Students	42	40.0	105 [100.0]
	Self-employed	9	8.6	
	Employer	45	42.8	
	Professional	9	8.6	

Source: Primary data

Table 1 show that majority of the respondents are male (65.7%), Most of the them are in the age group of 18-27 (43.8%), Majority of them are Undergraduates (61%) and employed (42.8%) with a monthly income ranging between 30001-40000 (28.6%).

TABLE 2: FREQUENCY OF ONLINE SHOPPING

Particulars	Frequency	Percentage
Once in week	6	5.7%
Once in month	84	80.0%
Twice in month	12	11.4%
Everyday	3	2.9%
Total	105	100%

Source: Primary data

Table 2 reveal the frequency of online shopping. Out of 105 respondents 5.70% shop online in once a week, while 80% shop once a month. 11.40% respondents shop twice a month. 2.90% respondents shop every day. Majority of the respondents shop online once a month.

TABLE 3: OPTION TO VIEW ONLINE REVIEWS

Particulars	Frequency	Percentage
Yes	86	81.9%
No	19	18.1%
Total	105	100%

Source: Primary data

Table 3 show that the option to view online reviews. Out of 105 respondents, 81.90% option to view online reviews, while 18.10% do not view online reviews. So it can be inferred that the majority (81.90%) respondents to view online reviews

TABLE 4: CHECKING ONLINE REVIEWS BEFORE PURCHASING PRODUCTS

Particulars	Frequency	Percentage
Often	20	19.%
Always	55	52%
Sometimes	23	22%
Rarely	7	7%
Total	105	100%

Source: Primary data

Table 4 reveals the checking online reviews before purchasing products. Out of 105 respondents, often 19% check online reviews before purchasing products, while 52% respondents always check online reviews before purchasing products, 22% of respondents sometimes check online reviews before purchasing product, whereas 7% of respondents used to check online reviews rarely. It concludes, Majority of the respondents always check online reviews before purchasing products

TABLE 5: OPINION ON ONLINE REVIEWS

Opinion	Frequency	Percentage
Create confusion	66	62.9%
No confusion	39	37.1%
Total	105	100%

Source: Primary data

Table 5 show that the opinion online reviews creating confusion while purchasing goods and services. Out of 105 respondents, 62.90% consumers have confusion while purchasing goods and services when they go through reviews, while 37.10% consumers did not create confusion while purchasing goods and services. So it can be inferred that the majority (62.90%) of the respondents are have confusion while purchasing goods and services if they look for reviews.

RANKING

TABLE 6: WEBSITES FOR ONLINE REVIEWS

Products	Frequency	Ranking
Amazon Customer Reviews	89	1
Facebook	26	2
Twitter	15	3
IMDB	10	4
TRIP ADVISER	1	5

Source: Primary data

Table 6 show that the websites browsed by the respondents for online reviews. Amazon is frequently used website for online reviews followed by Facebook, Twitter, IMDB, and Trip Adviser.

TABLE 7: PRODUCTS PURCHASED BASED ON REVIEWS

Products	Frequency	Ranking
Electronics	67	1
Movie Tickets	28	2
Textiles	27	3
Electricals	25	4
Book / Magazines	18	5
Airline / Train Reservation	14	6
Food and Beverage	12	7
Hotel Booking	11	8
Stationeries	4	9

Source: Primary data

Table 7 show that the preferred product purchased based on reviews. Majority of the respondents look for online reviews before purchasing electronics goods. This is followed by Movie tickets; Textiles, Electricals, Books/Magazines, Reservation, Food & Beverage, Hotel booking and the least preferred products for online reviews are Stationary products. It can be inferred that Majority of the respondents rely on reviews for purchase of electronic products.

CHI SQUARE TEST

Null hypothesis: There is no association between demographic variables and the opinion on Online reviews.

Alternative hypothesis: There is association between demographic variables and the opinion on Online reviews.

TABLE 8: CHI SQUARE ANALYSIS: DEMOGRAPHICS AND THE OPINION ON ONLINE REVIEWS

	Chi- Square Value	Degree of freedom	P-value
Age	15.186(a)	9	.086
Gender	2.947(a)	3	.400
Occupation	9.232(a)	9	.416
Education	2.456(a)	6	.874
Monthly Income	5.951(a)	9	.745

Source: Primary data

Table 8 the chi square test on the summarized cross tabulation about reveals that there is no association between demographics and the opinion on online reviews. Majority P value is 0.874 which is greater than 0.05. Hence, null Hypothesis is accepted.

MULTIPLE REGRESSION

TABLE 9

Dependent variable: Purchase decision	Interdependent variable: Online Reviews
Multiple R value: .740	R square value: .547
F value: 30.195	P value: 0.000

TABLE 10: MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square	F Change	df1	df2	Sig. F Change
1	.740 ^a	.547	.529	.609	.547	30.195	4	100	.000

a. Predictors: (constant), desire, interest, attention, action

Source: Primary data

This table 10 provides the R and R² values. The R value represents the simple correlation and is 0.740 (the "R" Column), which indicates a high degree of correlation. The R² value (the "R Square" column) indicates how much of the total variation in the dependent variable, Intrinsic Motivation, can be explained by the independent variable perception on purchase decision. In this case, can be explained, which is very large. The multiple correlation coefficient is 0.740 measures the degree of relationship between the actual values and the predicted values. This coefficient value of 0.740 indicates that the relationship between (Independent Variables) Desire, Interest, Attention Creator, Action of Purchase and (Dependent Variable) Purchase Decision based on good review and good rating is quite strong and positive.

TABLE 11: ANOVA

Model	Sum of Square	Df	Mean Square	F	Sig.
Regression	44.838	4	11.210		
Residual	37.124	100	.371	30.195	.000 ^b
Total	81.962	104			
a. Dependent Variable: Purchase Decision					
b. Predictors: (constant, Online Reviews					

Source: Primary data

From the table 11. ANOVA significance 0.000 indicates that statistical significance of the regression model that was run. Here, p <0.000, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable (i.e., it is a good fit for the data).

TABLE 12: COEFFICIENT

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(constant)	-.413	.465		-.887	.377
Action of purchase	.008	.019	.038	.411	.682
Attention creator	.037	.034	.085	1.082	.282
Interest	.231	.031	.664	7.392	.000
Desire	.009	.026	.025	.334	.739

Source: Primary data

a. Dependent Variable: Purchase Decision

From the table 12 coefficient the inference is been determined. The coefficient of determination R-square measures the goodness of fit of the estimated Sample Regression Plane (SRP) in terms of the proportion of the variation in the dependent variables explained by the fitted sample regression equation. Thus, the value

of R square is .547 simply means that about 54.7 % of the variation in Purchase Decision based on good review and good rating is explained by the estimated SRP that uses the AIDA (Attention, Interest, Desire And Action) independent variable and R square value is significant at the 5% level.

The beta coefficient tells you how strongly is the independent variable associated with the dependent variable. It is equal to the correlation coefficient between the variables. Thus, this regression model is excellent in creating impact between online reviews and the purchase decision. It can be concluded that the online reviews have a significant impact on the purchasing decision of the respondents. The customers' decision to purchase products online is influenced by the reviews posted on the internet

SUGGESTIONS

Polite and prompt responses from the company to the negative reviews of the customers can change the customer perception about the products. The reviews can be given in a long sentence instead of giving a single word evaluation such as good, bad and worthless reviews. The videos, pictures and cumulative reviews can be posted to create a positive impact on customer purchasing behavior. Many people are buying the products and posting their reviews in social Medias, I suggest that there could be an option that people who are buying the new products can discuss with the people who have already posted the reviews.

CONCLUSION

Online reviews has a strong impact on customers purchasing behavior, 8 out of 10 consumers trust online reviews as much as a personal recommendation. Consumers prefer to shop through channels that make product information, including rating and reviews, easily accessible. The result suggests that the majority of consumers have a positive relationship between online consumer reviews and product sales. Consumers believes that online reviews has become a major driving force in new product sales and it creates Action, Interest, Desire, Attention towards customers purchasing behavior. The ways consumers use online reviews may differ by specific product categories and product familiarity and involvement. Thus, investigating consumer review usage behavior in different product categories and focusing on the level of familiarity and involvement would enrich our understanding regarding online consumer review usage behavior.

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FINANCIAL STRUCTURE OF SELECT BATTERY COMPANIES IN ANDHRA PRADESH – AN ANALYTICAL STUDY

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ABSTRACT

Any business enterprise requires a combination of both long term and short term funds so as to equip itself with an appropriate combination of fixed assets and current assets. The long term financial strength as well as profitability of a business enterprise are influenced by its financial structure. The financial structure brings to the fore relative size and changing importance of both long term and short term funds as two components of total capitalization. The aim of present research paper is to analyse the trends in the financial structure of select battery companies in Andhra Pradesh. The present study is based on the secondary data only. The present study needs a ten year period commencing with the financial year 2002-03 and ending with 2011-12. Various tools like trend, average, percentages are applied. Graphs and diagrams are presented to illuminate the facts and figures at appropriate contexts. It reveals that ARBL and NBL, had heavily relied on internal source of funds for meeting their financial requirements. In other words, these companies could find it very easy to generate internal funds to finance their activities. But only one company, HBL had depended more on external funds than on internal funds for financing its projects. Long term funds were more than the short term funds in all the battery companies during the entire study period under observation. Hence all individual battery companies and the industry in Andhra Pradesh were heavily depended on long term funds in order to finance their fixed and current assets requirement.

KEYWORDS

ARBL, HBL, NBL financial structure, Battery Industry in A.P.

JEL CODE

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INTRODUCTION

Any business enterprise requires a combination of both long-term and short-term sources so as to equip itself with an appropriate combination of fixed assets and current assets. The long-term sources are required to finance both (i) long term uses i.e., fixed assets and (ii) net working capital. The long term financial strength as well as profitability of a business enterprise are influenced by its financial structure. The term 'financial structure' refers to the left hand side of the balance sheet as represented by 'total liabilities' consisting of current liabilities, long-term debt, preferred and common stock. The financial structure brings to the fore relative size and changing importance of both long-term and short-term funds as two components of total capitalization. It provides an insight into the various types of sources tapped to finance the 'total assets' employed in a business enterprise.

REVIEW OF LITERATURE

Rajeswari Rao¹ (1994) in her study entitled, Impact of capital structure decisions on operating performance of state enterprises in Andhra Pradesh. She concluded that the process of capital structure planning was not a one time job, but needs revision and monitoring throughout the time in different situations. Syam Babu² (2009) in his study on Financial performance of select pharmaceutical companies in South India, observed that the pharmaceutical companies utilized less debt capital. In order to increase the equity shareholders wealth, the pharmaceutical companies have to raise debt capital. Purushothamachari³ (2009) in his study, Financial performance of private sector cement companies in Andhra Pradesh, suggested that the cement companies in Andhra Pradesh should design a balanced capital structure, use fixed assets efficiently, adopt sound credit policies, apply modern inventory and cash management systems and control operating costs effectively in order to improve the financial performance in the future. Padmini⁴ (2012), in her study, Financial performance of Pharmaceutical Industry in India, concluded that there is effective use of long term funds to finance the long term needs and also to finance the core current assets in industry. She suggests that the proportion of proprietary funds have to be increased in order to provide greater coverage to fixed assets in all the pharmaceutical groups.

OBJECTIVE OF THE PAPER

The aim of present research paper is to analyse the trends in the financial structure of select battery companies in Andhra Pradesh.

RESEARCH METHODOLOGY**SAMPLE DESIGN**

According to A.P. industries website, four registered battery companies are operating in the state of Andhra Pradesh. They include Nippo Batteries Limited (NBL - 1972), Amara Raja Batteries Limited (ARBL - 1985), Hyderabad Batteries Limited (HBL - 1986) and Energy Leader Batteries India Limited (ELBIL - 2007). In order to carryout time series analysis, the companies with ten years of existence were brought into the sample frame. In other words, the companies, which were established prior to 2002-03 alone, are considered for the purpose of the study. Barring ELBIL, the rest of the battery companies fulfilled this criteria.

DATA BASE

The present study is based on the secondary data only. The data for the study have been primarily obtained from the annual reports of select battery companies in Andhra Pradesh. Relevant information is also gathered from the data published by the reports of battery companies, libraries of various institutions and the companys' website and other related websites on the battery industry were consulted. Also internet, journals, magazines, periodicals and research dissertations on finance and industry have been referred.

PERIOD OF THE STUDY

The present study needs a lengthy period so as to arrive at meaningful and purposeful inferences. Therefore, a ten year period commencing with the financial year 2002-03 and ending with 2011-12 has been adopted.

SCOPE AND LIMITATIONS OF THE STUDY

The present study is confined to issues relating to the study of financial structure of battery industry in Andhra Pradesh. The present study may not be free from limitations. The figures taken from the annual reports have been rounded off to two decimals of rupees in crores. Secondary data have been collected from more

than one source. Hence, there may be slight discrepancies between one source and another on the same variable. The reliability and correctness of calculation and findings depend upon the information obtained through secondary data.

TOOLS AND TECHNIQUES OF ANALYSIS

The data gleaned from the annual reports of select battery companies in Andhra Pradesh has been carefully processed, tabulated, analysed, and interpreted by using well established financial tools. Various tools like trend, average and percentages are applied. Graphs and diagrams are presented to illuminate the facts and figures at appropriate contexts.

FINANCIAL STRUCTURE OF BATTERY INDUSTRY

The term financial structure refers to the left hand side of the balance sheet as represented by total liabilities consisting of current liabilities, long term debt, preferred common stock. The financial structure therefore, includes both short term and long term funds. The financial structure of a business enterprise, therefore, consists of three elements – assets, liabilities and capital. The interrelation of these three elements is indicated by the following equation:⁵ Assets = Liabilities + Capital.

The term ‘financial structure’ is broader in its concept than ‘capital structure’. Gestenberg has treated both the terms synonymously and has used it only in its narrow sense, indicating the long-term funds.⁶ Walker has considered capital structure as having two connotations, the broader connotation to include both the long-term and short-term funds and narrow connotation to include only long-term funds.⁷ Weston and Brigham have clearly brought out the distinction between the two terms. “Financial structure refers to the way the firm’s assets are financed. It is the entire right hand side of balance sheet. Capital structure is the permanent financing of the firm, represented primarily by long-term debt, preferred stock and common equity but excludes all short-term credit. Thus, firm’s capital structure is only part of financial structure”.⁸ Similar view is also expressed by Grunewald and Nemmers.⁹ Capital Structure = Total Assets – Current Liabilities.

The overall financial structure of select battery companies and the battery industry in Andhra Pradesh has been studied keeping in view of the following aspects:

- Growth in internal and external sources of finance,
- Quantum and structure of total funds,

SOURCES OF FINANCE

Conventionally, the sources of finance are divided into internal and external sources and they together make up fresh capital.

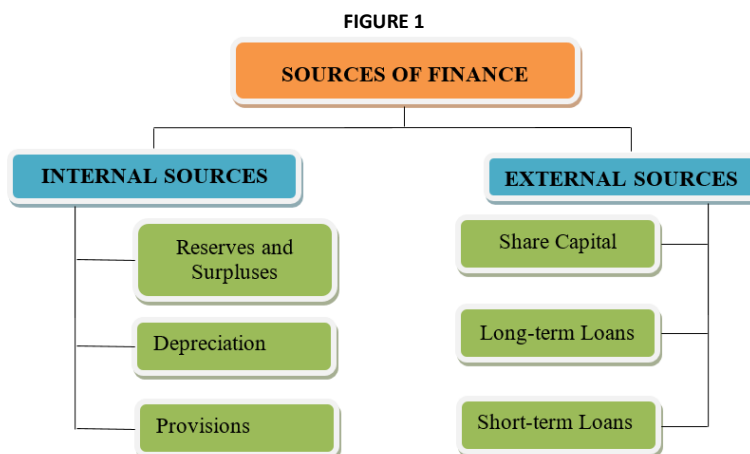
INTERNAL SOURCES

Generally, internal sources refer to the funds generated within the company and they contribute significantly to the financing and growth of companies. The permanence of internal funds minimizes solvency risk. The generation of internal funds reflects the soundness of financial health and buoyancy of a company. On the other hand, heavy dependence on external sources leads the organization into troubles. Whenever there is a shortage of funds in the capital market, the only source available to the organization is internal sources of funds.¹⁰

EXTERNAL SOURCES

External funds refer to the sources of finance external to the firm. They include amounts obtained through the issue of share capital, borrowings from various sources, trade dues and other current liabilities. In companies where there is poor generation of internal sources, the external sources of finance will play a crucial role in financing their requirements.

In order to have a clear understanding of the financing methods and practices followed in battery industry; emphasis has been focused on the study of sources of finance. It enables the analyst to keenly observe the shifts in the financial pattern and also to ascertain the significance of diverse internal and external sources of finance in battery industry in Andhra Pradesh. The sources of finance is shown in Figure 1.



Only year-wise changes in the amounts of various internal and external sources of finance are incorporated for the present analysis. The data pertaining to the structure of internal and external sources of finance for the period from 2002-03 to 2011-12 for the select battery companies and the industry in Andhra Pradesh are embodied in Table 1 and Figure 2.

