

Opening the Sesame of Retail Valuation

An empirical study of valuation discrepancies between E-commerce and Brick-and-Mortar apparel retailers

Marat Vardanyan¹ & Timmy Maddison²

1 Abstract

This study enquires into the potential valuation differences between listed E-commerce and traditional Brick-and-Mortar apparel retailers, as well as the underlying factors explaining the discrepancy. Publicly available financial data was used to analyze the historical relationships between the variables. We find significant differences in valuation multiple means between the two groups. Furthermore, we used the profitability and growth dimensions to explain the differences in valuation multiple means. The results support our hypotheses that Return on Assets, EBITDA margin, Total asset turnover and Revenue growth are statistically significant in explaining the existent differences in valuation multiples. These findings lead to several critical implications and pave the way for further research on the matter.

Keywords: Valuation, Retail, Apparel, E-commerce, Brick-and-Mortar

Acknowledgments: We express our gratitude to our thesis supervisor, Professor Micael Dahlén, for his guidance and encouragement. We would also like to thank Johnny Brjohnny for his valuable advice. Our warmest thanks to our families and friends for their love and support.

¹ 50453@student.hhs.se

² 50446@student.hhs.se

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2 Introduction

The advent of digitalization to the retail industry has altered business models and reshaped the terms of the market landscape (Verhoef et al., 2015). One type of an innovative and digital avenue of conducting business is over the Internet, in this case in form of online retailing, widely known as E-commerce. The largest retailer today is Amazon, an E-commerce player with a valuation three times higher than that of Walmart³, the titan Brick-and-Mortar retailer which was the largest player during the 2000s⁴. Amazon filed for its Initial Public Offering (IPO) 1997, and has during these 20 years reached a valuation higher than all of its peers.

Retail has its roots in antiquity and has been reshaped over and over again over the course of history. The latest force of change, namely digitalization, has put its mark on the retail industry and enabled innovative business models to win customers from traditional retailers and shopping malls. As of now, The Internet is available to more than 54.4% of the world's population, up from 1.7% in 1997 (Internet World Stats, 2018). It is paving the way for E-commerce and its rapid expansion enables a similar growth trajectory for retailers capitalizing on the opportunity to go online. Instead of opening new physical stores, many in the retail elite focus their resources on the digital channel. More than 10,000 apparel and consumer electronics Brick-and-Mortar stores have been closed between 2007 and 2017 in the US alone, being the most exposed categories to digital disruption (Statista, 2018).

Besides the disruptive effect from adding a new sales channel, the Internet creates the opportunity for retailers to gather and analyze an even larger amount of data, reach customers worldwide without physical presence and raise the service level through increased customization and convenience (Neslin et al., 2006, Verhoef et al., 2015).

Many incumbent retailers have turned to Mergers & Acquisitions (M&A) to penetrate the Internet consumer segment and digitalize themselves. Several E-commerce players have also filed their documents for an IPO and became publicly listed. Behind all these transactions, extensive valuations are performed to determine the value of the companies and share prices.

The current fast-paced changing nature of the retail industry with regards to digitalization has led to significant questions regarding valuation differences and performance evaluation between E-commerce and Brick-and-Mortar players. From a performance perspective there are several studies on the effects and strategies of going online and integrating a digital channel with a previous traditional one (Zhang et al., 2010) (Cao & Lin, 2015) (Neslin & Shankar, 2009) as well as how it affects customer purchase behavior (Hernant & Rosengren, 2017). However, no studies have assessed the valuation differences dimension.

2.1 Purpose of the study

The purpose of this study is to address the aforementioned area of research, identify potential differences in retail valuations and explain them. More specifically, the goal is to measure if there is a significant difference in valuation multiples between E-commerce and Brick-and-

³ Comparison of Market Capitalizations as of 2018-05-19

⁴ By Market Capitalization

Mortar apparel retailers and investigate the explanatory effects of profitability and growth on those differences. Since there is such a large difference in valuation between Amazon and Walmart, archetypes for the “new” and “old” way of retailing, it is highly relevant to ascertain if there exists similar discrepancy between E-commerce and Brick-and-Mortar retailers in more general terms. Given the factual grounds presented above one may anticipate that higher valuation of E-commerce is a general phenomenon and since apparel is currently one of the most exposed categories, the phenomenon should be easier to observe in that category.

What makes this study so purposeful is the fact that no previous research was conducted on valuation of retail firms and potential valuation differences between retailers that can arise from choosing different sales channels. As a result, this study provides a platform to address these important, but untouched questions. Based on the purpose of the study, the overall research question is formulated in section 2.2 below.

2.2 Overall research question

Do E-commerce apparel retailers have higher valuation multiples than Brick-and-Mortar apparel retailers, and if that is the case, what financial and operating metrics explain this gap?

3 Theory

This chapter provides the theoretical and conceptual framework for economic and retail concepts. Section 3.1 provides a summary of previous theory on strategic, operational and financial differences between E-commerce and Brick-and-Mortar players. Section 3.2 presents the Strategic Profit Model, widely used for evaluating the profitability of retail companies. Section 3.3 provides concepts and methodologies for valuation. Section 3.4 addresses the growth dimension.

3.1 Differences in economic effects between retail channels

3.1.1 General differences

E-commerce retailers' digital way of conducting business enables access to new geographic markets without the need to build an additional store. This also provides the opportunity to gain economics of scope when the requirement to be physically present is bypassed (Zhang et al., 2010). The expansion of an E-commerce actor is only restricted by the access to an Internet connection and technological infrastructure (eMarketer, 2016). Customers that utilize digital channels to a larger extent are male, come from larger families and earn higher income compared to customers that use a physical channel (McGoldrick and Collins, 2007; Kushwaha and Shankar, 2013; Chintagunta et al., 2012; Alreck and Settle, 2002). Besides the differences in customer demographics the value propositions of the channels differ. The digital alternative provides a better search convenience and more transparent comparisons between products. The physical alternative performs better on measures such as assortment, service, risk reduction, and support after sales (Grewal et al., 2004; Grosso et al., 2005; Verhoef et al., 2007).

E-commerce retailers can gather tons of knowledge about their customers when they visit the digital store and through their purchases with cards instead of cash. This data collection provides an opportunity to create a strategic advantage through customization that is hard for competitors to copy, yet it requires substantial investments in IT infrastructure and technological expertise. Brick-and-Mortar players try to collect this information through loyalty-program cards or asking for telephone numbers yet the same extent of information collection is not available (Zhang et al., 2010).

3.1.2 Profitability

The gross margin of E-commerce players is generally low, often weighed down by markdowns following returns and a smaller amount of recognized private label products. A large amount of returns occurs when people either buy a wrong size or several sizes to make sure they get the right one, which is a big profitability problem for E-commerce apparel retailers today. It also requires extra labor as orders must be repacked or packed twice. This is somewhat offsetting the potential that the digital players could have when it comes to cutting down personnel expenditure. The supply chains must be streamlined to minimize the costs of provided free shipping, which is a hygiene factor to most consumers. Marketing costs are often high as well,

since it is hard for E-commerce players to establish a brand name when there are so many alternatives to choose from when shopping online (Laudon, 2017).

E-commerce players require substantial investments in a website, IT-infrastructure for orders and delivery, and marketing to create brand awareness. With no physical stores, there is no need to invest in building and maintaining physical stores, which enables a more focused allocation of resources. As physical retailers require more invested capital than E-commerce players their asset in general becomes larger than that of digital retailers (Laudon, 2017).

3.1.3 Growth

There is a significant difference in the amount of growth between B2C E-commerce and Brick-and-Mortar retailers. E-commerce sales experienced almost a 25% growth from 2016 to 2017, meanwhile the Brick-and-Mortar segment grew almost 5% (Statista, 2018). The E-commerce growth is fueled to a large extent by facilitating customer behavior towards electronic devices and making the shopping experience more convenient through technological advancements. Also, in relation to the Brick-and-Mortar sector, the E-commerce sector is a growing market in a nascent stage (eMarketer, 2016).

3.2 Strategic Profit Model

There are evolving problems to compare and evaluate retailers' strategies across channels. Certain problems arise around established key metrics that are not applicable for the digital channel, namely gross profit per square foot and same-store sales (Zhang et al 2010). There are plenty of key metrics to evaluate both E-commerce and Brick-and-Mortar, but it is not clear which metrics are best to draw comparisons (Strauss & Frost, 2014).

The Strategic Profit Model is used as a method to assess a retailer's financial performance by summarizing all the factors that affect the company's performance financially. The model takes the retailer's profit relative to its asset efficiency, to help company stakeholders, such as managers and shareholders, better understand a company's financial and operational performance. This implies that the retailer must have both asset efficiency and profit to achieve a high Return on Assets (Levy, Weitz and Grewal, 2014).

