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## Article

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## Article

# Empirical Examination of the Relationship between Supply Chain Effectiveness and a Company's Overall Success

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**Abstract:** The relationship between the effective management of supply chains and overall organizational success is not fully explained in the literature. The differences in the effectiveness of supply chains as well as the corporate social responsibility (CSR) of supply chain companies in North America, Europe, and Asia Pacific are not broadly studied. This article attempts to bridge that gap in the literature using data from the Gartner Supply Chain Group, Brand Finance, American Consumer Satisfaction Index, and Bloomberg Finance. Pertinent statistical tools including multiple regression, ANOVA, *t*-tests, and chi-square tests were utilized in the study. SCM top performers were found to have higher customer satisfaction than their industry counterparts; supply chain variables used currently do not have a statistically significant impact on the overall success of those companies; North American companies have experienced significantly higher supply chain effectiveness than their counterparts in Europe and Asia Pacific; and European supply chain companies are significantly ahead of companies in America and Asia in the area of CSR. The findings can help managers in companies to benchmark with their global peers. The main contribution of this research is that it demonstrates the value of supply chain effectiveness while underscoring the need for further research to link supply chain effectiveness with organizational performance. Supply chain managers need to explore operational or internal process metrics that have a more significant impact on overall company success.

**Keywords:** supply chain effectiveness; customer satisfaction; brand value; corporate social responsibility; market capitalization; inventory turns; return on assets



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## 1. Introduction

Supply chain management (SCM) has gained an ever-increasing level of importance around the world in the past two decades in both academe and industry (Yildiz Çankaya and Sezen 2019; Fulconis and Paché 2005). Many universities have introduced majors, tracks, and concentrations in SCM at the MBA as well as the undergraduate levels (Bahouth et al. 2014; Stewart et al. 2017). Leading companies around the world have realized the importance of supply chain management in improving customer satisfaction, enhancing market share, and increasing profitability. There have been scores of companies that have succeeded or failed based on the level of importance that they have placed on managing their supply chains (for example, Agus 2013; D'Amico et al. 2017; Lockamy 2019). Forty years ago, Hayes and Wheelwright (1984) came up with the hierarchical four-stage operations strategy model to classify companies. The fourth and most matured stage is "Externally Supportive," where the operations function takes the lead in proactively helping the company be a best-in-class in its sector. Today, the term operations can be replaced with supply chain. In addition to managing operations in one's business, companies need to effectively coordinate the complex set of activities in their supply chains. Supply chain effectiveness can be correlated with the "Externally Supportive" companies of Hayes and Wheelwright (1984) that include a variety of activities such as designing and developing quality products that the customers want (Zimon 2017), delivering the right products to the right place at the right time while maintaining cost efficiency (Luo et al. 2021), and having

the infrastructure to coordinate the information and the inventory pertaining to the various entities in the supply chain (Badenhorst-Weiss and Waugh 2015). Supply chain activities encompass the entire gamut of functions within the organization as well as its suppliers, partners, and customers. Works of authors such as Kraljic (1983, 1984) and van Weele (1984) helped elevate purchasing and supply chain management from more of an operational and tactical function to a more strategic one, leading to overall company performance.

Today's global and complex supply chains need to manage the sequence of operations between five common supply chain entities—customer, retailer, distributor, manufacturer, and supplier (Olhager et al. 2015). This is a simplified version of the supply chain since, in reality, there may be more entities such as the wholesalers, the manufacturer's distributors, and several tiers of suppliers (Ekinci and Baykasoğlu 2019; Turner et al. 2018).

Companies in a supply chain always need to engage in trade-offs to balance conflicting objectives (Manuj and Mentzer 2008). Customers typically expect product variety which companies must deliver without undue increase in inventory. Strategies such as postponement or delayed differentiation are often used in a diverse set of companies from electronics to garment manufacturing to assure both product variety and lower inventory costs (Yang et al. 2005). Another trade-off is the inventory/transportation cost. Practicing just-in-time delivery is ideal to minimize inventory; however, small lot sizes will result in less-than-truck-load shipments, which can result in higher transportation costs per unit (Baker 2007). Strategies such as cross-docking can help alleviate this conflict. The lot size/inventory tradeoff is similar which has been addressed by strategies such as Kanban and setup time reduction (Birkie 2016). Any time the customer service is improved, there is a possibility for the costs to go up. Historically, many companies chose to excel in either innovation (e.g., Intel) or operations (e.g., Walmart), but it is important for today's businesses to assure excellence in both innovation and operations (e.g., Apple). There is a growing trend among leading companies to elevate the company's top supply chain official to the C-level in the organization (e.g., Villena et al. 2018) to be on par with the chiefs of finance and marketing.

The chief objectives in a supply chain are to enhance profitability, improve customer satisfaction, and increase market share. None of these would be possible without gaining competitive advantage and differentiating capabilities. Porter (1985) and many scholars, subsequently, have provided substantial evidence that managing primary and secondary activities not only helps in attaining differentiating capabilities in the value chain but is also at the root of a strong supply chain (for example, Friis et al. 2016; McPhee and Wheeler 2006; Sakuramoto et al. 2019). Porter classified inbound logistics, operations, outbound logistics, marketing and sales, and service as the five primary value-adding activities, while accounting, information systems, purchasing, human resources, etc. were secondary value-adding activities. Three of the primary value-adding activities (inbound logistics, outbound logistics, and operations) represent the major activities in today's supply chains. The value associated with the product can be maximized by innovation excellence while the cost incurred can be minimized with the help of operational excellence. While managing supply chains is critical, their impact needs to be reflected in external market and financial measures. Supply chain effectiveness is measured not only by operational measures but also by its impact on customer-based and financial measures.

Very few research studies have empirically examined the relationship between supply chain effectiveness and overall business performance as evidenced by publicly available data of financial and market measures of successful companies. The primary goal of this paper is to use a wide array of secondary data to examine the interrelationship between the company's supply chain resources and the overall success of the company as evidenced by the financial, customer/market, and related key performance indicators of the company.

The role of corporate social responsibility (CSR) in companies that constitute today's global supply chains has been carefully examined by governments and customers (e.g., Novitasari et al. 2023; Le 2023; Modak et al. 2020). Research companies such as Gartner (2021) have highlighted the importance of CSR in today's supply chains. CSR is evolving into a more quantifiable and auditable framework called ESG or environment, social, and

governance. [Vollero et al. \(2022\)](#) compared the CSR messaging among companies in three macro regions of the world—Asia, Europe, and North America. The secondary goal of the current paper is to examine if there is a preponderance of effective supply chain practices and focus on CSR in a specific region of the world in order for companies in other regions to benchmark their business practices.

The contributions of this article are three-fold: (a) using a highly popular practitioner-oriented supply chain ranking ([Gartner 2021](#)) to develop a supply chain effectiveness metric that could be used for statistical analysis in research studies; (b) statistically testing the impact of supply chain effectiveness on customer satisfaction and the financial performance of companies; and (c) examining the differences in supply chain effectiveness and corporate social responsibility among companies in major industrialized regions of the world.

This paper flows as follows: after the introduction, a literature review on supply chain effectiveness and its importance is presented along with the theoretical background and research hypotheses. Subsequently, the research methodology to assess the hypotheses is presented, followed by results and analyses. The practical implications are outlined in the subsequent section. Finally, the conclusions, limitations, and future research directions are offered.

