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Do marketing-related intangible assets affect the company's net income?

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Abstract

The study examines the correlation between marketing-related intangible assets and net income for the last reporting period of 100 U.S. stock market leaders. Given that 102 companies were included in this ranking, but not all of them reported the necessary information for the calculations, the sample for regression analysis was 44 companies. Based on information on marketing-related intangible assets available in the companies' reports, we concluded that the hypothesis that marketing-related intangible assets determine net income is rejected because this factor is considered insignificant (Model 1). Of the four analyzed models, Model 4 is optimal for further use, which confirms the significant impact of marketing costs (expenses) on the company's net income. Our study makes two important contributions. First, the regression analysis based on the reporting data of companies refutes the hypothesis that marketing-related intangible assets affect the company's net income. Second, the proposed model (Model 4) confirms the significant impact of marketing expenses (costs) on net income, which leads to appropriate recommendations for further improvement of this model.

Keywords: marketing-related intangible assets; intangibles; net income; financial performance; trade name; trademark; marketing expenses (costs); regression analysis.

1. Introduction

The need to study the impact of intangible as sets is due to the fact that in the context of digitalization's requests and understanding of the importance of intangible value drivers, managers must be provided with relevant information about

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intangibles and use effective forecasting tools to manage them. Therefore, we emphasize the need to disclose transparent information about intangible assets in company reports and to understand the existence or absence of a correlation between these types of assets and financial performance.

The situation with tangible assets does not cause difficulties in finding information about them in the reporting lines. But intangible assets, intellectual capital, and related value drivers have been the focus of many relevant studies in recent years, primarily because of the difficulty of having complete information about them. A number of articles are devoted to confirming or refuting the impact of intellectual capital or its components (human, relational (customer), structural capital) on financial performance [Acuña-Opazo & González, 2021; Lehenchuk & Zavalii, 2021; Xu & Liu, 2021; Suryani & Nadhiroh, 2020; Ahmed et al, 2019; Albertini & Berger-Remy, 2019; Forte et al, 2019; Hatane et al, 2019; Pucci et al., 2015; Wang, 2011], but no focus on the impact of intangible assets in terms of their dividing into marketing-related, customer-related, artistic-related, contract-based, and technology-based.

In particular, our attention was focused on marketing-related intangible assets that are associated with company marketing activities and are responsible for gaining competitive advantages in a market environment. Firms spend considerable efforts to build brand awareness and associations among consumers. Yet there is a limited understanding of the financial returns of such investments [Krasnikov et al, 2009]. With regards to brand awareness, it consists of consumers' ability to detect the brand under dissimilar conditions, as mirrored by their brand recognition or recall performance [Kotler & Keller, 2009]. According to R. Kamasak, reputational resources (e.g. corporate reputation, customer/product service reputation or brand name) which are among the intangible resource categories might be described as an outcome or the result of previous successful marketing or communication activities of a firm's managerial and/or networking capabilities [Kamasak, 2017]. Brands have become main means of marketing and making profit [Aničić et al, 2016]. Thus, there are assumptions that marketing-related intangible assets, which include such types of intangibles as trademarks, trade names, trade dress, brands, logos, newspaper mastheads, internet domain names, non-competition agreements, affect the financial performance of companies. A broader context is presented next, briefly illustrating the wide scope of marketing, before returning the heed to the main topic under study.

According to N. Antoniades, in business, marketing an idea entails an attempt to communicate a brand, product, or concept to the public by creating an effective message; within a political marketing context, the question arising comprises how a government may effectively communicate its «product» to citizens [Antoniades, 2020]. Adding to this, if marketing identifies and satisfies customer needs whereas political marketing identifies and satisfies voter/citizen needs, with packaging consisting of a large part of marketing and an extension of branding (given it is the procedure where firms enclose or protect their products for distribution and sale), then, politicians may also «package» their ideas. Further, the research findings of the recent study of N. Antoniades [Antoniades, 2021] align with the previous study made by N. Antoniades & P. Haan [Antoniades & Haan, 2019], who argued that entrepreneurial capability (as a business's personality and branding characteristic) in addition to adaptive capability, not only have a strong positive impact on political performance leading to a nation's prosperity, but they also have a strong relationship with the attainment of competitive advantage (that is, political popularity, superiority and leadership).