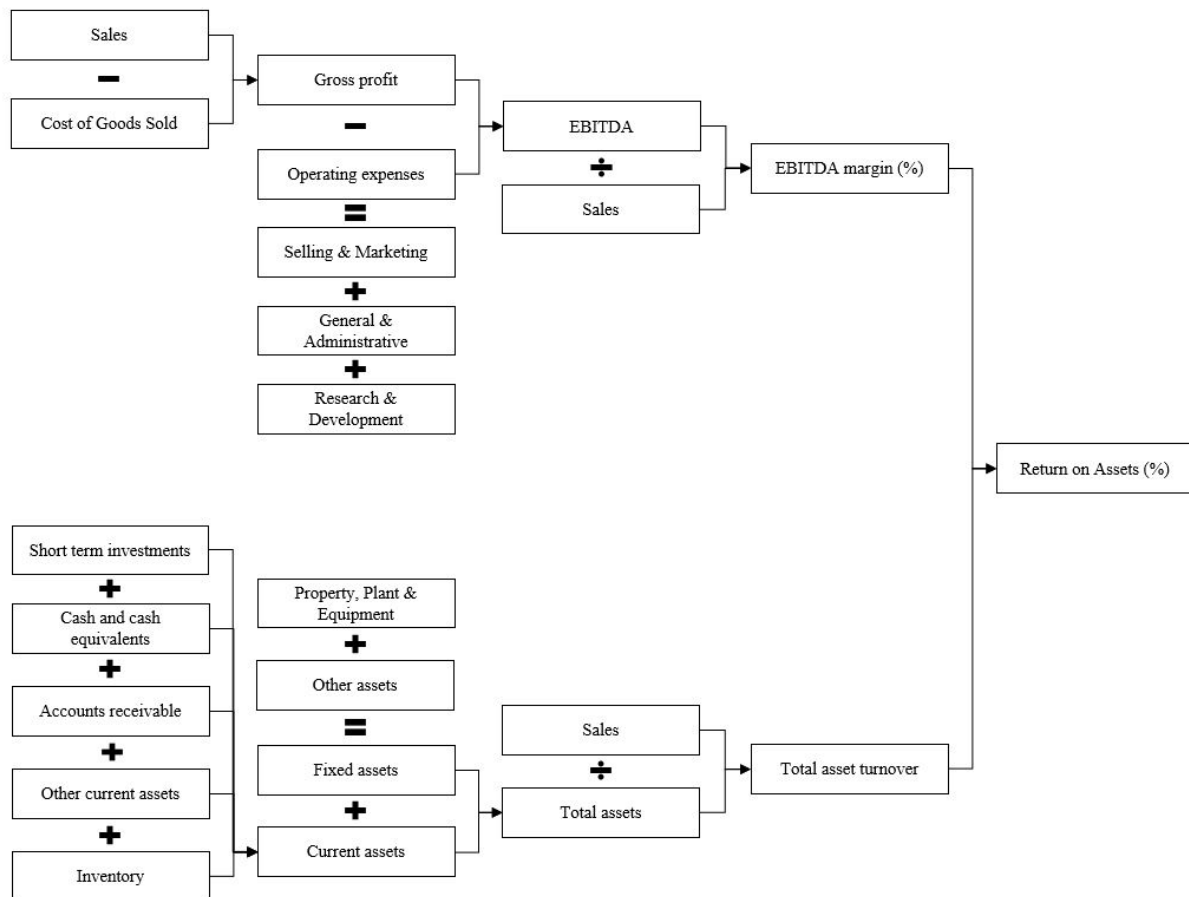


Fig. 3.2.1 The revised Strategic Profit Model used in the current study⁵

Return on Assets

The model is concluded with Return on Assets (RoA), and decomposes the key metric into two different paths, namely the Profit Management Path and Asset Management Path. The Profit Management Path is a company's financial performance deducted from its Income Statement with Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) as the representative measure. The Asset Management Path reflects how efficiently the firm uses its accumulated assets to generate sales, measured by Total asset turnover. Retailers use different strategies to reach a high RoA, either by putting more emphasis on a single path or a hybrid approach with the combination of both. By using RoA as the key metric, comparison between retailers with various profitability strategies becomes more applicable since both the profit and asset management paths contribute to this specific measure (Levy, Weitz and Grewal, 2014). Each path with its relevant items is described thoroughly in section 3.2.1 below.

$$\text{Return on Assets (\%)} = \text{EBITDA margin} \times \text{Total asset turnover}$$

3.2.1 Profit Management Path

Income Statement

⁵ Other assets includes Intangible assets

The income Statement is also referred to as the Statement of Operations for a retailer. It reflects a firm's financial performance for a given period.

Sales

Sales, also known as revenue, is the first line in the company's Income Statement, thus also often also referred to as "top-line" (Rosenbaum & Pearl, 2013). It represents the total amount of money a company has realized during a given period of time from selling its products and delivering services (Levy, Weitz and Grewal, 2014).

Cost of Goods Sold (COGS)

Cost of Goods Sold are the production costs that are directly related to the manufacturing of products and delivery of services.

Gross profit and Gross margin

Sales less Cost of Goods Sold is defined as Gross profit. The metric is often used as an indicator of how strong a company's pricing power is, how efficient its operations are and what type of product mix it offers (Rosenbaum & Pearl, 2013). Increasing the number of products produced often gives economies of scale due to a higher utilization of capacity. Producing or offering a high variation in *Stock Keeping Units* usually means that economies of scale is less applicable (Levy, Weitz and Grewal, 2014). Gross margin is Gross profit presented as a percentage of Sales.

$$\text{Gross profit} = \text{Sales} - \text{Cost of Goods Sold}$$

$$\text{Gross margin (\%)} = \frac{\text{Gross profit}}{\text{Sales}}$$

Operating expenses (OPEX)

Operating expenses is referred to as the fixed overhead costs of a company not directly tied to the production of goods or services.

Operating expenses

$$\begin{aligned} &= \text{Selling \& Marketing expenses} + \text{General \& Administrative expenses} \\ &+ \text{Research \& Development expenses} \end{aligned}$$

Selling \& Marketing expenses

Expenses that are reported as Selling \& Marketing represent labor costs for keeping the store shelves full, costs for transportation of goods from distribution centers as well as expenses related to advertisements and promotions.

General \& Administrative expenses

General \& Administrative expenses are costs related to the day-to-day operations of a firm, such as rent, managerial salaries, and utilities.

Research \& Development expenses (R\&D)

These are costs associated with the development and invention of new products, technologies etc.

Earnings Before Interest, Taxes, Depreciation & Amortization (EBITDA)

EBITDA is a non-GAAP financial measure representing the operating profit before depreciation and amortization costs and is not always reported in public company filings. The metric is a good proxy for a company's cash flows and helps to create an "apples-to-apples" comparison between two companies that are active within the same industry as it removes the impact from different capital structures or effective tax rates on the company's earnings (Rosenbaum & Pearl, 2013).

$$EBITDA = Sales - Cost\ of\ Goods\ Sold - Operating\ expenses + Depreciation + Amortization$$

$$EBITDA\ margin\ (\%) = \frac{EBITDA}{Sales}$$

3.2.2 Asset Management Path

The asset management path evaluates the retailer's efficiency, by analyzing its balance sheet where all short and long-term investments are reported, and gives a summary of the retailer's financial state (Levy, Weitz and Grewal, 2014).

Balance Sheet

The Balance Sheet is a representation of the assets and liabilities carried by company. With other words it provides information about a company's assets and the way that those assets are financed.

Total assets

Total assets is the sum of all the assets that are expected to yield benefits to the owner and expensed over time. To assess how efficiently a retailer is at managing its assets, Total asset turnover is calculated by dividing Sales by the average amount of Total assets carried on the Balance Sheet during the chosen period. Total assets is comprised of Current and Fixed assets.

$$Total\ assets = Total\ current\ assets + Total\ fixed\ assets$$

$$Total\ asset\ turnover = \frac{Sales}{((Total\ assets_t + Total\ assets_{t-1})/2)}$$

Where:

- $Total\ assets_t$ is Total assets for the period t
- $Total\ assets_{t-1}$ is Total assets for the period t-1

Current assets

Assets that are expected to be converted into cash within one year are reported as Current assets on the Balance Sheet.

Current assets

$$= \text{Cash and cash equivalents} + \text{Short term investments} \\ + \text{Accounts receivable} + \text{Inventory} + \text{Other current assets}$$

Cash and cash equivalents

A firm's cash is reported as Cash and cash equivalents on the Balance Sheet. It is important to keep a cash reserve at hand to always stay liquid, but carrying too much without gaining any interest could also be hard to defend from a financial perspective.

Short term investments

Investments, such as liquid stocks and bonds, made by the firm and expected to be converted into cash within a year are reported as Short-term investments on the Balance Sheet.

Accounts receivable

Money owed to the reporting company for delivered products and services is referred to as Accounts receivable. Managing the collection process of receivables is very important for retailers to insure their liquidity.

Inventory

The value of a firm's finished goods, work in progress and raw materials is referred to as Inventory. A retailer's value proposition is providing assortment and breaking bulk, which implies that an extensive amount of inventory is needed to avoid stock-outs and reduced service delivery (Levy, Weitz and Grewal, 2014). Managing inventory efficiently thus becomes very important to minimize costs, but also offer an acceptable service to consumers.

Other current assets

Current assets that do not fall into any of the previous mentioned categories are often bundled together into one generic category, which is called Other current assets. This item can contain non-recurring situations which are explained by the filing, e.g. prepaid salaries to employees, advances to suppliers or property that has been put on sale.

Fixed assets

Fixed assets are assets reported on the Balance Sheet that are not expected to be converted into cash within one year. For retailers, Fixed assets are usually divided into two sub-segments, Property, Plant & Equipment and Other assets.

$$\text{Fixed assets} = \text{Property, Plant \& Equipment} + \text{Other assets}$$

Property, Plant & Equipment (PP\&E)

Property, Plant & Equipment for a retailer is first and foremost the buildings where the stores are located if they are owned and not leased. Secondly, it is fixtures, such as displays and racks, along with equipment needed to run the daily operations, e.g. delivery trucks and computers.

Other assets

Other assets are assets that naturally do not fit into any of the main asset categories and in this case also include Intangible assets. Goodwill, patents, trademarks and brand recognition are all examples of Intangible assets. Something that it does not capture is the value of a retailer's store

locations, which is most often referred to as the single most important part of the Retail Mix (Levy, Weitz and Grewal, 2014).

Cash flow metrics

Expenses are costs incurred immediately, but when a firm makes a long-term investment the cost is capitalized and represented in the investing activities section in the Cash Flow Statement. The capitalized expenditure listed on the Balance Sheet is depreciated and expensed in the Income Statement over its useful lifetime and added back in the Cash Flow Statement, because company cash flows are not reduced by non-cash expenses (Rosenbaum & Pearl, 2013).

