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The relationship between supply chain management and financial performance: Supported by Dell and HP analysis as evidence

Nafisah Yami[1], Maha Shehadeh[2], Hashem Alshurafat[3*], Suhaib B. Bani Kinana[4]

[1]*King Saud University, Saudi Arabia.*
[2]*Department of Financial Technology, Al-Ahliyya Amman University, Amman, Jordan.*
[3,4]*Accounting Department, Business School, the Hashemite University, Jordan.*

Corresponding author: Hashem Alshurafat (*Email: hashema@hu.edu.jo*)

Abstract

Supply chain management (SCM) makes firms intensively link their operations by building strong relationships with their customers and suppliers. This link can be established through investing in IT services, supplier relations, customer services, and other aspects related to the effective management of their activities or processes. By doing so, firms can increase their profitability while reducing their costs and waste. The purpose of this study is to identify how SCM can influence a firm's performance and how its theories apply to the real world. Therefore, this study examines the relationship between SCM and the firm's performance, analyzing Dell and HP financial reports and SCM strategies to support the results. For data collection, all the related information was gathered through Thomson One, Bloomberg, and BBC News. To analyze this data, DuPont analysis and the Business Model Canvas have been used. The findings of this study were as follows: a direct relationship between SCM and return on assets (ROI) and profit margin, and an indirect relationship with return on investment and market share.

Keywords: Business Model Canvas, DuPont analysis, Financial performance, Supply chain management.

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1. Introduction

Numerous firms are continuously investing in the supply chain in order to increase their sales and profits accordingly. Some of these firms are personal computer (PC) manufacturing firms, which have faced considerable changes in demand due to the increase in mobile devices, shortened product life cycles, and the reduction of desktop prices [1]. However, some of these firms are able to compete successfully, such as Dell and HP, by adapting to the changes that occur in their market.

More importantly, Dell has focused on customer aspects since it started in 1984, a strategy called "build to order." This strategy enables Dell to achieve higher profits and lower inventory levels than its competitors [2, 3]. In contrast, HP focuses on the innovation of its products, attempting to meet different customers' desires. In addition, it has acquired many IT firms since 2006, which is considered vertical integration, in order to develop its services, reinforcing the connection with its suppliers [4-7]. All these aspects that Dell and HP are focusing on are parts of the supply chain. Because of their higher position in the market, it would be useful to connect these aspects or strategies to their financial performance, observing how their outcomes change in relation to their plans.

Due to the different interpretations and definitions of the SCM concept by various disciplines, it is significant to view and present a clear insight into them. In addition, as Storey, et al. [8] noted, there is a lack of connection between SCM and its theories. Furthermore, there is a disconnect between SCM and financial performance in different industries, except for the automotive industry, indicating a need to conduct a related study. Therefore, by studying the performance of Dell and HP, this study will contribute to other computer industry studies regarding SCM.

This study aims to examine the relationship between SCM and a firm's financial performance, choosing Dell and HP as evidence to support its results. Regarding objectives, this study will have three: first, to understand how SCM might influence the firm's outcomes; second, to explain the relationship between SCM and a firm's profitability; and third, to observe the connection between SCM and a firm's shareholder wealth. The second and third objectives will be clarified by using DuPont analysis.

2. Literature Review

Since the emergence of SCM, there have been many researchers connecting it to a firm's strategies and how they exploit it in order to achieve their objectives. Some of them relate to increasing a firm's profitability and efficiencies. This chapter depicts the relationship between SCM and financial performance in terms of inventory management, supplier management, customer management, IT services management, and research and development management (R&D). Considering SCM as a strategy, the Business Model Canvas (BMC) will explain all the important aspects that relate to SCM. In order to link SCM strategies, which BMC explains, and financial performance, researchers use DuPont analysis; this measurement will also be presented to give insight into its usefulness. This chapter will conclude with details of other related research on this subject.