TABLE 1: STRUCTURE OF INTERNAL AND EXTERNAL SOURCE OF FINANCE (Rupees in crores)

Years	INTERNAL FUNDS				EXTERNAL FUNDS				Total Funds	Internal Funds as a % of Total Funds	External Funds as a % of Total Funds
	Reserves and Surplus	Depreciation	Provisions	Total	Share Capital	Long-Term Debt	Current Debt	Total			
Amara Raja Batteries Limited											
2002-03	163.74	46.89	30.18	240.81	11.39	9.74	40.15	61.28	302.09	79.71	20.29
2003-04	163.20	59.16	19.84	242.20	11.39	14.88	31.55	57.82	300.02	80.73	19.27
2004-05	169.30	72.37	29.39	271.06	11.39	23.31	47.60	82.30	353.36	76.71	23.29
2005-06	189.90	86.36	48.01	324.27	11.39	37.87	82.09	131.35	455.62	71.17	28.83
2006-07	232.28	100.95	57.70	390.93	11.39	140.71	87.14	239.24	630.17	62.04	37.96
2007-08	321.71	121.73	99.34	542.78	11.39	316.26	119.69	447.34	990.12	54.82	45.18
2008-09	388.51	145.77	70.51	604.79	17.08	285.87	132.05	435.00	1039.79	58.16	41.84
2009-10	526.56	185.38	153.45	865.39	17.08	91.18	187.27	295.53	1160.92	74.54	25.46
2010-11	628.85	223.67	157.22	1009.74	17.08	95.04	212.38	324.50	1334.24	75.68	24.32
2011-12	806.39	266.68	220.71	1293.78	17.08	84.07	223.27	324.42	1618.20	79.95	20.05
Total	3590.44 (43.87)	1308.96 (15.99)	886.35 (10.83)	5785.75 (70.69)	136.66 (1.67)	1098.93 (13.43)	1163.19 (14.21)	2398.78 (29.31)	8184.53 (100.00)	70.69	29.31
Mean	359.04	130.90	88.64	578.58	13.67	109.89	116.32	239.88	818.45	71.35	28.65
Hyderabad Batteries Limited											
2002-03	77.32	20.95	11.69	109.96	20.07	69.49	32.71	122.27	232.23	47.35	52.65
2003-04	81.74	25.75	5.64	113.13	20.07	62.92	45.00	127.99	241.12	46.92	53.08
2004-05	96.75	31.39	12.36	140.50	20.07	112.21	64.14	196.42	336.92	41.70	58.30
2005-06	168.23	38.04	17.69	223.96	22.07	140.10	73.43	235.60	459.56	48.73	51.27
2006-07	215.53	46.34	7.75	269.62	24.28	176.28	105.06	305.62	575.24	46.87	53.13
2007-08	278.36	60.56	13.91	352.83	24.28	352.45	159.58	536.31	889.14	39.68	60.32
2008-09	360.79	87.48	24.09	472.36	24.28	367.57	168.45	560.30	1032.66	45.74	54.26
2009-10	486.03	115.00	147.51	748.54	25.30	426.97	162.64	614.91	1363.45	54.90	45.10
2010-11	499.54	144.93	11.77	656.24	25.30	701.47	224.57	951.34	1607.58	40.82	59.18
2011-12	404.73	162.49	13.31	580.53	25.30	591.03	440.28	1056.61	1637.14	35.46	64.54
Total	2669.02 (31.87)	732.93 (8.75)	265.72 (3.17)	3667.67 (43.79)	231.02 (2.76)	3000.49 (35.83)	1475.86 (17.62)	4707.37 (56.21)	8375.04 (100.00)	43.79	56.21
Mean	266.90	73.29	26.57	366.77	23.10	300.05	147.59	470.74	837.50	44.82	55.18
Nippo Batteries Limited											
2002-03	94.61	62.06	11.65	168.32	3.75	0.00	33.88	37.63	205.95	81.73	18.27
2003-04	104.95	68.23	11.72	184.90	3.75	0.00	32.36	36.11	221.01	83.66	16.34
2004-05	106.92	75.25	56.95	239.12	3.75	0.00	33.99	37.74	276.86	86.37	13.63
2005-06	108.61	82.47	63.17	254.25	3.75	2.50	30.36	36.61	290.86	87.41	12.59
2006-07	109.15	88.57	64.33	262.05	3.75	3.80	35.29	42.84	304.89	85.95	14.05
2007-08	116.38	93.25	11.79	221.42	3.75	3.50	30.99	38.24	259.66	85.27	14.73
2008-09	123.64	98.60	26.25	248.49	3.75	1.80	26.32	31.87	280.36	88.63	11.37
2009-10	131.39	104.27	26.70	262.36	3.75	1.90	26.97	32.62	294.98	88.94	11.06
2010-11	137.30	108.40	26.78	272.48	3.75	0.00	25.71	29.46	301.94	90.24	9.76
2011-12	138.63	113.27	8.10	260.00	3.75	8.87	28.66	32.41	292.41	88.92	11.08
Total	1171.58 (42.93)	894.37 (32.77)	307.44 (11.27)	2373.39 (86.97)	37.50 (1.37)	22.37 (0.50)	304.53 (11.16)	355.53 (13.03)	2728.92 (100.00)	86.97	13.03
Mean	117.16	89.44	30.74	237.34	3.75	2.24	30.45	35.55	272.89	86.47	13.53
Consolidated											
2002-03	335.67	129.90	53.52	519.09	35.21	79.23	106.74	221.18	740.27	70.12	29.88
2003-04	349.89	153.14	37.20	540.23	35.21	77.80	108.91	221.92	762.15	70.88	29.12
2004-05	372.97	179.01	98.70	650.68	35.21	135.52	145.73	316.46	967.14	67.28	32.72
2005-06	466.74	206.87	128.87	802.48	37.21	180.47	185.88	403.56	1206.04	66.54	33.46
2006-07	556.96	235.86	129.78	922.60	39.42	320.79	227.49	587.70	1510.30	61.09	38.91
2007-08	716.45	275.54	125.04	1117.03	39.42	672.21	310.26	1021.89	2138.92	52.22	47.78
2008-09	872.94	331.85	120.85	1325.64	45.11	655.24	326.82	1027.17	2352.81	56.34	43.66
2009-10	1143.98	404.65	327.66	1876.29	46.13	520.05	376.88	943.06	2819.35	66.55	33.45
2010-11	1265.69	477.00	195.77	1938.46	46.13	796.51	462.66	1305.30	3243.76	59.76	40.24
2011-12	1449.75	542.44	242.12	2234.31	46.13	683.97	692.21	1422.31	3656.62	61.10	38.90
Total	7531.04 (38.83)	2936.26 (15.14)	1459.51 (7.52)	11926.81 (61.49)	405.18 (2.09)	4121.79 (21.25)	2943.58 (15.17)	7470.55 (38.51)	19397.36 (100.00)	61.49	38.51
Mean	753.10	293.63	145.95	1192.68	40.52	412.18	294.36	747.06	1939.74	63.19	36.81

Source: Annual Reports of select battery companies in Andhra Pradesh

FIGURE 2: INTERNAL AND EXTERNAL FUNDS AS A PERCENTAGE OF TOTAL FUNDS



Amara Raja Batteries Limited

Financial structure of ARBL resembles the overall industry position. The company is finding it very easy to generate internal funds to finance its activities. The internal funds were in positive level in view of earning profits. Its operating revenue position over the years was such that it could even provide for depreciation during the study period. The continuing operating revenues have helped to improve the net worth of the company. The company, in order to finance its activities, had to rely on the internal sources of funds largely. The amount of internal funds acquired increased from Rs.240.81 crores in 2002-03 to Rs.1293.78 crores in 2011-12 and recorded 70.69 per cent of total source of funds. The external borrowed funds were shared more or less equally between long-term and short-term funds. For the ten-year period, the long-term and short-term loans contribution worked out to be 13.43 per cent and 14.21 per cent respectively of the total external source of funds. The amount of total external funds increased from Rs.61.28 crores in 2002-03 to Rs.324.42 crores in 2011-12 and formed 29.31 per cent of total source of funds. It may be observed that ARBL had heavily relied upon internal funds for meeting its financial requirements.

Hyderabad Batteries Limited

In HBL, internal funds generated accounted for 43.79 per cent of total funds mobilized from 2002-03 to 2011-12. In internal funds, reserves and surplus occupied a major place followed by depreciation with 31.87 per cent and 8.75 per cent respectively. The amount of provisions moved from Rs.11.69 crores in 2002-03 to Rs.13.31 crores in 2011-12. The company's external funds formed at 56.21 per cent of total funds, which is greater than internal funds by 12.42 per cent. HBL was forced to depend on external sources of funds as it undertook major expansion programme. In the case of borrowings – long-term debt was more than the short-term debt. For the ten-year period, the contribution of long-term and short-term loans recorded 35.83 per cent and 17.62 per cent respectively of the total external source of funds. Share capital formed 2.76 per cent of total external sources of funds. It is evident that there was an increase in total external sources of funds as a percentage of total sources of funds from 52.65 per cent in 2002-03 to 64.54 per cent in 2011-12. It may be concluded that the company had depended more on external sources of finance when compared to internal sources of finance. All these external funds were used for meeting its financial needs, which may be a good financial practice.

Nippo Batteries Limited

In the case of NBL, the total internal funds so generated, accounted for 86.97 per cent of total funds. NBL was able to generate adequate funds internally. The major components of internal funds were reserves and surplus (42.93 per cent of total internal sources of funds) followed by depreciation and provisions. These variables had formed 32.77 per cent and 11.27 per cent respectively of the total internal sources of funds. External funds in NBL consist of capital and borrowings - long-term as well as short-term. During the period under reference, share capital as a source of external funds, was mobilized to a cumulative amount of Rs.37.50 crores. For the ten-year period, the contribution of long-term and short-term loans worked out to be 0.50 per cent and 11.16 per cent respectively of the total external source of funds. Meagre percentage of long-term borrowed funds was observed in NBL. It may be observed that the company had heavily depended on internal sources of funds.

Consolidated

An observation of the data concerning the financial structure of consolidated position of battery companies (here after termed as battery industry) reveals that these companies relied on internal sources of funds for meeting their financial requirement. In other words, its business operations have been carried on efficiently which resulted in creating internal funds. Internal funds in the battery industry consist of reserves and surplus amounting to a cumulative figure of Rs.7531.04 crores followed by depreciation of Rs.2936.26 crores and provisions of Rs.1459.51 crores. It is noticed that the total internal funds registered Rs.11926.81 crores. In percentage, total of these internal funds formed 61.49 of total source of funds. In this context, it may be pointed out that the internal funds exceeded external funds by 22.98 per cent. Further, it may be stated that the battery industry depends more on internal sources of finance than external sources of finance. External funds in the battery industry consist of capital and borrowings – long-term as well as short-term. During the period under observation, share capital as a source of external funds, was mobilized to a cumulative amount of Rs.405.18 crores. Share capital as an external source of funds was not popular with battery industry in Andhra Pradesh. Of the borrowings, it is surprising to observe that the industry used more long-term debt funds as against short-term funds. Long-term debt formed 21.25 per cent while the percentage of short-term debt was 15.17 per cent and of share capital, 2.09 per cent of total external source of funds for the study period. Borrowings seemed to be more acceptable to battery industry.

To conclude, the battery industry depended more on internal sources of finance. Percentage of total internal source of funds on the whole contributed to a higher portion of the total source of funds for the battery industry in Andhra Pradesh. Further, the industry relied on long-term funds for financing modernization and expansion programmes. It may be concluded that the financial structure of battery industry was balanced as it has earned profits, which contributed to internal sources of funds.

To sum up, an analysis of individual battery companies under reference reveals that two out of three battery companies i.e., ARBL and NBL, had heavily relied on internal source of funds for meeting their financial requirements. In other words, these companies could find it very easy to generate internal funds to finance their activities. But only one company, HBL had depended more on external funds than on internal funds for financing its projects.

QUANTUM AND STRUCTURE OF TOTAL FUNDS

In the present study funds are, however, divided into two categories, viz., short-term funds and long term funds. The former includes current liabilities and provisions while the latter consists of all funds whose repayment period is more than one year. Thus, long term funds include long-term borrowed funds and also owners' funds. The long term funds for battery industry include net worth as denoted by share capital, reserves & surplus and long term borrowed funds consisting of debentures and other long term loans from financial institutions and government whose repayment period is beyond one year. The short term funds include current liabilities and provisions. The details concerning quantum and structure of long term and short term funds of select battery companies in Andhra Pradesh are presented in Table 2 and Figure 3. The overall picture of long term and short term funds in the battery industry has been studied through the analysis of data contained in this Table.

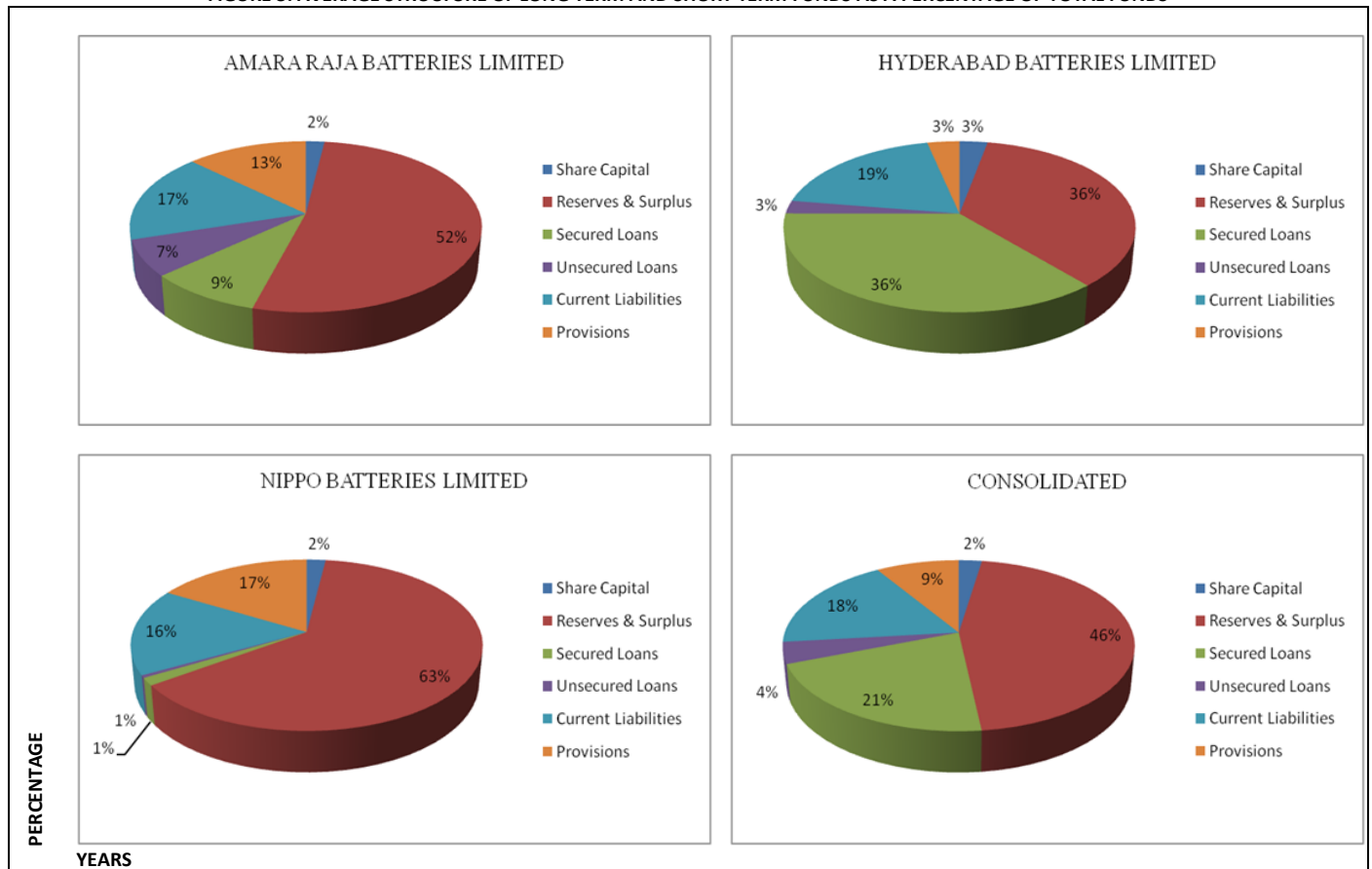
Amara Raja Batteries Limited

It is obvious that long-term funds went up from Rs.184.87 crores in 2002-03 to Rs.907.54 crores in 2011-12 during the same period while short-term funds increased from Rs.70.33 crores to Rs.443.98 crores. It may be noted that the short-term funds were less than the long-term funds in ARBL. Owned funds which amounted from Rs.175.13 crores in 2002-03, went up to Rs.823.47 crores in 2011-12 with an average of 54.21 per cent of total funds. Borrowed funds had ranged from a minimum of Rs.9.74 crores in 2002-03 to the maximum of Rs.316.26 crores in 2007-08. Current liabilities varied between the lowest of Rs.31.55 crores in 2003-04 and the highest of Rs.223.27 crores in 2011-12. The analysis reveals that the company had largely depended on long-term funds to finance not only its fixed assets but also core current assets requirement.

