RESEARCH ARTICLE

Drivers' estimation of the luxury companies

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Abstract One of the important financial issues for the public companies is how to achieve the most optimal way to maximize firm value and shareholder wealth in a competitive environment. Another problem is connected with the search for an efficient method of the evaluation of social media mood impact on companies' values as it creates their image and reputation. The paper aims to investigate the impact of financial indicators and news related to enterprise on luxury companies' performance. Luxury industry is chosen as an object of the study as it has a range of specifics, which can cause the changes in the variables' effects. To accomplish the purpose of the research, the authors design fixed-effects regression models on a sample of 45 European, Asian and American luxury companies for the period 2010–2019 and conduct sentiment, correlation and Granger-causality analyses using the extracted Twitter data. The results show that net margin, return on

investments, total revenue, earnings per share, current ratio and asset turnover have a significant positive effect on the luxury companies' market capitalization, while total debt percentage of total equity influences negatively and significantly. The study also finds that participation in M&A and luxury companies' location have a significant impact on their market capitalization. Various impacts within the specifics of luxury sectors are also established for the sample examined in this research. Furthermore, strong relationships between news background and companies' performance are discovered.

Keywords Companies' performance · Market capitalization · Financial ratios · News background · Luxury industry

JEL Classification C21 · G34 · L1

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Introduction

Maximization of the company value is the main goal for enterprises to be accomplished by financial management concept. For companies that have gone public, this goal can be achieved by maximizing the value of the relevant market price to increase the shareholder welfare (Salvatore 2005). Since the future dividends and income from the shares expected by the owners are based on the real value of the enterprise or

its ability to generate cash flows, a change in market value can be considered one of the most important indicators for evaluating the company's performance by shareholders.

The majority of authors argue that the market capitalization is a proxy for the company performance (Chander and Aggarwal 2008; Singhania 2008; Kenneth 2009; Kohansal et al. 2013; Omodero 2019). It is calculated by multiplying the value of company stock market price by the number of shares outstanding. Therefore, the higher the company's share price and the larger number of shares outstanding in the market, the greater the company's market capitalization. Considering the number of outstanding shares to be constant (except in the case of buyout or split share), the firm's value is largely affected by the market price of firm (Rajhans and Kaur 2013).

One of the specifics of the luxury industry is a late entry into the online space, which has led to the fact that the only luxury companies on the market are in the stage of active growth in e-commerce and interaction with consumers through social networks. The concern about news background in social networks about a luxury brand, which has emerged in last few years, is raising a number of questions and explorations to the top management of companies that are willing to get higher returns from their investments. It is the second problem of the enterprises: to find out the efficient way of evaluation of social media audience mood impact on companies' values. Besides the assessment of social network statistics, consumers' satisfaction, loyalty, etc., sentiment analysis could be applied in order to expose the significance of reactions, emotions and tones to stock prices (Brown 2012; Tsytsarau et al. 2014).

Many authors explore the effect of financial indicators on market capitalization as an indicators of company performance, but only few of them analyze specifically the luxury industry (Prasad and Shrimal 2015; Munther and Al-Nimer 2015; Qurashi and Zahoor 2016; Lestari and Armayah 2016; Murniati 2016). In addition, many studies consider the impact of various above-mentioned qualitative indicators, but do not take into account the possible influence of the financial ratios represented in financial statements. To bridge the gap of evaluation of luxury companies' performance, the relation between financial ratios, as well as news background in social media

and luxury firms' performance will be examined applying the appropriate types of methodology.

The paper aims to evaluate the impact of financial indicators and news related to enterprise on luxury companies' performance.

The database collected for the financial part of the research is a panel sample of 45 listed companies from Europe, Asia and America, including the period from 2010 to 2019. It consists of different financial indicators contained in the companies' annual and financial reports, underlying their performance. Panel regressions with few dummy variables, reflecting the specifics of luxury industry, are applied for the purposes of empirical analysis. A cross-sectors analysis provides a comparative study of financial ratios' endowment to the future growth or value reduction of luxury companies.

Data for the non-financial analysis contain more than 900 thousand published tweets with the word "Prada" from the 14th of February to 17th of April 2020. In this part, methods of machine learning and sentiment analysis using emotional and evaluative lexicons are used as well as the Spearman correlation analysis to investigate the influence of tweets tonality to the luxury companies' share values.

The novelty of the work contains the knowledge development in the evaluation of companies' performance drivers based on the luxury retail market, which is little studied in the context of the financial ratios and news tonality analyses. The results are of the great interest nowadays due to the necessity to recover the reduced luxury goods demand caused by world pandemic.

Financial and non-financial drivers of companies' efficiency

This paper aims to evaluate luxury companies' performance drivers, in other words to define the factors that influence the company's value. The existing financial and non-financial factors that can impact company's performance will be considered in the next subsection of the investigation. Based on the literature review (Friedman 2007; Omodero 2019; Kenneth 2009), it was decided to put market capitalization and market stock prices as indicators of company's performance. The use of stock prices can be explained by the fact that non-financial factor is the

news background that is generated every day. Moreover, the proxy of company's performance that is published every day is stock prices (it is the component of the evaluation of the market capitalization). Therefore, in the case of financial factors, market capitalization is used as a general indicator of a company's value, that is calculated as multiplication of number of outstanding shares by the stock price.

Financial indicators for assessing market capitalization

Authors invented different approaches to examine the relationships between market capitalization and other figures and distinguished several groups of indicators as macroeconomic and microeconomic factors, tangible and intangible assets, financial or non-financial indicators.

Recent literature reviews papers where researchers examined different groups of financial indicators and provided information about right allocation of companies' investments. Most of authors covered the profitability group, which included such indicators as gross profit margin (GPM), EBITDA margin, net profit margin (NPM), return on equity (ROE), assets (ROA), investments or invested capital (Deloof 2003; Padachi 2006; Narware 2010; Rayan 2008).

Part of studies considered that profitability indicators are crucial in explaining market variables. For instance, the research by Qurashi and Zahoor (2016) explored a positive relationship between market capitalization and ROI, but no connection between stock prices and return on assets and return on equity. The higher the ability of a company to benefit from money that could be invested, higher the value of the company. These results of study were consistent with research by Sun and Kim (2011). Moreover, studies of Pavone (2019) and Munther (2015) supported these findings and indicated statistically significant relationships between market performance and return on investments. Other scientists (Höbarth 2006; Prasad 2015) investigated the impact of margins on the market capitalization. They examined positive power in creating value by gross profit margin, EBITDA margin and net profit margin. On the contrary, Lestari and Armayah (2016) conducted study where negative impact of net profit margin on the stock prices was proven.

Many authors explored correlation between market performance and liquidity ratios. Studies examined to what extent quick ratio or current ratio affect the stock prices development. The paper of Jaya and Sunder (2012) carried out a study that 91% of the change in market capitalization was explained by liquidity variables. Kohansal et al. (2013) highlighted that stock prices reacted positively on independent variables as liquidity ratios (quick and current ratio), activity ratio (asset turnover) and financial leverage ratio (debt ratio) and explanatory power of suggested model is significant.

Some researchers grouped balance sheet ratios indicators separately as well as factors of leverage like debt to asset ratio or debt-to-equity ratio (DER) that measured how efficiently companies used their resources and managed debts. Thus, studies provided by Putu, Suaryana (2013) and Asmirantho, Yuliawati (2015) found out the negative effect of DER on stock prices, whereas, other papers of Murniati (2016), for example, confirmed the opposite influence of this indicator to the share prices movements. Total assets turnover ratio was also included in some studies and led to the contradictory results.

Besides the impact of financial indicators, mergers and acquisitions are considered the significant factor for developing market capitalization of companies in luxury industries. According to EY research (2019), there was a substantial growth in transactions last time confirming the positive expectations of investors about the potential in the luxury market. In fact, M&A activity reached all-time highs with 140 deals, where accessories and e-commerce are the most attractive sectors. Chari et al. (2005) in their research investigated how acquiring firms affect market capitalization. Panel data estimations suggested that stock market anticipates the considerable value creation and the increase of shares' prices from cross-transactions leading to significant gains for the shareholders of both target firms and buyers.