To remain within the business milieu, however, a brand consists of a combination of name, visual identity as well as characteristic design which separates the products of a firm from those of its antagonists [Palmer, 2012]. Put differently, it is a unique product offering formed using a name, symbol, design, packaging, or some amalgamation of these, intended to differentiate it from its rivals [Jobber & Ellis-Chadwick, 2020]. The salience of the financial element in the present study becomes evident in the ensuing information.

The necessity to establish a clear relationship between marketing assets and financial results of companies is noted by R.K. Srivastava, A. Tasadduq, and F. Liam. In particular, the relationship between marketing and finance must be managed systematically; no longer can marketers afford to rely on the traditional assumption that positive product-market results will translate automatically into the best results. These assets can be conceptualized as market-based assets or assets that arise from the commingling of the firm with entities in its external environment [Srivastava et al, 1998]. Marketing efforts can add predictive power to the valuation model in parallel with abnormal earnings, particularly explaining the gap between the market and book value through creating intangible marketing assets which provide a convenient explanation of observations related to market value [Mousa et al, 2021].

The issue of marketing-related intangible assets is the focus of managers, accountants, marketers, financiers, and other related experts who need to understand the synergies and confirmed correlations between what is managed and what it causes as a result of financial performance. Assumptions or hypotheses by researchers that intangible assets have an impact on financial performance are not always confirmed. But the insignificance of the impact of intangible assets may be due to incomplete data on these types of assets in the company's reporting. According to E. Albertini & F. Berger-Remy, paradoxically, intangible assets that have not been bought are not reported in a company's financial statements, leading to situations where the book value of brands, such as Apple or Hermès, is equal to zero [Albertini & Berger-Remy, 2019]. As R. Bužinskiene notes in her dissertation, each element of intangible assets includes different subelements. Some subelements are recognized and recorded as intangible assets in accounting, and others are written off as operating expenses. This is due to the fact that the legal acts regulating the accounting of intangible assets limit the accounting of these assets because it is necessary to justify the economic benefits of the asset, to determine the fair value and to ensure control [Bužinskiené, 2017].

Actual marketing-related intangible assets and marketing-related intangible assets reported by the company are not the same due to current regulatory requirements for the recognition of intangible assets. Of course, focusing on such intangible assets, we can only consider the information that is in the company's reports.

This study aims to confirm or refute the significance of such a parameter as marketing-related intangible assets for such a financial indicator as net income. This hypothesis was tested by regression analysis, which comprises a method for measuring

the linear association between a dependent and an independent variable [Zikmund et al, 2010]. The information base for the calculations was the annual report (Form 10-K) of companies for the last reporting period (mostly data for December 31, 2020). The results of this study will be useful for researchers from different academic fields (strategic management, marketing, accounting, finance, etc.) and practicing experts.

2. Literature review

Precisely due to the need to find new ways to increase the competitiveness of companies, identifying the links between intangible assets and performance indicators has been at the center of research by many authors. It is logical to assume that the effective management of intangible assets, which according to B. Lev are sources of future benefits that lack a physical embodiment [Lev, 2005], and investing in their development should lead to improved financial results.

Analyzing the relevant literature, the authors of this article came to the conclusion that it was necessary to equate such terms as «intangible assets», «intangible resources», «intangible capital», «intangibles» and «intellectual capital» in the context of this study.

Some researchers focused on determining the impact of the company's intangibles and investments in intangibles on financial or market performance [Xu & Liu, 2021; Qureshi & Siddiqui, 2020; Seo & Kim, 2020; Ferdaous & Rahman, 2019; Hatane et al, 2019; Kamasak, 2017; Wang, 2011; Ruiwen & Honghui, 2010]. It is clear that to determine the impact of intangible assets using a regression model, the authors took into account different metrics of financial performance as dependent variables:

- J. Ferdaous & M.M. Rahman – earning per shape;
- S.E. Hatane, C. Zanderet's & J. Tarigan – EVA spread;
- R. Kamasak – firm performance as a multi-dimensional construct that includes market share, sales growth, and profitability items;
- M.J. Qureshi & D. Siddiqui – financial performance (ROE, ROA, ROIC, Net profit margin, ATO), financial policies (debt policy, the dividend policy), market value (price earnings ratio, price to sales ratio, price to book value);
- H.S. Seo & Y.J. Kim – profitability (profit margin), firm value;
- M. Wang – operating cash flow, ROA, and market capitalization;
- J. Xu & F. Liu – firm profitability (earnings before interest, taxes, depreciation and amortization (EBITDA), net profit margin (NPM), gross profit margin (GPM), corporate return (ROI, ROA, ROE)).