TABLE 2: QUANTUM AND STRUCTURE OF TOTAL FUNDS (Rupees in crores)

Particulars	2002-03		2003-04		2004-05		2005-06		2006-07		2007-08		2008-09		2009-10		2010-11		2011-12		Average	
	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.	%
Amara Raja Batteries Limited																						
Share Capital	11.39	4.46	11.39	4.73	11.39	4.05	11.39	3.08	11.39	2.15	11.39	1.31	17.08	1.91	17.08	1.75	17.08	1.54	17.08	1.26	13.67	1.99
Reserves & Surplus	163.74	64.16	163.20	67.76	169.30	60.25	189.90	51.43	232.28	43.89	321.71	37.05	388.51	43.46	526.56	53.98	628.85	56.62	806.39	59.67	359.04	52.22
Share holders' funds - I	175.13	68.62	174.59	72.49	180.69	64.30	201.29	54.51	243.67	46.04	333.10	38.36	405.59	45.37	543.64	55.73	645.93	58.16	823.47	60.93	372.71	54.21
Secured Loans	1.07	0.42	4.49	1.86	7.37	2.62	16.23	4.40	107.49	20.31	226.65	26.10	207.83	23.25	27.29	2.80	24.04	2.16	5.60	0.41	62.81	9.13
Unsecured Loans	8.67	3.40	10.39	4.31	15.94	5.67	21.64	5.86	33.22	6.28	89.61	10.32	78.04	8.73	63.89	6.55	71.00	6.39	78.47	5.81	47.09	6.85
Borrowed Funds - II	9.74	3.82	14.88	6.18	23.31	8.30	37.87	10.26	140.71	26.59	316.26	36.42	285.87	31.98	91.18	9.35	95.04	8.56	84.07	6.22	109.89	15.98
A Long Term Funds (I+II)	184.87	72.44	189.47	78.66	204.00	72.60	239.16	64.77	384.38	72.63	649.36	74.78	691.46	77.34	634.82	65.07	740.97	66.72	907.54	67.15	482.60	70.19
Current Liabilities	40.15	15.73	31.55	13.10	47.60	16.94	82.09	22.23	87.14	16.47	119.69	13.78	132.05	14.77	187.27	19.20	212.38	19.12	223.27	16.52	116.32	16.92
Provisions	30.18	11.83	19.84	8.24	29.39	10.46	48.01	13.00	57.70	10.90	99.34	11.44	70.51	7.89	153.45	15.73	157.22	14.16	220.71	16.33	88.64	12.89
B Short Term Funds	70.33	27.56	51.39	21.34	76.99	27.40	130.10	35.23	144.84	27.37	219.03	25.22	202.56	22.66	340.72	34.93	369.60	33.28	443.98	32.85	204.95	29.81
C TOTAL FUNDS (A+B)	255.20	100.00	240.86	100.00	280.99	100.00	369.26	100.00	529.22	100.00	868.39	100.00	894.02	100.00	975.54	100.00	1110.57	100.00	1351.52	100.00	687.56	100.00
Hyderabad Batteries Limited																						
Share Capital	20.07	9.50	20.07	9.32	20.07	6.57	22.07	5.24	24.28	4.59	24.28	2.93	24.28	2.57	25.30	2.03	25.30	1.73	25.30	1.61	23.10	2.98
Reserves & Surplus	77.32	36.60	81.74	37.95	96.75	31.67	168.23	39.91	215.53	40.75	278.36	33.59	360.79	38.17	486.03	38.93	499.54	34.15	504.73	32.05	276.90	35.77
Shareholder's funds - I	97.39	46.10	101.81	47.27	116.82	38.24	190.30	45.15	239.81	45.34	302.64	36.53	385.07	40.74	511.33	40.96	524.84	35.88	530.03	33.66	300.00	38.75
Secured Loans	57.04	27.00	49.64	23.05	92.83	30.38	118.56	28.13	153.66	29.05	327.84	39.57	350.41	37.07	409.81	32.83	683.48	46.73	565.93	35.94	280.92	36.28
Unsecured Loans	12.45	5.89	13.28	6.17	19.38	6.34	21.54	5.11	22.62	4.28	24.61	2.97	17.16	1.82	17.16	1.37	17.99	1.23	25.10	1.59	19.13	2.47
Borrowed Funds - II	69.49	32.89	62.92	29.21	112.21	36.73	140.10	33.24	176.28	33.33	352.45	42.54	367.57	38.89	426.97	34.20	701.47	49.96	591.03	37.53	300.05	38.76
A Long Term Funds (I+II)	166.88	78.99	164.73	76.49	229.03	74.96	330.40	78.38	416.09	78.67	655.09	79.06	752.64	79.63	938.30	75.16	1226.31	83.84	1121.06	71.19	600.05	77.51
Current Liabilities	32.71	15.48	45.00	20.89	64.14	20.99	73.43	17.42	105.06	19.86	159.58	19.26	168.45	17.82	162.64	13.03	224.57	15.35	440.28	27.96	147.59	19.06
Provisions	11.69	5.53	5.64	2.62	12.36	4.05	17.69	4.20	7.75	1.47	13.91	1.68	24.09	2.55	147.51	11.82	11.77	0.80	13.31	0.85	26.57	3.43
B Short Term Funds	44.40	21.01	50.64	23.51	76.50	25.04	91.12	21.62	112.81	21.33	173.49	20.94	192.54	20.37	310.15	24.84	236.34	16.16	453.59	28.81	174.16	22.49
C TOTAL FUNDS (A+B)	211.28	100.00	215.37	100.00	305.53	100.00	421.52	100.00	528.90	100.00	828.58	100.00	945.18	100.00	1248.45	100.00	1462.65	100.00	1574.65	100.00	774.21	100.00
Nippo Batteries Limited																						
Share Capital	3.75	2.61	3.75	2.45	3.75	1.86	3.75	1.80	3.75	1.73	3.75	2.25	3.75	2.06	3.75	2.03	3.75	1.94	3.75	1.99	3.75	2.03
Reserves & Surplus	94.61	65.75	104.95	68.69	106.92	53.03	108.61	52.12	109.15	50.46	116.38	69.94	123.64	68.02	131.39	68.90	137.30	70.94	138.63	73.74	117.16	63.55
Share holders' funds - I	98.36	68.36	108.70	71.15	110.67	54.89	112.36	53.92	112.90	52.19	120.13	72.19	127.39	70.09	135.14	70.86	141.05	72.88	142.38	75.73	120.91	65.59
Secured Loans	0.00	0.00	0.00	0.00	0.00	0.00	2.50	1.20	3.80	1.76	3.50	2.10	1.80	0.99	1.90	1.00	0.00	0.00	0.00	0.00	1.35	0.73
Unsecured Loans	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.87	4.72	0.48
Borrowed Funds - II	0.00	0.00	0.00	0.00	0.00	0.00	2.50	1.20	3.80	1.76	3.50	2.10	1.80	0.99	1.90	1.00	0.00	0.00	8.87	4.72	2.24	1.21
A Long Term Funds (I+II)	98.36	68.36	108.70	71.15	110.67	54.89	114.86	55.12	116.70	53.95	123.63	74.29	129.19	71.08	137.04	71.86	141.05	72.88	151.25	80.45	123.15	66.80
Current Liabilities	33.88	23.55	32.36	21.18	33.99	16.86	30.36	14.57	35.29	16.31	30.99	18.62	26.32	14.48	26.97	14.14	25.71	13.28	28.66	15.24	30.45	16.52
Provisions	11.65	8.10	11.72	7.67	56.95	28.25	63.17	30.31	64.33	29.74	11.79	7.08	26.25	14.44	26.70	14.00	26.78	13.84	8.10	4.31	30.74	16.68
B Short Term Funds	45.53	31.64	44.08	28.85	90.94	45.11	93.53	44.88	99.62	46.05	42.78	25.71	52.57	28.92	53.67	28.14	52.49	27.12	36.76	19.55	61.20	33.20
C TOTAL FUNDS (A+B)	143.89	100.00	152.78	100.00	201.61	100.00	208.39	100.00	216.32	100.00	166.41	100.00	181.76	100.00	190.71	100.00	193.54	100.00	188.01	100.00	184.34	100.00
Consolidated																						
Share Capital	35.21	5.77	35.21	5.78	35.21	4.47	37.21	3.72	39.42	3.09	39.42	2.12	45.11	2.23	46.13	1.91	46.13	1.67	46.13	1.48	40.52	2.46
Reserves & Surplus	335.67	54.99	349.89	57.45	372.97	47.32	466.74	47.71	556.96	43.70	716.45	38.45	872.94	43.19	1143.98	47.38	1265.69	45.75	1449.75	46.55	753.10	45.75
Share holders' funds - I	370.88	60.76	385.10	63.23	408.18	51.79	503.95	50.44	596.38	46.80	755.87	40.56	918.05	45.43	1190.11	49.29	1311.82	47.41	1495.88	48.03	793.62	48.21
Secured Loans	58.11	9.52	54.13	8.89	100.20	12.71	137.29	13.74	264.95	20.79	557.99	29.95	560.04	27.71	439.00	18.18	707.52	25.57	571.53	18.35	345.08	20.96
Unsecured Loans	21.12	3.46	23.67	3.89	35.32	4.48	43.18	4.32	55.84	4.38	114.22	6.13	95.20	4.71	81.05	3.36	88.99	3.22	112.44	3.61	67.10	4.08
Borrowed Funds - II	79.23	12.98	77.80	12.77	135.52	17.20	180.47	18.06														

FIGURE 3: AVERAGE STRUCTURE OF LONG TERM AND SHORT TERM FUNDS AS A PERCENTAGE OF TOTAL FUNDS



Hyderabad Batteries Limited

It is evident that long-term funds had contributed more on an average 77.51 per cent of total funds when compared to short-term funds (22.49 per cent) during the entire period of the study. In other words, long-term funds were more than the short-term funds in HBL. Long-term funds had formed nearly more than two-thirds of total funds. The borrowed funds had varied between the lowest of Rs.62.92 crores in 2003-04 and the highest of Rs.701.47 crores in 2010-11. Share holders’ funds had jumped from Rs.97.39 crores in 2002-03 to Rs.530.03 crores in 2011-12. Reserves and surplus had occupied on an average 52.22 per cent, a major chunk of the total funds. It is interesting to note that on an average, shareholders’ funds are equal to the borrowed funds. It may be concluded that HBL had used more long-term funds when compared to short term funds. The company had shown an inclination to strengthen long term funds consisting of both shareholders’ funds as well as long term borrowed funds in order to finance its total assets requirement.

Nippo Batteries Limited

In NBL, shareholders’ funds which stood at Rs.98.36 crores in 2002-03 went up to Rs.142.38 crores in 2011-12 because of attractive profits earned by the company. The long-term funds continued to be more than the short-term funds during the study period. Borrowed funds as a source of long-term funds were stagnant with an average of 1.21 per cent of total funds and it was quite a negligible share. It is observed that an insignificant proportion of long-term borrowed funds were used in NBL. The issue of shares remained constant as there is no fresh issue of equity shares during the entire study period. Reserves and surplus had increased from Rs.94.61 crores in 2002-03 to Rs.138.63 crores in 2011-12. It is observed that reserves and surplus had formed on an average 63.55 per cent, a major portion of the total funds. Short-term funds varied between the minimum of Rs.36.76 crores in 2011-12 and the maximum of Rs.99.62 crores in 2006-07. For the ten-year period, the current liabilities and provisions contribution recorded on an average 16.52 per cent and 16.68 per cent respectively of the total funds. The owned funds of NBL were more significant than the borrowed funds. It may be concluded that the company had heavily depended on shareholders’ funds. In other words, long-term borrowed funds were not adequately represented in its financial structure.

Consolidated

It is apparent that long term funds constituted the major source of financing the investments in battery industry in Andhra Pradesh. It contributed on an average 73.25 per cent of the total investment in the consolidated position. Of these, owners’ funds constituted 48.21 per cent and that of long-term borrowed funds 25.04 per cent. The use of long-term funds was, therefore, more than short-term funds. But the extent of long term funds as a percentage of total funds invested had fluctuated between the minimum of 68.50 per cent in 2005-06 and the maximum of 77.85 per cent in 2008-09. Short-term funds on an average contributed 26.75 per cent of total investments. Short-term funds as a percentage of total funds fluctuated between the lowest of 22.15 per cent in 2008-09 and the highest of 31.50 per cent in 2005-06. Thus, it may be noted that in absolute figures, the amount of short-term funds in battery industry put together had advanced from Rs.160.26 crores in 2002-03 to Rs.934.33 crores in 2011-12. It may be observed that the short-term funds in absolute figures registered an increasing trend. It may be concluded that the industry had heavily depended upon long term funds in financing its fixed and current assets requirement. In other words, long term funds were sufficient to finance fixed assets and leave a part of these funds to finance core current assets.

An observation of the financial structure of individual battery companies resembles the overall industry position. It reveals that the long-term funds were more than the short-term funds in all the battery companies during the entire study period under observation. Hence, all individual battery companies and the industry in Andhra Pradesh were heavily depended on long term funds in order to finance their fixed and current assets requirement.

CONCLUSION

The financial structure brings to the fore relative size and changing importance of both long term and short term funds as two components of total capitalization. ARBL and NBL, had heavily relied on internal source of funds for meeting their financial requirements. In other words, these companies could find it very easy to generate internal funds to finance their activities. But only one company, HBL had depended more on external funds than on internal funds for financing its projects. Internal source of finance on the whole contributed to a higher portion of the total source of funds for the battery industry in Andhra Pradesh. Long term funds were more than the short term funds in ARBL, HBL and NBL during the entire study period under observation. Hence, all the battery companies heavily depended on long term funds in order to finance their fixed and current assets requirement. The financial structure of individual battery companies resembles the

overall industry position. Long term funds of the battery industry in Andhra Pradesh were sufficient to finance fixed assets and leave a part of these funds to finance core current assets.

SUGGESTIONS

ARBL and NBL had depended on internal sources of funds for meeting their financial requirements. These companies shall tap the external sources of funds more particularly debt capital to reap the benefits of financial leverage, so that the capital structure will become a balanced capital structure. The NBL Company shall raise long term debt for meeting the expansion requirement since the debt capital is a cheaper source than equity finance. The reason is that the interest on debt is tax deductible.

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A STUDY ON THE IMPACT OF GST ON GOODS TRANSPORT AGENCIES (GTA) WITH REFERENCE TO TAMIL NADU

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ABSTRACT

The researchers have attempted to study the impact of GST on Goods Transport Agencies (GTA) in select districts of Tamil Nadu namely Erode, Tirupur and Coimbatore. The paper aims to follow a qualitative approach and hence proper review of the literature has been taken into consideration. The review of literature provided a basic understanding on how to proceed with the research work and provided insights to learn new information. Since there are no much articles and published sources on GST and its impact on GTA, the researchers have collected literature reviews from various sources. The study also concentrates on primary data collection using a focus group approach. The study concludes that GST has been finally implemented officially throughout the Indian scenario and has a confused effect. Experts are looking forward to find solution for these problems. Transporters will have to make a significant investment in making technological advancements in the system of booking. Experts must be employed in order to comply with the rules and guidelines of the law. Now is the time to make reforms in business. The researchers have spent quality time to analyze and understand each component concerned with this research work. This research outcome will be favorable to all the connected parties and will be a very strong mechanism for transport agencies. The researchers have concentrated only on Tamil Nadu, which is the limitation of the study. The future researchers can conduct a comparative study and explore various industries and sectors.


KEYWORDS

GST effect and impact, goods transport agencies.

JEL CODES

H2, L9, R4.

1. INTRODUCTION

 GST was officially implemented in India during the month of July 2017. This implementation is considered to be a major reform in the domain of Indian taxation system. An article published by (Ernst and Young) says that it is an amalgamation of all central and state government taxes. The double taxation effect and the cascading effect will be relaxed through GST. This helps the common national market says (Desreka, 2017). For different goods and services different tax slabs such as 5%, 12%, 18%, and 28% has been fixed says (Economic times, 2017). (Lourdunathan, 2017) Conducted a qualitative analysis to analyze in depth about GST and its entire related concept.