Various sources such as EY and Deloitte identify mergers and acquisitions as a trend for expansion and increasing companies' value, so it is crucial to confirm the positive relationship between such transactions and market capitalization in the modern conditions of the luxury industry operational strategies.

News background in social media as a driver of luxury companies' efficiency

In the century of fast-changing trends, luxury companies have started to keep an eye on the new consumers' classes: younger segments, namely Millennials and Generation Z—the customers of the future. To engage these consumers, companies from luxury industries are required to apply strategies with digital innovations, to use social networks actively, as traditional ways of customers' involvement do not show effective results anymore.

According to the specifics of luxury industry, brand image is the most important part of creating value. Quality, price and other attributes take a back seat. Relationship between brand image and customers is a priority goal for every luxury company, as only positioning of companies on the market will allow them to get decent sales and to attract new profitable customers.

To stimulate interest among new groups of consumers' luxury goods companies developed their own social media strategies as their future success depends on the ability to communicate with the consumers in the right way. One of the social networks with the rapidly growing popularity is Twitter. Researchers studied Twitter messages to attempt to gauge if there is any measurable way to gather people's opinion about companies, their products and goods. No doubt, volume of Twitter messages made the task of monitoring customers' comments extremely time consuming and manually impossible. Sentiment analysis appears to be a promising tool for solving this issue. Sentiment analysis is more time-efficient and allows extracting opinions “in-real-time” avoiding recall biases. Authors Bifet and Frank (2010), Bollen et al. (2011), Pak and Paroubek (2010) involved in their papers sentiment analysis for understanding Twitter relevance for estimating companies reputation.

Brown's study (2012) tried to analyze whether there is a correlation between sentiments in Twitter and stock prices of companies. It was investigated that news background of companies measured by Twitter sentiment might be a cause of movements on the stock market. This conclusion, as author pointed out, should provide some amendments into decision-making mechanisms for investors and traders while attempting to determine investments into a particular stock or sector.

Another important publication is belonged to Tumasjan et al. (2014). The main idea of this paper was in using special nomenclature, which allowed to define only those users with the interest in the stock markets in order to reduce “noise” in data of Twitter. They focused on S&P top 100 stocks, collected only related tweets and determined positive correlation of the sentiments in Twitter and movements in stock prices.

Hypotheses development

To bridge the gap of evaluation of luxury companies' performance drivers, the relation between both financial indicators and news background and luxury firms' performance will be examined applying the appropriate types of methodology.

The main specifics of luxury industry, identified above in the market overview subsection, allowed to conclude that the strength and direction of influence on companies' performance in this industry might differ from the rest of the market. It forms the basis for the hypotheses of the research. In the research, several mathematical hypotheses were put forward, which were verified using tests and models.

Hypothesis 1.1: *Profitability influences luxury companies' performance significantly and positively.*

Hypothesis 1.2: *Growth influences luxury companies' performance significantly and positively.*

Hypothesis 1.3: *Liquidity influences luxury companies' performance significantly and positively.*

Hypothesis 1.4: *Efficiency ratios influence luxury companies' performance significantly and positively.*

Luxury goods and services are characterized by their exclusive nature and superior customer experience. They are unique in terms of positioning in the customers minds. Probably, such specifics can lead to the changes of the key financial drivers of companies' performance opposite to the FMCG and other similar spheres. The investigations within other industries suggested considering financial performance indicators aggregated in groups: profitability, growth, liquidity, leverage, efficiency (Puspitaningtyas 2017; Mondal 2010). The impact of financial factors is supposed to evaluate in terms of luxury industry.

Hypothesis 2: *Values of luxury companies' efficiency drivers differentiate depending on external factors associated with luxury goods sectors.*

As it was mentioned in the previous subsection, one of the specifics is that luxury industry comprises several sectors. It was suggested to verify whether there are differences in strength and direction of the significant financial variables' impact depending on affiliation to one of the sectors. Therefore, the following hypothesis was elaborated.

Hypothesis 3: *European location of luxury companies influences their market capitalization to the larger extent compared to other regions.*

This hypothesis is related to luxury companies' location. Most of the largest famous luxury brands have European origin and plenty of world-known fashion events take place in European countries, for instance, Fashion Weeks. Furthermore, Europe had a 32%-share in global luxury goods sales and experienced moderate growth in sales in 2018. Stoenescu et al. (2015) have already supported the significance of country of origin for brand positioning of luxury goods. Consequently, the third hypothesis was suggested.

Hypothesis 4: *Mergers and Acquisitions positively affect luxury companies' performance.*

This hypothesis relates to one of the main specifics of the luxury industry—high percentage of mergers and acquisitions. As was mentioned in the previous subsection, M&As are the focus and strategic goal of most luxury conglomerates to reach strong value and expand brand portfolio. Moreover, many authors (Leitão and Kovacs 2014; Abdel 2020) developed hypotheses about the impact of the enterprises' participation in transactions on the market capitalization and proved positive significant influence in different sectors, for instance, in paper and banking industries and in companies from BRICS countries.

Hypothesis 5: Negative (positive) emotional coloring of news about luxury brand leads to influence the share values to a higher (lower) extent.

This business later entered online platforms and social media to avoid the loss of status and uniqueness. Since producers of luxury goods just started digitalization, now they are going through a period of active

growth in social networks. News with various announcements about goods and events are posted both in luxury companies' profiles and in followers accounts daily. So, it is of great interest to discover possible effect of these news on the companies' value expressed by stock prices. Some researchers (Brown 2012; Tsytsarau et al. 2014) have already proved that social media sentiment was driving the movements of stock market and it became the basis for the next hypothesis.

Methodology and data

The paper investigates the relation between financial indicators and news background and luxury firms' performance, which will be examined applying the following methodology. This part is divided into two parts considering two types of drivers.

Financial drivers' analysis

The research was based on a panel sample of 45 listed companies from Europe, Asia and America continents. The data period was from 2010 to 2019. In order to accomplish the goal of the research, it was necessary to collect quantitative data contained in the companies' annual and financial reports and characteristics, reflecting the specifics of luxury industry, from various relevant websites and databases. The dataset in this study was obtained from Thomson Reuters Eikon Database. Data sample covered the time period of 10 years according to the data availability in the database.

Companies from five luxury goods product sectors were used for analysis: clothing and footwear, bags and accessories, cosmetics and fragrances, jewelry and watches and multiple luxury goods in order to preserve the data randomness, its representativeness (Table 1). A company was assigned to one of the five specific product sectors if a high percentage of its luxury goods sales are derived from that product sector. Multiple luxury goods companies were those with substantial sales in more than one of the luxury goods product sectors.

Clothing and footwear sector witnesses the highest concentration of luxury goods companies with 14 companies in the sample. This sector includes such companies as PVH Corp., Ralph Lauren, Hugo Boss

Table 1 Product sector profile. *Source:* Authors' own calculation

Sector	Number of companies	Share of luxury goods sales, 2019
Clothing and footwear	14	21.8%
Bags and accessories	4	5.1%
Cosmetics and personal care	9	16.4%
Jewelry and watches	10	23.2%
Multiple luxury goods	8	33.5%

etc. The sector is the third largest contributor to the luxury goods sales with 21.8 percent share. On the contrary, bags and accessories sector witnesses the lowest number of companies and the luxury sales contribution of this sector is also insignificant (5.1%). Data contain in this sector four companies: Luxottica Group, Safilo Group, Vera Bradley and Mulberry Group. Cosmetics and fragrances is the fourth largest sector and includes nine companies like The Estee Lauder, L'Oréal Luxe, Shiseido and so on. Share percentage of sales in 2019 is equal to 16.4. The following sector is jewelry and watches. This sector experienced sales share of 23.2% ranking the sector as second in terms of composite sales performance in FY2019. Compagnie Financière Richemont SA, The Swatch Group and Chow Tai Fook Jewellery Group Limited are the examples of jewelry and watches sector. The eight multiple luxury companies are the top contributors with the 33.5% share to the overall luxury sales in the sample. The group consists predominantly of European multinationals with two companies based in Italy (Prada Group and Salvatore Ferragamo), three in France (LVMH Moët Hennessy-Louis Vuitton SE, Kering SA and Hermes International SCA) and two in UK (Michael Kors Holdings Limited (now Capri Holdings Limited) and Burberry Group). Only one company is from USA—Tapestry, Inc. (formerly Coach, Inc.).