Kamasak's hypothesis «Capabilities will make a larger contribution to firm performance than that of IRs (intangible resources)» was partially supported, provided that intangible resources or IR items include company reputation, organizational culture, customer service reputation, legally protected copyrights, designs and patents, human resource management policies, organization structure, product/service reputation, and trademarks [Kamasak, 2017]. Given intellectual capital is the combination of human, relational and structural capital, based on the interaction variables result of Hatane's article, only structural capital disclosure has significant impact toward EVA Spread [Hatane et al, 2019].

A group of researchers is clearly distinguished, who dedicate their works to the topic of determining the impact of intangible assets on the value of the company [Gomes et al, 2020; Ievdokymov et al, 2020; Ocak & Findik, 2019; Glova & Mrazkova, 2018; Jaara & Elkotayni, 2016; Behname et al, 2012; Nesta & Saviotti, 2003]. For example, L. Nesta & P.-P. Saviotti (2003) found evidence that the degree of knowledge integration within biotechnology firms is a significant explanatory variable of firms' stock market value. Based on the results obtained, H.B. Gomes, T.J. de C. Gonçalves & A. de L. Tavares (2020) determined that the companies' intangibility level has a positive and statistically significant relationship with its market value. The results of Jaara & Elkotayni's research (2016) showed that investment in intangible assets strongly affects maximizing the market value of companies [Jaara & Elkotayni, 2016]. According to Ionita & Dinu's research, intangibles classified as innovative competences (R&D and Patents) do not have a positive impact on sustainable growth rate and the firm value in listed companies from Romania [Ionita & Dinu, 2021]. The results obtained as a result of regression analysis in each article have their own characteristics, primarily because they are based on different data (industry, sample size, country, etc.) for different time periods.

In the aspect of our research, it is necessary to analyze the article by T. Pucci, C. Simoni, & L. Zanni, as they raise the issue of the impact of marketing assets on the performance of the firm. Marketing assets or resources, according to their approach, include brands, stores, advertising expenses, the balance sheet's intangible assets, and their interactions. The empirical analysis of the authors highlights that: a) there is a positive direct relationship between a firm's intellectual capital value and its performance; b) the combination and interaction of specific marketing resources affect the intellectual capital value. The results show that intellectual capital value can be used as a synthetic indicator to evaluate the impact of some specific marketing resources on business performance [Pucci et al., 2015]. This paper proposes a framework to measure the effect of the use and interaction of different marketing assets on firm performance, through their impact on the level of the firm's intellectual capital.

The impact of intangible assets on the financial performance of companies has received some excitement in recent years, but the issue of the similar impact of certain types of intangible assets is an area of little study. This once again emphasizes the need to study marketing-related intangible assets for various indicators of the financial performance of companies.