The researcher has clearly mentioned that there is a mixed response saying that manufacturers have not welcomed GST and this concept has not been fully accepted by the people. The researcher has concluded by saying that GST will bring about a new change and this change is called "one tax one country". Thus, it has to be understood that GST is a very positive concept if it has been understood and used properly by the central and state government. Proper resource and revenue generation is possible through GST if the government shows an improvement in the tax compliance. Before we look at the GST impact on supply chain, it must be understood that supply chain management is vital for the running of business organisations producing and distributing merchandise according to an article concentrating on (How is Goods and service tax (GST) relevant for supply chains?). (The Impact of GST on Supply Chain Management, 2018). Some researchers say that a superior inventory management can be organized in the system by the removal of stock transfer benefits, which has an increased share in direct dispatch on various dealerships (Rajat, 2017). Lead time can be given importance and with more scope for warehouse consolidation for effective inventory management. Tangential decrease in incoming logistics costs – An impact of GST on supply chain will also be seen in the form of tangential benefits for direct out-of-state procurements and logistics costs (Impact of GST on Wholesalers and Retailers, 2017), (ETRISE), (PROFIT BOOKS). These small things have to be considered, as it would help the producers to expand their vendor business in the external environment and gain position that is more profitable. This has been supported by many articles published by (The economic times), (masters India, 2017), (Deskera, 2017), (Santhanam) and (Tax Mantra, 2017). Export business can concentrate well for better cash flow because of the tax exclusion being more streamlined there is more scope for export business and export promotion. At the same time importance has to be given to after-sales distribution models because GST can have a significant impact on storage and retail penetration says (The Indian tax guide), (KPMG, 2015), (Resilium). Taking into consideration the impact of GST on business firms can think and develop their own distribution model, which offers high quality service at a very lower cost or an affordable cost understanding the advantages in the logistic industry due to GST says an article published by (The economic times). This article also makes it clear that, GST is the most powerful tax reform to settle down some negative market conditions. Thus it can be understood that based on the domain it has its own advantages. Some business and sales have been badly affected and an example has been mentioned by an article published by (Indian Times) thus, GST structure has its own dis-advantages. For instance, lowering of tax on coal and capital goods came in as a big surprise for the market. To begin with, there will be more compliance and adjustment costs because the frequency of filing returns has increased for businesses. Further, to claim the input tax credit, compliance will be expected from every single party across the value chain. This may hurt the profitability of the industry in the short run, but in the end, operational efficiency is bound to enhance. It might affect or hurt the profitability position but it has its own pros and cons, according to an article published by (IIFL) stating on how GST works in organised and un-organised sectors. Overall, it is believed that GST will integrate, the economy on a common parlance says an article by (Business standard). It is to be noted that every domain has its own advantages says an article by (QUORA) by discussion on various industries and its relationship with GST effect but in reality it is said by many articles that GST has buoyancy in the economy, (Quora, 2016), (Ajay), (Equity master).

BACKGROUND OF GTA SERVICE

Goods and Service Tax (GST) rate tariff in India is designed in 6 categories of goods and services. Four main GST rate slabs framed with essential goods, services, Standard goods, services, luxury goods, and services with 5%, 12%, 18% and 28% respectively. Commonly used Goods and Services at 5%, Standard Goods and Services fall under 12%, Standard Goods and Services fall under 18% and Special category of Goods and Services including luxury at 28%. The most essential goods and services attract nil rate of GST under Exempted Categories. Luxury goods and services and certain specific goods and services attract additional cess than 28%

GST (The Times of India, 2017), (The Economic Times, 2018). The levy of Service Tax on Road Transportation Service has always remained a subject matter of uncertainty. Initially, Finance Act, 1997 proposed to tax the services of road transportation, which was subsequently withdrawn after nation-wide strike. Thereafter, in the Budget of 2004, it was proposed to levy service tax on services provided by a GTA in relation to transport of goods by road vide Finance Act, 2004 with effect from 10-9-2004. However, the levy was deferred till further notice again in view of protest by transporters. The Government thereafter constituted a committee to study the matter (Agarwal, 2014). Taking into account the recommendations of the Committee, Notification Nos. 32 to 35 /2004 – ST all dated 3-12-2004 were issued, so as to effectively impose tax on the service of transport of goods by road with effect from 1-1-2005 under reverse charge. The services, which were provided under existing law, it is also applicable in the GST regime with new rates having given some relaxation. Under GST, Transport sector is closely monitored and the tax rates are apt. Transportation sector has accepted the changes made under GST by the government of India.

IMPACT OF GST ON LOGISTICS AND SUPPLY CHAIN

The backbone of the manufacturing sector is logistics and supply chain management as it is the mechanism to take the goods to the final consumer. Transportation sector in Indian economy is one of the prime domains for the economic growth and development. In a country like India, demand is always high and consumption is never ending process thus, the supply has to continue without any break for which transportation plays an important role. The risk is always high for the supplier and for the consumer and it consists of many variables such as the fiscal costs and physical supply chain costs. Thus, it has to be understood that the stake is always high. However, GST has a sharp effect though locations will be tax neutral. Large supply chain cost and competences of large organisations and units have to be configured properly. Geographical locations are highly influenced by the differential taxes and this affects the structure of supply chain says an article content by (Capital Float , 2017), stating that GST has a very strong effect and has an impact on the border domain of the logistics business. This effect is expected to continue for few days in future. Warehouses can be consolidated rather than maintaining one in every state, which would be helpful for the logistics firms to avoid central tax. (Livemint, 2017) Says that could affect effectiveness of the logistics segment in the short run, but working competence is bound to improve in the long run. These efforts will help the logistics firms to bring down the overall cost of the product by considering the inventory cost and carrying cost which will affect the final price of the product and bring down the selling price. It has to be understood that the cost saved by the firms because of GST can be used for providing better services. The pre-existing VAT and Service laws had so many complications with regard to transportation service. There was too much paperwork involved, which involved a lot of cost to the service providers. Every document was a physical document, which caused time and cost hurdles. With the implementation of GST regime, transportation industry has been facing a lot of boons and banes. Paperwork has been reduced, cost has been reduced and complications with regard to charging of tax for inter-state supplies have been eradicated. Transit of goods from one place to another has been made easier. Necessity for work force with this regard has been reduced. The concept of E-way bill, which is to be enforced from Feb 1st 2018 will make it easier for clearance and transit. Despite these benefits, the transportation industry has been facing many hurdles too with the implementation of GST regime. Day to day business has been severely affected because of confusions and difficulties in adapting to this new tax regime. This study will provide an outlook on the changes, difficulties and opportunities that the GST regime will bring in to the transportation industry. The main concentration of this research intends to provide an outlook on the future scope for transportation service providers with the implementation of one unified tax regime, provide an outlook on the day-to-day issues faced by GTA's with the implementation of GST, to provide suggestions and recommendations to Goods Transport Agencies and the Government to overcome the hurdles created by the new tax regime and finally to analyse the impact on various domains like compliance, liquidity, cost of operations and movement of trucks using descriptive statistics.

CONCEPT OF E-WAY BILL

While transporting goods from one place to another, the transporters will have to carry an electronic way bill. When a transporter carries goods worth more than Rs. 50,000 E-way bill must be carried which can be generated with GSTIN in the common portal. (India Today , 2018) also mentions that, the e-way bill mechanism will ensure that the goods that are transported comply with GST law and will prevent tax evasion. This E-way bill will replace the Way bill, which was necessary as per VAT law. If an unregistered person transports goods, he should still generate an E-way bill either by himself or through the transporter. This makes it mandatory to generate an E-way bill while transporting goods for both registered and unregistered dealers. If the consignor or the consignee has not generated an E-way bill, it is the responsibility of the transporter to generate an E-way bill and the same details have also been mentioned by (Batra).

2. REVIEW OF LITERATURE

Anita Ratosgi, in her article “Decoding GST for transportation & freight sector” has provided an outlook about the possible impact that GST could have on the transportation sector. The article was published in 2016, a year before the implementation of GST. The article starts with describing how the then indirect tax regime was highly complicated, inefficient and opaque. The article then describes how transport and logistics sector will gain from removal of multiplicity of taxes and availability of additional credits. The article used the information from World Bank, which says Indian corporates can save upto 30-40 per cent of logistic cost with the implementation of one unified tax regime. The article has also thrown light on areas, which needed clarifications like taxability of international freight. This article was one of the first to throw light on how GST could benefit with the implementation of GST. Even though the article was just based on the model framework provided by the Government in 2016, most of the predictions made by the author seem to become reality. Varun Biyani, in his article had predicted the future opportunities in logistics industry and how the GST regime could help the logistics industry. The researcher talks about variables like transit time, paperwork and consolidation, technology, and future scope. GST regime promises a unified market, which has made transit of goods within states easier. This change will enable logistics companies to deliver goods more efficiently, optimize delivery timelines, and improve capacity utilization. The researcher has also discussed how paperwork has been reduced. Since multiple previous taxes have been subsumed by one tax regime, the burden of paperwork has been reduced. This also reduces the cost of transportation. The author also focuses on the future possible technological advancements in the transportation industry. The compliance requirements will make the logistics companies to adopt ERP accounting systems and inventory management systems to remain compliant during all stages. To conclude, the changes in the proposed indirect tax system could reduce transportation cycle times, enhance supply chain decisions which could help the logistics industry reach its potential in terms of matching high-quality service levels and growth. Rajat Arora, from the Bureau of Economic times, has published an article headlined “Logistics sector to gain most from GST as costs will be down by 20% “dated July 05, 2017. The title was a statement by Mr. Nitin Gadkari, Minister for Road Transport & Highways, Shipping and. The article also discusses about the possible impact of GST on logistics. The calculations made by Economic times say that the costs incurred by the logistics service providers would at least come down by 20 percent. Hassle free transportation was enabled since states like Karnataka, Andhra Pradesh and Tamil Nadu, along with 20 more states, have dismantled border check posts. The article had predicted the average speed of trucks to increase from 20-25 km per hour to 40 km per hour. It also expected the average distance covered by a truck in one day would double with the implementation of GST i.e, from 200kms to 400 kms. This article was published within few days from the implementation of GST, predicting the future opportunities for transportations service providers with the possible decrease in cost. Prabhanga Borpuzari, in his article in The Economic Times, dated June 12th 2017, discusses about the E-way bill concept. The headline of the article says “E-way bill concern: Why moving goods under GST can come to a grinding halt “. The article starts by throwing some light on what an E-way bill is. When a transporter carries goods worth more than Rs. 50,000 E-way bill must be carried which can be generated with GSTIN in the common portal. As if the headline says, this article has predicted that the concept of E-way bill would bring in much confusion and would bring transportation of goods to a stagnant position. The article also includes information shared by Mr. Priyajit Ghosh from KPMG. He says that the concept of E-way bill would be a significant challenge to the transportation industry since way bill needs to be generated in real time along with the invoice. Unless a company has the IT system to support and generate way bills in real time, it will be a huge issue. The article also states that the major hindrance with the concept of E-way bill is that, its validity is based on distance. The article concludes with a note that this concept has both a good side and a bad side. The good side is that the implementation of E-way bill will ensure smooth transit of goods between states and would reduce a lot of paperwork and reduce transportation cost. The bad side is that, many transportation service providers lack the technological skill and knowledge to adapt to this new concept. Adapting to this concept would be a major challenge for the service providers. Economic Times Auto published an article, dated July 26th 2017 about how the GST regime would benefit the transport sector. The article compares the scenario that existed during the previous indirect tax with GST. The ministry of Road Transport and Highways let out s statement stating “Monitoring and collection of sales tax at interstate check posts led to major traffic congestion at these points, resulting in slower movement of freight and passenger, and consequently higher costs and pollution.” The article also compares India with the United States of America where an average truck covers covers 3

lakh kms in a year whereas an average Indian truck covers only 50,000-60,000 kms. The implementation of GST will reduce the travel time of long haul trucks by at least 1/5th and increase the kms covered by at least 30 percent. The article also discusses about how E-way bill will ensure transparency and reduce paperwork. The articles also quotes an analysis of freight movement before July 1st (Pre-GST) in top 15 states which says that a truck spends 20-30 minutes in borders of states like Rajasthan and Maharashtra whereas it will take 2-3 hours in states like Bihar and Jharkhand. This is expected to be eradicated with the removal of inter-state check posts and implementation of E-way bill.

TABLE 1

The Maharashtra government has announced that the logistics and manufacturing sectors will benefit a lot due to GST. Each state is ranked based on their performance on logistics. The main factors, which have to be taken into consideration, are truck stoppages, anti-competitive practices and export role.	(Jog, 2017)
The new law holds importance to freight, shipping and logistics and it is said that certain variables such as supply of goods and services, input tax credit, time and place of supply, valuation, and provisions for transition plays an important role in logistics.	(Derninger, 2017)
According to the words of ICRA (Senior Vice President), GST will be welcomed and successful for some port players such as CONCOR. He also mentioned that, logistics, as GST will lead to a realignment of warehousing and supply chain requirements of companies.	(Daily Shipping Times , 2016)
Insufficient supply chains of the firms are because of the highly fragmented logistics sector involving 3PL's. Firms in the post GST regime will enjoy added incentives. These incentives can be used to develop its own logistics arm or tie up with the domain experts who are 3PL companies.	(Web Exclusive , 2017)
Transportation plays an important role and it has a huge connectivity with GST. It is important to consider factors such as: Loading/unloading, Packing/ unpacking, Trans-shipment and Temporary warehousing etc.	(Cleartax, 2017)
Any person who provides service in relation to goods transportation by roadways and issues consignment note is called Goods Transport Agency and factors which are very important are service in Relation to Transport and consignment Note.	(Tax guru, 2017)

From the above table it is clear that GST is being rightly used in the transport sector the firms can enjoy many benefits. Thus, all these above advantages are taken into consideration to determine how the respondents respond to these variables. Most of the transport agency owners will take GST in a negative way because they might not know how to use it in a positive way. Thus, many variables has been considered for the qualitative study. These variables are converted into question statement and the same is asked to the respondents to see how they react.

3. RESEARCH METHODS

The problem that this paper will study is the impact of GST on the day-to-day business affairs because of the sudden shift to a complete technological base. Indian transportation industry is a mixture of giant corporations, medium scale GTA firms and low scale service providers. While the high level and medium level corporations can manage this sudden shift, the survival of the low-level service providers is at stake. This study aims at providing the problems faced by medium and low level Goods transport agencies in day-to-day conduct of business. An article by (HM Revenue and customs , 2015), conducted a close interview with 12 respondents to draw data and to know the behaviour and attitude towards tax. To find the burden of tax an article by (Noor Sharoja Sapiei, 2013) used a qualitative method has been used. In a very different domain to study the fear and greed in tax policy domain an article by (Christopher Fennell, 2003), have used a qualitative approach. Thus, since it becomes very difficult to use a quantitative methodology, this research employs a pure qualitative study to see how GST has an impact in the transportation and supply chain domain. This justification has been strongly stated here because it is very important from a researcher's point of view on how to provide a solution for the research problem.

SAMPLE RESPONDENTS

Face to face interaction was made with officials from 32 Goods transport agencies overall in the districts of Erode, Tirupur and Coimbatore. In order to avoid a narrow study, interactions were made with transporters who transport different type of Goods. The breakdown with respect to interactions made in every district has been given below.

SCOPE OF THE STUDY

The scope of the study is confined only to the domain of logistics and supply chain and the data collection is restricted to three major districts of Tamil Nadu, Coimbatore, Erode and Trippur. This can also be considered as study limitation. But the future researchers have a lot of scope to be extended.

SAMPLING METHOD

Sampling has been done based on the convenience of the researcher. Transporters from the districts of Erode, Coimbatore and Tirupur were chosen and interacted with to analyse the impact of GST on Goods Transport Agencies. Since it is very important to know how and what the business owners and agencies feel about GST and its effect in their transportation business a focus group approach has been used. A group comprising 12 members (Transportation agents of Coimbatore, Erode and Trippur have been used to draw data). Many studies in the previous years have used qualitative approach to study on tax. An article published by (Partners, 2015), on "Tax Reform Qualitative Research Findings" which is a pure qualitative approach. Likewise, this research paper has also used qualitative approach. To find the UK Bedroom tax the researchers have used an interview schedule with 38 respondents, (Moffatt, 2016). Thus, in this research interview has also been used at needed situations. Thus it can be understood that this research is a combination of focus group, interview schedule method and content analysis.

4. SIGNIFICANCE OF THE STUDY

This paper is a qualitative study. With the opinion of transportation service providers a model framework will be prepared to address the problems faced by GTA's. This framework will provide suggestions to the government and GTA is which would help the smooth conduct of business.

5. FUTURE SCOPE

The study will be useful for future studies, which will be conducted on the impact of GST, not only on GTA but also on other industries. This study will not only elucidate the problems but also the future scope of expansion and opportunities available for logistics service providers with the positive impact of GST. For example, the cost of providing service is expected to come down by at least 30 percent in the long run. GTA's can utilize these savings for future expansion of business. The study will also predict the future growth of transportation industry with the implementation of GST. This will help the logistics service providers to plan for their future expansion.

6. RESEARCH MOTIVATION & ANALYSIS

Logistics and Supply chain management are two inevitable factors in the course of production. Most of the manufacturing concerns outsource logistics services. Any impact faced by the logistics industry will directly affect the course of production of other industries. With the implementation of GST, a lot of industries have been facing delay in production because of delay in delivery of raw materials by logistics service providers. This in turn delays the time of sale. Hence, the demands of the consumers are not met on time. Thus, the confusions amongst goods transport agencies affects the entire supply chain. GTA's have a lot of issues that need to be addressed by the GST council. If not, the entire supply chain will be severely affected. Not many studies have been conducted in this field and not much importance has been given problems faced by logistics service providers with the implementation of GST. Hence, this research paper will address the problems and will provide suggestions in order to overcome these problems and ensure smooth conduct of business.