## 2. Literature Review, Theoretical Background, and Hypotheses

The literature review was conducted using EBSCOhost and relevant databases. Care was taken to ensure the top journals in the supply chain management area, as outlined in structured literature review (SLR) articles such as [Swanson et al. \(2018\)](#) and [Grimm et al. \(2015\)](#), were included in the review. Key word phrases used included “supply chain effectiveness”, “supply chain performance”, “supply chain and CSR”, “supply chain and customer satisfaction”, and “global supply chains.” Articles from 2000 onwards were identified and selected, and pertinent articles are referenced in this article.

### 2.1. Global Nature of Modern Supply Chains

Supply chains are more complex and global than most people can imagine. [Schwartz \(2014\)](#) shows that supply chains have been global even for a common pencil which requires graphite from Sri Lanka, rubber from Malaysia, wood from Oregon, and clay from Mississippi. For a more complex product such as Apple’s iPhone, [Bostic \(2013\)](#) shows how Apple’s supply chain spans dozens of countries in multiple continents. A published list of the top 200 suppliers on Apple’s web site ([Supplier List 2023](#)) shows that in addition to the much-talked-about Taiwan’s Hon-Hai (Foxconn) contract assembly operations in China, Apple has suppliers in many other parts of Asia including Samsung in S. Korea, Hitachi in Japan, and lesser known subcontractors in Vietnam, Indonesia, India, Philippines, Thailand, etc. Apple’s supply chain is also distinct in North America, with companies like Intel, 3M, and Corning. There are some suppliers in Europe as well as in South America. Companies such as Apple have reached the pinnacle of managing supply chains because of their impeccable management of suppliers and contractors from around the world ([Subedi 2013](#)). The more global the supply chains, the more complex they are to manage ([Sajadieh 2009](#)).

It is important today for companies from different regions of the world to benchmark with each other on supply chain and related practices. Benchmarking is the process of comparing performance metrics with the best in the industry while identifying and emulating the best practices in the leading companies ([Camp 1989](#)). [Vollero et al. \(2022\)](#) compared the CSR messaging among companies in three macro regions of the world—Asia, Europe, and North America. [Mahadevan et al. \(2022\)](#) found that the supply performance of Asia-Pacific organizations is different when compared with that of global organizations.

[Ibrahim et al. \(2015\)](#), in a content analysis of global supply chain research, found that the global supply chain studies were far fewer than the non-global/domestic supply chain studies. They also discovered that most studies pertain to a single industry and very few cut across industries. The same article talks about the lack of empirical research pertaining to supply chains beyond North America. The current paper tries to fill that

gap by examining commonalities and differences in supply chains pertaining to several industries and encompassing various regions of the globe.

## 2.2. Supply Chain Effectiveness

Supply chain effectiveness is measured by metrics such as costs pertaining to transportation, warehousing, inventory, and logistics (Fugate et al. 2009; Mulchandani et al. 2023). The topic of supply chain effectiveness has been studied by authors in different parts of the world and in different industries, for example, small and medium enterprises in China (Wang and Ali 2023), small and medium enterprises in India (Mulchandani et al. 2023), state-owned enterprises in South Africa (Chinomona et al. 2023), the manufacturing sector in Africa (Tlale et al. 2022), supply chain and logistics sector companies in the UAE (Albishri et al. 2019), to name but a few. Garai and Roy (2020) demonstrate from their literature review that the classical performance indicators in supply chains included “aggregate revenue, customer satisfaction, and environmental concern.”

The resource-based view (RBV) introduced by Barney (1991) provides companies a way by which internal resources, that are mainly under the purview of supply chain management, can be deployed to gain competitive advantage. RBV has gained the significant attention of supply chain scholars in the recent past (Shibin et al. 2020). Since the concept of balanced scorecard (BSC) was made popular more than twenty years back (Kaplan and Norton 1996; Kaplan and Norton 2001), there have been scores of articles of its application in a variety of fields. BSC is the approach where the business is expected to view itself in a balanced way from four different perspectives as opposed to exclusively or predominantly from the financial perspective. While the financial performance and stewardship of financial resources are critical, businesses also need to look at the customer/market, internal process, and organizational learning/growth perspectives. In this paper, the internal business process perspective is used synonymously with the supply chain of the organization. RBV and BSC have elevated the importance of supply chain effectiveness in companies and its relationship with market and financial performance.

Ellinger et al. (2012) examined the relationship between SCM competency and customer satisfaction as well as shareholder value. They found that a higher level of SCM competency resulted in higher levels of surrogate measures of customer satisfaction and shareholder value. The SCM competency in that study was based on the Gartner Supply Chain Group’s annual rankings of the top 25 companies. However, only the opinion part of the ranking process was used in the Ellinger et al. (2012) study. In an exploratory research study, Bharadwaj (2015) examined the correlation between SCM competency and surrogates of marketing and financial measures. The current research significantly expands on these papers and examines the annual data from fifteen years of Gartner Top 25 supply chain competency rankings as well as data pertaining to brand value, customer satisfaction, revenue growth, price/earnings (P/E) ratio, and market capitalization.

## 2.3. Supply Chains and CSR

Researchers have been increasingly focused on CSR with respect to supply chains as opposed to individual companies. Stekelorum et al. (2019) studied the extent to which the CSR expectations of customers influence the CSR activities of French companies and their CSR requirements of their own suppliers. Bowrey and Clements (2019) introduced a framework for the holistic evaluation of the entire supply chain CSR reporting as opposed to individual segments within supply chains. Lee et al. (2018) studied the issue of greenwashing in the name of CSR in competing supply chains. Vo and Nguyen (2017) studied the factors in improving the performance of CSR implementation in a multi-level supply chain.

The importance of CSR has been elevated in the recent past by the adoption of triple bottom line metrics (profit, people, and planet) by Apple, one of the most globally recognizable and profitable companies in the world (Bonsu 2019). Gartner (2021), the reputed research company, has identified Apple as the best supply chain in the world.

#### 2.4. Hypotheses Development Based on Extant Literature

The Gartner Top 25 supply chain methodology has been popular among practitioners for the past fifteen years (Gartner 2023). The overall composite score for each company is calculated with 50% weight attributed to publicly available financial data and 50% based on subjective opinions of the Gartner experts and peers in the supply chain industry. The companies with the 25 highest overall composite score are identified as the top companies in decreasing order of the composite scores. Ellinger et al. (2012) used only the opinion part of the Gartner study in their research and did not use the financial part of the data. It is important to examine if the objective data from company financials can predict supply chain effectiveness as well as the experts and peers in the supply chain industry could do.

**H1.** *The objective financial data can predict supply chain effectiveness better than subjective opinions.*

Ellinger et al. (2012) demonstrated that firms with high levels of SCM competency had higher levels of customer satisfaction and shareholder value. The supply chain-related data that were used in that study were based on the annual Top 25 supply chain rankings by Gartner Supply Chain Group from 2004 to 2010. Skipworth et al. (2015) concluded that supply chain management must deliver customer value at the lowest possible cost, thereby increasing net income and return on assets. Wong et al. (2012) tested the hypothesis that supply chain enablers deliver better customer value and shareholder value. Kumar et al. (2015) tested the importance of supply chain management practices on stockholder wealth in a developing country.