3. The identification of previously unresolved issues and the formulation of research hypotheses

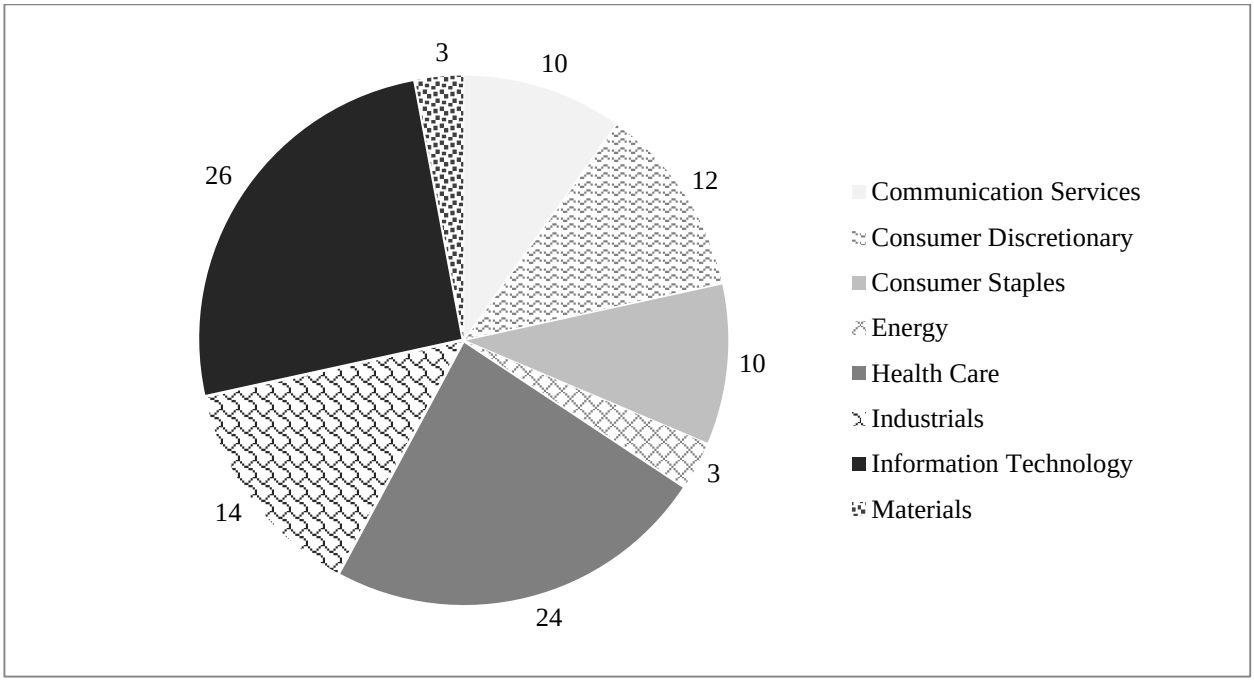
The issue of the impact of intangible assets in terms of their dividing in accordance with IFRS 3 Business Combinations (marketing-related, customer-related, artistic-related, contract-based, and technology-based intangible assets) on financial performance has not been raised in scientific publications. In particular, verification of the significance of marketing-related

intangible assets on the net income of companies was not offered. Therefore, we consider this segment of research very important to understand the existing correlations between intangible assets that are related to marketing activities and financial performance. The hypothesis of this study is that marketing-related intangible assets affect a company's net income.

4. Research methodology and methods

For building a regression model that would reveal the correlation between companies' marketing assets and their performance, it is necessary to be able to analyze the data of companies that directly reported on such assets. Therefore, we first chose the analytical basis for the study, and then determined the share of companies that report on marketing intangible assets, and chose an indicator that directly characterizes the performance of companies. Next, we tested the model, which provides for one dependent and one independent factor, and supplemented it with other independent factors to increase the efficiency of the obtained model.

The basis for building a regression model, in which one of the independent variables was marketing intangibles, was information from the annual reports of the 100 U.S. stock market leaders [43]. In particular, taking into account the current rules of international reporting (IFRS 3 «Business Combinations»), we focused on components of intangible assets, namely marketing-related intangible assets. By the way, this list for the fourth quarter of 2021 included 102 companies from different types of industry (Fig. 1).



Source: systematized on [1]

Fig. 1. The industry structure of the list of companies whose reports have been analyzed

The largest share in the total number of analyzed companies is occupied by technology companies (26%); a slightly smaller share – by health care companies (24%), and even smaller – by industrial companies (14%).

All company reports are freely available on the official websites of companies and on other Internet resources (for example, https://www.annualreports.com), so finding and processing annual reports (Form 10-K) does not cause many difficulties. The lack of a clear form of reporting on marketing-related intangible assets causes the vagueness of data for analysis. According to IFRS 3 Business Combinations [21], identifiable intangible assets consist of marketing-related, customer-related, artistic-related, contract-based, and technology-based intangible assets. In particular, among marketing-related intangible assets, for which a contractual basis is necessary, distinguish, such as (Table 1).

Table 1

The types of marketing-related intangible assets according to IFRS 3 Business Combinations

MARKETING-RELATED INTANGIBLE ASSETS				
trademarks, trade names, service marks, collective marks, certification marks	trade dress (unique colour, shape or package design)	newspaper mastheads	internet domain names	non-competition agreements

Source: [21, p. 10]

Summarizing the vision of marketing-related intangible assets, we conclude that it is a set of intangibles directly used by the company in processes related to marketing activities (communications, sales, promotion, distribution of products, building its reputation in the market, etc.), which are regulated by relevant intellectual property rights and which can be recognized, separated from other assets and can bring economic benefits to the owner.