QUALITATIVE ANALYSIS

Qualitative research is a method, which is very popular amongst the social science field. This study is qualitative since the results are arrived from the opinions of officials in Goods Transport Agencies. No financial statements are studied. The responses are recorded and analysed to find out the most common variable that

affects the sample. Interactions were made with 31 transporters from three different districts who deal with different types of goods. The responses have been elucidated in this chapter.

TABLE 2: OUTCOME OF THE QUALITATIVE METHOD BASED DISCUSSION

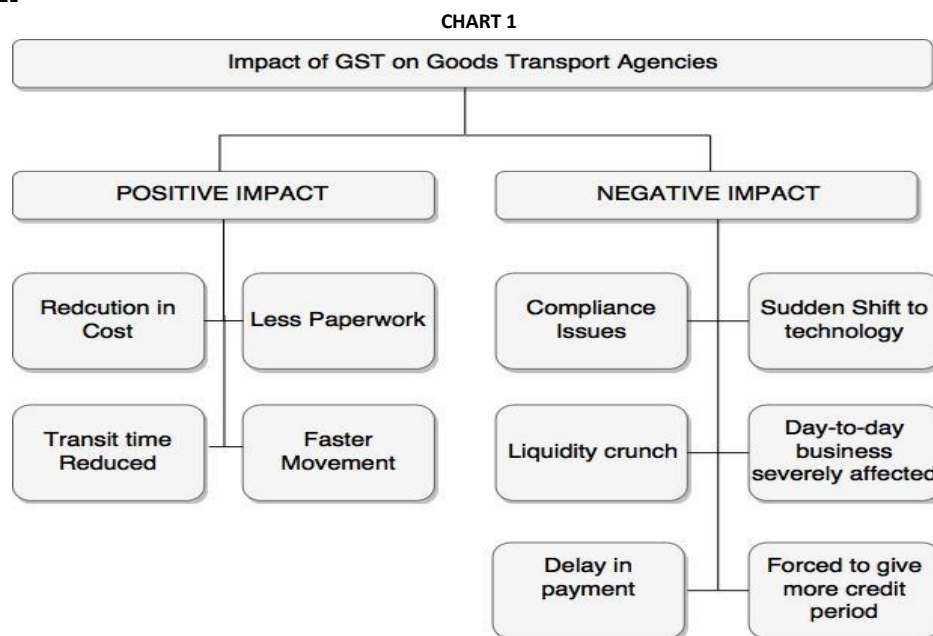
Cases	Critical Variables	Reasons	Future Scope
Case 1	1. Liquidity 2. Compliance Issues	Clients require more credit period to pay. Hence, liquidity is affected. Returns keep getting rejected due to technical glitches	Turnover is expected to increase but expansion is uncertain because of prevailing liquidity crunch.
Case 2	1. Liquidity. 2. Compliance 3. Sudden shift to technology	Liquidity of clients is affected which directly affects payment. Payments are delayed. Having practiced conventional methods of book keeping, sudden transition to technology involves a lot of cost and employees must be trained accordingly	Future is at stake since the organisation is not dynamic. A lot of investments are required to advance technologically.
Case 3	1. Registration 2. Lack of Expertise 3. Compliance 4. Shortage of funds	It is a low level transportation firm which used to operate in the unorganized sector. Forced to register with the enforcement of GST. Lacks experts to take care of legal aspects. Lacks funds for carrying on business.	Future expansion is merely possible. Will have to merge with other GTA's in order to survive.
Case 4	1. Liquidity	A well-established transportation firm Only problem is liquidity since all industries face liquidity crunch and hence, payments are being delayed.	If it surpasses this short period of liquidity crunch, future expansion of business is possible since cost of operations are expected to come down.
Case 5	1. Compliance 2. E-way bill	Had initial problems with registration. Returns are being continuously rejected. return filing consumes a lot of time. Could not generate E-way bill due to technical glitches during the trial period.	Partners feel that the cost of operations will reduce by 25 percent in another year. Hence, this savings can be used for expansion.
Case 6	1. Liquidity 2. Lack of clients	Liquidity crunch because of delay in payment. The organisation charges 12 percent GST to avail ITC. This costed them to lose few of their customers since competitors charge only 5 percent.	Survival is at stake. Should provide discounts and come up with advancement in services, which will attract customers.
Case 7	1. Return filing 2. Increase in Cost	Returns keep being rejected. Technical glitches in the server. Costs have increased because of digitalizing the system of book keeping for the purpose of GST.	Future expansion is possible with the possible reduction in cost.
Case 8	1. Liquidity 2. Compliance	Just like other, major problems are liquidity crunch and compliance issues.	Future expansion is possible once liquidity crunch is over.
Case 9	1. Hit on turnover 2. Liquidity	Textile industry is severely hit by GST. Hence, the numbers of orders received by GTA's have reduced. This has reduced the turnover. Moreover, liquidity has been hit affecting day-to-day business.	If textile industry survives this hit and revives, there is scope for expansion.
Case 10	1. Survival 2. Unorganised sector	Being a low level transporter who deals in the unorganized sector, business is severely affected and runs on debt.	No future scope. Will either have to sell or merge with other GTA's.
Case 11	1. Hit on turnover 2. Compliance 3. E-way bill 4. Liquidity	Turnover has come down by 40 percent in the month of October. Complications regarding E-way bill seem to be a challenge to the business. Liquidity crunch has severely affected day-to-day business.	The hit on turnover will take a brief period of time to recover. Changes must be made in the method of operations in order to reduce cost.
Case 12	1. Return filing 2. E-way bill	Being a well established GTA, the business faces only two issues. Return filing because of technical issues. Complications regarding E-way bill seem to be a challenge since no one has a clear picture about it.	Once the law settles, the business will flourish with the reduction in cost and increase in turnover. Since they deal with all types of goods, it is easy to survive in the market.
Case 13	1. Hit on turnover 2. Liquidity	The hit on turnover of textile products has affected the turnover of the transporter. Liquidity crunch because of delay in payments.	Future is unpredictable. Depends on the survival of textile industry.
Case 14	1. Unorganised Sector 2. Unregistered clients	Since the transporter deals with unregistered dealers, the liability of paying GST is on the transporter which increases complications.	Must move to the organised sector to survive.
Case 15	1. Compliance 2. Hit on turnover	Returns are getting constantly rejected. Turnover has come down by at least 40 percent compared to the previous year.	Future is unpredictable.
Case 16	1. Lack of clients 2. Hit on turnover	Clients who are into textile industry have stopped production. So the turnover has fallen drastically.	Must find a new set of clients in order to survive.
Case 17	1. Liquidity crunch 2. Lack of Expertise	Lacks expertise to work on filing of GST returns. Auditors are inefficient.	Future is unpredictable.
Case 18	1. Liquidity crunch 2. Hit on turnover	Being one of the well established GTA's in the district, liquidity is the only major problem. Turnover has decreased because of decrease in production	Has a vast range of clients. If the production increases, future expansion is possible.
Case 19	1. Hit on turnover 2. Liquidity	Wood and wooden products have become expensive under GST. Hence, demand for wood has come down to some extent. Hence, turnover has decreased. Liquidity crunch since clients need more credit period.	Wood will always have demand. This is a short term fall. Hence, future expansion is possible
Case 20	1. Compliance 2. E-way bill	Liquidity is not a problem in this case. Since E-way bill is a totally new concept, the transporter feels it to be a challenge.	Future expansion is possible.
Case 21	1. Compliance 2. Liquidity	Just like other transporters, compliance and liquidity crunch seem to be the major problem.	Future expansion is possible. Must narrow down to a certain permanent clients in order to prevent uncertainty.
Case 22	1. Higher Rate of GST 2. Lack of clients 3. Liquidity	Since it is a startup, the transporter charges 12 percent GST in order to claim ITC on capital goods. Since competitors charge only 5 percent, it is difficult to get clients.	Expand client base. Secure funds in order to curb liquidity crunch. Future expansion is possible since the promise better services.
Case 23	1. Hit on turnover 2. Liquidity	Turnover has fallen since price of steel has increased. Input cost for production of steel has increased. Hence steel industry faces liquidity crunch more than any other industry.	Liquidity crunch is short term. Steel will always have demand since it has no substitute. Future expansion is possible.

Cases	Critical Variables	Reasons	Future Scope
Case 24	1. Hit on turnover 2. Liquidity	Turnover has fallen down by 30 percent. Liquidity crunch because of the prevailing shortage of funds in steel industry.	Future expansion is possible if it survives the current liquidity crunch.
Case 25	1. Unorganised Sector 2. Hit on turnover 3. Lack of expertise	Since the GTA deals with the unorganised dealers of steel, turnover has witnessed a drastic fall. Being a low level transporter, compliance issues are being faced because of lack of expertise.	Future is at stake. Must make a lot of advancements to survive.
Case 26	1. Hit on turnover 2. Compliance 3. Liquidity crunch	Cement industry has been severely affected by GST. Prices have increase and so has cost of production. Hence, the payments to GTA are delayed.	Cement has no substitute. The fall is short term. Hence, future expansion is possible.
Case 27	1. Compliance 2. E-way bill 3. Liquidity	Since E-way bill is a very new concept, the transporter feels it to be a challenge. Short-term liquidity crunch because of hit on production.	Since the GTA has a vast range of clients, future of the business has no threat.
Case 28	1. Liquidity 2. Decrease in turnover	Short term liquidity crunch. Turnover has fallen because of decrease in production of steel.	Future expansion is possible.
Case 29	1. Hit on turnover 2. E-way bill	Price of plastic products saw huge rise in the initial months of GST. Hence, demand reduced in the first four months. This had an impact on turnover. E-way bill being a new concept will be a challenge.	Prices have now come down since GST rates have been reduced. Industry is recovering. Future expansion is possible.
Case 30	1. Hit on turnover 2. Compliance	Turnover saw a drastic fall in the initial months. Compliance issues are being faced because of returns constantly getting rejected.	Future expansion is possible since cost of operations will come down.
Case 31	1. Liquidity 2. Compliance	Being one of the well established GTA in the district, short term liquidity seems to be the only major problem. Compliance issues are being faced since filing of returns consumes a lot of time.	Survival of business would not be a problem. Future expansion of business is possible since costs are expected to come down.

MODEL FRAMEWORK

A model is the demonstration in graphic form. Based on literature reviews and personal interactions with various transportation firms, this paper will assess both the positive and negative impact faced by Goods Transport Agencies with the implementation of Goods and Service Tax. The various variables that will be studied in the paper are listed down in the following flowchart.

THE TWO-BRANCH MODEL



Note: This model work belongs to the original work of Krishna B and Anand Shankar Raja M.

The above model work talks about two branches, which talk about two different aspects. One being the positive impact of GST on GTA and the other being negative impact. The model simplifies the variables that are going to be studied in this research. The variables mentioned in the model framework have been explained in this chapter.

INTERPRETATION FOR THE CONCEPTUAL MODEL

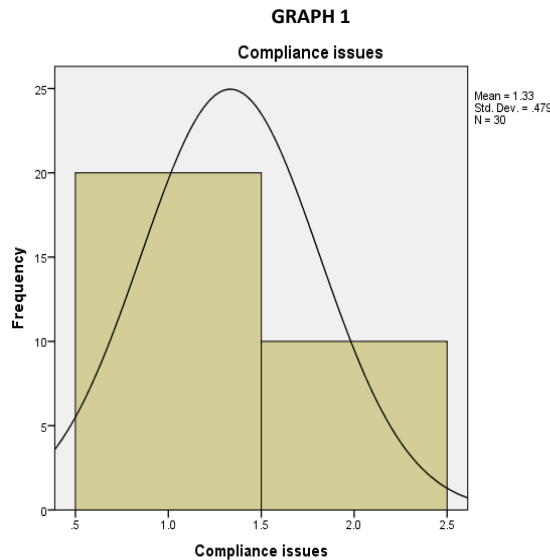
The cost incurred by GTA (Goods Transportation Agencies) has come down by almost 10 percent with the implementation of GST. Further, it is expected to come down by at least 30-40 percent in the end. With the implementation of E-way bill from 1st February 2018, many documents have been replaced by one single E-way bill. Cost to CFA is expected to come down from 2-4% to 1-3%. Hub warehousing cost is expected to come down from 1-2% to 0-1%. The major outbound logistics cost is expected to come down from 5-8% to 4-7%. GST has eliminated all the paperwork that had to be filed during the Pre-GST era. E-way bill has replaced the Waybill, which was a physical document. E-way bill is a completely electronically generated document, which will replace various documents like lorry receipt, state permits, state waybills etc. Before the implementation of GST, an average truck would spend at least 2-3 hours in a check post, which caused a lot of delay in transit and delivery of goods. The implementation of GST will reduce the travel time of long haul trucks by at least 1/5th and increase the kms covered by at least 30 percent. The average speed of trucks has increased from 20-25 km/hr to 40-45 km/hr with the removal of check posts in various locations. Clearance is now happening faster than it used to. An average truck, which would cover 100-150 kms per day during the pre-GST era, now covers at least 200-250 kms per day. This is also expected to increase with the enforcement of E-way bill from 1st Feb 2018 since average waiting time for vehicles will reduce, as verification processes will be online.

Transport industry officials face many compliance issues since everything has now been made online. Transport industry is vital and inevitable. The Government website server also faces many technical glitches which delay the delivery of goods. GST returns of GTA's are constantly rejected every month for majority of transporters, which hinders the course of business. GST promotes online registrations and cash-free transactions. Transport industry being an offline industry finds it very difficult to completely shift to an online platform. They lack proper human and technical resources. This sudden shift to a technological platform will involve

a lot of cost. Moreover, with the implementation of E-way bill, it will become compulsory for all transporters to register online. Small-scale transporters who deal in a low level will be severely affected because of this. The liquidity crunch in the economy after demonitisation and GST has severely affected the transport industry. Transport industry survives on cash transactions. The sudden liquidity crunch forces the GTA's to run their business on credit. They are running short of money to fund their costs for future orders which puts the survival of the industry at stake. Transport industry depends on the business of its clients. Other industries, which are severely affected by GST, delay their payments. This is one of the major causes for liquidity crunch in transport industry. Transporters are forced to give more credit period to their clients since they are severely affected by this new tax regime. The effect on one industry will indirectly affect the transport industry since it depends on the survival of other industries. Some unscrupulous traders who are resorting to 'zero business' claims and evading taxes are exploiting the closure of commercial tax check-posts on state borders following the GST regime. Many products like iron, oil, stone chips and granite are being transported between Andhra Pradesh and Telengana. These products move from one commercial tax circle to another and one state to another without paying any GST. With enormous confusions and technical glitches, day-to-day business had been severely affected. Although experts say that this is temporary, transport industry is facing a hard time in overcoming these hurdles. The accrued income keeps increasing but the payment for these services are not being received on time. This makes it difficult to carry on further business. E-way bill, being a complete new concept, will bring in much confusion and put a halt to transport of goods in the initial stages. One of the major inputs for transporters is Diesel. The GST council has not notified petrol and diesel. Hence, the previous VAT laws govern them. Input tax credit cannot be claimed on the excise duty and VAT paid for fuel since the transporter does not collect any tax other than GST from his customers.

IMPACT BASED ON VARIOUS DOMAINS

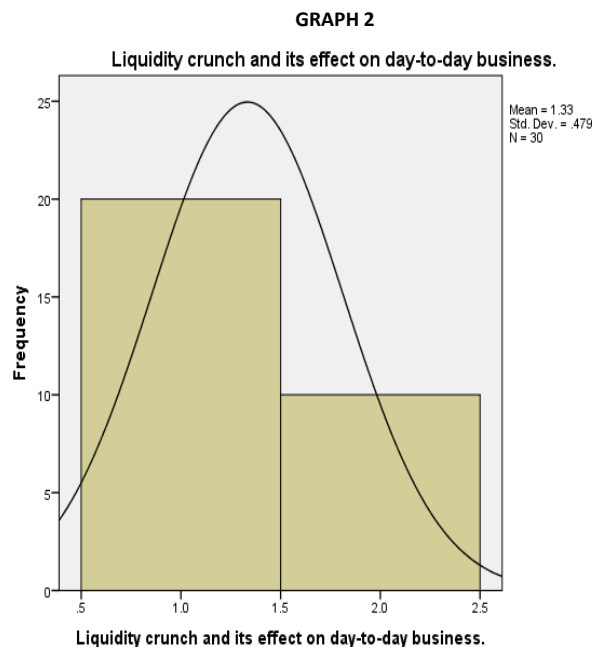
Compliance



More than 70 percent of the respondents face compliance issues with regard to registration, return filing, generating E-way bill etc. The reasons for these issues have been listed below:

1. Technical glitches in the GST portal
2. Lack of Expertise in GTA's
3. Continuous rejection of GST returns by the Server
4. Time consumption
5. Sudden shift to a complete technological based taxation system
6. E-way bill being a complete new concept in several states.