Capital expenditure

The funds a firm uses for investments in machinery, equipment, facilities, buildings and other assets are summed up as Capital expenditure. Capital expenditure is disclosed under investing activities in the company's cash flow statement. A retailer looking to expand its operations and grow or have a large share of assets, that require continuous investments, will need a larger amount of Capital expenditure to support the initiatives.

Net Working Capital

A company needs funds on an ongoing basis to finance its short-term liabilities and purchases of Current assets. The capital tied up in these operations is labeled as Net Working Capital. The components necessary to determine Net Working Capital are found on the Balance Sheet under Current assets and Current liabilities. To calculate the Net Working Capital one subtracts Accounts Payable, Accrued Liabilities and Other Current liabilities (Current liabilities) from Accounts receivable, Inventory, Prepaid expenses and Other current assets (Current assets). This reflects how much more or less cash has been tied up in the day-to-day operations during the fiscal period.

$$\text{Net Working Capital} = \text{Current assets} - \text{Current liabilities}$$

$$\text{Change in Net Working Capital} = \text{Net Working Capital}_t - \text{Net Working Capital}_{t-1}$$

Where:

- $\text{Net Working Capital}_t$ is Net Working Capital for the period t
- $\text{Net Working Capital}_{t-1}$ is Net Working Capital for the period t-1

3.3 Valuation & Multiples

Maximizing the company value and shareholder wealth is often regarded as the most important task for a company. Valuation is also the decisive factor when it comes to investment alternatives and corporate governance.

3.3.1 Equity Value & Enterprise Value

In terms of corporate valuation there are two main valuation measures: equity value and enterprise value (Frykman & Tolleryd, 2010).

Equity value, also called market value or market capitalization, simply amounts the value that is attributable to the company's shareholders. The value represents the market's given valuation of shareholders' claims instead of book value of equity. Equity value is calculated by multiplying the company's share price by the number of fully diluted shares outstanding.

$$\text{Equity value} = \text{Share price} \times \text{Number of fully diluted shares}$$

Share price is the price of a single share of a number of saleable stocks of a company at a given moment. Number of fully diluted shares outstanding is the total number of shares that would be outstanding if all possible sources of conversion are exercised.

Enterprise value is the value of the entire company, the value attributable not only to shareholders, but to all claimholders of the company. It is a more accurate representation of the total value of a company (Hunt, 2011). The enterprise value is the sum of the company's equity value, financial debt, preferred equity and minority interest less cash and short-term investments (Damodaran, 2014).

$$\text{Enterprise value} = \text{Equity value} - \text{Cash \& Short term investments} + \text{Total Debt} + \text{Preferred Equity} + \text{Total Minority Interest}$$

Apart from equity value, all other items are based on their book value from the balance sheet.

3.3.2 Valuation multiples

There is a wide spectrum of methods and models used to measure a firm's value. The two most common ways to value a company are: fundamental valuation and relative valuation (Frykman & Tolleryd, 2010). A fundamental valuation is calculated using the company's individual performance. This method provides an explicit value of the company based only on the company's fundamental information and financial performance.

Relative valuation, on the other hand, is the method of valuing a company by benchmarking its financial or operational performance with other comparable companies' performance. Such analysis is also called Comparable Companies Analysis (CCA) (Rosenbaum & Pearl, 2013). Relative valuation is a quicker way to value a company and also gives the opportunity to benchmark a company's performance and valuation against the industry.

Relative valuation is conducted using valuation multiples and a group of firms that comprise the comparable firms, based on different criteria, such as industry and assortment. Those valuation multiples are ratios, where the numerator is the value of the firm, predominantly the equity or enterprise value, and the denominator is a value driving performance measure like Sales, EBITDA or Net income. The division of these numbers gives a valuation multiple, which can be compared with other similar firms.

It is important to match the denominator with the value measure to have an accurate multiple. When calculating equity multiples, one should use a denominator that is explicitly attributable to the company's shareholders e.g. Net income. When calculating enterprise multiples the denominator should be attributable to all the firm's claimholders including the shareholders e.g. Sales or EBITDA. It is more accurate to compare companies using enterprise multiples since it represents the total "true" value of the company, which makes it possible to compare firms with different capital structures with various equity/debt proportions (Hunt, 2011).

The most common valuation multiple for enterprise value is Enterprise value to EBITDA, also called EV/EBITDA and EBITDA multiple (Fernandez, 2001). Since EBITDA is a proxy for cash flow and is more stable over time, it can be used to value a company with regards to future cash flow performance assumptions. The multiple, however, does not take the required future investments into consideration e.g. Capital expenditure and change in working capital.

$$EV/EBITDA = \frac{\text{Enterprise value}}{EBITDA}$$

Enterprise value to Sales, also known as EV/Sales and Sales multiple, is the second most common valuation multiple for enterprise value (Fernandez, 2001), when it comes to financial performance. There are several advantages with using this multiple. Since no measurement of the company's profitability is needed, the multiple can be used to value both profitable and loss-making companies. It is also harder to manipulate revenue numbers than other income numbers down the line (Frykman & Tolleryd, 2010). Therefore, using EV/Sales makes it easier to compare firms that use different accounting principles.

$$EV/Sales = \frac{\text{Enterprise value}}{Sales}$$

The main determinants for both valuation multiples are: expected growth (e.g. revenue growth), profitability (e.g. EBITDA-margin) and risk (e.g. beta of stock) (Damodaran, 2007).

3.4 Growth

As discussed above, expected growth and profitability are key performance and valuation drivers for a company. It is the ability of generating revenues and converting them to profits that leads to positive cash flows.

Revenue growth is the key company growth measure and is calculated as the annual percentage change in total revenue. Expected revenue growth is projected based on factors such as

historical performance, macroeconomic and industry trends as well as equity research estimates (Rosenbaum & Pearl, 2013). It is a key financial assumption that affects the enterprise value.

$$Revenue\ growth\ (\%) = \left(\frac{Sales_t}{Sales_{t-1}} - 1 \right) \times 100$$

Where:

- $Sales_t$ is Sales for the period t
- $Sales_{t-1}$ is Sales for the period t-1

4 Hypotheses

By using existing literature on techniques and approaches for valuation in combination with the collected set of data on all publicly listed companies, a list of hypotheses was drafted to shed a light on the research question. Amazon is valued several times higher than Walmart and has expanded its operations both rapidly and effectively in a very short period. Based on the example of the large discrepancy in valuations between Amazon and Walmart we want to check if there exists a generally established phenomenon in today's stock markets. Furthermore, since E-commerce has shown a higher scalability potential from both geographical and cost perspectives, along with better opportunities for long-term competitive advantages through utilization of digital tools we believe that investors value E-commerce higher than Brick-and-Mortar.

H1: *E-commerce apparel retailers have higher valuation multiples than Brick-and-Mortar apparel retailers.*

Based on previous literature we have concrete expectations concerning both variables that Return on Assets consists of. Since E-commerce players have lower gross margins it is more likely for them to also have a lower EBITDA margin than Brick-and-Mortar players. However, since E-commerce players have a much smaller asset base, we expect them to have a higher Total asset turnover than Brick-and-Mortar players. As a result, we have the two variables that Return on Assets consists of, pointing in different directions, which makes it difficult to conclude if E-commerce players have a higher or lower Return on Assets than Brick-and-Mortar player. However, since Return on Assets should positively affect the valuation differences and we anticipate higher valuation multiples for E-commerce apparel retailers, we assume that the E-commerce group has a higher average Return on Assets compared to the Brick-and-Mortar group.

H2a: *E-commerce apparel retailers have a higher Return on Assets than Brick-and-Mortar apparel retailers.*

There are multiple ways to assess E-commerce and Brick-and-Mortar retailers' performance and efficiency, one of them being the Return on Assets metric concluded in the Strategic Profit Model. The metric is a common profitability measure and normalizes the financial effects of different retail-mix strategies, making comparison possible between both high-end and low-end apparel retailers. Given the clear stance of previous literature on the expected effects of profitability on valuation and the anticipated differences in profitability margins and asset structures between the aforementioned groups, we expect Return on Assets to explain the valuation gap.

H2b: *Return on Assets is an explanatory variable for the difference in valuation multiples between E-commerce and Brick-and-Mortar apparel retailers.*

As there are two different paths to Return on Assets, we want to investigate which path investors devote most focus to and put emphasis on as the determinant factor for the retailers' valuations. Through separation of Return on Assets in to the variables EBITDA margin and Total asset turnover, we analyze if there is a difference in these metrics between the groups.

Regarding margins, product returns, higher customer acquisition and supply chain costs will offset the potential operational expenditure decrease E-commerce players achieve from not being required to maintain staff in physical stores. Since E-commerce players have a lower gross margin than Brick-and-Mortar players we thus expect them to have a lower EBITDA margin.

E-commerce players are mainly dependent on investing in IT-infrastructure and inventory, while Brick-and-Mortar players also have to invest in building and accommodating stores in addition to its IT-infrastructure and inventory. This along with the fact that Brick-and-Mortar players are often more mature leads to the conclusion that E-commerce apparel retailers operate with a smaller asset base than Brick-and-Mortar apparel retailers and therefore should have a higher Total asset turnover.

H3a: *E-commerce apparel retailers have a lower EBITDA margin than Brick-and-Mortar apparel retailers.*

H4a: *E-commerce apparel retailers have a higher Total asset turnover than Brick-and-Mortar apparel retailers.*

Given that these two metrics compose Return on Assets, which in its turn is anticipated to explain the valuation multiples, we believe both EBITDA margin and Total asset turnover will be explanatory variables for the difference in valuation multiples. They are performance metrics on profitability and efficiency, and given the anticipated differences between the groups they should be fit to explain the differences in valuation multiples.