During the processing and analysis of annual reports of companies, we encountered ambiguous presentations of marketing assets. In particular, some companies report on marketing-related intangible assets as a single reporting line:

- «Amazon.com Inc.» reports on marketing-related intangible assets of $1844 million as of December 31, 2020 [5, p. 55];
- «Microsoft Corp.» reports on marketing-related intangible assets of $2914 million as of June 30, 2021 [30, p. 75];
- «PayPal Holding Inc.» reports on marketing-related intangible assets of $43 million as of December 31, 2020 [36, p. 70].

Some companies report combined groups of intangible assets, which makes it difficult to distinguish the size of those related to marketing. For example, «CVS Health Corp.» reports on customer contracts/relationships and covenants not to compete of $16029 million as of December 31, 2020 [13, p. 140]; «Danaher Corp.» reports on customer relationships, trade names, and other intangibles of $6120 million as of December 31, 2020 [14, p. 84]. More detailed information is given in Table 2.

Table 2
Examples combined reporting marketing-related intangible assets with other groups of intangible assets

№	Company	Reporting line	Net carrying amount, $ million
1	CVS Health Corp.	**Customer contracts**/ relationships and covenants not to compete	16029
2	Danaher Corp.	**Customer relationships,** trade names and **other intangibles**	6120
3	Gilead Sciences Inc.	Trademarks, **copyrights** and trade names	16236
4	Intel Corp.	**Customer relationships** and brands	1256
5	International Business Machines Corp.	**Patents**/trademarks	1747
6	Johnson & Johnson	**Patents** and trademarks	22372
7	Raytheon Technologies Corp.	**Patents** and trademarks	13
8	Starbucks Corp.	Trade names, trademarks and **patents**	74,4
9	T-Mobile US Inc.	Trade names and **patents**	186
10	UnitedHealth Group Inc.	Trademarks and **technology**	973
11	United Parcel Service Inc.	Trademarks, **patents** and **other**	5
12	Walt Disney Co.	**Character/franchise intangibles, copyrights** and trademarks	7055

Source: intangible assets, which do not recognize as marketing-related intangible assets, are highlighted in bold

Accordingly, marketing-related intangible assets are reported mostly together with customer-related or technology-based intangible assets. Although in some cases it is really difficult to separate intangible assets that characterize customer capital from marketing intangible assets due to common points of intersection. But in the above cases, when there is a transfer of two or more united groups in one reporting line, it would be better to report their value separately. In our study, this circumstance is one of the limitations of the model that will be proposed.