Both Cohen and Frazzini (2008) and Li et al. (2015) provide empirical evidence of the relationship between supply chain performance and stock-market performance. In a comprehensive literature review of the relationship between SCM and financial performance, Shi and Yu (2013) affirm the importance of effective supply chain practices on financial performance measures such as revenue growth, operating costs, and working capital efficiency. The presence of a company in the SCM Top 25 lists is a measure of superior performance in the supply chain area. These companies are expected to perform better than their industry counterparts.

**H2.** *Superior performance in the supply chain area results in (a) higher customer satisfaction and (b) financial results.*

**H3.** *Superior performance in the supply chain area results in overall superior performance in the company as measured by the market capitalization of the company.*

One of the areas for future directions for research that Shi and Yu (2013) recommend includes determining the regional differences pertaining to financial performance and SCM practices. There is a stream of research that focuses on the comparison of supply chains in the three main industrial regions of the world: North America, Europe, and Asia-Pacific. Bookbinder and Tan (2003) examined the logistics systems in Europe and Asia and categorized different countries into different logistics tiers or clusters.

**H4.** *The proportion/share of top SCM performing companies in North America, Europe, and Asia is the same as the proportion/share of the companies from these three regions in the Fortune Global 500 list, which identifies the 500 largest companies by revenue in the world.*

Corporate social responsibility (CSR) has become a critical factor for both customers and shareholders judging companies in the supply chain. Davidson et al. (2018) discuss the origins of the formal CSR concept in the academic and business worlds of North America and Europe while exploring the incorporation of CSR (or lack thereof) in Asia's biggest economies: China, Japan, India, and South Korea. Aigbedo (2021) used data from 10 industry sectors in 32 countries to empirically study the impact of financial performance on environmental performance in global supply chain companies.

**H5.** *Supply chain companies in North America do not have statistically different levels of focus on corporate social responsibility as compared to their European and Asian counterparts.*

### 3. Research Methodology

First, we describe the several sources of data that are utilized in this study.

#### 3.1. Gartner Supply Chain Group's Top 25 Data

Gartner Supply Chain (previously, AMR Research) has been publishing its Supply Chain Top 25 lists since 2004, with 2019 marking its 15th edition. In this research, it was decided that it would be ideal to use the data from 2004 to 2019 since fifteen years of data was substantial, and we did not want to mix the data with post-COVID data since the supply chain industry went through significant disruptions during 2020–2023. The methodology and criteria used to determine the Top 25 have evolved over the years. Although any methodology could have pitfalls, the Gartner Top 25 methodology, which uses a combination of well-accepted financial measures as well as expert and peer opinions, is as robust as it can get in practice. Companies in the Top 25 understand the need for demand-driven management as well as to excel in innovation and operations. The rankings in 2019 were developed based on the following criteria and weights ([Gartner 2019](#)):

- Fifty percent of the weight is based on opinions by experts and industry peers, including over 162 senior executives from different supply chain organizations around the world and 38 Gartner experts.
- Forty percent of the weight is attributed to financial metrics that are publicly available.
  - The three financial measures are revenue growth (10%), inventory turns (10%), and return on assets (ROA; 20%).
  - Both revenue growth and ROA are three-year weighted averages with 50%, 30%, and 20% weights assigned to the three previous years. The three-year average, as opposed to annual figures, not only takes care of any peaks and valleys in the revenues but also provides ample time for certain investments to bear fruit.
  - The inventory turns are based on the quarterly-ending inventory as opposed to the annual-ending inventory used in the earlier years of the ranking.
  - The revenue growth, although dependent on many external factors, is a good surrogate measure for the innovation and operational excellence of a company. ROA provides a good measure of the overall productivity of the organization, while inventory turns are a solid supply chain measure that can be easily calculated using publicly available data. It is also a measure to which both finance and operations professionals can easily relate.
- The final 10% of the weight in the ranking methodology is given to an evidence-based corporate social responsibility (CSR) Index from 1 to 10. The CSR component was added only in 2016 to reflect the commitment of the companies to social and environmental causes as expected by customers, investors, employees, and other stakeholders of the organizations.

For more details on the Gartner top 25 methodology, please see [Griswold et al. \(2019\)](#). The rankings of the Gartner SCM Top 25 are modified and used as a surrogate for supply chain effectiveness, as explained in the next section.

Gartner looks at both Fortune Global 500 and Forbes Global 2000 company-lists and gleans out companies that meet the minimum revenue threshold of USD 12 billion. Only the companies in industries such as manufacturing, retail, and distribution sectors are included. Companies in many service industries where supply chain management is not as critical are eliminated from the study, for example, sectors such as banking, utilities, energy, real estate, information technology, etc. The panelists participating in the peer opinions come from many significant industries, with no single industry accounting for more than 25%. The panelists are also spread across the world, coming from each of the three major regions: Americas (38%), Europe–Middle East–Africa (EMEA, 40%) and

Asia-Pacific (APAC, 22%). There is also diversity in terms of the size of the companies, with nearly 20% of the companies having revenues of less than USD 1 billion; on the other hand, 15% of them have revenues between USD 1 billion and USD 50 billion. The remaining 65% of the companies have revenues of over USD 50 billion.

### 3.2. Brand Finance

Brand Finance is an independent London-based firm that has been calculating brand value of companies since 1996 using a proven methodology, with the help of publicly available financial data. The methodology, known as the Royalty Relief Methodology, involves calculating the brand value as a function of three factors: (i) Brand Strength Index (BSI) from zero to 100, which is based on a number of financial and non-financial attributes; (ii) Brand Royalty Rate for the respective sectors based on licensing agreements; and (iii) Brand Revenues, based on actual historical data as well as expert forecasts. The brand value is the current value of the future income attributable to the brand asset. Each year, companies not only receive a rating akin to the credit rating scale from D to AAA but also a dollar amount. For example, in 2019, Amazon had a rating of AAA- with a brand value of USD 188 billion while Apple had a rating of AAA with a brand value of USD 154 billion. For more information, please refer to [Brand Finance Global \(2019\)](#). More than 95% of the companies in the Gartner Supply Chain Top 25 have brand values reported each year by Brand Finance.

### 3.3. American Consumer Satisfaction Index (ACSI)

The ACSI was founded in 1994 at the University of Michigan in conjunction with the American Society for Quality, and it was the first multi-sector customer satisfaction index. The ACSI has made reporting customer satisfaction a science, with the use of customer survey data and its proprietary model. The 0–100 range of the satisfaction index is based on several factors such as customer expectations, perceived quality, perceived value, customer complaints, and customer loyalty. The ACSI conducts over 300,000 interviews annually and produces indexes for about 400 major companies. Since the data are restricted to U.S. companies, about 40% of the companies in the Gartner Supply Chain Top 25 have ACSI ratings. For more information, please refer to [American Customer Satisfaction Index \(2023\)](#).

For each of the years 2012 to 2019, where available, the ACSI scores of all the companies in the SCM Top 25 were tabulated next to the corresponding industry average. For example, the ACSI scores of Coca Cola and Pepsi were compared to the industry average (benchmark) score of the Soft Drinks industry, while the ACSI scores of Proctor and Gamble, Unilever, and Colgate Palmolive were compared to the industry average (benchmark) of the Personal Care and Cleaning Products industry.