Taking into account the existence of high concentration of luxury goods companies headquartered in Europe, the USA and the largest markets in Asia, it was decided to divide all countries—manufacturers of luxury goods—into three categories: European, Asian and American regions (Table 2). The majority of luxury companies are located in Europe due to the fact that this region is a motherland of fashion and has a great history of luxury industry. According to Xerfi Global, Europe remained the top region for luxury goods sales, followed by the America, Asia (including

mainland China), Japan and the rest of the world (Xerfi Global 2019).

European luxury companies are mostly located in Italy, France, Switzerland, UK and Germany. Twenty-two companies out of 45 are located in Europe. Twelve companies have their headquarters in the USA and other countries of American continent, and 11 ones are belonged to the Asian part: China, Japan, India and Hong Kong.

Description of the analyzed variables

Most investors would agree that market capitalization is the most important determinant of a company's size because it reflects market value, and therefore, expectations about a company's future. Understanding and assessing the market capitalization of companies is crucial to making smart investment choices. Therefore, it was decided to consider market capitalization as an explanatory variable.

For the research, it was agreed to create dummy variables that define affiliation to different sectors and regions. Five dummy variables were determined according to the number of sectors and three other variables were introduced to present European, Asian and American regions. Furthermore, as it was mentioned above, the fact of the participation in mergers and acquisitions could be the driver of creating additional value for luxury companies. Thus, the M&A dummy variable was elaborated: it was decided to assign "1" if the company had a transaction at the particular year and "0"—otherwise.

Dependent variables were analyzed based on the firms' fundamental information measured using profitability, growth, leverage, liquidity and efficiency groups of indicators. The variables taken into consideration in order to perform the study, as well as their characteristics and previous studies, were synthesized into Appendix 1.

Table 2 Country profiles. *Source:* Authors' own calculation

Countries			Number of companies	Average size of companies by luxury goods sales, mln \$	Share of luxury goods sales, %
Europe		Belgium	1	236,847	10
	Denmark	1	2 317,642	1.1
	France	4	14 536,264	40
	Germany	1	3 054,004	1.4
	Italy	8	3 645,937	10.3
	Switzerland	2	14 581,471	9.3
	UK	4	1 589,608	3.3
America		USA	10	4 480,150	18.9
	Canada	1	238,234	0.1
	Brazil	1	318,986	0.1
Asia		China/Hong Kong	4	2 427,213	6.1
	India	2	1 788,744	1.3
	Japan	5	2 221,837	7.4

Table 3 contains descriptive statistics for all variables involved. According to this, it can be concluded that the sample is heterogeneous in terms of creating market value.

Methodology

Within the empirical approach, to verify the mentioned hypotheses, a financial analysis was conducted using the multiple correlations and regression analysis. After descriptive analysis, check for normal distribution of variables was conducted. It was observed that the main part of variables did not meet the condition of normal distribution and logarithms of these variables were applied.

Before creating regression models, correlation matrix for selected variables was proposed to exclude multicollinearity in the model. The matrix

demonstrates that some variables as logarithms EBITDA, gross profit margin, total assets, debt to assets ratio and liquidity quick ratio should be dropped due to acceptable strength of correlation coefficients (< 0.6) and common sense. After that, a final correlation matrix was conducted, and the results show that multicollinearity between remaining variables is absent.

The final model included variables for which complete information was obtained, which theoretically had an impact on improving the efficiency of companies in the lux sector, in which multicollinearity was not found.

According to the data analysis, the general model was conducted:

$$MCap_{it} = \beta_0 + \beta_1 X1_{it} + \dots + \beta_n Xn_{it} + \gamma_1 D1_{it} + \gamma_2 D2_{it} + \varepsilon_{it} \quad (1)$$

Table 3 Descriptive statistics for variables. *Source:* Authors' own calculation

Variables	Mean	Observations
Gross profit margin, % (GPM)	58.10	450
EBITDA margin, % (EBITDAM)	17.91	450
Net margin, % (NETM)	8.63	450
Return on equity, % (ROE)	19.29	450
Return on assets, % (ROA)	9.45	450
Return on investments, % (ROI)	15.32	450
Total revenue, mln \$ (REV)	4847.01	450
Earnings before interest, taxes, depreciation and amortization, mln \$ (EBITDA)	1014.61	450
Earnings per share, mln \$ (EPS)	2.59	450
Total assets, mln \$ (TA)	6382.3	450
Total debt percentage of total assets, % (DA)	17.34	450
Total debt percentage of total equity, % (DE)	37.86	450
Dividend payout ratio, % (DPR)	47.59	450
Current ratio (CR)	2.36	450
Quick ratio (QR)	1.39	450
Asset turnover (TATO)	1.07	450
Accounts receivable turnover (RecTurn)	11.32	450
Payables turnover (PayTurn)	8.70	450
Inventory turnover (InvenTurn)	2.07	450

where independent regressors are represented by the following variables:

- X1—EBITDA margin, %
- X2—net margin, %
- X3—return on assets, %
- X4—return on equity, %
- X5—return on investments, %
- X6—total revenue, mln \$
- X7—earnings per share, mln \$
- X8—total debt percentage of total equity, %
- X9—dividend payout ratio, %
- X10—current ratio
- X11—asset turnover, mln \$
- X12—accounts receivable turnover, mln \$
- X13—payables turnover, mln \$
- X14—inventory turnover, mln \$
- X15—mergers and acquisitions, %
- D1—USA dummy.
- D2—Europe dummy,
- β_0 —constant of the model.
- ε_{it} —error term.

In order to avoid possible problems with heteroscedasticity and autocorrelation, Newey–West standard errors correction was applied.

Further step of the research was to determine the differences between financial indicators contribution in value creation or destruction of companies, which operate in the different sectors. For this purpose, interaction terms were used in order to clarify if the same indicator can act as resource or liability in various conditions. Interaction effects occur when the effect of one variable depends on the value of another variable. In other words, this method allows finding out the differences between the meanings of the factors in general model and by two sectors.

News background analysis

RStudio was chosen to collect news, which includes the terms of the luxury industry, and then analyze the tone of the news and conduct analytics. By writing special code, the program in real time selected news that included the Prada_data phrases. As a result, 929,358 published tweets with the word “Prada” from

the 14th of February to 17th of April 2020 were obtained. Data were uploaded several times every week.

As a tool for measuring financial performance of luxury companies, the stock prices were chosen, since this indicator is published on a daily basis, which allows to compare it with the current mood in social networks. Yahoo Finance provides open, high, low and close stock price values. For the study, a close stock price was selected, as it is the final trading price of a day.

The higher probability of a change in the tonality of news tweets might occur with the company, which actively participates in the development of Twitter account and has a sufficient number of followers. For this research, it was decided to choose Prada Group Company as Prada Twitter blog is active (there are several tweets a day) with more than one million followers. Moreover, Prada is the listed company and has the appropriate data for the analysis.

For the qualitative research, it is crucial to process data, as the sample should be cleared of contaminated data. To obtain complete analytics on news sentiment, news containing hashtag (#trend, #luxurybrand), that is used to facilitate the retrieval of messages by topic or content; links (reference to a web resource that is located out of Twitter); username (a unique designation of a user, on Twitter a username starts with an @ symbol such as @Prada); and stop words (words that do not carry the semantic load. This category includes conjunctions, pronouns, prepositions, particles, interjections and numbers). Special characters, punctuation, additional spaces and numbers with spaces were also removed from the texts. The removal of such words in many cases makes it possible to improve the quality of the data set and clear the sample from extraneous noise. In connection with the current situation in the world, it was decided to clear the data from information related to the coronavirus pandemic, namely tweets with the words “quarantine”, “covid-19”, “coronavirus”, “stayhome” and others in different languages, since the information space is oversaturated with this topic.