Due to SCM's importance in managing the operation activities of firms, many managers seek to understand its strategies in order to achieve their firm's objectives. Its importance has been increasing over the years owing to changes in market conditions. Naslund and Williamson [9] clearly proved that by conducting a survey that involved executives attempting to ask about the importance of SCM. Results showed 89% of respondents confirmed it, and 51% of those executives have invested in SCM. Therefore, the interest in SCM has been increasing due to two main reasons. One is that companies nowadays are working in a highly competitive economy, and performance is not merely measured or considered for those companies. Still, it would extend further to measure all the supply chains that those companies are dealing with. The second reason is considering the benefit of managing the whole supply chain, which could reap rewards through the increase of return on investment (ROI), return on assets (ROA) profitability, decreasing costs, number of products in stock, and time load [9-11].

Mentzer [11] explained that market information might be considered as alerts that indicate changing strategies should be made, which could be to decrease investment in certain products or the need for innovation, enabling firms to adapt to external changes. Agus [12] highlighted the importance of having a deep understanding of SCM strategies, which would possibly reflect in improving the bottom-line performance, such as enhancing the quality of raw materials. However, Wagner, et al. [13] concluded that a supply chain strategy should fit with a firm's operation activities in order to have a positive return on its assets. Otherwise, the costs would have been considerable. The previous writer studied 259 firms from different countries, highlighting the importance of understanding the product characteristics and the demand changes. From this factor, a firm would know which strategy might be a good fit with their operations. Tony [14] noted that there are two important strategies related to SCM: one is related to inside activities of the firms and how they would change plans for their product or processes, and another is related to outside the firm's boundaries, which might be managing suppliers and distributor activities.

However, Coppola and Torre [15] emphasized that managing inventory requires several elements that might highly achieve the objectives, such as building a strong relationship with firms' suppliers and customers; doing so could make all parties win rather than merely one side. For instance, Ross [16] mentioned that if suppliers know accurately what the requirement is of the firms, they will work based on that information, which would ensure the accurate time of delivery, and reduce overproduction. Besides building relationships with both suppliers and customers, De Treville, et al. [17] stated that estimation of sales or forecasting by observing monthly customer orders might assist the firms in configuring their inventories, which would also decrease their time load of products. For instance, Dell schedules the demand rate, sending it regularly within two weeks, which gives suppliers an indication of what demand they should work on [18]. As a result of managing inventory, the working capital improves, giving the companies a competitive advantage in respect of delivering at the right time with lower cost [11, 18] and also increasing their market share [10].

3. Methodology

3.1. Methodology and Data Analysis of This Study

This study will focus on analyzing firms' financial figures in their annual reports, which indicate the path of the quantitative approach. This approach is connected to the deductive paradigm, which concentrates on a theory and attempts

to understand its application in the real world. In this analysis, the transaction cost theory will be used, explaining how firms change their decisions or strategies to reduce their costs.

Regarding the qualitative approach, the researcher will not conduct interviews or distribute questionnaires due to the time constraint of this study and the numerous obstacles that faced previous researchers. Such obstacles might result in not having the right address for a certain department or person that would go back to information not being updated frequently. In addition, another obstacle that could result from distributing questionnaires is delays in response, which would require the researcher to repeatedly call those respondents in order to gather the information. These obstacles existed in Georgise, et al. [19] and Johnson, et al. [20] studies.

Therefore, to avoid these obstacles on a short timescale, one would rely on secondary data, which is available through database systems such as Thomson One and Bloomberg. This will also be supported by complementary information from the firm's websites or the BBC News website.

3.2. Analysis

The structure of analysing the relationship between SCM and financial performance will be as follows:

1- Background information about both firms, focusing on the activities that occurred between 2003 and 2012. The activities after 2012 will not be included due to the difficulties in finding Dell's financial reports in Thomson One and Bloomberg. This will be amended to reflect changes in Dell's structure, transitioning from a public firm to a private one.

2- The final discussion will compare the results of ROA and ROI, which are calculated in step 5, with their activities and strategies in steps 1 and 3. Following this, there will be a discussion of the market share, share price, and dividend of both firms, ending with a reflection on the general discussion of the transaction cost theory.