### 3.4. Bloomberg Financial Data

The Bloomberg Terminal provides access to a variety of real-time and historical data for publicly traded companies. This was the source for the stock performance, price/earnings (P/E) ratios, and market capitalization data used in this study. These data could have been obtained from many other publicly available sources, but Bloomberg is one of the most widely accepted and reliable sources ([Blackhurst 2014](#)). The author's university has a Bloomberg Financial Lab with access to Bloomberg Terminals, using which the data were downloaded for all the companies in the Gartner Supply Chain Top 25.

Table 1 presents the summary data of companies compiled by the author based on the ranking by the Gartner Supply Chain Group over time. It has some interesting insights. The Gartner data have 25 top companies ranked each year for fifteen years. Five companies have achieved the status of Master (M) supply chains since they made the top five rankings for seven years in a row in the previous decade of rankings. That includes Apple and P&G in 2015, Amazon in 2017, McDonald's in 2018, and Unilever in 2019. For eight years in a row, 2008–2014, Apple was the #1 ranked company on this global list.

**Table 1.** Ranking of supply chain companies by Gartner Supply Chain Group.

[illegible]

Table 1. *Cont.*[illegible]

The researcher in this study created a weighted Top 25 rating for each company by giving 25 points for each appearance as #1 (or as Master), 24 points for appearing at the 2nd spot, and all the way to 1 point for appearing at the 25th spot in the Top 25 rankings. These weighted ratings are shown in the last column in Table 1. This weighted rating is a surrogate measure for supply chain effectiveness. P&G tops the list in this weighted ranking with 349 points, even though Apple had taken the #1 spot or was regarded as Master for 12 of the 15 years. The reason for that is that P&G has been among the top companies in every one of the fifteen years of the Gartner study, while Apple did not feature on the list during the first two years of the study.

Table 2 shows the domination of the US companies in the Top 25 SCM list. Although there was the potential to have over 375 different companies featured in the rankings over 15 years ( $15 \text{ years} \times 25/\text{year} = 375$ ), there are only 66 companies that have shared the honors over this long period of time. Of those companies, 38 (nearly 60%) are from the US, 18 from Europe, 8 from Asia (Japan, China, and South Korea), and 1 each from Australia and Canada. When the number of total spots in the rankings is considered, 276 out of 391 spots of the Gartner Top 25 rankings (about 70%) are taken by US companies. Based on the weighted Top 25 rating, 17 of the top 20 SCM companies are US companies, with Samsung from South Korea and Inditex from Spain being the non-US companies. Nokia is the other non-US company which is in the top 20 because of its success more than a decade back. The US companies have clearly dominated the Top 25 SCM lists; however, the Fortune Global 500 and Forbes 2000 lists, the sources for the initial lists, have only about 30% of the companies from North America. Table 3 depicts the industry sector spread among the Top 25 SCM companies.

**Table 2.** Global spread of the Gartner Top 25 SCM companies.

|               |             | No. of Companies | # of Entries in 15 Years | Weighted Ranking |
|---------------|-------------|------------------|--------------------------|------------------|
| North America | Canada      | 1                | 3                        | 46               |
|               | USA         | 38               | 276                      | 3828             |
| Europe        | Belgium     | 1                | 4                        | 55               |
|               | Denmark     | 1                | 2                        | 21               |
|               | Finland     | 1                | 7                        | 133              |
|               | France      | 1                | 4                        | 46               |
|               | Germany     | 3                | 10                       | 42               |
|               | Ireland     | 1                | 4                        | 47               |
|               | Netherlands | 2                | 2                        | 4                |
|               | Spain       | 1                | 10                       | 162              |
|               | Sweden      | 1                | 8                        | 119              |
|               | Switzerland | 1                | 9                        | 108              |
|               | UK          | 5                | 19                       | 252              |
| Asia-Pacific  | China       | 2                | 6                        | 40               |
|               | Japan       | 4                | 10                       | 128              |
|               | South Korea | 2                | 15                       | 217              |
|               | Australia   | 1                | 2                        | 27               |

**Table 3.** Industry spread of the Gartner Top 25 SCM companies.

| Industry                      | No. of Companies | Companies                                                                                                                                                                                                         |
|-------------------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Technology                    | 17               | Apple, Cisco Systems, Samsung Electronics, Intel, Dell, IBM, Hewlett-Packard, Nokia, Texas Instruments, Lenovo, Qualcomm, Research In Motion (RIM), Microsoft, Seagate Technology, Motorola, Sony Ericsson, Canon |
| Food/Beverage                 | 10               | The Coca-Cola Company, PepsiCo, McDonald's, Nestlé, Starbucks, Anheuser-Busch, Woolworths, Kraft Foods, Royal Ahold, Diageo                                                                                       |
| Retail                        | 10               | Wal-Mart Stores, Tesco, Amazon, BestBuy, Publix Super Markets, Home Depot, Lowe's, Sysco, Marks & Spencer, Alibaba                                                                                                |
| Personal/Healthcare           | 9                | P&G, Johnson and Johnson, Unilever, Colgate-Palmolive, Kimberly-Clark, L'Oreal, GlaxoSmithKline, AstraZeneca, Novo Nordisk                                                                                        |
| Basic Materials and Machinery | 8                | 3M, Caterpillar, Schlumberger, POSCO, Schneider Electric, BASF, AkzoNobel, Cummins                                                                                                                                |
| Automotive                    | 6                | Toyota Motor, Johnson Controls, Ford Motor, Paccar, Nissan Motor, BMW                                                                                                                                             |
| Apparel/Textile               | 4                | Inditex, H&M, Nike, Adidas                                                                                                                                                                                        |
| Aerospace                     | 1                | Lockheed Martin                                                                                                                                                                                                   |
| Entertainment                 | 1                | Walt Disney                                                                                                                                                                                                       |

For all statistical analysis, the data for eight years from 2012 to 2019 were considered. The data pertaining to the Top 25 companies in the eight years of Gartner rankings plus the Master companies account for 216 cases. The Gartner data were broken down into peer opinion, expert opinion, return on assets, inventory turns, revenue growth, the CSR Index, and the composite score, which is a weighted average of these six factors. The CSR Index was introduced only in 2016 and, consequently, the data were available only for four years (2016–2019). The P/E ratio was gleaned for each company for each year based on the Bloomberg data at the end of each year. Similarly, the market capitalization at the end of year was gathered from Bloomberg for each company. The annual American Consumer Satisfaction Index (ACSI) was obtained for companies on the Gartner Top 25 supply chain list and, similarly, the annual brand value for each of these companies was collected from the Brand Finance web site.

### 3.5. Statistical Methodologies Used for Each Hypothesis

**H1.** *The objective financial data can predict supply chain effectiveness better than subjective opinions. For this purpose, multiple regression was conducted with Gartner composite score as the dependent variable and the independent variables being revenue growth, inventory turns, ROA, CSR score, and the opinions of peers and experts.*

**H2a.** *Superior performance in the supply chain area results in higher customer satisfaction. For this purpose, a pairwise t-test of ACSI Means of the SCM Top 25 companies and Industry Benchmark was conducted.*

**H2b.** *Superior performance in the supply chain area results in better financial results. For this purpose, a pairwise t-test of revenue growth and the P/E ratios of the individual companies with their industries/sectors was conducted.*

**H3.** Superior performance in the supply chain area results in overall superior performance in the company. For this purpose, multiple regression was conducted with revenue growth, return on assets, inventory turns, the ACSI, and brand value as independent variables and market capitalization as the dependent variable.