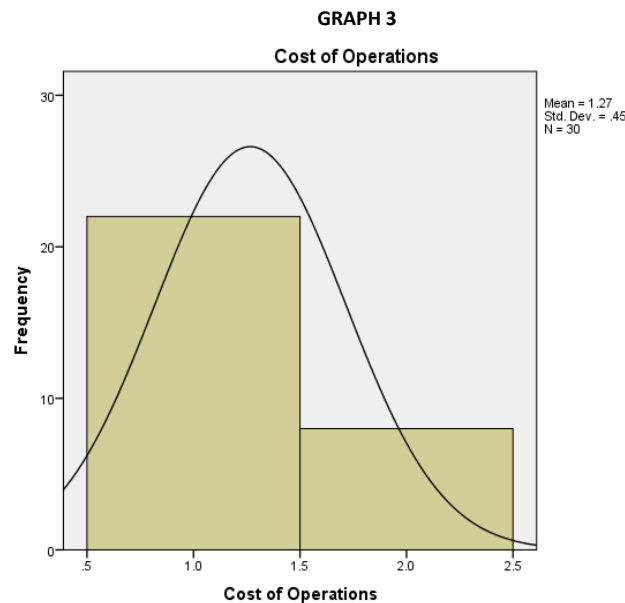
Liquidity Crunch



The economy as a whole has been facing a severe liquidity crunch since demonitisation and GST implementation. GTA's have been severely affected since most of the transactions are on cash basis and this has severely affected the day-to-day business. Since most of the industries that GTA's deal with face severe liquidity crunch, payments are being delayed by the clients. Hence, accrued income keeps increasing and income received remains stagnant. Clients seek more credit period

than they used to. GTA's which earlier used to provide 1 month credit period are now forced to provide a credit period of at least 3 months. Moreover, GTA's which charge GST on forward charge basis, will have to pay GST out of their own pockets since payment by the clients are delayed and paid after the due date for GST payment.

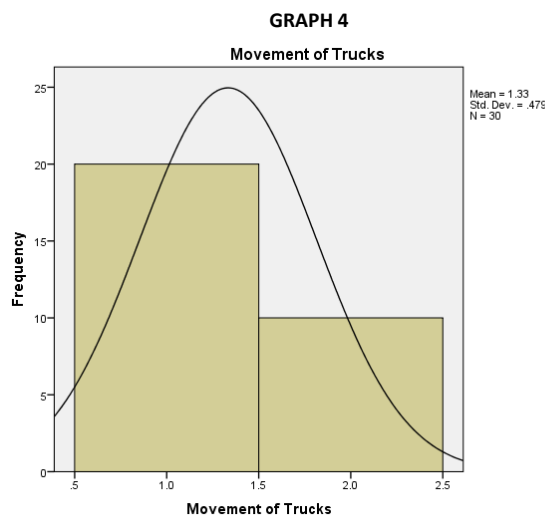
Cost of Operations



Although experts say that cost of operations have come down, based on the interactions made, GTA's claim that there has been an increase in cost. But this increase in cost is because of the short term inflation and it expected to come down soon. The reasons behind increase on cost are have been listed below.

1. Most of the GTA's charge 5 percent GST without ITC. Since GTA involves capital goods like trucks, vans and other commercial vehicles. ITC cannot be claimed by those who charge 5 percent GST. Majority charge only 5 percent in order to provide a better price to the clients.
2. One of the major inputs for GTA's is fuel. GST is not charged on fuel. They are charged with CST and VAT. Credit cannot be claimed on these taxes since GTA's do not collect any VAT. Hence, these add up to the increase in cost of operations.
3. Since the implementation of GST, the economy has been witnessing inflation. Hence, the cost of inputs have increased, wages have increased and standard costs have also increased.

Movement of Trucks



With the removal of check posts at several states, movement of trucks has become more feasible and fast. Transporters claim that the delivery time has decreased to a great extent. Clearance is more fast and entry in states takes lesser time. For example, A consignment from Delhi to Mumbai would take at least 5 days in the pre-GST era. Now, it takes less than 3 days. Moreover, the number kilometre has increased by at least 50-100 kms on an average. This also has an impact on the cost since the mileage per litre has also decreased. The transit time is expected to decrease more with the mandatory implementation of E-way bill.

7. FINDINGS

This study aimed at elucidating the impact of GST on Goods Transport Agencies. After analyzing the data collected from transporter, the following results were revealed. Transport industry was one of the most organized sectors before the implementation of GST. With the enforcement of GST, many unregistered transporters have been brought under the indirect tax regime. The number of registrations has increased to a significant number. The government has made good progress in achieving its objective of bringing all business concerns under the tax regime. A lot of issues are being faced by transporters in complying with the regulations. There has been a major transformation and many low level GTA's find it difficult to comply with these regulations due to lack of expertise. The server keeps rejecting GST returns even if there are minute errors. Since it is completely automated, even small decimal error would end up getting the entire return rejected by the portal. Moreover, E-way bill is to be made mandatory in the coming days. The trial period has revealed that many transporters find it difficult to generating E-way bills because of technical glitches. Owing to this, the government has postponed the mandatory enforcement until notice. Cost of operations has increased to a reasonable extent. This is because of the costs incurred in training employees to the new tax regime and digitalization of book keeping systems in order to comply with return filing. Fuel prices are constantly increasing and taxes paid on fuel cannot be claimed as ITC. This increase in cost is only a short-term rise. Overall cost expected to come down by at least 30-40 percent once inflation settles. Majority of transporters face a liquidity crunch. This is because of the

prevailing liquidity crunch in the economy because of major reforms like demonetisation and GST have been made by the government. This liquidity crunch is expected to settle by the end of 2018. Once this settles, transport industry has a lot of scope in the future.

8. SUGGESTIONS

A lot of GTA's lack knowledge about the new tax reform. This is one of the major tax reforms made by the government. Transporters can make use of online materials available, which explain the regulations and guideline. Many workshops are being conducted by the GST council and by many educational institutions. These would help the transporters to overcome the compliance issues. Employ individuals other than auditors for the purpose of GST. Though it adds up to the cost, it would help in eliminating, the burden of GST affecting the course of business. Make use of online softwares, which help in filing returns with just the invoice. Outsource services from individuals who provide services with regard to registration and filing of returns are also possible. Any problems in transportation will affect the entire business says, (Cleartax, 2017) article. Thus, it's the duty of the transportation agencies to consult tax experts to get rid of certain complicated issues. This industry is a very wide industry and plays an important role in economic development (Priya, 2018). Thus, the government also has to take efforts to make clear rules and regulations so that business has no negative impact on development of the economy.

9. RECOMMENDATIONS

Transporters will have to make a significant investment in making technological advancements in the system of booking. Experts must be employed in order to comply with the rules and guidelines of the law. Now is the time to make reforms in business. The survival of the organisations will be at stake if they still rely upon conventional ideas of doing business. The cost of operations is expected to come down by at least 30-40 percent. Transit time has also come down and movement of consignments has become faster. This shows the future scope and opportunities available for the logistics industry. Transporters must make use of these opportunities and concentrate on future expansion of business. Low level GTA is who deal in the unorganized sector are in a tight spot. They should make many investments to adapt to the upcoming changes. It is highly recommended to merge with other GTA's. This will not only ensure the survival of the organisation but also increases the future scope of carrying on business. The short-term liquidity crunch is a major hindrance for day-to-day operations. Transporters will have to avail loans with their accrued income in order to carry on business. This liquidity crunch will take at least one-ore year to completely settle. If the transporters do not figure out a way to overcome the hindrance, they might end up losing their clients. Though the government is close to achieving its objective of brining all GTA's under the tax regime, many issues need to be addressed with regard to compliance. The GST portal is completely automated. Since transport industry was one of the unorganized sectors, transporters now find it difficult to comply with the portal. The server even for minute decimal errors keeps rejecting GST returns. A separate portal must be established where these rejected returns are given a platform to provide clarifications. This would save a lot of time for the transporters. The GST portal has been facing many technical glitches since day one. The server has crashed several times. More servers must be established since a lot of information is being uploaded and accessed by millions of people in the portal. E-way bill is one of the major challenges for the transportation industry. The transporters feel that various issues need to be addressed by the tax authorities before the enforcement of the new mechanism. Slow moving cargo i.e, heavy cargo which take comparatively a longer period to reach the destination than a normal truck will be severely affected by E-way bill. E-way bill rule mandates 100 km per day movement. Such cargo generally does not travel more than 20 km a day. This must be taken into consideration and it would be better to provide a sort of relaxation for slow moving cargos.

10. CONCLUSION

Goods and Service Tax is one of the major tax reforms in the country. Several industries have been affected and transportation industry is of no exception. Problems like fall in turnover, liquidity crunch, compliance issues etc., are temporary. The industries must change with time and in accordance with the law. The economy will revive in less than a year. The E-way bill mechanism has been rolled out since April 1st 2018 for inter-state transport and it will be applicable for intra-state transport from July 1st 2018. This mechanism, although is a challenging one, it will prevent and eradicate tax evasion in the long run. From this study, the researchers have understood that, despite several problems, this tax mechanism will be one of the major boons for transportation industry. Once the economy revives, transportation industry will be one of the industries will be benefited the most. Costs are expected to come down and transit time is expected to reduce. Hence, the future holds many opportunities for Goods Transport Agencies in India.

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ENHANCED SPARSE SYSTEM FOR MULTI-CHANNEL MANAGEMENT USING REDUCED MONOTONE GEOMETRIC ALGEBRA

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ABSTRACT

Sparse representations are mainly used in colour image processing. However, existing sparse models are used only in scalar methods to demonstrate colour image pixels. In these models, loss is very high compared to structured monotone geometric algebra. If we use vector matrix in multichannel management it gives more computational complexity. In our proposed system for novel enhanced sparse system for colour image that bears multi channel management based on monotone geometric algebra. Firstly, a novel theory of monotone vector geometric algebra (MVGA) is provided, including monotone vector matrix sparse basis and the reduced geometric operations. Secondly, taking advantage of the MVGA theory, the model represents colour image with multi-channel as a matrix vector with the spatial and spectral information in MVGA space. Thirdly, the dictionary learning algorithm is provided using the K-MVGA-based multi value decomposition (K-MVGAMVD) (Generalized K-means clustering for MVGAMVD) method. The comparison results demonstrate that the proposed model can remove the data redundancy and reduce the computational complexity, and can mean while effectively preserve the inherent colour structures. The result suggests its potential as a heterogeneous and efficient tool in various applications of colour image analysis.

KEYWORDS

dictionary learning, multi-channel image, reduced monotone geometric algebra, sparse representation.

JEL CODE

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I. INTRODUCTION

Sparse representations of colour image based on dictionary learning have currently been an energetic area for its potential of providing extremely high performance for various applications [1, 2, 3, 4]. In this model, a multi-colour image can be well-represented as a sparse non linear combination of attributes from properly chosen over-complete dictionary instead of being separated into Independent attributes [4, 5]. The excellence of dictionary determines the performance of the sparse coding, which can be chosen as a pre-defined set of bases, such as monotone geometric transformations, wavelets [6], curvelets [7], contourlets [8], short-time Fourier kernels [9], Laplacian pyramid [10], or unions of bases. Conventional monotone models regard each colour image pixel as a scalar and process the pixel in an independent way, which fails to use the inter-relationship among the RGB colour channels, potentially resulting in some colour distortions and blurring effects always appearing in reconstruction results [11, 12]. Although the scalar product is modified to enforce average colours, which improves the efficiency of the illustration for denoising [11], in-painting [12] classification [13] and object detection [14], some unproductive results still persist. For development, Mairal et al. [15] proposed a concatenate model by performing simple concatenation of the RGB values to a single vector and training on those directly to alleviate the hue distortion problem. Unfortunately, the lack of explicit constraints on the correlations among colour channels inexorably leads to some unproductive results. Another scheme is using independent colour channels rather than RGB channels. Monotone-based methods have shown the efficiency in dealing with colour images. Recently, monotones have been introduced to represent multi-channel RGB structures for vector sparse representations of colour images [3] in which have shown improved performance for reconstruction [3] in proposed a vector sparse representation model for colour images using monotone vector matrix analysis, which conducts the sparse basis selection in monotone vector space to successfully avoid the hue bias issue. However, the monotone-based methods are known to suffer from high computational complexity due to non-commutative multiplication. To improve the method, reduced monotone vector matrix (RMVM) with commutative multiplication is introduced to reduce computational complexity. A new monotone vector-valued sparse representation model for colour images using RMVM. In general, the existing sparse models treat each colour image pixel either as a scalar, which loses some colour structures, or as a monotone vector matrix with high computational complexity. In this paper, we implement a monotone vector based sparse representation model for reduced geometric algebra in multi-channel image management. In particular, a novel theory of monotone based reduced geometric algebra (MRGA) is provided with commutative multiplication rules. Taking advantage of the MRGA theory, the model represents each colour image as a multi vector with the spatial and spectral information in MRGA space, where the basic operational rules, properties and MVD analysis of colour image are defined. We use multi vector operations among the colour atoms of the learned MRGA-based dictionary and the sparse MRGA-based coefficients to reconstruct colour image blocks. Then, the corresponding dictionary learning method namely K-MVGAMVD (Generalized K-means clustering for Multi Value Decomposition using MVGA), is provided. The MVGA-OMP (orthogonal matching pursuit in MVGA form) method is used to compute the sparse coefficients. Thus, it achieves the removal of the redundancy among colour channels, the inherent colour structures preserved, and low computational complexity. The rest of this paper is organized as follows. Section II describes the implementation and algorithm of proposed method for novel MVGA-based sparse representation model. The MVGA-based dictionary training algorithm is represented in Section III. In Section IV, the reconstruction and denoising experiments are implemented to show the effectiveness and rationality of this algorithm. Finally, Section V concludes the paper.

II. IMPLEMENTATION OF MONOTONE VECTOR BASED REDUCED GEOMETRIC ALGEBRA

The multiplication of GA is not commutative, which leads to the high algorithm complexity. As an improvement, we provide a novel monotone based vector reduced geometric algebra theory with commutative properties.

The monotone vector based Reduced Geometric Algebra (MVGA) is defined as follows:

$$\gamma_i = \frac{1}{2} m(1 + e_i e_{n+i}) \in \mathcal{G}_n, i = 1, 2,$$

According to the geometric product of γ_i and γ_j

$$\Delta \mu \{ \gamma_i, i = 1, 2, \dots, n-1 \}$$

$$\gamma_i^2 = \gamma_i \gamma_j = \begin{cases} i+1 \\ i=n \end{cases} \gamma_1, \quad (1)$$

MVGA is generated by the collection of

$$k = \mu \{ a_1 \gamma_1 + a_2 \gamma_2 + a_3 \gamma_3, a_1, a_2, a_3 \} \in \mathcal{P}$$

GA, here the multiplication operation is provided as follows.

$$\forall k, l \in \Gamma \mathcal{R}, \text{ suppose } k = \mu \{ a_1 \gamma_1 + a_2 \gamma_2 + a_3 \gamma_3 \} \text{ and } l = \mu \{ b_1 \gamma_1 + b_2 \gamma_2 + b_3 \gamma_3 \},$$

then the multiplication

$$k l = \mu \{ (a_1 \gamma_1 + a_2 \gamma_2 + a_3 \gamma_3) (b_1 \gamma_1 + b_2 \gamma_2 + b_3 \gamma_3) \}$$

$$= \mu \{ (a_1 b_3 + a_2 b_2 + a_3 b_1) \gamma_1 + (a_1 b_1 + a_2 b_3 + a_3 b_2) \gamma_2 + (a_1 b_2 + a_2 b_1 + a_3 b_3) \gamma_3 \}$$

Therefore, the multi-dimensional MVGA overcomes the data redundancy embodied in the previous sparse representation for colour image based on monotone vector. The norm of the elements in G_{2R} is defined as

$$k = \mu a' \gamma_1 + \mu b' \gamma_2 + \mu c' \gamma_{12} \tag{2}$$

$$k k = \mu \{ (a \gamma_1 + b \gamma_2 + c \gamma_{12}) (a' \gamma_1 + b' \gamma_2 + c' \gamma_{12}) \} \tag{3}$$

$$= \mu \{ (ca' + bb' + ac') \gamma_1 + (aa' + cb' + bc') \gamma_2 + (ba' + ab' + cc') \gamma_{12} \} \tag{4}$$

Solving the above equations yields the values of the individual attributes but not all the elements of G_{2R} are conjugate.

Suppose a MVGA multi vector is given as $\mathbf{K}m(M) = \mu A(C) + \mu B(C) \gamma_2 = \mu \mathbf{K}1(C) \beta_1 + \mu \mathbf{K}2(C) \beta_2$

Thus, $\mathbf{K}1(C)$ and $\mathbf{K}2(C)$ are two equivalent complex matrices. The MVD of the RGA multivector (MVGAMVD) is performed by the complex MVD of the equivalent complex matrices.

Consequently, the original RGA multivector is reconstructed by the sum of outer products

$$\mathbf{K}m'(M) = \mu \{ \mathbf{U}(M) \left[\sum(M) \right] \left[\mathbf{V}(M) \right] \} = \sum u(iM) \delta(iM) \left[v(iM) \right] \tag{5}$$

where $\mathbf{K}'(M)$ is the reconstruction of $\mathbf{K}(M)$.