Within the framework of word processing tasks, the representation of the information in the form of n-grams is popular, where n-gram is a contiguous sequence of n items from a given sample of text or speech. The most used in the studies n-grams are unigrams and bigrams, which consist of a single and a

pair of words from text, respectively. For instance, the sentence “Julia loves Prada accessories” can be represented as unigrams: {“Julia”, “loves”, “Prada”, “accessories”} or bigrams: {“Julia loves”, “loves Prada”, “Prada accessories”}. Mostly, using bigrams gives more relevant results as some combinations of words can have one emotional coloring, while constituents of this combination express the opposite mood.

Sentiment analysis exposes the attitudes in the mined text. It helps to explore information about reactions, emotions and tonality tones. The purpose of the sentiment analysis is to find opinions in the text and determine their properties. According to the goal of the research, the position of the follower regarding the mentioned topic (tonality) is interesting for the study. Sentiment analysis exposes the attitudes in the mined text. It helps to explore information about reactions, emotions and tonality tones. For the analysis, vocabulary related to the mood (for example, anger, anticipation, disgust, fear, joy, sadness, surprise, trust) was selected. In the analysis performed using special RStudio functions, each sentence was scored for each sentiment category.

After providing the sentiment analysis, the aggregated indicators of positive and negative emotions were created. Daily average values of tweets with positive and negative coloring were calculated for the further Spearman correlation analysis. To double-check the existence of positive and negative news’ impact on stock prices and to compare them between each other, the Granger-causality test with lags was used.

Analysis of financial indicators contribution

This part of the investigation aims to assess the financial indicators’ contribution in the market capitalization using panel regression.

As it was mentioned, the differences of variables’ impact by sectors were considered. The reason was to explore the role of the factors in the transformation of market value under various conditions. There was a guess that factors might reverse sign minus to plus (plus to minus) and become an asset (a liability). Thus, the following sectors were chosen: clothes and footwear and jewelry and watches as they varied widely and might demonstrate more representative results.

Thereby, two regression models were developed in accordance with the purpose of the research: the general one and by sectors. The general model regression, which was unrestricted and included all the mentioned variables, showed that there was no multicollinearity between the factors, but many of them were insignificant and the model did not provide correct results. To solve this problem, the F-test for redundant variables was applied. This test helps to determine whether the joint impact of all the variables that have been excluded is significant. The null hypothesis is that redundant variables are statistically insignificant, the alternative hypothesis—otherwise. The program (EViews) estimated the restricted model and displayed the F-test results and restricted estimates. The next step was to consider the correlation matrix for the restricted model variables. It showed that there were no strong correlations. They all could be included in one restricted model. To support the evidence, a VIF test was done. VIF was closer to 1–2; it means that the model is strong, as the factors are not impacted by correlation with other factors.

Finally, general model was obtained:

$$MCap_{it} = \beta_0 + \beta_1 X1_{it} + \dots + \beta_n Xn_{it} + \gamma_1 D1_{it} + \gamma_2 D2_{it} + a_i + u_{it} \quad (2)$$

where independent regressors $X1 \dots Xn$ are represented by the following variables:

$X1$ —net margin, %

$X2$ —return on investments, %, mln \$

$X3$ —total revenue, mln \$

$X4$ —earnings per share, mln \$

$X5$ —total debt percentage of total equity, %

$X6$ —current ratio

$X7$ —asset turnover

$X8$ —mergers and acquisitions

$D1$ —USA dummy

$D2$ —Europe dummy

β_0 —constant of the model.

a_i — n entity-specific intercepts.

u_{it} —error term

It was estimated using fixed-effects regression approach and the following results were provided (Table 4).

This model is significant; explanatory power is high: adjusted R-squared is 84%. Discovered significant coefficients could be provided in terms of key market capitalization drivers.

Table 4 demonstrates that indicator total debt percentage of total equity has a negative effect on market capitalization. The 1% increase of percentage of debt in total equity decreases market capitalization by 0.07%. Companies that have too much debt relative to equity might find that eventually, their creditors restrict their freedom of action; or it could experience diminished profitability because of paying steep interest costs. In addition, enterprises could have trouble meeting their operating and debt liabilities

Table 4 Fixed-effects regression for restricted model. *Source:* Authors' own calculation

Dependent variable	Coef Market Capitalization (MCap)
Independent variables	
Net margin (netm)	0.18 (0.05)***
ROI (roilog)	0.46 (0.05)***
Total revenue (rev)	1.01 (0.03)***
Earnings per share (eps)	0.09 (0.03)***
Total debt percentage of total equity (delog)	− 0.07 (0.03)*
Current ratio (cr)	0.15 (0.07)**
Asset turnover (tato)	0.13 (0.08)*
Mergers and acquisitions (m&a)	1.57 (0.06)***
America (us)	0.12 (0.10)***
Europe (eur)	0.24 (0.09)***
Intercept	− 0.65 (0.29)**
Number of observations	450
Adjusted R-squared	0.84
Rho	0,31

* Significant at $p < 0.1$.

** Significant at $p < 0.05$.

*** Significant at $p < 0.001$

during periods of adverse economic conditions. Or, if the business sector is extremely competitive, then competing companies could take advantage of debt-laden firms by swooping in to grab more market share.

Total revenue from business activities contributes to market capitalization to the greatest extent within financial variables. 1% increment of this indicator promotes growth of market capitalization by 1.01%. Revenue is one of the main drivers of creating company value. Therefore, the relationship between indicator and dependent variable is strongly positive.

ROI indicator also contributes positively to market capitalization (1% increase of ROI leads to 0.46% rise in market value). High ROI means the investment's gains compare favorably to its cost. This reveals the willingness to pay of investors and availability of magnification market capitalization.

Concerning net margin indicator, 1% augment of net margin causes 0.18% growth of dependent variable. If a company's net income goes up, the stock price and therefore the market capitalization will probably increase. This is especially true if investors look at other factors and conclude the increase is likely to continue in the future. For example, if a company retains a large part of its earnings, this increases the shareholders' equity. Even more important for most investors, growth in net income that is retained and reinvested means the company is likely to enlarge, and they can expect more increases in income in the future. Under these circumstances, investors will pay more per share thereby increasing market capitalization.

Another affirmative indicator that enhances market capitalization is earnings per share. By 1% growing this factor improves market capitalization of companies by 0.09%. Therefore, the higher earnings per share value the better the company is in the eyes of investors.

Furthermore, direct relationship is observed between market capitalization and current ratio: 1% growth of current ratio brings 0.15% enhancement of companies' stock prices. The higher the ratio, the greater the company's ability to pay bills. This may affect the interest of investors to invest in the luxury companies, consequently the enterprises' market capitalization will rise. Therefore, the current ratio moves in the same direction of stock prices.

One more indicator with positive impact on the market capitalization is asset turnover. 1% increment of this variable contributes by 0.13% in market

capitalization increase. This indicator measures how efficiently a company uses its assets to generate revenue. The more efficient use of all companies' assets to support sales activities, the greater attractiveness for the investors and, consequently, the increase in corporate value. Thus, asset turnover moves in line with market capitalization.

Considering dummy variable related to the existence of mergers and acquisitions in the luxury companies' history, this indicator brings the most valuable contribution to the market capitalization development: the participation in transactions leads to 1.57% enlargement of stock prices movement in the luxury industry. Many enterprises in the luxury industry use M&A to grow in size and leapfrog their rivals, while it can take years or decades to extend the size through organic growth.