4. Results

Before comparing Dell and HP figures with their strategies, this analysis reviews their performance in their industry. Figure 1 shows this comparison:

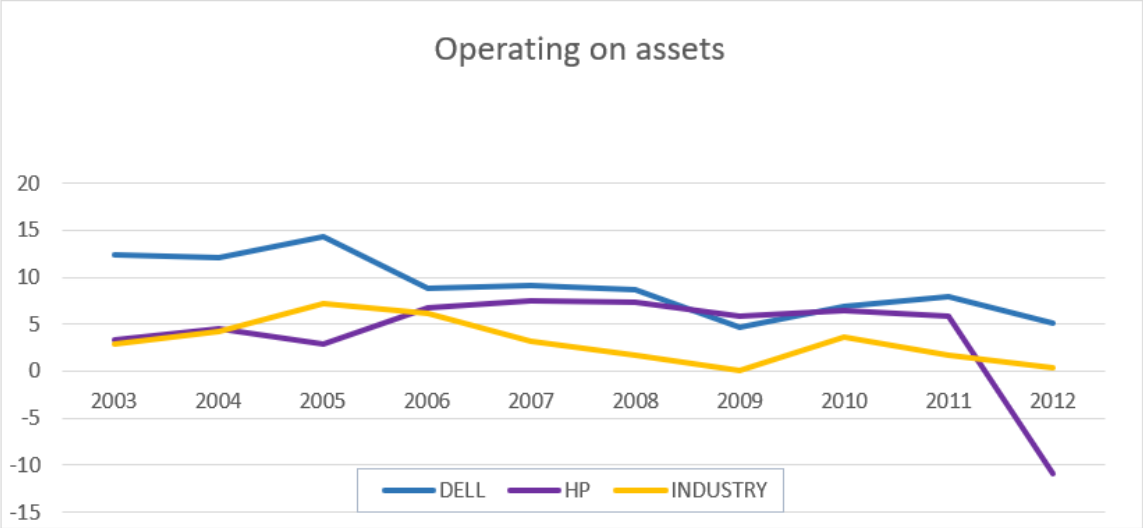

Figure 1.
ROA comparison between Dell and HP in the same industry.

The chart shows that Dell consistently outperformed its industry over the ten years studied, reflecting its leadership. However, Dell's ROA decreased by 7.26% from 2003 to 2012. In contrast, HP outperformed the industry for the first two years but declined by 4.38% in 2005. HP's performance rebounded in 2006 to 6.79% but sharply declined to negative 10.94% by 2011, possibly due to restructuring and asset impairment noted in its 2012 annual report. In terms of ROI, the industry outperformed both companies, except in 2008, 2010, and 2011, when HP exceeded the industry by 0.77%, 1.54%, and 4.2%, respectively. The next section will explore the main drivers behind these changes in ROA and ROI for both companies, along with a comparison of their strategies and activities. The analysis will cover ROA and ROI and conclude with market share, stock prices, and dividends.

4.1. ROA Analysis for Both Firms

Dell's performance was higher for all ten studied years compared to HP's. However, Dell's ROA decreased throughout the years. ROA was 12.45 per cent in 2003, dropping to 5.19 per cent in 2012. On the other hand, as mentioned, HP's performance was lower than Dell's, but the general performance improved from 2003 to 2012 by 3.33 to 5.88 per cent, respectively.

4.2. Dell ROA

The analysis of Dell's performance over ten years (2003–2012) is divided into three periods. From 2003 to 2005, Dell achieved its highest ROA, driven by increased sales ($41,444M to $55,908M) and net income ($2,460M to $3,339M), reflecting innovations such as printers and the success of partnerships in China. Improved asset turnover (2.1% to 2.4%) and efficient working capital management highlighted Dell's just-in-time approach, avoiding waste and overproduction.