**H4.** The proportion/share of top SCM performing companies in North America, Europe, and Asia is the same as the proportion/share of the companies from these three regions in the Fortune Global 500 list. For this purpose, a chi-square goodness-of-fit test was conducted to test for differences in proportions in the three geographic regions.

**H5.** Supply chain companies in North America do not have statistically different levels of focus on corporate social responsibility as compared to their European and Asian counterparts. For this purpose, one-way ANOVA was conducted with CSR as the dependent variable and the region as the factor.

#### 4. Results and Analysis

H1 hypothesizes that the objective financial data can predict supply chain performance better than the subjective opinion of peers and experts. Multiple regression analysis was conducted with composite score as the dependent variable; the independent variables were the publicly available figures of revenue growth, inventory turns, and ROA; the objectively calculated CSR score; and the opinions of peers and experts. The results of the regression analysis show that peer opinion makes the greatest contribution towards explaining the composite score. Peer opinion and expert opinion together account for an R-square of 0.68, while the model with just the other four objective measures together accounts only for an R-square of 0.44. H1 is rejected. Table 4 (a) and (b) show the results of the regression analysis.

**Table 4.** (a) Regression model with financial metrics and composite supply chain score. (b) Regression model with peer/expert opinion and composite supply chain score.

| (a)                                                      |                    |                  |                         |                                |                            |       |
|----------------------------------------------------------|--------------------|------------------|-------------------------|--------------------------------|----------------------------|-------|
| Model Summary                                            |                    |                  |                         |                                |                            |       |
| Model                                                    | R                  | R Square         | Adjusted R Square       |                                | Std. Error of the Estimate |       |
| 1                                                        | 0.664 <sup>a</sup> | 0.441            | 0.418                   |                                | 0.898845                   |       |
| a. Predictors: (Constant), CSR, ROA, RevGrowth, InvTurns |                    |                  |                         |                                |                            |       |
| b. Dependent Variable: Composite                         |                    |                  |                         |                                |                            |       |
| Coefficients                                             |                    |                  |                         |                                |                            |       |
| Model                                                    |                    | Unstandardized B | Coefficients Std. Error | Standardized Coefficients Beta | t                          | Sig.  |
| 1                                                        | (Constant)         | 1.766            | 0.339                   |                                | 5.204                      | 0.000 |
|                                                          | ROA                | 2.200            | 1.518                   | 0.112                          | 1.449                      | 0.151 |
|                                                          | InvTurns           | 0.023            | 0.004                   | 0.520                          | 6.466                      | 0.000 |
|                                                          | RevGrowth          | 4.142            | 0.902                   | 0.358                          | 4.592                      | 0.000 |
|                                                          | CSR                | 0.153            | 0.034                   | 0.361                          | 4.470                      | 0.000 |

Table 4. Cont.

| (b)                                                   |                    |                  |                         |                                |        |       |
|-------------------------------------------------------|--------------------|------------------|-------------------------|--------------------------------|--------|-------|
| Model Summary                                         |                    |                  |                         |                                |        |       |
| Model                                                 | R                  | R Square         | Adjusted R Square       | Std. Error of the Estimate     |        |       |
| 1                                                     | 0.824 <sup>a</sup> | 0.679            | 0.675                   | 0.671145                       |        |       |
| a. Predictors: (Constant), ExpertOpinion, PeerOpinion |                    |                  |                         |                                |        |       |
| b. Dependent Variable: Composite                      |                    |                  |                         |                                |        |       |
| Coefficients                                          |                    |                  |                         |                                |        |       |
| Model                                                 |                    | Unstandardized B | Coefficients Std. Error | Standardized Coefficients Beta | t      | Sig.  |
| 1                                                     | (Constant)         | 1.859            | 0.104                   |                                | 17.808 | 0.000 |
|                                                       | PeerOpinion        | 0.001            | 0.000                   | 0.488                          | 9.655  | 0.000 |
|                                                       | ExpertOpinion      | 0.003            | 0.000                   | 0.433                          | 8.569  | 0.000 |

<sup>a</sup> Dependent Variable: Composite.

H2a hypothesizes that the companies that excel in supply chain management also experience higher levels of customer satisfaction. The data were obtained from the same database as in the Ellinger et al. (2012) study. However, in that study, the scores of the Top 25 performers were combined for each year and compared to the combined corresponding scores of their industries in that year using *t*-tests for each year. This was repeated for ten years from 2000 to 2009. In the current study, one pairwise *t*-test was conducted for the entire set of available data from 2012 to 2019. Specifically, the ACSI score of each company in the Top 25 in each year was a data point along with its industry's corresponding ACSI score. The ACSI industries and the corresponding companies are shown in Table 5.

Table 5. Top 25 SCM performers (2012 to 2019) and their corresponding ACSI industries.

| ACSI Industry                       | Top 25 SCM Companies                     |
|-------------------------------------|------------------------------------------|
| Athletic Shoes                      | Nike, Adidas                             |
| Automobiles and Light Vehicles      | BMW, Toyota, Ford                        |
| Cellular Telephones                 | Apple, Samsung, Nokia, Lenovo            |
| Department and Discount Stores      | Walmart                                  |
| Food Manufacturing                  | Nestle                                   |
| Health and Personal Care Stores     | Walmart                                  |
| Household Appliances                | Samsung                                  |
| Internet Retail                     | Amazon, Apple, Walmart                   |
| Limited-Service Restaurants         | McDonald's, Starbucks                    |
| Personal Care and Cleaning Products | P&G, Unilever, Colgate-Palmolive, J&J    |
| Personal Computers                  | Apple, HP, Samsung, Lenovo, Amazon, Dell |
| Soft Drinks                         | Pepsi, Coca Cola                         |
| Specialty Retail Stores             | Home Depot                               |
| Supermarkets                        | Walmart                                  |

More than two dozen companies were featured in both the top SCM performers and the ACSI database. The results of the pairwise *t*-test for the entire set of data ( $n = 158$ ) is shown on the left-hand side of Table 6. The *t*-test shows that the ACSI mean of the Top 25 SCM companies (78.94) is less than the mean of the corresponding industry ACSI mean (79.37), but the difference is not statistically significant. Upon closer examination of the data, while the majority of the Top 25 SCM companies outperformed the industry averages (benchmarks), two Top 25 SCM companies were mainly responsible for skewing the results to the negative side: Walmart and McDonald's. McDonald's was rated well below its peers in the industry and finished at the very bottom in the most recent ACSI results. acsimatters.com (2019) reports that McDonald's lags its peers in speed of service as well as

courtesy of service. While the legendary inventory management of McDonald's has helped in the effective management of its supply chain to provide value and standardized products to its customers, the company is yet to address other aspects that the customers are seeking. In the case of Walmart, it is classified under multiple industries including Supermarkets, Department and Discount Stores, Health and Personal Care Stores, and Internet Retail. In the Health and Personal Care sector, Walmart must compete with specialized stores such as CVS and Walgreens, while in the Internet Retail, it still lags the industry leader Amazon and specialty companies such as Apple and Nike. A second pairwise *t*-test was conducted after removing McDonald's and Walmart from the data, and the results are shown on the right side of Table 6. The results of the test ( $n = 130$ ) show that the SCM top performers clearly have higher customer satisfaction than their industry benchmarks, with a statistical significance of  $p = 0.0001$ . H2a was accepted with some caveats.