Considering variables about region distribution on luxury brands, it could be concluded that Europe countries are more preferable for this segment brand location. Regression model shows that the company's location in Europe is almost twice as good as increasing the market capitalization than American placement. This can be caused by the fact that fashion and luxury industry is more developed in Europe and therefore larger investments are attracted.

The regression with sector dummies

Turning to the consideration of key market capitalization drivers in terms of sectors, the additional analysis using interaction terms in regression was conducted. Firstly, as was noted, the most widely represented two sectors were chosen—clothing and footwear and jewelry and watches. These sectors are interrelated because mostly people choose jewelry and other accessories based on the clothing outfit for the day. However, clothes and jewelry sectors vary significantly because of price segments, customer loyalty, raw materials, and so on. For instance, people are less selective to clothes and footwear as fashion is very changeable and wearing time is limited, while they are more attentive to the purchase of jewelry due to the much higher price and longer expiration period. The sectors are widely represented in the sample, have a similar number of observations and means of dependent variable—market capitalization. These facts gave an opportunity to compare regression coefficients with each other.

The next point that needed to be addressed was variable selection. It was decided to take those variables, which present in both industries to almost the same extent. Moreover, the significance of chosen variables in the general model should be taken into account. According to the conditions above, the following variables were selected: net margin, ROI, total revenue from business activities, debt to equity ratio, mergers and acquisitions factor and American or European affiliation. To compare the impact of these factors on companies' market capitalization under conditions of two sectors, interaction terms to regression were added.

As in the previous case, a fixed-effects regression approach was used for the same reasons. The results are presented further (Table 5).

To interpret the obtained results by sectors, the values without multiplication should be summed with the cross-variables for each sector separately. It gives an opportunity to find out if the indicator has positive or negative impact on company value depending on the sector. For instance, the factor "America" has influence in 0.79% in clothes and footwear by summing -0.39 and 1.18 , whereas it has impact in -0.18% in jewelry and watches by summing -0.39 and 0.21 . The other results were calculated in the same way (Table 6).

It was observed that variables have the same direction of influence in clothes and footwear sector as in the general model without separation above, while America dummy variable reversed the direction of impact in jewelry and watches sector.

Table 5 Fixed-effects regression for model in terms of two sectors.
Source: Authors' own calculation

Dependent variable	Coef Marketing capitalization (mcap)
Independent variables	
Net margin (netm)	0.25 (0.08)***
Net margin*clothes (netm*cloth)	-0.13 (0.10)*
Net margin*jewelry (netm*jew)	0.08 (0.12)**
ROI (roi)	0.40 (0.05)***
ROI*clothes (roi*cloth)	-0.05 (0.09)**
ROI*jewelry (roi*jew)	-0.01 (0.10)**
Total revenue (rev)	0.96 (0.03)***
Total revenue*clothes (rev*cloth)	0.13 (0.04)***
Total revenue*jewelry (rev*jew)	-0.01 (0.3)
Total debt percentage of total equity (de)	-0.01 (0.04)**
Total debt percentage of total equity *clothes (de*cloth)	-0.03 (0.06)
Total debt percentage of total equity *jewelry (de*jew)	-0.25 (0.09)*
Mergers and acquisitions (m&a)	1.15 (0.08)***
Mergers and acquisitions*clothes (m&a*cloth)	0.81 (0.13)**
Mergers and acquisitions*jewelry (m&a*jew)	-0.73 (0.15)***
Europe (eur)	0.03 (0.13)*
Europe*Clothes (eur*cloth)	0.23 (0.22)
Europe*Jewelry (eur*jew)	0.44 (0.28)*
America (us)	-0.39 (0.14)**
America*clothes (us*cloth)	1.18 (0.22)***
America*jewelry (us*jew)	0.21 (0.25)
Intercept	-0.11 (0.24)
Number of observations	450
Adjusted R-squared	0.85

* Significant at $p < 0.1$.

** Significant at $p < 0.05$.

*** Significant at $p < 0.001$

Table 6 The degree of influence of factors depending on the sector. *Source:* Authors' own calculation

Variables	Clothes and footwear	Jewelry and watches
Net Margin (netm)	0.12	0.33
ROI (roi)	0.35	0.39
Total revenue (rev)	1.09	0.95
Total debt percentage of total equity (de)	− 0.04	− 0.26
Mergers and acquisitions (m&a)	1.96	0.42
America (us)	0.79	− 0.18
Europe (eur)	0.26	0.47

Net margin and ROI have stronger positive influence in jewelry and watches sector than in the clothes and footwear one. Besides, net margin enhancement in jewelry and watches sector is even higher than in general model that means higher possibilities of luxury companies in this sector for enlargement and higher expectations of growth of revenues in the future. The increase of net margin by 1% leads to increase of market capitalization by 0.12% and 0.33%; the increase of ROI by 1%–0.35% and 0.39% in clothes and footwear and jewelry and watches sectors, respectively. It could be concluded that companies of jewelry and watches sector have better company management allowing them to significantly increase the value of the company, namely market capitalization.

On the contrary, indicator total revenue from business activities have a little bit stronger positive influence in clothes and footwear sector than in jewelry and watches sector. As in the general model, revenue has the greatest impact on market capitalization within financial variables: the growth of revenue by 1% results in increase of market capitalization by 1.09% and 0.95%, respectively by sectors. It appears that for apparel sector it is more important to have greater revenues because each percent growth of this indicator increases market capitalization more significantly. However, generally, the values for the sectors are approximately the same and this indicator of total revenues is one of the most important for paying attention to.

Factor total debt percentage of total equity has a negative effect both in clothes and footwear and jewelry and watches sectors. Companies always try to find an optimal capital structure expressed as a combination of equity, short-run and long-run

liabilities in order to maximize the stock prices. The higher debt percentage of total equity the less company is attractive for the investors. Table 6 indicates that jewelry and watches is more susceptible to the losses in market capitalization value.

Variable, which reflects the existence of mergers and acquisitions in the luxury companies' history, has almost five times higher effect on stock exchange movements in clothes and footwear than in jewelry and watches sectors. However, both sectors demonstrate strong results and add 1.96% and 0.42% to market capitalization, respectively. Such findings can be explained by the statistics of impressive number of transactions especially in clothes and footwear sector.

Concerning country variables, Table 6 demonstrates that America has much greater positive impact in clothes and footwear sector than in the general model and reversed the direction of influence in the second sector. The negative sign could be caused by the fact that the main market players of this sector are located in Europe (Switzerland and so on). Moreover, American location influences the market capitalization stronger than European in the first considered sector. The reason could be that in America, clothes are more affordable, and customers are not so dependent on fashion trends, while in Europe customers tend to make purchases in accordance with the latest fashion trends.

Analysis of news coloring contribution

After consideration the influence of financial ratios on performance of luxury companies, the study places the emphasis on the investigation of emotional coloring measures of companies' values in social media.

Table 7 Form of tweet text for the sentiment analysis. *Source:* Twitter

Jennifer aniston out in hollywood promoting murder mystery may 30th 2019 Jen is wearing prada
 Like prada satin wrap mini skirts
 My car was stolen and in it was my brand new bottle of prada luna rossa

Each uploaded tweet had the following attributes: tweet text, date of publication, author's id and nickname, number of retweets, source status etc.

Before providing the sentiment analysis, data processing was conducted. As it was mentioned above, tweets text was cleared of different types of noise and irrelevant information such as hashtags, links, usernames, and so on. Furthermore, all tweets with the mention of the information about coronavirus were removed from the sample. The final form of tweet text for the further analysis is presented below (Table 7).

General sentiment analysis

Sentiment analysis was conducted for the entire data set to interpret general tonality of social network audience. For its implementation, bigrams and unigrams were used. Applying the package “syuzhet”, the emotional coloring of tweet text was got. This tool matches the words in unigrams and bigrams with lexicons in the package (in the case of this research, “nrc” lexicon with ten emotions is considered). In this lexicon, the occurrence in the text of a word appearing

in one of the categories (say the disgust one) counts as 1 in the sentiment score for that category.