In 2006, ROA dropped 61% due to a profit margin decline from 5.97% to 4%, attributed to a $440M battery recall tied to defective Sony products. To rebuild customer trust, Dell launched a blog, used Twitter for feedback, and partnered with retailers like Wal-Mart. These strategies boosted 2007 sales by $3,713M and net income by $251M. However, the 2008 financial crisis caused sales and net income to drop, though Dell's geographic expansion led to non-US sales rising to 47% by 2009.

Increased IT investment and workforce reductions helped improve ROA to 7.92% by 2011. Cost reductions lowered the cost of sales from 95% to 92%, though asset turnover declined due to inventory mismanagement linked to store placements. By 2012, declining PC demand and operational challenges caused ROA to drop by 2.73%. Dell faced competition from mobile devices and shipping difficulties due to natural disasters. This concludes Dell's ten-year ROA analysis; HP's analysis follows next.

4.3. HP ROA

HP's ROA was lower than Dell's, except in 2009. From 2003 to 2005, HP's ROA initially increased by 1.24% due to a 9.3% sales rise and a 41.6% increase in net income, driven by improved printer quality and reduced waste. However, in 2005, despite an 8.4% sales increase, ROA dropped by 1.73% due to a sharp decline in net income ($3,419M to $2,148M) caused by selling older inkjet printers at reduced prices as customers preferred newer LaserJet models.

Between 2006 and 2009, ROA rose in 2006 and 2007 (3.95% and 0.77%), with significant sales and net income growth due to innovations like touch PCs and acquisitions of software firms. However, the financial crisis in 2008–2009 caused ROA to fall (7.56% to 5.82%), impacted by decreased asset turnover and extended receivable days due to customer payment difficulties.

In 2010, ROA recovered, rising 0.65% from increased sales and net income ($11,614M and $1,374M), supported by HP's acquisition of Palm and other software firms. However, natural disasters and restructuring in 2011–2012 led to a decline, with ROA at 5.88% in 2011 and -10.94% in 2012.

The changes in ROA for both HP and Dell highlight the influence of profit margin, asset turnover, and strategic decisions such as innovation, inventory management, and acquisitions, underscoring their link to SCM. ROI will be discussed next.

4.3. ROI analysis

The DuPont analysis divides ROI into five elements. These elements will be calculated according to the following equation:

ROA- borrowing cost= spread * leverage = operating spread

ROI= ROA + operating spread

In this section, the researcher will explain whether the ROI increases with changes in SCM as ROA or not. First, Dell and then HP will be discussed.

4.4. Dell ROI

As for the positive ROI in 2003, 2011, and 2012, all the figures were lower than ROA. By observing the percentage of leverage that Dell had, it indicated that in those three years, the percentage was lower than in other years. Additionally, the amount of net financing assets would support this answer in the balance sheet; in those mentioned three years, the net financing assets were between $2,000 million and $5,000 million, while they were higher for other years by about $3,000 million. This amount of leverage affected the result of ROI, and it did not follow the changes in Dell's strategies as ROA did.

4.5. HP ROI

From 2003–2007, ROI was lower than ROA due to negative net financing assets. ROI equals ROA when no leverage is used, is lower with negative financing assets, and becomes higher with debt due to tax savings and increased dividends [21]. In 2008, 2010, and 2011, higher debt levels ($17,852M, $21,635M, and $30,091M) caused ROI to surpass ROA by 0.47%, 0.84%, and 2.12%, respectively.

In 2009, ROI fell below ROA due to negative leverage caused by high borrowing costs during the financial crisis, reducing ROI by 0.88%. Similarly, in 2012, negative ROA from restructuring led to a lower ROI.

While ROI is influenced by leverage and borrowing costs, its impact on SCM is less direct than ROA. The next section discusses market share, share price, and dividends.

4.6. Dell case

The market capitalization of Dell increased from 2003 to 2004 by 17,865 million shares and reached 104,717 million shares, decreasing gradually after 2004 until the end of 2012. This decrease was about 87,094 shares, which might reflect the reduction of PC prices, moving towards high-touch devices and notebooks. As for the share price, Figure 2 illustrates the changes from 2003 to 2012.