**Table 6.** Results of paired *t*-tests—Comparison of SCM Top 25 ACSI scores vs. industry benchmark ACSI scores.

| <i>t</i> -Test: Paired Two-Sample for ACSI Means |            |                    | <i>t</i> -Test: Paired Two-Sample for ACSI Means—Without McDonald's and Walmart |            |                    |
|--------------------------------------------------|------------|--------------------|---------------------------------------------------------------------------------|------------|--------------------|
|                                                  | SCM Top 25 | Industry Benchmark |                                                                                 | SCM Top 25 | Industry Benchmark |
| Mean                                             | 78.94      | 79.37              | Mean                                                                            | 80.66      | 79.75              |
| Variance                                         | 23.70      | 6.33               | Variance                                                                        | 10.54      | 6.10               |
| Observations                                     | 158        | 158                | Observations                                                                    | 130        | 130                |
| Pearson Correlation                              | 0.61       |                    | Pearson Correlation                                                             | 0.60       |                    |
| Hypothesized Mean Difference                     | 0.0000     |                    | Hypothesized Mean Difference                                                    | 0.0000     |                    |
| Df                                               | 157        |                    | Df                                                                              | 129        |                    |
| t Stat                                           | −1.3916    |                    | t Stat                                                                          | 3.9512     |                    |
| P (T ≤ t) one-tail                               | 0.0830     |                    | P (T ≤ t) one-tail                                                              | 0.0001     |                    |
| t Critical one-tail                              | 1.6546     |                    | t Critical one-tail                                                             | 1.6568     |                    |
| P (T ≤ t) two-tail                               | 0.1660     |                    | P (T ≤ t) two-tail                                                              | 0.0001     |                    |
| t Critical two-tail                              | 1.9752     |                    | t Critical two-tail                                                             | 1.9785     |                    |

H2b hypothesizes that the companies that excel in supply chain management have better financial results. For each of the Top 25 companies in the 2018 SCM top performers plus the four Master SCM companies ( $n = 29$ ), the data of the revenue growth for that year as well as the year-ending price/earnings (P/E) ratios were compiled. Next, using Bloomberg software (<https://www.bloomberg.com>, accessed on 31 March 2024), the 2018 revenue growth and the P/E ratios for the entire industry/sector of each of the 29 companies were tabulated. A pairwise *t*-test was conducted to compare both the revenue growth and the P/E ratios of the individual companies with the industries/sectors. Table 7 shows the Bloomberg industry/sector for each of the 29 companies. Table 8 shows the results of the *t*-test for revenue growth. It is surprising that the revenue growth in the overall industry/sector is higher than that of the SCM Top 25 companies. The results are statistically significant at the 0.05 level. However, Table 9 shows that the difference in P/E ratios of the SCM Top 25 companies and their industries/sectors is not statistically significant. The big variance is a result of one company, Amazon. A *t*-test with Amazon removed from the data does not yield statistically significant results either.

**Table 7.** Top 25 SCM performers (2018) and their corresponding Bloomberg industry/sector.

| Bloomberg Industry/Sector        | SCM Top 25 Companies                             |
|----------------------------------|--------------------------------------------------|
| Apparel                          | Adidas. H&M. Inditex. Nike                       |
| Automotive                       | BMW                                              |
| Consumer Products                | Diageo                                           |
| Food/Beverage                    | Coca-Cola, Nestle, Pepsi                         |
| Healthcare                       | Johnson & Johnson                                |
| Industrials                      | 3M. Schneider Electric                           |
| Materials/Chemicals              | Akzo Nobel. BASF                                 |
| Personal and Household           | Colgate-Palmolive. Kimberly-Clark, L’Oreal. P&G. |
| Restaurants and Hotels           | McDonald’s. Starbucks                            |
| Retail                           | Amazon, Home Depot, Walmart.                     |
| Technology—Hardware and Software | Apple. Cisco Systems, HP, Intel, Samsung         |

**Table 8.** Results of *t*-tests—Comparison of SCM Top performers’ revenue growth and P/E ratio with Bloomberg industry/sector figures.

|                              | <i>Industry Revenue Annual Growth</i> | <i>SCM Companies’ Annual Growth</i> |
|------------------------------|---------------------------------------|-------------------------------------|
| Mean                         | 0.076                                 | 0.042                               |
| Variance                     | 0.002                                 | 0.009                               |
| Observations                 | 29                                    | 29                                  |
| Pearson Correlation          | 0.450                                 |                                     |
| Hypothesized Mean Difference | 0                                     |                                     |
| df                           | 28                                    |                                     |
| t Stat                       | 2.110                                 |                                     |
| P (T ≤ t) one-tail           | 0.022                                 |                                     |
| t Critical one-tail          | 1.701                                 |                                     |
| <b>P (T ≤ t) two-tail</b>    | <b>0.044</b>                          |                                     |
| t Critical two-tail          | 2.048                                 |                                     |

H3 hypothesizes that superior performance in the supply chain area results in overall superior performance in the company. Balanced scorecard has been one of the most popular tools in practice to evaluate company performance (for example, [Camilleri 2021](#); [Hegazy et al. 2020](#); [Nazari-Shirkouhi et al. 2020](#)). It looks at meeting the company’s strategic objectives with the help of a balanced focus on financial performance, customer satisfaction, internal process efficiency, and innovation/learning.

For this study, market capitalization was used as a measure of overall company performance, which was hypothesized to depend upon five independent variables: revenue growth, return on assets, inventory turns, the ACSI, and brand value. Revenue growth was the surrogate for financial performance; return on assets and inventory turns for internal process efficiency; and the ACSI for customer satisfaction. The revenue growth, inventory turns, and ROA are publicly available data that are also used in the Gartner supply chain study. In addition, the brand value obtained from Brand Finance was used as a catch-all metric since it was calculated utilizing brand royalty, revenue forecasts, and qualitative measures.

**Table 9.** Results of *t*-tests—Comparison of SCM Top performers’ revenue growth and P/E ratio with Bloomberg industry/sector figures.

|                              | <i>Industry P/E</i> | <i>SCM Companies’ P/E</i> |
|------------------------------|---------------------|---------------------------|
| Mean                         | 22.57               | 26.67                     |
| Variance                     | 31.64               | 949.52                    |
| Observations                 | 29                  | 29                        |
| Pearson Correlation          | −0.145              |                           |
| Hypothesized Mean Difference | 0                   |                           |
| df                           | 28                  |                           |
| t Stat                       | −0.69               |                           |
| P (T ≤ t) one-tail           | 0.25                |                           |
| t Critical one-tail          | 1.70                |                           |
| P (T ≤ t) two-tail           | 0.50                |                           |
| t Critical two-tail          | 2.05                |                           |

A multiple linear regression analysis using SPSS was conducted. The results of the regression models are shown in Table 10. The model is significant with an R-square of 0.587. The brand value is the independent variable that makes the strongest contribution (Beta = 0.715) to explaining the dependent variable, market capitalization. The typical supply chain or internal process efficiency surrogates, ROA and inventory turns, are either statistically not significant or make insignificant contributions in the model. Revenue growth and customer satisfaction index have statistically significant impact. It is clear that the surrogate measures for financial performance and customer satisfaction have a higher impact than internal process or supply chain performance on the overall company performance. The data were further analyzed to ascertain that there was no multicollinearity, but the scatter plot showed that there were a few outliers in the market capitalization. After the data were sieved through, the two companies that were outliers for market capitalization were Amazon and Apple. The same model was rerun after removing these two companies from the analysis. The results are shown in Table 11. The model is weak, with R-square dropping to 0.138, and the only variable that is significant is brand value, with Beta being only 0.315. The typical supply chain metrics of inventory turns and ROA did not have any impact on the market capitalization of the successful supply chain companies.