H3b: *EBITDA margin is an explanatory variable for the difference in valuation multiples between E-commerce and Brick-and-Mortar apparel retailers.*

H4b: *Total asset turnover is an explanatory variable for the difference in valuation multiples between E-commerce and Brick-and-Mortar apparel retailers.*

Besides Return on Assets, a key metric to benchmark retailers' historical performance is Revenue growth. If the company is operating in a market that is flat or declining, it must fuel its growth by stealing market shares from competitors. This often leads to a more aggressive competition and price wars. Such processes negatively impact the stagnant market, making it even less attractive to potential investors. Hence, we want to investigate if the top-line growth differs between the E-commerce and Brick-and-Mortar groups. Given that the Statista market report indicates that the digital channel has grown much faster than the physical channel, we anticipate a higher Revenue growth for the E-commerce group compared to the Brick-and-Mortar group.

H5a: *E-commerce apparel retailers have a higher Revenue growth than Brick-and-Mortar apparel retailers.*

The same argument we use to anticipate an explanatory power for profitability metrics can apply for growth metrics, as discussed in the theory chapter. A higher Revenue growth implies a

higher expected income and often more strategic power, which should inevitably impact the valuation. We therefore anticipate Revenue growth to explain the expected differences in valuation multiples.

H5b: *Revenue growth is an explanatory variable for the difference in valuation multiples between E-commerce and Brick-and-Mortar apparel retailers.*

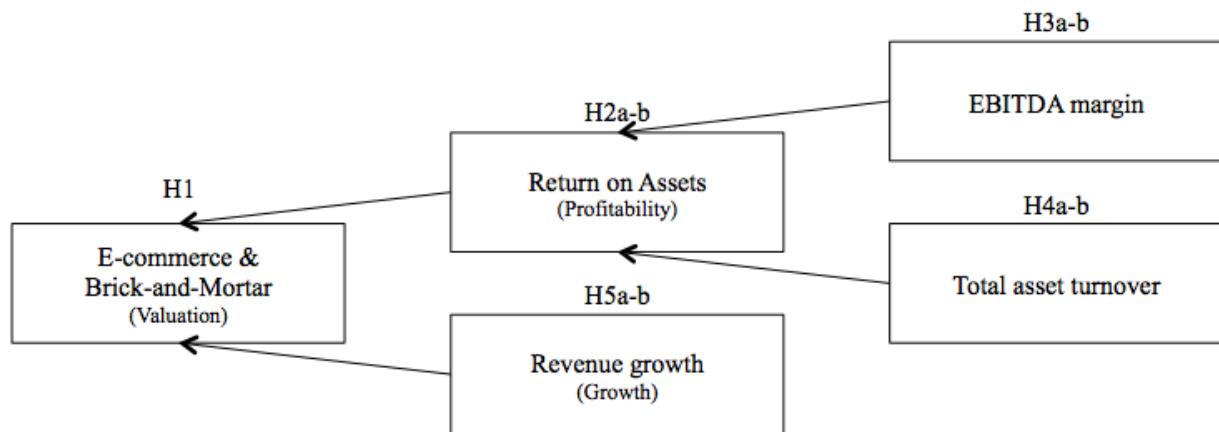


Fig. 5.1.1 An illustration of the 5 hypotheses of the present study and their internal relationships

5 Methods

This chapter describes the total procedure of the analysis needed to test the research hypotheses including data collection and use of statistical methods. In section 5.1 the data description is provided and motivated. In section 5.2 we describe the procedure of using statistical methods to test the hypotheses and the required assumptions. In section 5.3 the list of tested variables is provided and motivated.

5.1 Data description

The data were collected on publicly traded companies in order to base our analysis on information that has ecological validity and is accessible for everyone. The list of public companies was compiled through searching the stock exchanges worldwide for firms active within the retailing industry. Some chosen companies have evolved business models and are not solely B2C retailers. The criteria for being included were that companies must predominantly focus on retail sales of apparel, accessories or both. This includes firms like Nike and Adidas, given that their current focus and priority are retail sales. Companies with exclusively or an absolute majority of offline sales were categorized as Brick-and-Mortar and companies with exclusively or an absolute majority of online sales were categorized as E-commerce. The data was collected with the help of CapitalIQ, and the key metrics were calculated manually with the definitions from previously mentioned literature to maintain consistency.

A time period between January 2014 and December 2017, 16 quarters in total, was chosen for the purpose of this study. Given that different companies have different fiscal periods for reporting, we calendarized all the companies' reports to the same calendar years to make their reported numbers directly comparable in terms of periods.

The dataset consists of 109 number of companies, where 15 are labeled as E-commerce players and 94 as Brick-and-Mortar. The selected companies are listed on stock exchanges in 16 different countries from four different continents. 46 in the United States, 6 in China, 10 in Sweden, 4 in Germany, 7 in Italy, 10 in the United Kingdom, 1 in Canada, 5 in Hong Kong, 4 in Japan, 1 in Finland, 5 in Brazil, 1 in Spain, 4 in France, 2 in Schweiz, 1 in Belgium and 2 in India. The disclosed information varies between companies, which is why we only used certain metrics to analyze the dataset.

5.2 Statistical methods

In order to test our hypotheses, we used several statistical methods. At first we tested whether there are differences between E-commerce and Brick-and-Mortar group means for all the relevant variables, later used as dependent and independent variables in the regression models (see section 5.3). These tests were Welch's independent sample t-tests, given the independent nature of the data for both groups and the lack of information to assume equal variance for values between these two groups' populations. These tests helped us to test our main hypothesis (H1) and several others (H2a, H3a, H4a and H5a).

Thereafter we tested if the key statistical assumptions required for a regression model do hold between every independent and dependent variable. First we looked whether there is a linear

relationship between each individual candidate for independent variables and each dependent variable, by displaying the relationships in a scatterplot. Having all the relevant variables ready, we conducted a regression analysis for the sake of testing hypotheses H2b, H3b, H4b and H5b.

When conducting the initial and second regressions we checked if all the independent variables are significant for explaining the change in the dependent variables. Then, using a normal probability plot of the residuals (P-P plot), we checked if the error terms are in line with or deviate from the trend lines, in order to indicate if the regression error terms are normally distributed or not. We also checked for multicollinearity (VIF & Tolerance), heteroscedasticity and autocorrelation (Durbin-Watson).

5.3 Variables

Based on our assumptions and hypotheses, we collected, calculated, and used certain relevant variables.

5.3.1 Dependent variables

In order to compare group valuations and explain the differences between their values, valuation multiples were chosen as the dependent variables. Two such variables were calculated and used in the t-tests and regression models:

- EV/NTM Sales
- EV/NTM EBITDA

$$EV/NTM\ EBITDA = \frac{Enterprise\ value}{NTM\ EBITDA}$$

$$EV/NTM\ Sales = \frac{Enterprise\ value}{NTM\ Sales}$$

Where:

- NTM Sales is the expected total sales of a company for the next twelve months from a given point in time, based on consensus research estimates
- NTM EBITDA is the expected EBITDA of a company for the next twelve months from a given point in time, based on consensus research estimates

We used enterprise value as the numerator for both multiples to make sure that the multiples represent the total true value of the companies, making them comparable with each other regardless of their capital structure.

We used Sales and EBITDA metrics as denominators, given that these measures: 1) are attributable to the enterprise value of a company, 2) are commonly used for valuation practices and 3) include several advantages discussed in sections 3.2.1 and 3.2.2. We used Next-Twelve-Months (NTM) estimates for these metrics, to make sure we take future expectations into account, because company valuations are based on future expectations.

5.3.2 Independent variables

A list of variables was tested for several assumptions in order to be used in the regression models as independent variables. The variables are:

- Return on Assets (RoA)
- Gross margin
- EBITDA margin
- Total asset turnover
- Revenue growth
- CapEx (Capital expenditure)/Sales
- Change in NWC (Net working capital)/Sales

Return on Assets, Gross margin, EBITDA margin and Total asset turnover were calculated in accordance with the formulas in section 3.2. Revenue growth for every quarter was calculated as follows:

$$\text{Revenue growth (\%)} = \left(\frac{\text{Sales}_{q,n}}{\text{Sales}_{q,n-1}} - 1 \right) \times 100$$

Where:

- $\text{Sales}_{q,n}$ is Sales for the q-th quarter in the year n
- $\text{Sales}_{q,n-1}$ is Sales for the q-th quarter in the year n-1

Capital expenditure and Change in Net working capital are calculated in accordance with the formulas in section 3.2 and divided by Sales to present them as a percentage of Sales. This will enable a comparison between the companies.

$$\text{Change in NWC/Sales (\%)} = \frac{\text{Change in New Working Capital}}{\text{Sales}}$$

$$\text{CapEx/Sales (\%)} = \frac{\text{Capital expenditure}}{\text{Sales}}$$

Return on Assets is used to test H2b. EBITDA margin and Total asset turnover are used to test H3b and H4b. Revenue growth is used to test H5b. The remaining variables are used to 1) better understand the underlying factors for the regressions, 2) better understand the potential group mean differences in the other variables and 3) take reinvestments into account.

6 Results

6.1 Independent samples t-test

The initial stage results from Welch's independent t-tests showed that there are statistically significant differences in all the observed variables between E-commerce and Brick-and-Mortar for a 95% confidence interval, reported in Table 6.1.1 below. All the tested variables but CapEx/Sales and Change in NWC/Sales have p-values lower than 0.001. N stands for number of observed quarterly data points in tables: 6.1.1, 6.1.2 and 6.1.3.

Table 6.1.1 Variable means for each group. T-test for test of significance.