Figure 2.
Illustration of the share price of Dell from 2003 to 2012
Source: Bloomberg.

In Figure 2, the increase in share price at the beginning of the studied years can be seen, but there was a sharp decrease in 2006, as indicated by the yellow down arrow. This result would explain the effect of recalling Dell batteries from the market. Another severe decrease occurred between 2008 and 2009, as shown in the above chart by a red rectangle, which might be related to the financial crisis. Regarding dividends, Dell was not paying any dividends to its shareholders for all the ten studies years except in 2012, when there was a payment of 1.17 per cent. Dell's strategy was reinvesting and repurchasing stock, taking advantage of the benefit of receiving cash in advance.

4.7. HP Case

The market capitalization of HP gradually increased from 2003 to 2009, rising from 69,897 million to 121,821 million shares. This might be the result of successful innovative products that HP produced and the acquisition of many IT firms. However, by decreasing PC prices, the market share decreased after 2009, reaching 27,970 million shares in 2012. As for the share price, Figure 3 provides a picture of the changes during the studied period.

Figure 3.
Illustration of the share price of HP from 2003 to 2012.
Source: Bloomberg.

In Figure 3, the HP share price increased gradually until it reached its peak in 2007 and at the beginning of 2008. After that, the share price started to fluctuate, dropping at the end of 2008 and in 2009 due to the tough economic conditions during that period, which is illustrated by a red rectangle. After 2009, there was a recovery trend until the end of 2011, when there was a decline from $42 in 2010, reaching $26 and $13 in the two following years. According to HP's 2011 and 2012 annual reports, this decrease might be the result of considerable logistics costs due to shipping printers to Japan, which was affected by an earthquake [22]. In addition, there was an overpayment for the acquisition of Autonomy by HP in 2012. As for dividends, HP continuously paid dividends to its shareholders, paying less than 1 percent from 2003 to 2005, decreasing it to less than 1 percent for the following five years. It returned to an increase in 2011 and 2012 by 0.74 percent and 2.14 percent, respectively.

From Dell and HP's market share and dividends analysis, it appeared there is no direct relationship with SCM. However, the share price of both firms might partly have a relationship with SCM because the disruption that occurred to

the supply chain, such as the recall of products and incurring extra costs of logistics, might affect the firms' share prices, as can be seen in respect of recalling products in 2006 for Dell and incurring disruption costs for HP in 2011. In the next section, transaction cost theory will be discussed in relation to SCM for both firms.

Regarding Dell's costs, total costs were lower in the three early years at about 91 percent. In those three years, Dell's strategy, which was to build to order, was prominent in the market. Creating a unique website would be considered a rational decision at that time, eliminating other costs related to warehousing or distributors and keeping it in the top position with better performance. However, these costs rose by 94 percent between 2006 and 2009; this might have resulted from placing some products in other retailers' stores. This decision would be considered to be under the opportunistic theory, which Dell at that time decided to follow in order to increase sales. As Vickery, et al. [23] explained, this decision would involve managers' manipulation, such as cheating; this could be the result of the poor quality of Dell batteries that were produced by Sony Corporation [24]. Such an error would be deemed the risk of transaction that is related to the uncertainty of the third party, which cost Dell more than $440 million in order to maintain its position and its customers' satisfaction.

This action made Dell create a blog and enhance its relationship with customers. According to the Dell website [25], there was intense competition for IT services from numerous firms attempting to develop their devices' capacity and solve their problems. The first step for Dell was the acquisition of some professional firms on IT software, including Silverback Technologies and Perot Systems. As a result of these acquisitions, Dell reaped the benefit from the cost reduction. According to its annual report in 2010, Dell succeeded in developing its responsiveness and cutting its number of employees by more than 19000 workers [25]. Therefore, its costs were reduced from 94 percent to 93 and 92 in 2010 and 2011. These Dell activities are what occurred with HP's costs in the same period; the explanation will be given in the next section.