H4 proposes that the proportion of top SCM performing companies in North America, Europe, and Asia is the same as the proportion of the companies from these regions in the Fortune Global 500 list. The percentages of North American, European, and Asian companies in the Fortune Global 500 list are 30%, 28%, and 42%, respectively. A chi-square goodness-of-fit test was run to test this hypothesis, and the results are shown in Table 12. The results indicate that there is significant difference in the proportion of companies represented on the SCM top performers as compared to the proportion of companies represented in the Fortune Global 500 list,  $\chi^2 (2, 216) = 159.29, p = 0.000$ . It is obvious that the North American (specifically, US) companies dominate this list. H4 is rejected.

H5 hypothesizes that supply chain companies in North America, Europe, and Asia do not have statistically different levels of focus on corporate social responsibility. The descriptive statistics showed that the companies in Europe had higher CSR scores than their North American counterparts and the Asian companies had the lowest CSR scores. A one-way ANOVA was run with CSR as the dependent variable and the region as the factor. The post hoc Tukey test results with multiple comparisons of the three regions are shown in Table 13. It is very clear that the CSR focus of European companies is statistically superior to that of North American and Asian companies, but the difference between North American and Asian companies is not significant. H5 is rejected. The results of the ANOVA test are shown in Table 13.



**Table 12.** Chi-square goodness-of-fit test results for country of origin.

| Chi-Square Test: Country_Region |                      |            |          |
|---------------------------------|----------------------|------------|----------|
|                                 | Observed N           | Expected N | Residual |
| North America                   | 143                  | 64.8       | 78.2     |
| Europe                          | 59                   | 60.5       | −1.5     |
| Asia Pacific                    | 14                   | 90.7       | −76.7    |
| Total                           | 216                  |            |          |
| Test Statistic                  |                      |            |          |
|                                 | Country_Region       |            |          |
| Chi-Square                      | 159.288 <sup>a</sup> |            |          |
| df                              | 2                    |            |          |
| Asymp. Sig.                     | 0.000                |            |          |

<sup>a</sup> 0 cells (0.0%) have expected frequencies less than 5.

**Table 13.** ANOVA test results on CSR focus in North America, Europe, and Asia–Pacific.

| Multiple Comparisons                 |                    |                         |            |       |                                     |                                     |
|--------------------------------------|--------------------|-------------------------|------------|-------|-------------------------------------|-------------------------------------|
| Dependent Variable: CSR<br>Tukey HSD |                    |                         |            |       |                                     |                                     |
| (I) Country_Region                   | (J) Country_Region | Mean Difference (I – J) | Std. Error | Sig.  | 95% Confidence Interval Lower Bound | 95% Confidence Interval Upper Bound |
| North America                        | Europe             | −2.7866 *               | 0.4930     | 0.000 | −3.960                              | −1.613                              |
|                                      | Asia Pacific       | 1.2372                  | 1.0246     | 0.452 | −1.202                              | 3.676                               |
| Europe                               | North America      | 2.7866 *                | 0.4930     | 0.000 | 1.613                               | 3.960                               |
|                                      | Asia Pacific       | 4.0238 *                | 1.0372     | 0.001 | 1.555                               | 6.493                               |
| Asia Pacific                         | North America      | −1.2372                 | 1.0246     | 0.452 | −3.676                              | 1.202                               |
|                                      | Europe             | −4.0238 *               | 1.0372     | 0.001 | −6.493                              | −1.555                              |

\*. The mean difference is significant at the 0.05 level.

#### Summary results of the hypothesis testing:

|     |                                                                                                                                                                                                       |                       |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| H1  | The objective financial data can predict supply chain effectiveness better than subjective opinions.                                                                                                  | Rejected              |
| H2a | Superior performance in the supply chain area results in higher Customer satisfaction.                                                                                                                | Accepted with caveats |
| H2b | Superior performance in the supply chain area results in higher financial results.                                                                                                                    | Rejected              |
| H3  | Superior performance in the supply chain area results in overall superior performance in the company.                                                                                                 | Rejected              |
| H4  | The proportion/share of top SCM performing companies in North America, Europe, and Asia is the same as the proportion/share of the companies from these three regions in the Fortune Global 500 list. | Rejected              |
| H5  | Supply chain companies in North America do not have statistically different levels of focus on corporate social responsibility as compared to their European and Asian counterparts.                  | Rejected              |

## 5. Discussion and Practical Implications

The examination of the impact of supply chain effectiveness on financial performance in business is the “holy grail” in both research and practice. The studies in the literature

which showed a positive impact of supply chain performance on financial performance were based on survey data where the financial performance was self-reported on a Likert scale (e.g., [Aćimović et al. 2022](#); [Agus 2013](#)). There have been qualitative studies about supply chain effectiveness (e.g., [Bambrick et al. 2023](#)). However, in a systematic review on performance measurement of supply chains from a financial perspective, [Rahiminezhad Galanakashi and Mokhatab \(2022\)](#) report that supply chain managers still prefer to consider financial metrics in their performance assessment process. The metrics that they found to be most common include ROA, ROI, sales, inventory turnover, profit margin, revenue growth, and cash-to-cash cycle. The Gartner study, that is the basis for this research, uses ROA, inventory turnover, and revenue growth.

The Gartner study currently utilizes financial data from the annual reports as well as opinions by experts and peers in compiling the composite scores that determine the annual rankings of highly effective supply chain companies. In this current study, it was observed that the peer and expert opinions explain the majority of the variation in the composite score and the publicly available financial data may not be sufficient to understand the impact of the effective supply chain companies.

The most surprising result was that the revenue growth in the leading supply chain companies lagged that of the average industry/sector. The P/E ratios of the leading supply chain companies were higher than their industry averages, but the results were not statistically significant. This shows that the leading supply chain companies are a combination of high-technology and -growth companies (Amazon, Apple, etc.) as well as stable companies (P&G, Unilever, etc.) It may be important to explore if there are mediating and/or moderating variables such as technology deployment, the maturity of the industry, risk management strategies, and the age of the company to better explain the impact of supply chain effectiveness on organizational performance.

It is very clear that the US companies are doing significantly better than their European and Asian counterparts in supply chain effectiveness. The automotive and aerospace companies, that form the backbone of several economies and supply chains, need to benchmark with companies in the technology, personal/healthcare, and food/beverage industries to bolster their supply chain effectiveness. Supply chain benchmarking research has focused mainly at the intra-company—rather than inter-company—level ([Peng Wong and Yew Wong 2008](#); [Simatupang and Sridharan 2004](#); [Soni and Kodali 2010](#)). The Gartner lists and this article help in the pursuit of benchmarking at the intra-company level. The SCOR (2017) model by the professional society ASCM provides a good framework for companies to benchmark with leading supply chain companies. The Gartner research is useful in identifying the top supply chain companies. The metrics used to identify the leading supply chain companies by Gartner are more financial in nature whereas the SCOR model can be used for benchmarking specific improvements at the firm/industry/global supply chain level (e.g., [Kottala and Herbert 2019](#); [Lockamy and McCormack 2004](#); [Lu et al. 2016](#)).