	E-commerce (N>125)	Brick-and- Mortar (N>1214)	Sig.
EV/NTM Sales	2.40	1.56	$p<0.001$
EV/NTM EBITDA	25.84	10.12	$p<0.001$
Return on Assets	0.09	0.19	$p<0.001$
Gross margin	0.40	0.49	$p<0.001$
EBITDA margin	0.08	0.14	$p<0.001$
Total asset turnover	1.87	1.40	$p<0.001$
Revenue growth	0.32	0.06	$p<0.001$
CapEx/Sales	0.04	0.04	$p<0.014$
Change in NWC/Sales	0.02	-0.01	$p<0.025$

Table 6.1.2 Variable descriptive statistics for E-commerce apparel retailers

E-commerce (N>125)	Min	Max	Mean	Variance
EV/NTM Sales	0.16	12.76	2.40	8.01
EV/NTM EBITDA	7.75	55.10	25.84	114.79
Return on Assets	-0.53	0.25	0.09	0.01
Gross margin	0.06	0.71	0.40	0.03
EBITDA margin	-0.18	0.44	0.08	0.01
Total asset turnover	0.27	6.13	1.87	1.17
Revenue growth	-0.23	1.06	0.32	0.05
CapEx/Sales	0.00	0.18	0.04	0.00
Change in NWC/Sales	-0.37	0.83	0.02	0.02

Table 6.1.3 Variable descriptive statistics for Brick-and-Mortar apparel retailers

Brick-and-Mortar (N>1214)	Min	Max	Mean	Variance
EV/NTM Sales	0.09	7.99	1.56	1.27

EV/NTM EBITDA	2.06	46.67	10.12	20.48
Return on Assets	-0.05	0.59	0.19	0.01
Gross margin	-0.20	0.89	0.49	0.02
EBITDA margin	-0.36	0.39	0.14	0.01
Total asset turnover	0.35	3.05	1.40	0.24
Revenue growth	-0.37	0.79	0.06	0.01
CapEx/Sales	-0.03	0.31	0.04	0.00
Change in NWC/Sales	-1.37	1.02	-0.01	0.02

6.2 Differences in valuation multiples

As anticipated, there are statistically significant differences in sample means for both valuation multiples between E-commerce and Brick-and-Mortar (Table 6.1.1). The average EV/NTM Sales for E-commerce and Brick-and-Mortar is 2.40 and 1.56 respectively with a discrepancy of 0.84 points, meaning a 54% higher valuation multiple for E-commerce companies. A larger discrepancy can be observed in the EV/NTM EBITDA multiple where the averages for E-commerce and Brick-and-Mortar are 25.84 and 10.12 respectively, resulting in a difference of 15.72 points and a 155% higher valuation multiple for E-commerce.

Given that the averages for both valuation variables are significantly different and that E-commerce has a higher average valuation multiple according to both variable means, there is enough supporting results for the hypothesis referring to the anticipated differences in valuation with E-commerce having a higher valuation. H1 is supported.

H1: *E-commerce apparel retailers have higher valuation multiples than Brick-and-Mortar apparel retailers.*

Supported

Besides supporting the hypothesis, the large difference in valuations leads to a number of corporate, financial and operational questions. The fact that a single unit of Sales and EBITDA generate a 54% and 155% higher enterprise value respectively, can and should be studied further.

6.3 Explanatory power of the Strategic Profit Model (Return on Assets)

This section deals with the anticipated differences in profitability between E-commerce and Brick-and-Mortar apparel retailers using the Strategic Profit Model and its concluding variable (Return on Assets). The results of the study show that there is a statistically significant difference in Return of Assets' averages between E-commerce and Brick-and-Mortar retailers (Table 6.1.1). The E-commerce group has an average Return on Assets of 0.09 or 9% when Brick-and-Mortar has an average Return on Assets of 0.19 or 19%, giving a difference of 10 percentage points.

Although p-value is below 0.001, Brick-and-Mortar has a higher Return on Assets, which leads to the rejection of our hypothesis expecting a higher Return on Assets for E-commerce apparel retailers. H2a is not supported.

H2a: *E-commerce apparel retailers have a higher Return on Assets than Brick-and-Mortar apparel retailers.*

Not supported

The discrepancy between both groups' Return on Assets enables us to test H2b in order to see if the difference in Return on Assets explains the difference in the valuation multiples.

Individual scatterplots provided evidence for the assumption that there are linear relationships between Return on Assets and each of the dependent variables; EV/NTM Sales and EV/NTM EBITDA for both groups.

The results from the regression analyses between Return on Assets and each valuation multiple as dependent variable are reported in Table 6.3.1 for E-commerce and Table 6.3.2 for Brick-and-Mortar below. All the required assumptions hold for all regressions. However, the Durbin-Watson statistic indicates autocorrelation, which can be explained by the seasonality effects, such as quarterly report numbers and industry trends.

Table 6.3.1 Regression analyses for E-commerce apparel retailers between Return on Assets as an independent variable and EV/NTM Sales and EV/NTM EBITDA as dependent variables. Standardized regression coefficients. (a: $p < 0.01$; b: $p < 0.05$; c: $p > 0.05$)

E-commerce	Return on Assets	$Adj. R^2$
EV/NTM Sales	0.28 ^a	0.08
EV/NTM EBITDA	-0.16 ^c	0.03

Table 6.3.2 Regression analyses for Brick-and-Mortar apparel retailers between Return on Assets as an independent variable and EV/NTM Sales and EV/NTM EBITDA as dependent variables. Standardized regression coefficients. (a: $p < 0.01$; b: $p < 0.05$; c: $p > 0.05$)

Brick-and-Mortar	Return on Assets	$Adj. R^2$
EV/NTM Sales	0.37 ^a	0.14
EV/NTM EBITDA	0.00 ^c	0.00

The results (Table 6.3.1) show that although the coefficient of determination ($Adj. R^2$) is low for all regressions (< 0.15), Return on Assets has some effect on EV/NTM Sales multiple for both groups. However, Return on Assets is not significant in explaining EV/NTM EBITDA multiple for both groups. It is also evident that Return on Assets has a stronger explaining effect on the EV/NTM Sales valuation multiple for Brick-and-Mortar apparel retailers than for E-commerce apparel retailers, given the higher $Adj. R^2$ (0.08 vs. 0.14) and slope coefficients (0.28 vs. 0.37).

The results state a rather weak but statistically significant effect of Return on Assets on one of the valuation multiples. The evidence is sufficient to support the hypothesis. H2b is supported.

H2b: *Return on Assets is an explanatory variable for the difference in valuation multiples between E-commerce and Brick-and-Mortar apparel retailers.*

Supported

6.4 Explanatory power of EBITDA margin and Total asset turnover

This section reports the empirical results from testing the difference in the average EBITDA margin and Total asset turnover between E-commerce and Brick-and-Mortar apparel retailers and the regression models used to determine the variables' fit for explaining the differences between groups' valuation multiples. It is a continuation of testing profitability differences and effects in section 6.3.

The results (Table 6.1.1) show that there are statistically significant differences ($p < 0.001$ for both tests) between the groups' average EBITDA margin and Total asset turnover. Average EBITDA margin for E-commerce and Brick-and-Mortar is 8% (0.08) and 14% (0.14) respectively with a discrepancy of 6 percentage points, meaning a 75% higher average EBITDA margin for Brick-and-Mortar companies. Average Total asset turnover for E-commerce and Brick-and-Mortar is 1.87 and 1.40 respectively with a discrepancy of 0.47 points, meaning a 34% higher group average Total asset turnover for E-commerce.

The results provide required evidence to support both hypotheses anticipating a lower EBITDA margin and higher Total asset turnover for the E-commerce group. H3a and H4a are supported.

H3a: *E-commerce apparel retailers have a lower EBITDA margin than Brick-and-Mortar apparel retailers.*

Supported

H4a: *E-commerce apparel retailers have a higher Total asset turnover than Brick-and-Mortar apparel retailers.*

Supported

The next step is to test H3b and H4b to see if the differences in EBITDA margin as well as Total asset turnover explain the differences in the valuation multiples.

Individual scatterplots showed linear relationships between each independent variable (EBITDA margin & Total asset turnover) and each dependent variable (EV/NTM Sales & EV/NTM EBITDA) for both groups.

The results from the regression analyses are reported in tables: 6.4.1, 6.4.2, 6.4.3 and 6.4.4 below. All the required assumptions hold for all regressions. However, the Durbin-Watson statistic indicates autocorrelation. We explain it by the seasonality effects.

Table 6.4.1 Regression analyses for E-commerce apparel retailers between EBITDA margin as an independent variable and EV/NTM Sales and EV/NTM EBITDA as dependent variables. Standardized regression coefficients.

(a: $p < 0.01$; b: $p < 0.05$; c: $p > 0.05$)

E-commerce	EBITDA margin	<i>Adj. R</i> ²
EV/NTM Sales	0.91 ^a	0.83
EV/NTM EBITDA	-0.07 ^c	0.00

Table 6.4.2 Regression analyses for E-commerce apparel retailers between Total asset turnover as an independent variable and EV/NTM Sales and EV/NTM EBITDA as dependent variables. Standardized regression coefficients. (a: $p < 0.01$; b: $p < 0.05$; c: $p > 0.05$)

E-commerce	Total asset turnover	<i>Adj. R</i> ²
EV/NTM Sales	-0.57 ^a	0.32
EV/NTM EBITDA	-0.09 ^c	0.00

Table 6.4.3 Regression analyses for Brick-and-Mortar apparel retailers between EBITDA margin as an independent variable and EV/NTM Sales and EV/NTM EBITDA as dependent variables. Standardized regression coefficients. (a: $p < 0.01$; b: $p < 0.05$; c: $p > 0.05$)

Brick-and-Mortar	EBITDA margin	<i>Adj. R</i> ²
EV/NTM Sales	0.65 ^a	0.42
EV/NTM EBITDA	0.18 ^a	0.03

Table 6.4.4 Regression analyses for Brick-and-Mortar apparel retailers between Total asset turnover as an independent variable and EV/NTM Sales and EV/NTM EBITDA as dependent variables. Standardized regression coefficients. (a: $p < 0.01$; b: $p < 0.05$; c: $p > 0.05$)

Brick-and-Mortar	Total asset turnover	<i>Adj. R</i> ²
EV/NTM Sales	-0.29 ^a	0.08
EV/NTM EBITDA	-0.22 ^a	0.05

The regression results (Table 6.4.1 to Table 6.4.4) show that EBITDA margin and Total asset turnover are statistically significant explanatory variables for companies' EV/NTM Sales valuation multiples for both groups. Concerning the EV/NTM EBITDA multiple the EBITDA margin and Total asset turnover variables are not statistically significant for the E-commerce group and are statistically significant for the Brick-and-Mortar group, but have trivial effect ($Adj. R^2 < 0.05$).