The complexity of MVGASVD is much lower than the monotone vector based application because more real multiplications are needed to calculate the product of two monotone vectors. Thus, the use of MVGAMVD for colour image processing is more efficient than using monotone vectors. Given a colour image \mathbf{I} , its MVGA form is

$Im(x, y) = ImR(x, y) \gamma_1 + IGm(x, y) \gamma_2 + IBm(x, y) \gamma_{12}$ (G_{2R}) respectively, and the colour image pixel $I(x, y)$ is re-presented in the form of a reduced geometric algebraic multi-vector. Each pixel of the image gives a data structure that is MVGA. To take the inter-relationship among the MVGB channels into consideration, a monotone vector based sparse representation model (MVGA-SR) for colour image based on reduced geometric algebra is presented in this paper.

The patch \mathbf{f} in the RGA form is given as: $\mathbf{f} = \mathbf{D} \mathbf{g}$

Each pixel of the image gives a data structure that is MVGA. Then, we can obtain the following equation as the generalized form of colour image representation model.

$$\begin{aligned} \mathbf{f} = \mathbf{D} \mathbf{g} &\Leftrightarrow \mathbf{f} \mathbf{R} \gamma_1 + \mathbf{f} \mathbf{G} \gamma_2 + \mathbf{f} \mathbf{B} \gamma_{12} \\ &= (\mathbf{D} \mathbf{R} \gamma_1 + \mathbf{D} \mathbf{G} \gamma_2 + \mathbf{D} \mathbf{B} \gamma_{12}) (\mathbf{g} \mathbf{1} \gamma_1 + \mathbf{g} \mathbf{2} \gamma_2 + \mathbf{g} \mathbf{3} \gamma_{12}) \\ &= (\mathbf{D} \mathbf{R} \mathbf{g} \mathbf{3} + \mathbf{D} \mathbf{G} \mathbf{g} \mathbf{2} + \mathbf{D} \mathbf{B} \mathbf{g} \mathbf{1}) \gamma_1 + (\mathbf{D} \mathbf{R} \mathbf{g} \mathbf{1} + \mathbf{D} \mathbf{G} \mathbf{g} \mathbf{3} + \mathbf{D} \mathbf{B} \mathbf{g} \mathbf{2}) \gamma_2 + (\mathbf{D} \mathbf{R} \mathbf{g} \mathbf{2} + \mathbf{D} \mathbf{G} \mathbf{g} \mathbf{1} + \mathbf{D} \mathbf{B} \mathbf{g} \mathbf{3}) \gamma_{12} \end{aligned} \tag{6}$$

The advantages of monotone based reduced geometric algebra (MVGA)-based sparse representation model over traditional sparse models for colour image can be summarized as follows: First, both the orthogonal property and the correlation among multiple channels are jointly preserved in the coefficient matrix. Each colour channel is linearly correlated with the MVGA dictionary, which is superior to traditional models in which atoms are selected from three independent channel dictionaries in the multi-channel interrelationship for colour patches can be preserved by properly training the MVGA-based dictionary \mathbf{D} . Then the explicit vector relationship among channel dictionaries, which has been proven to be useful in colour constancy, is described by $\mathbf{g}1, \mathbf{g}2$ and $\mathbf{g}3$. Finally, since the MVGA is commutative, the complexity of the algorithm is effectively reduced during the dictionary training stage, and the data redundancy is reduced accordingly.

III. MVGA BASED DICTIONARY LEARNING

When both the dictionary and the coefficients are unknown variables, the MVGA-based dictionary training process can be deemed as an extension of the model. Then, this process can be defined as $\mathbf{G} = \arg \min \mathbf{G} \mathbf{F} - \mathbf{D} \mathbf{G} \mathbf{2}$,

This dictionary algorithm called MVGA-DL is designed, a sparse coefficient matrix \mathbf{G} needs to be obtained during the sparse coding stage, in which a fixed dictionary \mathbf{D} is already given. In general, there exist a variety of methods that can be used to solve this sparse coding problem. Among them, methods such as matching pursuit (MP), basis pursuit (BP) and orthogonal matching pursuit (OMP) are the most common ones. Inspired by the high efficiency of OMP algorithm, the reduced monotone vector based geometric algebra-based orthogonal matching pursuit. Obviously, MVGA-OMP for MVGA multi vector is an extension of traditional OMP for the real data. Generally, the increase of the iteration number A leads to the consequent reduction of the reconstruction residual. And since the sparse coding phase aims to obtain the value of reconstruction residual as small as possible, and the sparsity of coefficient vector as large as possible, we set an upper bound of A to balance them. Let A be a monotone algebra and let Asa be the order unit (real) vector space of all self-adjoint elements of A . Let λ be a directed set and let $\{a_\lambda : \lambda \in \lambda\}$ be a net in Asa . The net is increasing if $\lambda \leq \mu$ implies $a_\lambda \leq a_\mu$. We say the net has least upper bound a when its range $\{a_\lambda : \lambda \in \lambda\}$ has a least upper bound a in Asa . We shall write $a_\lambda \uparrow a$. Similarly, the net $\{b_\lambda : \lambda \in \lambda\}$ is decreasing if $\lambda \leq \mu$ implies $b_\lambda \geq b_\mu$, and it has a greatest lower bound b if its range $\{b_\lambda : \lambda \in \lambda\}$ has the greatest lower bound b in Asa . We shall write $b_\lambda \downarrow b$. Clearly, a net $\{a_\mu : \mu \in M\}$ satisfies $a_\mu \uparrow a$ in Asa if, and only if, $-a_\mu \downarrow -a$ in Asa . Then we have the following:

1. When $\{a_\lambda : \lambda \in \lambda\}$ is an increasing net with $a_\lambda \uparrow a$ and $\{b_\lambda : \lambda \in \lambda\}$ is an increasing net with $b_\lambda \uparrow b$, then $\{a_\lambda + b_\lambda\}$ is an increasing net with $a_\lambda + b_\lambda \uparrow a + b$. Similarly, when $\{c_\gamma : \gamma \in \gamma\}$ is a decreasing net with $c_\gamma \downarrow c$ and $\{d_\gamma : \gamma \in \gamma\}$ is a decreasing net with $d_\gamma \downarrow d$ in Asa , $\{c_\gamma + d_\gamma\}$ is a decreasing net such that $c_\gamma + d_\gamma \downarrow c + d$ in Asa .

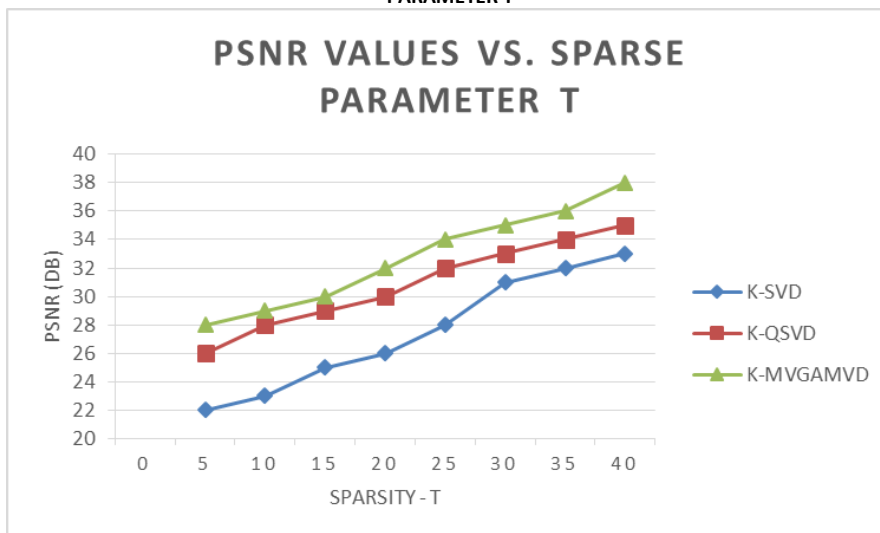
2. When $\{a_\lambda : \lambda \in \lambda\}$ is an increasing net with $a_\lambda \uparrow a$ in Asa , then, for any $z \in A$, $\{za_\lambda z^* : \lambda \in \lambda\}$ is also an increasing net satisfying $za_\lambda z^* \uparrow zaz^*$ in Asa .

To further analyze the efficiency of the MVGA-based joint sparse representation model, the time complexity of K-MVGAMVD will be compared to K-SVD (the traditional monochrome sparse model) and K-QSVD (quaternion-based sparse model). Because K-MVGAMVD makes use of the same framework of traditional K-SVD and quaternion form K-QSVD, its convergence is also similar to them. In each iteration, these three methods all consist of sparse coding phase and dictionary updating phase. In sparse coding phase, we use MVGA-OMP to obtain sparse codes while keeping the dictionary fixed. The MVGA-OMP is also a greedy algorithm like OMP, which means the construction residual will decrease when the number of nonzero coefficients we select keep growing. That is to say, the reconstruction residual reduces regarding the number of iteration. In dictionary learning phase, we optimize dictionary as K-MVD does while keeping the sparse codes fixed. The energy of the previous residual error matrix is reduced while each atom updating. In order to advance the above two dictionaries. The proposed MVGA-based sparse model takes full advantage of the MVGA (only three base elements $\mathbf{e}1, \mathbf{e}2, \mathbf{e}12$ are used for colour image), no extra component is produced. Thus, the MVGA overcomes the data redundancy experienced by the previous quaternion in colour image modeling.

IV. EXPERIMENTAL ANALYSIS

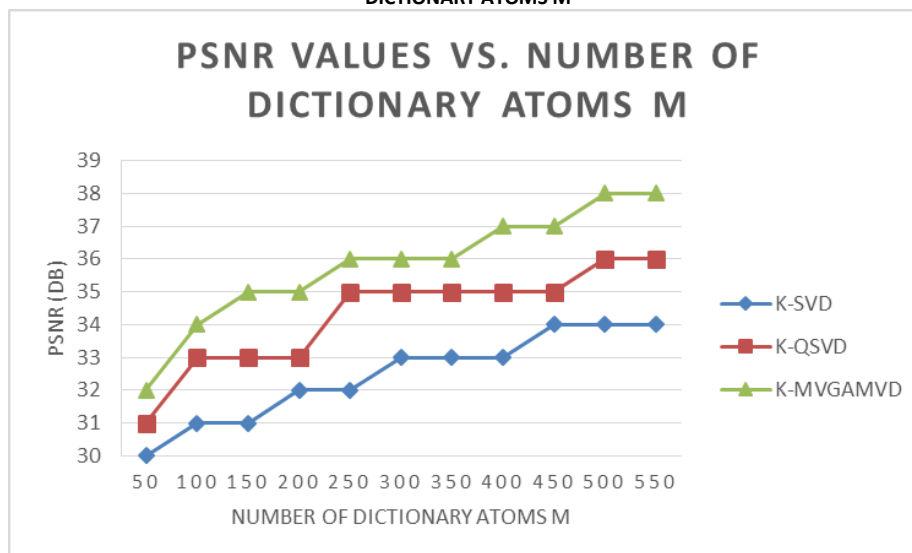
We first evaluate the proposed K-MVGAMVD based sparse model through colour image reconstruction experiments at different sparsity, comparing with K-SVD and quaternion-based sparse models. Based on the data sets above, the dictionaries using K-SVD, K-QSVD and K-MVGAMVD are trained respectively on the same training samples. A reasonable computational complexity can be maintained by choosing an appropriate number of dictionary atoms, which is not particularly large or small. In the sparse coding stage, we set the sparsity parameter T in OMP/QOMP/MVGA-OMP for the three sparse models, where T means the maximum value of nonzero coefficients allowed for representing each image block.

FIGURE 1: COMPARISON OF K-MVGAMVD, K-QSVD AND K-SVD BASED SPARSE MODEL FOR COLOUR IMAGE RECONSTRUCTION - PSNR VALUES VS. SPARSE PARAMETER T



The first reconstruction experiment is implemented to verify the superior performance of our K-MVGAMVD based sparse model through the PSNR (dB) values over different sparse parameter T for the three sparse models. And the number of the atoms of the three dictionary have been all fixed to be $M=256$. The relationship between reconstructed PSNR and sparse sparsity parameter T and the PSNR values of the proposed MVGA-based and quaternion-based sparse models are almost similar or a little higher. And they can present exactly higher PSNR values comparing to the traditional sparse model using K-SVD method under the same sparse parameter. When the number of atoms used increases, the superiority becomes even more distinct. Besides, the number of dictionary atoms is also an important indicator to evaluate the performance of reconstruction, and normally, has been fixed to be $M=256$. Since we suspect quaternions and our RGA better capture the correlations of colour channels, we now test the K-SVD, K-QSVD and our K-MVGAMVD algorithms with variety of atoms to see if these correlations can lead to a lower-redundancy for the dictionary. The comparison graphical analysis of K-MVGAMVD, K-QSVD and K-SVD based sparse model for colour image reconstruction - PSNR values vs. sparse parameter T is shown in Figure 1. Similarly, the comparison graphical analysis of K-MVGAMVD, K-QSVD and K-SVD sparse model for colour image reconstruction - PSNR values vs. the number of dictionary atoms M are shown in Figure 2.

FIGURE 2: COMPARISON OF K-MVGAMVD, K-QSVD AND K-SVD SPARSE MODEL FOR COLOUR IMAGE RECONSTRUCTION - PSNR VALUES Vs. THE NUMBER OF DICTIONARY ATOMS M



In this experiment, we test the reconstruction results of the three methods using dictionaries with the same number of atoms. The number of the atoms is set as 64, 128, 256, and 512. Clearly, in Figure 2, compared with the K-SVD based model, the K-QSVD and our K-MVGAMVD based models show great improvement in terms of the reconstruction PSNR values. And the increasing number of dictionary atoms greatly improves the results. This improvement can be more effective in the adaptive dictionary method. Generally, our K-MVGAMVD based model shows similar or a little higher PSNR values compared with the K-QSVD based model. We can clearly see that, owing to the commutative multiplication operation of MVGA, our proposed K-MVGAMVD algorithm achieves far less computational complexity compared to the K-QSVD algorithm. Therefore, we can conclude that, compared with the existing sparse models, our proposed joint representation model based on MVGA can greatly improve the performance of colour image processing while reducing the time complexity and removing the data redundancy.

V. CONCLUSION

In this paper, a novel sparse representation model for multi vector -channel image based on monotone vector geometric algebra is proposed, which formulates the colour image as a multi vector matrix with the spatial and spectral information in MVGA space. Our proposed K-MVGAMVD based model is shown better at retaining certain texture and colour information in the image for the retention of the correlation between multiple RGB channels. The experiments of reconstruction and noise removal natural colour images demonstrate our proposed model can preserve inherent colour structures completely, remove the data redundancy and reduce the computational complexity. Currently, our model focuses on modelling the multi vector-channel correlation which can be regarded as a sequence of channels for image information. We would like to extend to the case covering multiple images in video. On the other hand, we want to investigate the multi vector sparse representation of multispectral images based on geometric algebra. It is expected that the proposed MVGA model will be a heterogeneous and efficient tool in various applications of image analysis.

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THE STUDY OF CRYPTOCURRENCIES AROUND THE WORLD

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ABSTRACT

In this article, the author has given the detail about the origin of Cryptocurrencies and specially focussing on first cryptocurrency in the world. Bitcoin has emerged as the most successful cryptographic currency in history. Within two years of its quiet launch in 2009, Bitcoin grew to comprise billions of dollars of economic value despite only cursory analysis of the system's design. In my research, my main result was to discuss the various possibilities related to the market capturing of different Cryptocurrencies. I have given brief account of mining and the analysis of impact of Bitcoin and other Cryptocurrencies across the world. A general equilibrium monetary model is developed to study the optimal design of a cryptocurrency system based on a blockchain. The model is then calibrated to Bitcoin transaction data to perform a quantitative assessment of the scheme. Many Cryptocurrencies studies are included in this paper for better understanding.

KEYWORDS

cryptocurrencies, bitcoin.