For the three early years, as explained before, HP focused on increasing the quality of products, so there were more expenses involved in doing this. The costs dropped to 92 percent and 91 percent in 2006 and 2007. The reasons for this reduction were mentioned in HP's annual report in 2006 and 2007, highlighting the purchase of high-quality equipment for improving its color printers and recycling more than 1 billion printer cartridges. In addition, more professional employees in sales and marketing were employed [22]. By doing so with its multiple suppliers, HP could negotiate more successfully with its suppliers in terms of having a lower price with good quality. The total costs rose to 95 percent in 2008, 2009, and 2010, which could be linked to the tough economic conditions that occurred during that period. At this point, it would be hard to measure the benefit of the costs related to SCM, which were the activities of acquisitions and development of IT services. However, the benefit of those activities would be clear in 2011 and 2012, when the costs dropped by about 4 percent to 91 percent, and although there was an increase in logistics costs in 2011, HP was able to cut its costs with the benefit of IT development services.

The above discussion concentrated on the cost changes or reductions with regard to SCM. Still, as Garfamy [26] stated, transaction cost theory is not merely focused on cost reduction but extended further to include the benefit of outsourcing or insource activities. In other words, firms would benefit from those actions in increasing their sales, as discussed earlier in the ROA analysis. In addition, this theory cannot measure the transaction cost of human relationships that would occur amongst members of SCM, as Lavassani, et al. [27] noted.

5. Conclusion, Limitations and Recommendations

Based on the literature review and analytical section, since SCM emerged in 1982, it has had many interpretations by different disciplines, which have led to a state of confusion among academics. Those disciplines used different theories to assist them in explaining what the concept of SCM is, such as TCT, RBT, DCT, agency theory, and contingency theory. All of them contribute well to describing SCM, but there is still a lack of connection between those theories and real-world applications. Therefore, researchers tend to conduct experimental studies on those theories to clarify the concept.

Moreover, the competition has shifted from individual firms to competition between supply chains. This places firms under more pressure from the complexity and uncertainty of their environment. Therefore, firms should attempt to deeply understand each aspect of SCM, which relates to customer and supplier relationships, as this would assist in improving firm performance. In addition, SCM prompts firms to rethink their external and internal boundaries, which would enhance their future operations and increase their market shares. To clarify, firms should absorb market changes and accordingly attempt to adapt to those changes; this is what Dell did in 2007 by placing some of its products into retailers' stores and creating a blog to understand customer requirements. As a result, Dell's sales increased, which was reflected in the increase of its ROA.

Moreover, the analysis of this study used DuPont analysis and BMC as the main approaches to analyze the relationship between SCM and financial performance. The researcher proved those approaches and the connection of different strategies that firms follow regarding their financial performance, with ROA and ROI as prominent measures of those strategies. Finding the direct relationship between SCM and ROA and an indirect relationship with ROI is the main result of this study; this increase or decrease was also compared to both firms' reformulated balance sheets and income statements. More importantly, there was clarification of how the share price would change in response to any disruptions in the firm's production process, which was linked to mismanagement of the supply chain. All these discussions highlighted the tight link between SCM and the firm's performance.

5.1. Limitations of this study

Due to the time constraints that the researcher faced, this study merely covered the quantitative approach by analyzing both firms' financial reports for ten years. Additionally, there were some difficulties in finding certain information, such as shipment costs for both firms and the number of suppliers that dealt with them during the same period. This was also related to challenges in understanding the Bloomberg database, and by excluding Dell in 2013, some information was missing.

5.2. Recommendations for further study

For future research, in order to enhance this study, interviewing both firms and customers could increase their reliability on the relationship between SCM and financial performance. Other suggestions would be related to examining their warranty costs, observing their changes, and linking those changes with TCT and game theory. Additionally, it would be a good idea for the researcher to make comparisons between two or three PC firms in different locations to see how their varying markets could impact their financial performance.

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