For the E-commerce group, EBITDA margin (Table 6.4.1) has a very high slope coefficient (0.91) and coefficient of determination ($Adj.R^2 = 0.83$) in explaining EV/NTM Sales. The variable is insignificant in explaining the EV/NTM EBITDA multiple. Total asset turnover (Table 6.4.2) is also statistically significant in explaining the EV/NTM Sales multiple with a slope coefficient of -0.57 and an $Adj.R^2$ of 0.32. Total asset turnover is not statistically significant to explain the EV/NTM EBITDA multiple.

For the Brick-and-Mortar group, EBITDA margin (Table 6.4.3) has again a high slope coefficient (0.65) and a moderate coefficient of determination ($Adj.R^2 = 0.42$) in explaining EV/NTM Sales. The variable is statistically significant in explaining the EV/NTM EBITDA multiple, but given the very low coefficient of determination ($Adj.R^2 = 0.03$) it is considered trivial. Total asset turnover (Table 6.4.4) is statistically significant in explaining both valuation multiples with slope coefficients of -0.29 and -0.22 and determination coefficients of 0.08 and 0.05 for EV/NTM Sales and EV/NTM EBITDA respectively.

To summarize, EBITDA margin has a positive relationship with valuation multiples and Total asset turnover has a negative relationship with valuation multiples. The impact of EBITDA margin is overall stronger compared to Total asset turnover and the impact of both explanatory variables is stronger for the E-commerce group compared to the Brick-and-Mortar group.

The results of these tests give sufficient evidence to support the hypotheses referring to the explanatory fits of EBITDA margin and Total asset turnover to explain differences in valuation multiples between E-commerce and Brick-and-Mortar. Hence, H3b and H4b are supported.

H3b: <i>EBITDA margin is an explanatory variable for the difference in valuation multiples between E-commerce and Brick-and-Mortar apparel retailers.</i>	Supported
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H4b: <i>Total asset turnover is an explanatory variable for the difference in valuation multiples between E-commerce and Brick-and-Mortar apparel retailers.</i>	Supported
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6.5 Explanatory power of Revenue growth

Having covered profitability in sections 6.3 and 6.4, the growth metric results are presented in the current section.

The results of this study show statistically significant difference ($p < 0.001$) in the average Revenue growth between E-commerce and Brick-and-Mortar apparel retailers (Table 6.1.1). E-commerce group has an average Revenue growth of 0.32 or 32%, while Brick-and-Mortar has an average Revenue growth of 0.06 or 6%, giving a difference of 26 percentage points. This means more than five times higher average growth for E-commerce apparel retailers.

Given the large discrepancy and E-commerce having a higher average Revenue growth, the data support the hypothesis referring to the expected differences in revenue growth between E-commerce and Brick-and-Mortar apparel retailers. H5a is supported.

H5a: *E-commerce apparel retailers have a higher Revenue growth than Brick-and-Mortar apparel retailers.* Supported

The support for H5a leads to the next question, which is whether Revenue growth has an explanatory importance for the differences between E-commerce and Brick-and-Mortar valuation multiples.

The assumption of existent linear relationships between Revenue growth and each of the dependent variables (EV/NTM Sales and EV/NTM EBITDA) for both groups is supported by individual scatterplots indicating such relationships.

The results from the regression analyses between Revenue growth as independent variable and each valuation multiple as dependent variable are reported in Table 6.5.1 for E-commerce and Table 6.5.2 for Brick-and-Mortar below. All the required assumptions hold for both regressions. Durbin-Watson statistic indicates autocorrelation, much like in the previous regressions. Once again, the seasonality effects are its main cause.

Table 6.5.1 Regression analyses for E-commerce apparel retailers between Revenue growth as an independent variable and EV/NTM Sales and EV/NTM EBITDA as dependent variables. Standardized regression coefficients. (a: $p < 0.01$; b: $p < 0.05$; c: $p > 0.05$)

E-commerce	Revenue growth	<i>Adj. R</i> ²
EV/NTM Sales	0.43 ^a	0.17
EV/NTM EBITDA	0.46 ^a	0.21

Table 6.5.2 Regression analyses for Brick-and-Mortar apparel retailers between Revenue growth as an independent variable and EV/NTM Sales and EV/NTM EBITDA as dependent variables. Standardized regression coefficients. (a: $p < 0.01$; b: $p < 0.05$; c: $p > 0.05$)

Brick-and-Mortar	Revenue growth	<i>Adj. R</i> ²
EV/NTM Sales	0.24 ^a	0.06
EV/NTM EBITDA	0.23 ^a	0.05

The results (Table 6.5.1 and 6.5.2) show that the coefficient of determination (*Adj. R*²) is somewhat low for both E-commerce regressions and much lower for Brick-and-Mortar retailers. However, Revenue growth is statistically significant in explaining both valuation multiples for both groups. The effects on both valuation multiples are also similar considering how close the slope and determination coefficients are.

The explanatory power of Revenue growth is considerably higher (Table 6.5.1) for the E-commerce group with slope coefficients of 0.43 and 0.46 for Sales and EBITDA multiples

respectively and moderately low determination coefficients of 0.17 and 0.21 respectively. For the Brick-and-Mortar group (Table 6.5.2), the effect is existent, but trivial ($Adj. R^2 < 0.06$).

Although the coefficients of determination are low, the explanatory value is still statistically significant. Given that the valuation multiples include the expected growth the historical growth measures still show a remarkable explanatory value. Based on the results above there is sufficient evidence to support the hypothesis anticipating the explanatory capability of Revenue growth in relation to the valuation multiples. H5b is supported.

H5b: <i>Revenue growth is a statistically significant explanatory variable for the difference in valuations between listed E-commerce and Brick-and-Mortar apparel retailers.</i>	Supported
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The regressions truly indicate the explanatory power of both **profitability** and **growth measures** in explaining the valuation multiple differences between the groups.

7 Discussion

7.1 Do E-commerce apparel retailers have higher valuation multiples?

The current study has reported the financial performance and valuation metrics of 109 apparel retailers, 15 of them in E-commerce. By using the market data, theoretical framework and statistical tools we answered the main research question formulated as “*Do E-commerce apparel retailers have higher valuation multiples than Brick-and-Mortar apparel retailers, and if that is the case, what financial and operating metrics explain this gap?*” This project is the first of its kind given that the analyzed data and the group of listed E-commerce companies simply did not exist before. We created a unique database just by accumulating publicly available data from a single source. To answer the research question, five hypotheses were created: H1 to answer the first part of the question and the following hypotheses to answer the second part. Each of these hypotheses was tested providing a set of answers in the previous chapter. Those findings will be discussed in detail below.

The comparisons between E-commerce and Brick-and-Mortar apparel retailers (6.1 and 6.2) uncovered a significant difference in both valuation multiples, supporting our expectation that E-commerce retailers are valued higher. This is a critical finding for every stakeholder in the industry, including but not limited to shareholders, managements, employees, potential investors and governments. Valuation drives investments and investments drive financing, productivity, economic activity and growth. So, the fact that there is a big discrepancy is highly relevant for the industry, the corporate world and the society as a whole.

One unit of sales through a digital channel translates into a 54% higher enterprise value and one unit of EBITDA translates into a 155% higher enterprise value, which proves that conducting more sales online will generate a higher stakeholder return. It also indicates that a retailer generating profitable sales on an EBITDA basis online will be exceptionally rewarded compared to generating the same amount of EBITDA offline.

The spectrum of reasons behind E-commerce apparel retailers having higher valuation multiples than Brick-and-Mortar apparel retailers is wide. According to market reports the digital segment has a much higher expected growth, fueled by the rapid expansion and of Internet penetration worldwide, which of course is one reason behind it. Another interesting take is that previous barriers to expand geographically for Brick-and-Mortar retailers with the requirement to establish a physical presence is now gone for E-commerce retailers enabling a growth without location constraints. “Location, location, location” is known to be one of the most important competitive factors for a retailer (Levy, Weitz and Grewal, 2014), yet a digital channel neutralizes the advantage of a superior physical location, as it is less relevant online. Some factors regarding brand considerations such as awareness is still boosted through a sought-after location (Laudon, 2017). E-commerce retailers can also scale their business more efficiently from a cost perspective, as they do not need to have store personnel present in the stores, which is favored by investors. As an E-commerce retailer does not have to tie up as much capital in assets as a Brick-and-Mortar retailer, it can generate more sales and also more EBITDA using less funding, thus achieving a much higher return per unit of invested capital.

Besides the previous mentioned reasons behind a premium valuation, some retailers such as Nike and Adidas, that previously mostly acted as manufacturers and suppliers to retailers are now focusing on direct to consumer sales through their own retail shops and by internet utilization. This allows them to gain a larger share of the markup on their products and gather more intelligence about their end customers. The same type of option to disintermediate distributors in the supply chain is available to all E-commerce players through their digital business model and established IT platform. With a robust IT-infrastructure, a retailer can also gain a sustainable and hard to copy competitive advantage through collection of Big data, and subsequently leveraging its customer knowledge to customize offerings and offer a superior shopping experience (Zhang et al., 2010).