Then all scores were summed by sentiment categories and ten final scores were calculated in the following output (Table 8). It can be observed that the most tweets contain positive content (the score is 170544) and the least number of n-grams are surprised-coloring (27,080).

For the demonstration of the obtained results, Fig. 1 was created. It shows that mostly, the attitude of people to Prada is colored with various categories of optimistic emotions (anticipation, joy, trust, positive, surprise).

In order to find a correlation between luxury company's news background and stock prices, daily sentiment scores for tweets containing links to the company's ticker (Prada), and daily stock prices were considered. The obtained above scores for ten sentiment categories were aggregated into two indicators: positive (anticipation, joy, positive, surprise, trust) and negative (anger, disgust, fear, negative, sadness) to get the average scores. The stock prices were uploaded from Yahoo Finance database. As was mentioned above, the close price of the day of publishing tweet was chosen for the analysis.

Next, a correlation analysis of Spearman was performed. The results are presented in Table 9. The Spearman's rank correlation test showed a high correlation between news with negative coloring and the Prada stock rate, as opposed to positive news.

To confirm the existence of relationship between news background and stock prices, Granger-causality test was applied, as it allows to find out the impact at the particular time lag (in this research days are considered as lags). Thus, the number of times when the news cause a change in the price of shares can be identified.

Therefore, it is desirable to do a test for various values of lags to define which of them are significant. It was decided to consider four lags equal to 1, 2, 5, 7 based on the AIC. The effect of each variable on each was evaluated. When variables were identified, a 10%

Table 8 Summed sentiments' scores. *Source:* Authors' own calculation

Sentiment	Score	Share (%)
Anger	58,544	8
Anticipation	77,816	11
Disgust	54,408	7
Fear	58,616	8
Joy	61,240	8
Sadness	54,840	7
Surprise	27,080	4
Trust	84,792	11
Negative	90,168	12
Positive	170,544	23

Fig. 1 Sentiment analysis.

Source: processed by R studio

Table 9 Spearman correlation between stock prices and news.

Source: Yahoo Finance, 2020

	Stock prices	Positive news	Negative news
Stock prices	1.00	0.16	− 0.64
Positive news	0.16	1.00	− 0.31
Negative news	− 0.64	− 0.31	1.00

Table 10 Granger test with lags 1, 2, 5 and 7. Source: Authors' own calculation

		Negative mood does not Granger-cause price share	Positive mood does not Granger-cause price share
Lags: 1	F-Statistic	1.0066	4.9897
	Prob. (<i>p</i> -value)	0.0194	0.12895
Lags: 2	F-Statistic	1.7099	3.6826
	Prob. (<i>p</i> -value)	0.0893	0.13081
Lags: 5	F-Statistic	41.676	50.637
	Prob. (<i>p</i> -value)	< 2.5E-14	< 1.7E-16
Lags: 7	F-Statistic	69.316	54.242
	Prob. (<i>p</i> -value)	< 1.2E-19	0.1174

level of significance was chosen (i.e., the threshold value is 0.10). If the value of the relationship *p* (the level of minimum significance) was less than 0.10, the null hypothesis was rejected. The null hypothesis was that negative (positive) mood does not Granger cause price share; the alternative hypothesis—otherwise. So, according to the Granger test with a lag 1, it is

significant: *p*-value of negative mood is 0.0194 (< 0.10, so, the null hypothesis is rejected). *P*-value of positive mood is not significant, it displays the absence of a positive effect on lag 1 at lag 1. The other meanings are presented in Table 10.

Table 11 presents the visualization of the results obtained above. The “→” sign means confirmation of the influence and the “×” sign—the absence of influence. It can be noted that negative mood influence is observed during all considered lags. Otherwise, positive mood in social networks has an impact only on the fifth lag.

Granger-causality test confirmed the existence of relationship between news background and luxury company's stock prices. Furthermore, it could be concluded that negative tweets influence the Prada rate for various lags, while positive social mood affects only once out of five. So, the suggestion that negative emotional coloring of news leads to influence the share values to a higher extent than positive was supported.

Discussion

The conducted analysis provided several significant findings, which were interpreted with a certain dose of caution. The primary problem was to figure out the significant influence of financial indicators and news background in Twitter on luxury companies' performance. Meanwhile, a number of hypotheses were set and verified within the research paper. Table 12

Table 11 Granger test with lags 1, 2, 5 and 7. *Source:* Authors' own calculation

		Negative mood does not Granger-cause price share	Positive mood does not Granger-cause price share
Lags: 1	F-Statistic	1.0066	4.9897
	Prob. (<i>p</i> -value)	0.0194	0.12895
Lags: 2	F-Statistic	1.7099	3.6826
	Prob. (<i>p</i> -value)	0.0893	0.13081
Lags: 5	F-Statistic	41.676	50.637
	Prob. (<i>p</i> -value)	< 2.5E-14	< 1.7E-16
Lags: 7	F-Statistic	69.316	54.242
	Prob. (<i>p</i> -value)	< 1.2E-19	0.1174

presents the findings and the comparison with the drawn results in previous studies.

H1. Financial indicators

In terms of the first hypothesis, five groups of indicators were considered. Financial performance

was measured using the variables of profitability, growth, leverage, liquidity and efficiency.

Profitability

Net margin can show the efficiency and effectiveness of the company's operations in suppressing the existing costs so that the company can still generate maximum net profit from sales that occurred. This indicator positively affects market capitalization of luxury companies. The result is relevant to the researches of Savitri and Haryanto (2012), Nurhakim (2016), Maryyam (2016). Such findings are inconsistent with conclusions of Lestari (2016) and Egam et al. (2017) researches which showed negative effect of net margin on stock prices. However, some investigations do not prove the significance of the considered relationship (Putri and Sampurno 2012). The difference in directions of influence and its significance may be caused by the characteristics of samples (countries, industries, time periods and so on).

ROI is positively linked with market capitalization of luxury companies. It can be proved by the fact that

Table 12 Results of hypotheses testing. *Source:* Authors' own calculation

Research hypothesis	Acceptance/ rejection of mathematical hypothesis	Studies for comparison
1.1. Profitability influences luxury companies' performance significantly and positively	Accepted	Savitri and Haryanto (2012), Nurhakim (2016), Maryyam (2016)
1.2 Growth influences luxury companies' performance significantly and positively	Accepted	Matthew and Odularu (2009)
1.3. Leverage influences luxury companies' performance significantly and positively	Rejected	Asmirantho and Yuliawati (2015), Putu and Suaryana (2013)
1.4 Efficiency ratios influence luxury companies' performance significantly and positively	Accepted	Lestari and Armayah (2016); Putri and Sampurno (2012); Asmirantho and Yuliawati (2015); Putu and Suaryana (2013); Amanah et al. (2014)
2. Values of luxury companies' efficiency drivers partly differentiate depending on external factors associated with luxury goods sectors	Accepted	Kalayci, Karatas (2005)
3. European location of luxury companies influences their market capitalization to the larger extent	Accepted	Stoenescu et al. (2015)
4. Mergers and acquisitions positively affect luxury companies' performance	Accepted	Chari et al. (2005); Dobbs et al. (2006)
5. Negative (positive) emotional coloring of news about luxury brand leads to influence the share values to a higher (lower) extent	Accepted	Brown (2012); Tsytsarau et al. (2014)

higher profit is caused by quality of management, market power and economies of scale. The significant result is in line with the empirical studies on the sample of insurance, banking, infrastructural spheres (Al-Nimer and Alslihat, 2015; Qurashi and Zahoor 2016). So, this tendency is observed in various industries including luxury one. Initially other profitability ratios were also considered (ROA and ROE), but they were dropped out because of insignificance. The insignificance contradicts the findings of a study by Al-Nimer and Alslihat (2015), in which the authors concluded that there is an effect of ROA on market capitalization for the companies operating in the insurance sector. Moreover, Prasad and Shrimal (2015) justified the significance of ROE in infrastructure industry, whereas this factor became insignificant in luxury industry.