The results in this study showed that European companies are scoring significantly higher on corporate social responsibility compared to North American companies and especially Asian companies. This is in line with the observations by [Oberoi \(2018\)](#) that the European Commission's change in CSR guidelines in 2011 shifted the focus from a more voluntary approach of companies into a more aligned and embedded program. It is imperative for companies from other parts of the industrial world, especially Asia, to benchmark with these guidelines to improve their CSR activities. [Lines \(2004\)](#) has shown from a survey result that Asian executives care more about the immediate stakeholders (customers and shareholders) and very little about CSR. [Ferguson \(2011\)](#) cite several studies that have identified the general lack of progress in CSR activities in Asian companies in comparison with EU and US companies. Even among the Gartner Top 25 lists, the two companies that stood out for their focus on sustainability and ethics were the two European apparel industry giants—Inditex and H&M. It is important for companies around the world to benchmark with their European counterparts.

This study showed that the leading supply chain companies have higher customer satisfaction compared to their counterparts in the industry. There were two exceptions of companies that have extremely robust supply chain management—McDonald's and Walmart. The example of McDonald's shows that in the fast-food industry, the speed of service and courtesy of service are more critical. The company excels in its supplier management, supplier network configuration, inventory management, and other supply chain aspects, but they are all in vain if the customers are not satisfied. In the case of Walmart, it is renowned for its distribution channel, logistics, and supplier management. However, the one-stop shopping advantage of Walmart has resulted in poor customer satisfaction since the shoe and apparel department of the discount retailer is compared to specialty retailers such as Nike, while its health and beauty department is compared with specialty stores like Walgreens. The company needs to focus on product selection and customer satisfaction in each major department in addition to the overall supply chain management.

Gartner Supply Chain Group's Top 25 annual lists have played a key role for over a decade in identifying the leading supply chain companies in the world. Their methodology considers the companies' innovation excellence and operational excellence which together are supposed to lead to overall superior performance of the companies. These companies are a good source for other companies to benchmark their best practices. Here are some examples.

Apple and P&G have led in the overall rankings. While Apple is the upstart rejuvenated company with high-tech and glamorous i-products of the last decade, P&G is a nearly 200-year old consumer products giant. One of the other perennial companies in the Top 25 is the world's biggest retailer, Walmart. Walmart has one of the most complex and efficient supply chains in the world. With thousands of retail stores and hundreds of distribution centers in over two dozen countries, with its own transportation logistics, and with thousands of suppliers spread across the world, Walmart manages to provide "Everyday Low Prices" to its customer mainly through the effective management of its supply chain. Johnson and Johnson is the healthcare products and pharmaceutical company that has found a place in the Top 25 each year. The other two companies which have done consistently well and have been ranked in the Top 25 are the pop rivals Coca-Cola and Pepsi. Two companies that have finished strongly in the recent past are McDonald's and Amazon. McDonald's has been known for placing quality, service, cleanliness, and value as its corner stones to serve billions of customers while expecting a stringent 99.8% order delivery rate from its suppliers. Amazon has been scaling great heights each year and has finished at the top of the global Top 25 in recent years. Its diverse accomplishments are in the areas of retail, new products, IT (cloud services), and same-day delivery!

The high-tech companies, headed by Apple, have been at the forefront of supply chain management. In fact, the top spot in the list has gone to a technology company in twelve of the fifteen years. The initial two years (2004 and 2005), it was Dell at the helm, followed by Nokia (2006), after which Apple was at the top for nearly a decade until it graduated to be a Master SCM company. In 2015, the top spot went to Amazon, which is technically a retailer but is known for its innovation in technology. The food and beverage industry stalwarts such as Coca-Cola, Pepsi, and McDonald's are also at the top. In the retail sector, Walmart leads the pack as expected. Walmart is trying to match its unexpected rival Amazon in innovation and e-commerce, while wrestling with all the issues of being the largest employer in the U.S. In the personal/healthcare industry, several of the companies that make products that are household names are featured; they include P&G, J&J, Unilever, and Colgate-Palmolive. In the automotive industry, having Toyota at the top is expected, but none of the German big three had made it to the Top 25 until BMW found a place at the bottom of the list in 2016. Toyota's lean and supply chain management practices continue to be the hallmarks for excellence in the auto industry. In the aerospace industry, Boeing and Airbus have had a lost decade when it comes to product introduction and supply chain management. Neither of them has found a place in the Top 25 while their

rival Lockheed Martin made it to the Top 25 a few times. The apparel industry entrants in the Top 25 include two European companies—Inditex (known for the Zara brand) from Spain and H&M from Sweden. Entertainment giant Walt Disney has also found a place in the Top 25 a couple of times.

## 6. Research Limitations and Future Research

This article is an attempt to explore the landscape of the leading SCM companies in the world and the impact of supply chain competency on the overall effectiveness of the company. The Gartner SCM Top 25 methodology provides a good benchmark for companies around the world.

However, the companies in this methodology are from different parts of the world and from disparate industries such as automobile manufacturing, beverages, and high-tech. This presents an issue for generalizability. The focus of companies in different industries and geographies may vary and comparing them could be like comparing apples and oranges. More in-depth studies need to be conducted at the country and regional levels as well as at the industry/sector level to see if there are patterns that emerge. We can also use the international business theory to investigate the differences in countries and regions. There is a need to identify specific strengths in different industries and regions of the world that can be more useful sources of benchmarking for companies in those regions and industries.

Supply chain effectiveness and overall success are both multi-dimensional concepts and we have investigated the dimensions that are used in one popular source in practice (Griswold et al. 2019), and certain sources in the literature (Ellinger et al. 2012). Future research can explore the effect of other supply chain dimensions on different aspects of company success.

This study was restricted to the companies in the Gartner study. Half of the data in the study were objective data that are publicly available. Future studies could increase the sample size of the companies by gleaning the publicly available data for a large number of companies from different geographical regions and industries. A future research project can also substitute the expert opinion part of the Gartner study with a carefully planned Delphi approach of supply chain experts and focus on specific geographical regions and industries.

It is well established that balanced scorecard is a useful strategic tool but there needs to be more research to determine which supply chain metrics and key performance indicators are responsible for overall organizational effectiveness. Primary research by way of surveying leading companies could provide more in-depth data for analysis. Qualitative research methods can also provide more in-depth information about the supply chain and CSR practices in the companies. Interviews by researchers or the development of comprehensive case studies will provide more useful information that would be of assistance to companies that are in a quest to improve their supply chains as well as their overall organizational effectiveness.

## 7. Conclusions

The main contribution of this article was to theoretically and statistically test the popular methodologies used in practice to identify the impact of the resources employed by supply chains on the overall success of companies. A measure was developed to identify the supply chain effectiveness of individual companies identified in the widely used Gartner rankings. This research demonstrated that key supply chain performance indicators such as inventory turns, revenue growth, and return on assets are not able to explain the difference in organizational success as strongly as peer and expert opinions are able to. Supply chain effectiveness can result in higher customer satisfaction but not necessarily better financial outcomes. There may be a need for supply chain managers to identify performance indicators that are able to better assure organizational success. Companies in Asia and Europe need to benchmark their supply chains with their counterparts in North America, while the companies in North America and especially Asia need to benchmark

their formal corporate social responsibility efforts and effectiveness with companies in Europe. The hope of this research is to stimulate in-depth case studies and empirical research that shed more light on the relationship between supply chain effectiveness and overall organizational success.

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