Another result from the valuation comparison is that E-commerce apparel retailers have a higher variance than Brick-and-Mortar apparel retailers. This can be for several reasons, e.g. the fact that it is harder to assess companies acting in a fast-growing market rather than mature. The digital retail business models are still evolving at a high pace as IT-infrastructure and the possibilities following digitalization continuously increase, just like Moore's law underpins. Many established retailers have filed for bankruptcy and it is even harder to predict which player will manage in a market before it has reached its mature stage. Since we have chosen only publicly listed companies, all the retailers in the sample have supposedly surpassed their early stage of evolution and found a business model that generates sales. However, the fact that the market landscape for more technology influenced companies changes in such a high pace still demands a higher risk premium. All of these aforementioned factors that demonstrate characteristic differences between online and offline players are potential reasons to why E-commerce apparel retailers have higher valuation multiples than Brick-and-Mortar retailers.

The next step was to address the difference based on economic theory and making use of available tools to explain it. As discussed in chapter 3, there are three main determinants of valuation: profitability, growth and risk. This formulation is based on both economic theory and previous studies and provides the main criteria for understanding value. Within the limits of this study we used profitability and growth measures to explain the differences in the valuations.

7.2 Profitability measures in explaining the valuation gap

7.2.1 Return on Assets

The investigation of the explanatory power of the Strategic Profit Model was performed in two steps: first, examining the relationship between Return on Assets and the valuation multiples for each group (section 6.3) and then examining the relationship between EBITDA margin and Total asset turnover as independent variables and the valuation multiples for each group (section 6.4).

The results showed that there are statistically significant mean differences in Return on Assets between E-commerce and Brick-and-Mortar apparel retailers. However, opposed to our beliefs, the E-commerce group had a much lower Return on Assets compared to the Brick-and-Mortar group (0.09 vs. 0.19). Given the mean difference results of Return on Assets' constituents (Table 6.1.1), we know that the lower E-commerce Return on Assets is caused by its lower EBITDA margin, since the Total asset turnover is higher for E-commerce players. This means

that for the E-commerce group, the lower EBITDA margin weighs more than the higher Total asset turnover, as they do not balance each other out, leading to a lower Return on Assets.

Furthermore, Return on Assets is statistically significant for positively explaining the EV/NTM Sales valuation multiple for both groups. However, the variable does not explain the EV/NTM EBITDA multiple, which can be explained by the fact that Return on Assets' constituent EBITDA margin is already included in the EV/NTM EBITDA multiple as its denominator. Concerning the EV/NTM Sales multiple the explanatory power of Return on Assets is overall low for both groups. We suppose that the low explanatory power is a result of the outbalancing effect of the trade-off between its constituents, namely EBITDA margin and Total asset turnover. With the trade-off we mean that an inverse relation can be mathematically derived given the fact that Sales is the numerator in the Total asset turnover and the denominator in the EBITDA margin. In order to avoid this trade-off, we analyzed the individual effect of both constituent variables on valuation multiples. In a comparison between E-commerce and Brick-and-Mortar regressions we observe a higher slope and determination coefficient for the Brick-and-Mortar group. This shows the higher relevance of the Return on Assets variable for the Brick-and-Mortar group and signals that it is not equally relevant or up-to-date for E-commerce players, which is in line with previously mentioned problems when choosing comparison metrics between E-commerce and Brick-and-Mortar retailers (Strauss & Frost, 2014).

7.2.2 EBITDA margin and Total asset turnover

Like we presumed beforehand, E-commerce apparel retailers have a lower average EBITDA margin than Brick-and-Mortar apparel retailers. First and foremost, E-commerce retailers have, as stated in the literature, a lower gross margin than Brick-and-Mortar retailers. There is a 9% difference in absolute percentage points, which directly could translate into a 9% lower EBITDA margin as well. Yet, in this case E-commerce retailers have an average of 6% lower EBITDA margin than Brick-and-Mortar retailers, which indicates that their operating expenditure as a % of sales is relatively lower. Since the average EBITDA margin is still lower for E-commerce players, the reduced amount of operating expenses does not manage to offset the weaker gross margin.

Factors that decrease the gross margin for E-commerce apparel retailers below that of Brick-and-Mortar apparel retailers either have to do with pricing, volume or the product mix. Since online retailing is much more transparent than offline, a negative effect on companies' pricing power can be present which reduces the potential to raise prices. The fact that E-commerce is growing faster than Brick-and-Mortar, but still only making up 1/10 of all retail sales worldwide (Statista, 2018), could also mean that the digital players have not yet managed to accumulate enough sales volume to gain a more favorable negotiation power toward suppliers than that of their physical peers. A plausible explanation behind the product mix could be that Brick-and-Mortar apparel retailers own the manufacturing process of the apparel they sell to a larger extent. A larger share of private label products in their portfolio could easily translate into a higher average gross margin per product. Finally, all E-commerce apparel retailers struggle with a high amount of returns, which deteriorates their gross margins when they must put markdowns on returned products that no longer can be sold at a full price and increased costs when packages have to be shipped back and forth.

The efficiency of the E-commerce players' operations is not yet high enough to offset the reduced gross margin. Since it is hard to stand out as an online retailer a large amount of marketing is needed and the acquisition cost of an additional customer becomes high. The supply chain infrastructure requires a high level of sophistication to become profitable, and as the market is in its early phase most digital players have not yet figured out the optimal path to profitability. The fact that the E-commerce group has lower operating costs than the Brick-and-Mortar group could be explained by the absence of rental costs and the lower personnel costs.

The EBITDA margin has both a high slope coefficient and a high explanatory value for both E-commerce and Brick-and-Mortar apparel retailers' Sales multiples. As EBITDA is already included in the EV/NTM EBITDA multiple the EBITDA margin is non-significant in explaining the multiple. EBITDA is many times considered as a proxy for a company's free cash flows, which is many times used as a basis for valuations. It is a guide for how much a company can reinvest for expansion, how well they can manage their debts and avoid bankruptcy, as well as an indicator of how good they are at returning profits to their shareholders. All these factors demonstrate the importance of a strong EBITDA margin and underline why any rational investor would be willing to pay more for a unit of sales that generate a higher amount of EBITDA and give it a higher valuation.

In this case the EBITDA margin has a stronger relation with the E-commerce apparel retailers' valuation than that of the Brick-and-Mortar apparel retailers. A company in a growth phase needs more free capital to finance investments required to capitalize on the high amount of growth. It is also a strong indication that the company is not only acting in the right market and doing the right thing, but also doing things right, operationally. Another factor is that E-commerce apparel retailers have a lower average EBITDA margin to start with, which means that one unit of margin increase represents a much larger percentage increase (e.g. a 1 percentage point increase of a 5% margin means an increase of 20%, when a 1 percentage point increase of an 8% margin is only a 12.5% increase).

The second independent variable in the regression models was Total asset turnover. It has a moderate negative effect on both groups' EV/NTM Sales and is only fit to explain Brick-and-Mortar EV/NTM EBITDA. Hence, the overall effect of Total asset turnover is negative on a company's valuation. This can be for number of reasons. While focusing on the Asset Management Path normally increases the company balance sheet efficiency and consequently its Total asset turnover, it takes time, focus and resources that could be used in the Profit Management Path to improve the EBITDA margin. Another factor in explaining the negative effect can be the variable's constituents. Total asset turnover is a division of Sales by Total assets. Given the fact that Sales is a top-line item having a direct positive impact on EBITDA, the negative impact should come from Total assets, meaning that a lower Total assets (denominator) leads to a higher Total asset turnover and a lower valuation multiple. And given that having a large asset base is a prerequisite to maintain higher growth it implies that one should proactively invest in assets (Rosenbaum & Pearl, 2013). This will lead to increased growth at the expense of Total asset turnover. The negative effect is also dependent on the trade-off between EBITDA margin and Total asset turnover discussed above (section 7.2.2), since EBITDA margin has a strong positive effect on the EV/NTM Sales multiple for both groups.

7.3 Growth measures in explaining the valuation gap

7.3.1 Revenue growth

Here we also started with the comparison of the mean differences to ascertain that E-commerce apparel retailers have a higher Revenue growth. The findings were in line with our hypothesis and the Statista reports implying more than 5 times higher Revenue growth for E-commerce apparel retailers.

The higher growth was anticipated, given that the comparison is between an immature market in a growth stage (E-commerce) and a mature established market (Brick-and-Mortar). The higher growth can also be explained by the higher scalability of E-commerce companies made possible by economies of scope and Big Data (Zhang et al., 2010). So both the current market maturity and the technological advancements along with the rising Internet penetration enabled a higher growth trajectory for E-commerce players.

When examining the impact of a company's growth prospects on the valuation differences, we tested the explanatory power of company Revenue growth, since there was a huge discrepancy in Revenue growth between E-commerce and Brick-and-Mortar averages. The results (section 6.5) showed that Revenue growth has a positive effect on both valuation multiples for both groups. This was completely in line with the theoretical framework and our assumptions, as growth is one of the main determinants of value. There are number of reasons why growth can lead to a higher valuation. On the financial side, should Revenue growth, *ceteris paribus*, lead to growth in overall financial performance, cash flows and company value. On the strategic side, if Revenue growth outpaces the market average growth, it leads to more market share, stronger competitive position and more power in the market. Growth gives many kinds of advantages to a company including but not limited to economies of scale, financial perks, pricing power, and external risk reduction. However, Revenue growth produced an overall low explanatory value, which is natural, given that the valuation multiples are based on the next twelve months projected performance, meaning that they already take the expected growth under consideration to some extent. And the fact that historical Revenue growth still explains the NTM (next twelve months) valuation multiples shows how important and relevant a company's past growth is.