The conducted analysis supported that both profitability variables affect market capitalization of luxury companies positively and significantly. Profitable corporate conditions drive an increase in stock prices following an increase in market demand for company stocks. Profitability can become an important consideration for investors in their investment decisions.

Growth

Total revenue positively significantly contributes to luxury companies' performance. It is one of the most notional financial indicators that represents the income generated from the business. Increased revenue can cause the stock price to rise as investors feel more confident about the company's future and demand for the stock increases. The issuance of dividends and stock buybacks can also result from income and increase the stock price. The result is in line with Matthew and Odularu (2009) which clarified that revenue has positive and statistically strong significance on the value of company's market capitalization.

Earnings per share has a positive significant impact on luxury companies' values. If the value of earning per share increases, it is possible that the company can pay more dividends or issue bonus shares. With greater shareholder profits, it will attract investors to invest so as to drive stock prices up. Therefore, EPS moves in the direction of stock prices. The obtained result is supported by many authors which found out

partial EPS significant effect on stock prices (Al-Afeef 2020; Asmirantho and Yuliawati 2015). Meanwhile, the results of several studies proved that EPS does not affect the stock price (Meythi et al. 2011).

It is observed that all measures of growth have positive significant influence on luxury companies' performance. Growth reflects the company's ability to meet its financial obligations if the company finances its asset expenditures with debt. In addition, growth also reflects the success of the company, this condition will encourage the increase in stock prices following the increase in market demand for the company's shares.

Leverage

Debt to equity is negatively significant at 0.1% level of significance. The result is supported by other researchers (Asmirantho and Yuliawati 2015; Putu and Suaryana 2013). The low debt to equity value will increase the positive response of the market and improve company's ability to pay long-term liabilities because the risks arising from the use of funding derived from debt will be reduced, thus affecting the increase in stock prices. Therefore, debt-to-equity ratio moves in the opposite direction with market capitalization.

The result demonstrates the negative influence of leverage. High leverage jeopardizes the company because the company will be stuck in high debt levels and in difficulties to release the debt burden. The decision on the use of leverage should be carefully considered between the likelihood of the risk and the expected returns to be earned.

Liquidity

The current ratio shows the company's ability to pay current liabilities with current assets available. The higher the current ratio of a company means the less risk of a company's failure to meet its short-term liabilities. Therefore, information about a good current ratio will be appreciated by the market in the form of rising stock prices following the increase in the company's stock demand. This study supports that there is a positive significant relationship between liquidity (using current ratio indicator) and market capitalization. The finding refers to the results of studies by several authors which proved that (Amanah

et al. 2014). Meanwhile, some investigators rejected the existence of this relationship (Meythi et al. 2011).

It can be concluded that liquidity indicator has positive significant effect on luxury companies' value. A high level of liquidity reflects the company's financial performance in good condition. If the level of liquidity is low, it will create an illiquid financial condition. However, too high levels of liquidity can also have a material adverse effect on the company's financial condition, because it reflects the availability of overly high current assets or indicates a lot of idle funds.

Efficiency

Asset turnover captures how efficiently the firm utilizes assets to generate revenues. The analysis demonstrates the positive significant influence of this indicator on companies' market capitalization. The more efficient use of all companies' assets to support sales activities will affect the attractiveness for the investors and, consequently, the increase in corporate value.

Thus, efficiency ratio also positively affects luxury companies' market capitalization. It reflects how efficiently the management of the company is using the available resources most optimally. The higher efficiency indicates that the company generates more revenue per amount spent on the asset.

To sum up, the first hypothesis of a positive relationship between the financial performance measured by profitability, growth, leverage, liquidity and efficiency ratios and companies' value is partially accepted. Profitability (using net margin, ROI), growth (using EPS and total revenue), liquidity (using current ratio) and efficiency (using asset turnover) ratios indicate significant positive impact, while leverage ratio expressed by total debt percentage of total equity negatively affect luxury companies' market capitalization.

H2. Sectors

The second hypothesis suggested the differences of variables' impact by two sectors: clothes and footwear

and jewelry and watches. As was obtained, external factors associated with luxury goods sectors differentiated the value of luxury companies' performance drivers. Some authors have already supported the suggestion that financial ratios can be used in differentiating sub-sectors of industry. They considered eight sub-sectors of manufacturing industry and concluded that products of wood and manufacture of non-metallic products sectors have the highest profitability scores. Having a high profitability score is the desired property for the companies; a high profitability score is probably the result of the high operating performance (Kalayci et al. 2005).

Regarding the luxury industry, the considered two sectors' conditions do not change the direction and strength of the most powerful driver's impact. Total revenue from business activities have a little bit stronger positive influence in clothes and footwear sector than in jewelry and watches sector. The absence of the differentiation can be caused by the fact that turnover generates from normal business operations, it is a fundamental factor that determines companies' performance regardless of sector.

It was observed that all variables have the same direction of influence in clothes and footwear sector as in the general model without separation above, while American dummy variable reversed the direction of impact in jewelry and watches sector and became a liability. This variable indicates American headquarters' location of luxury companies. The negative sign could be caused by the fact that the main market players of this sector are located in Europe (Switzerland and so on). Moreover, American location influences the market capitalization stronger than Europe in the first considered sector. The reason could be that in America, clothes are more affordable, and customers are not so dependent on fashion trends, while in Europe customers tend to make purchases in accordance with the latest fashion trends.

To conclude, the second hypothesis that explored the role of the factors in the transformation of market value under various conditions is accepted. Values of luxury companies' performance drivers differentiate depending on external factors associated with clothes and footwear and jewelry and watches goods sectors.

H3. Location

Concerning the third hypothesis, there was a suggestion that European location of luxury companies influences their market capitalization to a larger extent. Regression model showed that the company's location in Europe is almost twice as good as increasing the market capitalization than American placement. Therefore, the hypothesis is accepted.

The results are supported by the investigators, who have already highlighted the relevance of country of origin in consumers' perceptions and purchasing behavior. The luxury industry has developed clear associations between product categories and countries of origin for which these products are typical and ethical, such as German cars, Italian fashion, French perfumes and Swiss watches (Stoenescu et al. 2015). All the considered types of fashion goods are associated in minds of customers with Europe, while America evokes only few brands' memories. Such a trick of the location attracts investors and it leads to the European companies' performance growth.

H4. M&A

The next hypothesis proposed that mergers and acquisitions positively affect luxury companies' performance. Luxury companies tend to participate in M&As (there was a 20% increase in transactions in 2017 vs. 2016) and it is one of the substantial specific of the industry. The conducted analysis demonstrated that dummy variable related to the existence of such transactions in the luxury companies' history brings the most valuable contribution to the market capitalization development. Based on the result, the hypothesis is accepted.

The finding is supported by a vast amount of research papers, which discovered that stock market anticipates the considerable value creation and the increase of shares' prices from transactions leading to significant gains for the shareholders of both target firms and buyers. Strong positive relationships between the existence of mergers and acquisitions and abnormal growth of stock prices after transaction announcement demonstrate that expectations of eco-

nomic improvements underlie the equity revaluations of the merging firms (Chari et al. 2005; Dobbs et al. 2006).

Therefore, the confirmation of the positive relationship between such transactions and market capitalization in the modern conditions of the luxury industry operational strategies is crucial and relevant as M&As are identified as a trend for expansion and increasing companies' value.

H5. Coloring of news

The fifth hypothesis is supposed that negative (positive) emotional coloring of news about luxury brand leads to influence the share values to a higher (lower) extent. The suggestion is in line with the fact that luxury industry later entered online platforms and social media to avoid the loss of status and uniqueness. Now the enterprises are going through a period of active growth in social networks and it was relevant to confirm the hypothesis. The results of sentiment analysis and correlation of attitude emotional coloring with stock prices allowed to accept it.