JEL CODE

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INTRODUCTION

 Since the creation of Bitcoin in 2009, numerous private Cryptocurrencies have been introduced. Bitcoin is by far the most successful one. It has been getting a lot of media attention, and its total market value has reached 20 billion USD in March 2017. More importantly, a number of central banks started recently to explore the adoption of cryptocurrency and block chain technologies for retail and large-value payments. For example, the People's Bank of China aims to develop a nationwide digital currency based on block chain technology; the Bank of Canada and Monetary Authorities of Singapore are studying its usage for interbank payment systems; the Deutsche Bundes bank has developed a preliminary prototype for block chain-based settlement of financial assets. Many proponents believe that cryptocurrency and blockchain technology will have a significant influence on the future development of payment and financial systems. While policy makers concern about the opportunities and challenges brought about by these technological advances, there is very little guidance provided by economic theory regarding the appropriate usage of these technologies and the optimal design of these systems. This paper attempts to provide an economic theory to help us understand the fundamental economic trade and address relevant policy issues. Most existing models of Cryptocurrencies are built by computer scientists who focus mainly on the feasibility and security of these systems. This line of research often ignores the incentives of participants (e.g., the incentives of malicious attackers) and the endogenous nature of key variables (e.g., the real value of Cryptocurrencies). More importantly, to study the optimal design of a cryptocurrency system, we need to model from first principles the behaviours of divergent participants, to derive the equilibrium interactions among these agents and to study the optimal usage of divergent policy instruments. To this end, this paper develops a general equilibrium monetary model of a cryptocurrency system to study its optimal design. This approach is desirable because the model endogenizes the value of cryptocurrency, and endogenizes the underlying trading activities and mining activities. It also provides a welfare notion for assessing alternative system designs. We will use this model to evaluate the performance of a cryptocurrency system calibrated to Bitcoin transaction statistics. We will study the optimal design of the cryptocurrency system in divergent settings. Furthermore, we compare the usage of divergent consensus protocols on different aspects of Cryptocurrencies. Chiu and Wong (2015) apply the mechanism design approach to review several e-money technologies including Bitcoin, PayPal and M-Pesa and identify some essential features of e-money that can help implement constrained efficient allocations. Gans and Halaburda (2013) develop a model of platform management to study platform-specific digital currencies such as Facebook Credits. Fernandez-Villaverde and Sanches (2016) model Cryptocurrencies as privately issued at currencies and analyze whether competition leads to efficiency. Agarwal and Kimball (2015) advocate that the adoption of digital currencies can facilitate the implementation of a negative interest rate policy. Rogo (2016) suggests subsidizing the provision of digital money to the unbanked in order to phase out paper currency, which facilitates undesirable tax evasion and criminal activities. To the best of our knowledge, our work is the first paper that explicitly models the distinctive technological features of a cryptocurrency system (e.g. blockchain, mining, double-spending problems) in an equilibrium monetary model and investigates its optimal design both qualitatively and quantitatively. Consider two opposing viewpoints on Bitcoin in strawman form. The first is that "Bitcoin works in practice, but not in theory." At times devoted members of the Bitcoin community espouse this philosophy and criticize the security research community for failing to discover Bitcoin, not immediately recognizing its novelty, and still today dismissing it due to the lack of a rigorous theoretical foundation. A second viewpoint is that Bitcoin's stability relies on an unknown combination of socioeconomic factors, which is hopelessly intractable to model with sufficient precision, failing to yield a convincing argument for the system's soundness. Given these difficulties, experienced security researchers may avoid Bitcoin as a topic of study, considering it prudent security engineering to only design systems with precise threat models that admit formal security proofs. We intend to show where each of these simplistic viewpoints fail. To the first, we contend that while Bitcoin has worked surprisingly well in practice so far, there is an important role for research to play in identifying precisely why this has been possible, moving beyond a blind acceptance of the informal arguments presented with the system's initial proposal. Furthermore, it is crucial to understand whether Bitcoin will still "work in practice" as practices change. We expect external political and economic factors to evolve, the system must change if and when transaction volume scales, and the nature of the monetary rewards for Bitcoin miners will change over time as part of the system design. It is not enough to argue that Bitcoin has worked from 2009–2014 and will therefore continue likewise. We do not yet have sufficient understanding to conclude with confidence that Bitcoin will continue to work well in practice, which is a crucial research challenge that requires insight from computer science theory. To the second viewpoint, we contend that Bitcoin is filling an important niche by providing a virtual currency system without any trusted parties and without pre-assumed identities among the participants. Within these constraints, the general problem of consensus in a distributed system is impossible, without further assumptions like Bitcoin's premise that rational (greedy) behaviour can be modelled and incentives can be aligned to ensure secure operation of the consensus algorithm. Yet these constraints matter in practice, both philosophically and technically, and Bitcoin's approach to consensus within this model is deeply surprising and a fundamental contribution. Bitcoin's core consensus protocol also has profound implications for many other computer security problems beyond currency such as distributed naming, secure time stamping and commitment, generation of public randomness, as well as many financial problems such as self-enforcing ("smart") contracts, decentralized markets and order books, and distributed autonomous agents. In short, even though Bitcoin is not easy to model, it is worthy of considerable research attention as it may form the basis for practical solutions to exceedingly difficult and important problems.

OBJECTIVES

1. To explain every aspect regarding cryptocurrencies.
2. To get all the prominent cryptocurrency firms and their statuses.

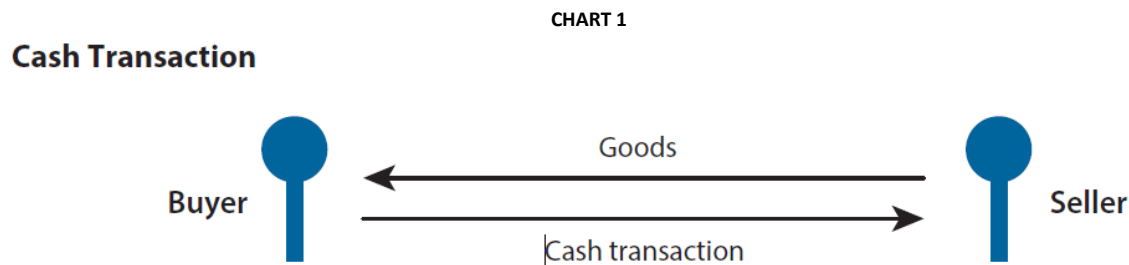
RESEARCH METHODOLOGY

The study is primarily based on the secondary data.

ANALYSIS**TRADITIONAL METHODS****CASH**

Cash is represented by a physical object, usually a coin or a note. When this object is handed to another individual, its unit of value is also transferred, without the need for a third party to be involved. No credit relationship arises between the buyer and the seller. This is why it is possible for the parties involved to remain anonymous.

The great advantage of physical cash is that whoever is in possession of the physical object is by default the owner of the unit of value. This ensures that the property rights to the units of value circulating in the economy are always clearly established, without a central authority needing to keep accounts. Furthermore, any agent can participate in a cash payment system; nobody can be excluded. There is permission less access to it. Cash, however, also has disadvantages. Buyers and sellers have to be physically present at the same location in order to trade, which in many situations makes its use impracticable.

**DIGITAL CASH**

An ideal payment system would be one in which monetary value could be transferred electronically via cash data files. Such cash data files retain the advantages of physical cash but would be able to circulate freely on electronic networks.¹ A data file of this type could be sent via email or social media channels.

A specific feature of electronic data is that it can be copied any number of times at negligible cost. This feature is highly undesirable for money. If cash data files can be copied and the duplicates used as currency, they cannot serve as a payment instrument. This problem is termed the “double spending problem.”

ELECTRONIC PAYMENT SYSTEM

To counteract the problem of double spending, classical electronic payment systems are based on a central authority that verifies the legitimacy of the payments and keeps track of the current state of ownership. In such systems, a central authority (usually a bank) manages the accounts of buyers and sellers. The buyer initiates a payment by submitting an order. The central authority then ensures that the buyer has the necessary funds and adjusts the accounts accordingly.

Centralized payment systems solve the double spending problem, but they require trust. Agents must trust that the central authority does not misuse the delegated power and that it maintains the books correctly in any state of the world—that is, that the banker is not running away with the money. Furthermore, centralized systems are vulnerable to hacker attacks, technical failures, and malicious governments that can easily interfere and confiscate funds.

CRYPTOCURRENCY (BITCOIN)

Bitcoin is a virtual monetary unit and therefore has no physical representation. A Bitcoin unit is divisible and can be divided into 100 million “Satoshis,” the smallest fraction of a Bitcoin. The Bitcoin Blockchain is a data file that carries the records of all past Bitcoin transactions, including the creation of new Bitcoin units. It is often referred to as the ledger of the Bitcoin system. The Bitcoin Blockchain consists of a sequence of blocks where each block builds on its predecessors and contains information about new Bitcoin transactions. The average time between Bitcoin blocks is 10 minutes. The first block, block #0, was created in 2009; and, at the time of this writing, block #494600 was appended as the most recent block to the chain. Because everyone can download and read the Bitcoin Blockchain, it is a public record, a ledger that contains Bitcoin ownership information for any point in time.

To use the Bitcoin system, an agent downloads a Bitcoin wallet. A Bitcoin wallet is software that allows the receiving, storing, and sending of (fractions of) Bitcoin units. The next step is to exchange fiat currencies, such as the U.S. dollar, for Bitcoin units. The most common way is to open an account at one of the many Bitcoin exchanges and to transfer fiat currency to it. The account holder can then use these funds to buy Bitcoin units or one of the many other cryptoassets on the exchange. Due to the widespread adoption of Bitcoin, the pricing on large exchanges is very competitive with relatively small bid-ask spreads. Most exchanges provide order books and many other financial tools that make the trading process transparent.

A Bitcoin transaction works in a way that is similar to a transaction in the Yap payment system. A buyer broadcasts to the network that a seller’s Bitcoin address is the new owner of a specific Bitcoin unit. This information is distributed on the network until all nodes are informed about the ownership transfer.

For a virtual currency to function, it is crucial to establish at every point in time how many monetary units exist, as well as how many new units have been created. There must also be a consensus mechanism that ensures that all participants agree about the ownership rights to the virtual currency units. In small communities, as with the Yap islanders, everyone knows everyone else. The participants care about their reputation, and conflicts can be disputed directly. In contrast, within the Bitcoin system the number of participants is substantially larger, and network participants can remain anonymous. Consequently, reputation effects cannot be expected to have a significant positive impact, and coordination becomes very difficult. Instead, there is a consensus mechanism that allows the Bitcoin system to reach an agreement. This consensus mechanism is the core innovation of the Bitcoin system and allows consensus to be reached on a larger scale and in the absence of any personal relations.

BITCOIN MINING

To understand the consensus mechanism of the Bitcoin system, we first have to discuss the role of a miner. A miner collects pending Bitcoin transactions, verifies their legitimacy, and assembles them into what is known as a “block candidate.” The goal is to earn newly created Bitcoin units through this activity. The miner can succeed in doing this if he or she can convince all other network participants to add his or her block candidate to their copies of the Bitcoin Blockchain.

Bitcoin mining is permissionless. Anyone can become a miner by downloading the respective software and the most recent copy of the Bitcoin Blockchain. In practice, however, there are a few large miners that produce most of the new generally accepted blocks. The reason is that competition has become fierce and only large mining farms with highly specialized hardware and access to cheap electricity can still make a profit from mining.

TABLE 1: TYPES OF PROMINENT CRYPTOCURRENCIES

Release	Status	Currency	Symbol	Founder(s)
2009	Active	Bitcoin	BTC, XBT	Satoshi Nakamoto
2011	Active	Litecoin	LTC	Charlie Lee
2011	Active	Namecoin	NMC	Vincent Durham
2011	Active	SwiftCoin	STC	Daniel Bruno
2012	Active	Peercoin	PPC	Sunny King
2013	Active	Dogecoin	DOGE	Jackson Palmer & Billy Markus
2013	Active	Emercoin	EMC	Yitshak Dorfman
2013	Active	Feathercoin	FTC	Peter Bushnell
2013	Active	Gridcoin	GRC	Rob Hälford
2016	Active	Zcash	ZEC	Zooko Wilcox

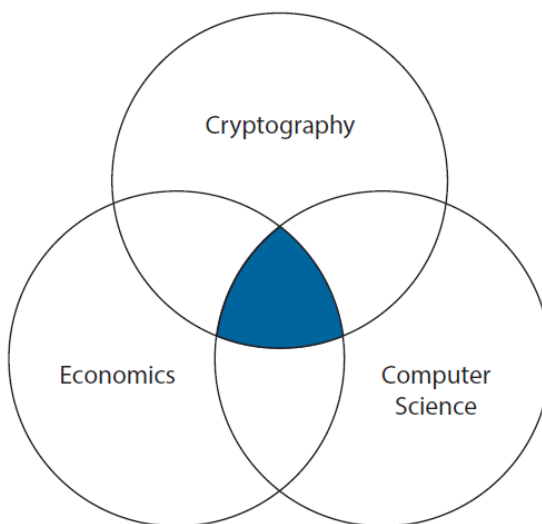
BITCOIN TRANSACTION

The complexity of the present material is due to interdisciplinarity. To understand the Bitcoin system, it is necessary to combine elements from the three disciplines of economics, cryptography, and computer science. Having presented a broad overview of the Bitcoin system, we will explain a few technical elements of the system in greater detail. Blockchain uses proven technologies and links these in an innovative way. This combination has made the decentralized management of a ledger possible for the first time.

Berentsen and Schär (2017) argue that transaction processing demands that three requirements are satisfied: (1) transaction capability, (2) transaction legitimacy, and (3) transaction consensus. These three requirements will now be considered. In particular, we will explain how these conditions can be satisfied in the absence of a central authority.

CHART 2

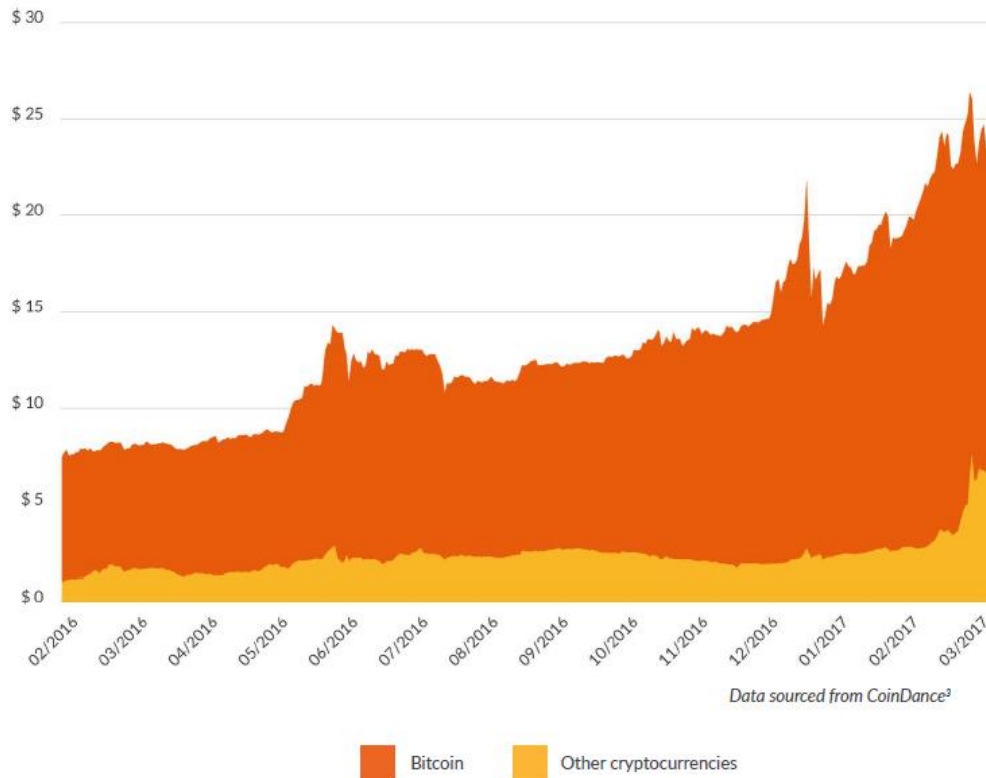
Interdisciplinarity



The common element of these different cryptocurrency systems is the public ledger ('blockchain') that is shared between network participants and the use of native tokens a way to incentivise participants for running the network in the absence of a central authority. However, there are significant differences between some Cryptocurrencies with regards to the level of innovation displayed (Figure 1). The majority of cryptocurrencies are largely clones of Bitcoin or other Cryptocurrencies and simply feature different parameter values (e.g., different block time, currency supply, and issuance scheme). These Cryptocurrencies show little to no innovation and are often referred to as 'altcoins'. Examples include Dogecoin and Ethereum.

The price of Bitcoin is highly volatile. This leads us to the question of whether the rigid predetermined supply of Bitcoin is a desirable monetary policy in the sense that it leads to a stable currency. The answer is no because the price of Bitcoin also depends on aggregate demand. If a constant supply of money meets a fluctuating aggregate demand, the result is fluctuating prices. In government-run fiat currency systems, the central bank aims to adjust the money supply in response to changes in aggregate demand for money in order to stabilize the price level. In particular, the Federal Reserve System has been explicitly founded "to provide an elastic currency" to mitigate the price fluctuations that arise from changes in the aggregate demand for the U.S. dollar. Since such a mechanism is absent in the current Bitcoin protocol, it is very likely that the Bitcoin unit will display much higher short-term price fluctuations than many government-run fiat currency units.

CHART 3



CONCLUSION

The Bitcoin creators' intention was to develop a decentralized cash-like electronic payment system. In this process, they faced the fundamental challenge of how to establish and transfer digital property rights of a monetary unit without a central authority. They solved this challenge by inventing the Bitcoin Blockchain. This novel technology allows us to store and transfer a monetary unit without the need for a central authority, similar to cash.

Price volatility and scaling issues frequently raise concerns about the suitability of Bitcoin as a payment instrument. As an asset, however, Bitcoin and alternative blockchain-based tokens should not be neglected. The innovation makes it possible to represent digital property without the need for a central authority. This can lead to the creation of a new asset class that can mature into a valuable portfolio diversification instrument. Moreover, blockchain technology provides an infrastructure that enables numerous applications. Promising applications include using colored coins, smart contracts, and the possibility of using fingerprints to secure the integrity of data files in a blockchain, which may bring change to the world of finance and to many other sectors.

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