When comparing between groups, Revenue growth showed both a higher slope coefficient and explanatory power for E-commerce retailers than for Brick-and-Mortar retailers. The regressions led to similar results for both valuation multiples, so we will discuss them together in order to facilitate the discussion. The higher coefficient and explanatory power for the E-commerce groups can be explained by the 5 times higher variance and noticeable differences between E-commerce players when it comes to growth. It simply should be much easier to pick a "winner" by its Revenue growth from E-commerce players than from Brick-and-Mortar, which ultimately leads to a stronger effect on valuations. Another factor leading to a higher explanatory value for E-commerce players is again the fact that E-commerce is a relatively immature market (eMarketer, 2016), which obviously makes the growth dimension a key determinant for success.

Apart from the direct effect of growth on valuation multiples, there can be number of indirect positive effects through the impact of growth on EBITDA margin. A higher growth, *ceteris paribus*, should lead to more income in relation to costs, as the fixed costs stay the same. This in

its turn leads to a higher EBITDA margin, which in its turn leads to a higher EV/NTM Sales valuation multiple. Another indirect effect of high Revenue growth is media attention and positive media outlook. On one hand it is free marketing and on the other hand it may increase the perceived trustworthiness of a company and potentially decrease the perceived risk-level.

7.4 Managerial implications

Our study's findings, being based on substantial public data, make its practical implications available to everyone. Any retail firm or analyst can acquire the data we used, continuously update it on a quarterly basis and make further analyses that are more specific for the firm. Our findings provide the main "objects" of interest leading to the following implications.

The key finding of this study is the existing valuation difference between E-commerce and Brick-and-Mortar apparel retailers. The exceedingly higher valuation of E-commerce players has clear implications for traditional retail companies. It has to be an absolute priority to evaluate going online and/or allocating more resources towards initiatives related to the online channel. This, if executed correctly, will lead to, *ceteris paribus*, a higher valuation multiple for the firm, meaning a higher company and shareholder value. And since shareholder value is the main objective for profit driven companies, the findings send an important signal. Having that said, it is not only a question of online presence that drives valuation. There are many central differences in strategy, operations, cost structure, and customer behavior when comparing E-commerce and Brick-and-Mortar discussed in other studies (see examples in chapter 2).

An important finding concerning the Strategic Profit Model and profitability strategies was the strong relationship and predictive power of the EBITDA margin upon both groups valuation multiples. It is imperative for both groups to prioritize margin expansion. For E-commerce apparel retailers the relatively low gross margin could be improved from a larger share of private label products. This could subsequently boost the EBITDA margin, and facilitate brand awareness, which will reduce the customer acquisition cost. On the other hand, Brick-and-Mortar apparel retailers have a relatively stronger gross margin, but higher operating costs. Investing in the digital channel to generate a larger share of sales online will reduce the operating costs due to savings in personnel and rent costs.

Total asset turnover's negative relationship with both groups valuation multiples leads to several tangible implications. It is important to state that the negative effect of Total asset turnover does not make it imperative that one should neglect efficiency. We know, on the contrary, that Revenue growth has a positive and strong impact on valuation (sections 6.5) and revenue is the numerator in Total asset turnover. So, the explanation of the negative effect lies within the denominator: Total assets. This can indicate that it is important to invest in the company balance sheet. Investing in tangible and/or Intangible assets means: 1) higher Total assets, as the tangible and Intangible assets grow, and 2) a positive or at least neutral effect on EBITDA, as it does not include depreciation and amortization costs. Both these factors have shown to have a positive linear effect on company valuations and therefore highlight the potential of investing in the company assets.

However, this is not only true for internal investments (organic growth), but also for external investments, namely acquisitions (inorganic growth). Acquiring an EBITDA-positive company leads to, *ceteris paribus*: 1) higher revenue (implying growth), 2) higher Total assets, as the

combined company comprises both companies' assets, and 3) higher EBITDA from a combination of both companies. All of these factors have been significant in positively explaining valuation multiples in our study.

Lastly, the major findings about the explanatory powers of profitability as well as growth should not have a blinding effect on managers. These metrics indicate general phenomena, with the aim to draw attention to the problematics and do not take into consideration the interrelationships between the tested variables, their underlying drivers as well as other potential consequences. Return on Assets is not fit to explain the whole picture, especially for E-commerce retailers where it can be considered obsolete. One should instead focus on Return on Assets' constituents and use additional evaluation metrics to assess a retailer's performance. Since the characteristics of an online and offline business model differ to a large extent, a deliberate and careful choice of metrics must be made for adequate comparisons. These areas of interest are relevant subjects for further studies and are discussed in detail in section 7.6.

7.5 Limitations of the study

The current section addresses the existent factors of either conceptual or methodological nature constituting limitations in our study.

The dataset only includes public companies listed on various stock exchanges all over the globe. Being a listed as a company also means that the corporate governance will be different and the ownership diluted which can create divergent and disparate incentives. Private retail companies that do not disclose their financial information to the public could not be included in this analysis, which resulted in a smaller sample size of E-commerce players, compared with Brick-and-Mortar retailers.

The level of transparency required for financial reporting in different countries and stock exchanges can vary significantly. In most cases there are no important accounting differences, because of the IFRS standards. However, the taxation practices and corporate tax rates do differ. Some retailers have a geographical focus and some are present on a global basis. This creates discrepancy from legal, political, macroeconomic perspectives and general business conditions such as infrastructure (e.g. Internet penetration and transport possibilities).

The two groups that are compared operate in two different channels with deviating market maturity. Brick-and-Mortar retailing is a mature market with a long history, while E-commerce has not been around for a long time. This means different organizational structures, strategic focus, different amounts of publicly available data, etc. The sample groups of retailers also carry a wide variety of assortments including apparel, accessory and to some extent groceries. Various assortments divert in their profitability and proportion of sales. All assortments are represented in both categories, which makes the comparison valid.

The degree to which the retailers are vertically integrated differs, which creates different conditions for e.g. potential margin realization. This also alters the business model and requires a more diverse set of prioritizations for resource allocation and managerial focus. Some retailers own the manufacturing component in the supply chain, meanwhile others only have a small or no share of private label products in their assortment.

All data is analyzed on a quarterly basis for a period of four years, creating a time series, which means that the results have seasonality effects.

7.6 Further Research

Since there are no previous studies of valuation differences between E-commerce and Brick-and-Mortar public retail companies in specific, this pioneering work and its findings open up fruitful areas of further research from the financial perspective on retail by indicating its importance.

Risk

Our analysis was mainly focused on profitability and growth measures. The risk factor, a key determinant for valuation is not included in our analysis. An additional study with a similar methodological design can be performed in order to test if there are statistically significant differences in risk levels between E-commerce and Brick-and-Mortar apparel retailers and test if the potential differences can be used as explanatory variables. This is highly relevant based on the theoretical relationship of risk and expected returns.

Growth

In our final regression model, Revenue Growth proved to be a significant explanatory variable for the chosen valuation multiples, which makes the growth dimension a valuable avenue for future extensions of knowledge. One may complement our studies with studies of underlying drivers of growth as well as determinant conditions in the market or the economic environment that enhance growth.

Profitability and investments

Our findings on profitability measures, namely EBITDA margin and Total asset turnover could be complemented with additional research aimed to better understand the underlying drivers of both variables. As discussed in section 7.4 Total assets and its influence on growth and valuation can provide many valuable findings for both profitability and investment dimensions. More concrete studies on internal and external investment effects on retail valuation differences are also an important topic to expand on.

Strategic and operational differences

The distinct discrepancy in valuations makes it even more valuable and interesting to further analyze and research the underlying differences of strategic and operational nature between Brick-and-Mortar and E-commerce apparel retailers.

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9 Appendix, List of companies in the dataset

Brick-and-Mortar			
Abercrombie & Fitch	Esprit	Li Ning	Skechers
Adidas	Express	Lojas Rennes	Sports Direct
Aditya Birla Fashion	Fast Retailing	Lululemon	Steve Madden
Alpargatas	Fenix Outdoor	Luxotitica	SuperGroup
Amer Sports	Foot locker	LVMH	Swatch Group
American Eagle Outfitters	Fossil	Macy's	Tapestry (Coach)
Arvind	Francesca's	Marks & Spencer	Ted Baker
Ascena Retail Group	G-III Apparel Group	Michael Kors	Tiffany & Co
Asics	Gap	Moncler	TJX
Björn Borg	Genesco	Mq Holding	TOD's
Bosideng	GEOX	Mulberry	Under Armour
Brunello Cucinelli	Gerry Weber	Next	United Arrows
Buckle	Grendene	Nike	Urban Outfitters
Burberry	Guess	Nordstrom	Van de Velde
Caleres	H&M	Onward Holdings	Venue Retail Group
Carter's	Hanes	Oxford Industries	Vera Bradley
Cato Fashion	Hermès	Prada Group	VF
Chico's	Hudson's Bay	PUMA	WeSC
Children's Place	Hugo Boss	PVH HQ (Calvin Klein)	Zhejiang Semir
Chow Tai Fook	Inditex (Zara)	Ralph Lauren	
Cia Hering	J.C Penney	Richemont	
Columbia Sportswear	JD Sports	RNB Retail and Brands	
Deckers Outdoor	KappAhl	Ross Stores	
Dick's Sporting Goods	Kering	Salvatore Ferragamo	
Dillard's	L Brands	Shanghai Metersbonwe	

E-commerce			
Alibaba	Boozt	Lightinthebox	Vipshop Holdings Limited
Amazon	Etsy	Netshoes	YOOX Net-a-Porter Group
ASOS	Jd.com	Overstock.com, Inc.	Zalando
Boohoo.com	Land's End	Sportamore	