Some researchers have already proved that social media sentiment is driving the movements of stock market (Brown 2012; Tsytsarau et al. 2014). The greater extent of negative news impact on companies' performance may be determined by the investors' strong reaction to dejection in media related to the luxury brand due to their fears about funds. Investors do not substantially respond to positive news background in networks as a supportive mood holds attention to the company but does not cause any monetary risks.

The discovered positive relationship of mentioning the luxury brand in media and companies' share prices (negative in higher extent than positive) should provide some amendments into decision-making mechanisms for investors and traders while attempting to determine investments into a particular luxury company.

To sum up, almost all the elaborated hypotheses were accepted. The obtained results can be applied by luxury companies to develop their strategic management approaches. Most of the considered indicators

are universal and significant in other industries that was confirmed by previous studies. The findings of this research are in line with luxury industry specifics.

Conclusion

The study aimed to identify the most important factors for luxury companies' performance by evaluation of the impact of financial indicators and news related to enterprises on their market capitalization. Ten years from 2010 to 2019 was examined including 45 luxury companies from Europe, Asia and America continents. The paper provided an analysis of different financial and non-financial ratios that could be useful for luxury companies to focus on particular factors in order to increase efficiency and for investors to make informed investment decisions.

The conducted analysis provided a number of significant findings, which were interpreted with a certain dose of caution. The primary problem was to figure out the factors that influence the luxury companies' performance significantly. Consequently, three research questions were covered.

The first question was associated with the identification of the drivers of luxury companies' performance. It can be concluded that net margin and ROI (profitability), total revenue and earnings per share (growth), current ratio (liquidity) and asset turnover (efficiency) have a significant positive impact on market capitalization whereas total debt percentage of equity has a significant negative influence. Concerning the sectors' features of luxury companies, it was investigated that the same factors had different effect on enterprises' performance. All variables had the same direction of influence in clothes and footwear sector as in the general model without separation, while American dummy variable reversed the direction of impact in jewelry and watches sector and became a liability.

The second question was related to the effect of the luxury industry specifics on companies' performance. The location and participation in M&A were considered as the main features of this industry. It was explored that European location was almost twice as

good as increasing the market capitalization than American placement. Furthermore, M&A was indicated as the most valuable driver of luxury firms' performance.

The third question was directed to the assumption that there was a relationship between news background in social networks and companies' performance. It was found out that there was a correlation between news background and stock prices. Moreover, negative emotional coloring of news about luxury brand led to influence the share values to a higher extent than the positive ones.

The directions for future research can be widening the selection of indicators by adding macroeconomic variables or intangible factors and development of additional models with different groups of variables to compare them. Moreover, there is a possibility to consider effects of factors in more luxury sectors through an addition of interaction terms. It will allow to make the conclusion about the endowments' diversities in the frame of sectors. Furthermore, prediction of luxury companies' stock prices based on sentiment analysis can be included in the research. In addition, to make more objective conclusion about news background impact, the qualitative research can include more luxury companies and cover a longer time period without coronavirus noise in social networks.

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Declarations

Conflict of interest We confirm the absence of both financial and non-financial conflicts of interest between the authors.

Appendix

See Table 13.

Table 13 Indicators for estimation. *Source:* Authors' own calculation

	Indicators	Estimation algorithm for the research	Previous studies
Profitability	Gross profit margin GPM = gross profit /total revenue	The percentage of sales that exceed the cost of goods sold (how efficiently a company uses its materials and labor to produce and sell products profitably)	Deloof (2003), Padachi (2006), (Rayan, 2008), Narware (2010), Prasal and Shrimal (2015)
	EBITDA Margin EBITDAM = EBITDA/Revenue	Company's operating profit as a percentage of its revenue (how much in earnings a company is generating before interest, taxes, depreciation, and amortization, as a percentage of revenue)	Deloof (2003), Padachi (2006), Rayan (2008), Narware (2010)
	Net margin NETM = net profit /revenue	Percentage of net profit generated from a company's revenue	Savitri and Haryanto (2012), Nurhakim (2016), Maryyam (2016), Lestari and Armayah (2016), Al-lozi and Obeidat (2016), Egam et al. (2017), Hutapea et al. (2017)
	Return on Equity ROE = net profit/equity	Profitability of a business in relation to the equity	Rayan (2008), Narware (2010), Prasal and Shrimal (2015), Munther and Al-Nimer (2015), Qurashi and Zahoor (2016), Lestari and Armayah (2016), Murniati (2016)
	Return on Assets ROA = net profit/total assets	Capabilities of an enterprise making a profit from any assets used	Nurmala (2006), Savitri and Haryanto (2012), Kohansal et al. (2013), Munther and Al-Nimer (2015), Prasal and Shrimal (2015), Qurashi and Zahoor (2016), Murniati (2016)
	Return on Investments ROI = Net profit/Investments	Return or gain from an investment	Munther and Al-Nimer (2015), Qurashi and Zahoor (2016), Lestari and Armayah (2016), Pavone (2019)
	Return on Capital Employed ROCE = Net profit/Capital Employed	Return on capital employed	Deloof (2003), Padachi (2006), Rayan (2008), Narware (2010), Adamczyk and Dawidowicz (2018)
Growth	Total revenue from business activities REV = Sales Price × Number of Units Sold	The income generated from normal business operations	Singhanian (2008), Matthew and Odularu (2009)
	Earnings before interest, taxes, depreciation and amortization EBITDA = Net Income + Taxes + Interest Expense + Depreciation and Amortization	Evaluation of a company's operating performance	Deloof (2003), Padachi (2006), (Rayan, 2008), Narware (2010), Adamczyk and Dawidowicz (2018)
	Earnings per share EPS = Net profit/number of shares outstanding	The level of benefits that accrue to any shares	Kusuma and Priantinah (2012), Islam (2015), Putu and Suaryana (2013), Asmirantho and Somantri (2015), Adipalguna and Suarjaya (2016)
	Total Assets TA = Non-Current Assets + Current Assets	The assets owned by the entity that has economic value whose benefits can be derived in the future	Putu and Suaryana (2013), Asmirantho and Somantri (2015), Murniati (2016)
	Dividend payout ratio DPR = dividends paid/net income	Percentage of earnings paid to shareholders in dividends	Nurmala (2006), Kusuma and Priantinah (2012)

Table 13 continued

	Indicators	Estimation algorithm for the research	Previous studies
Leverage	Total debt percentage of total assets DA = total debt/total assets	Percentage of a company's total assets that were financed by creditors	Murniati (2016)
	Total debt percentage of total equity DE = Total Debt/Equity	How large the amount of debt used to finance the company's equity	Putu and Suaryana (2013), Asmirantho and Somantri (2015), Murniati (2016), Adipalguna and Suarjaya (2016), Hutapea et al. (2017)
Liquidity	Quick Ratio QR = (Cash + Cash Equivalents + Short-Term Investments + Current Receivables)/Current Liabilities	Company's capacity to pay its current liabilities without needing to sell its inventory or get additional financing	Chander and Aggarwal (2008), Jaya and Sunder (2012), Kohansal et al. (2013)
	Current Ratio CR = Current assets/Current liabilities	A company's ability to pay short-term obligations or those due within one year	Nurmala (2006), Kohansal et al. (2013), Asmirantho and Somantri (2015), Adipalguna and Suarjaya (2016)
Efficiency	Asset Turnover TATO = Net sales/Total Assets	How efficiently a company uses its assets to generate revenue	Kohansal et al. (2013), Asmirantho and Somantri (2015), Adipalguna and Suarjaya (2016), Hutapea et al. (2017)
	Inventory Turnover InTurn = Revenue/Average Inventory	How many times a company has sold and replaced inventory during a given period	Chander and Aggarwal, (2008)
	Accounts receivable turnover RecTurn = revenue/average accounts receivables	The number of times over a given period that a company collects its average accounts receivable	Chander and Aggarwal, (2008)
	Accounts payable turnover PayTurn = Net credit purchases/average accounts payable	The rate at which a company pays off its suppliers	Chander and Aggarwal, (2008), Hutapea et al. (2017)

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