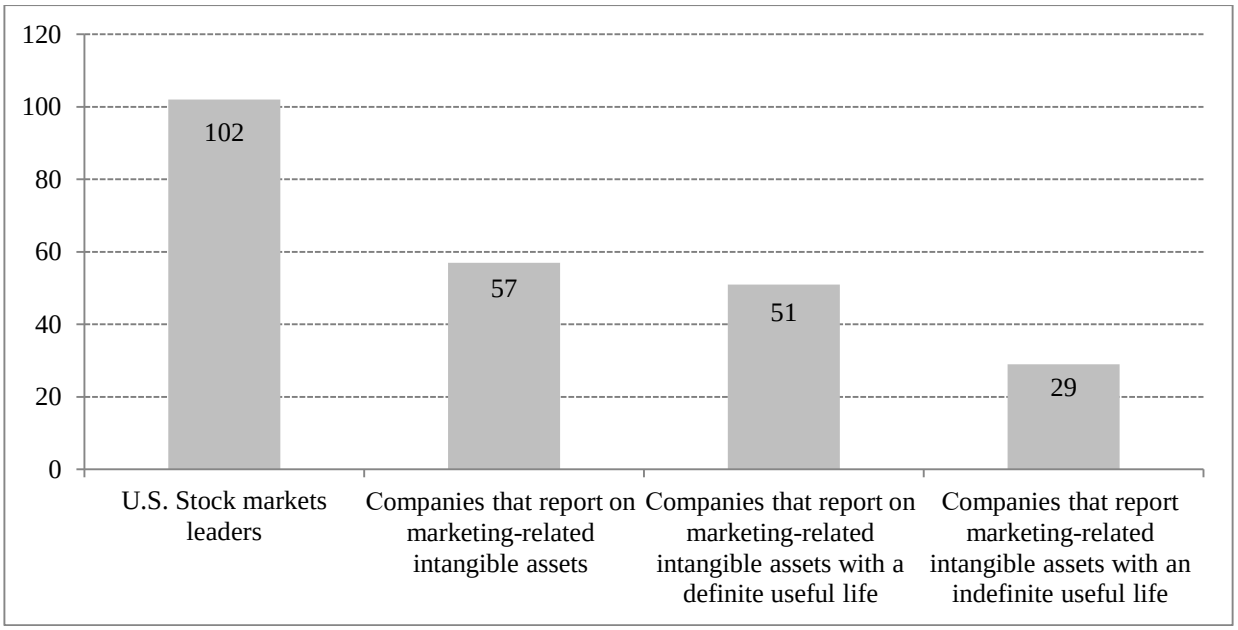


Fig. 2. U.S. stock market leaders which report on marketing-related intangible assets

Marketing-related intangible assets reported by companies can be divided into 2 groups: 1) with a definite useful life; 2) with an indefinite useful life. Fig. 2 shows how many companies report on intangible assets related to marketing, including their useful lives.

That is, if the entire study was based on the reporting of 102 companies, then we focused on only 57 companies that, directly or in combination with other groups of intangible assets report on marketing-related intangible assets. Almost 90% of those companies that report on marketing-related intangible assets with a definite useful life and 51% – with an indefinite useful life, besides only 22 companies (39%) report on both groups.

An analysis of the annual reports of the companies in the list of leaders in market capitalization showed that the structure of marketing-related intangible assets is as follows (Table 3).

Table 3
The share of companies that report on marketing-related intangible assets by their types

Number of companies (% of total)	The type of intangibles	The list of companies
29 (5 1%)	Trademarks	Activision Blizzard Inc., Adobe Inc., Anthem Inc., AT&T Inc., Becton, Dickinson & Co., Charter Communications Inc., Coca-Cola Co., Colgate-Palmolive Co., CVS Health Corp., Danaher Corp., Ecolab Inc., Estée Lauder Cos. Inc., Fidelity National Information Services Inc., General Electric Co., Gilead Sciences Inc., Honeywell International Inc., Illinois Tool Works Inc., International Business Machines Corp., Johnson & Johnson, Lockheed Martin Corp., Medtronic PLC, Nike Inc., Raytheon Technologies Corp., Sherwin-Williams Co., Starbucks Corp., Stryker Corp., UnitedHealth Group Inc., United Parcel Service Inc., Walt Disney Co.
24 (42 %)	Trade names	3M Co., Activision Blizzard Inc., AT&T Inc., Alphabet Inc., Boeing Co., Booking Holdings Inc., Broadcom Inc., Danaher Corp., Ecolab Inc., Facebook Inc., Fiserv Inc., Gilead Sciences Inc., Home Depot Inc., Intuit Inc., Linde plc, Merck & Co. Inc., Starbucks Corp., T-Mobile US Inc., Tesla Inc., Thermo Fisher Scientific Inc., TJX Cos. Inc., United Parcel Service Inc., Visa Inc., Zoetis Inc.
9 (16 %)	Brands (brand name)	General Motors Co., Illinois Tool Works Inc., Intel Corp., Linde plc, PepsiCo Inc., Pfizer Inc., Procter & Gamble Co., TJX Cos. Inc., Zoetis Inc.
3 (5 %)	Covenants not to compete (or sue)	CVS Health Corp. Intuit Inc. Waste Management Inc.
1 (2 %)	Internet domain names	Booking Holdings Inc.
1 (2 %)	Logos	Intuit Inc.
1 (2 %)	Marketed products	Eli Lilly & Co.

Based on understanding that the total (100 %) is 57 companies that report on marketing-related intangible assets, we can summarize the following. More than half (51 %) of companies that report on marketing-related intangible assets, in particular, disclose information about trademarks, slightly less (42 %) – about trademarks, the third largest share (16 %) – brands, and brand names. A small number of companies report on covenants not to compete (or sue) (5 %), Internet domain names (1 %), logos (1 %), marketed products (1 %).

Comparing the practical aspect of the types of marketing intangibles that are directly found in the reporting of companies and regulatory requirements of standards (Table 1), it should be noted that in company reports we did not find such reporting lines as «service marks», «collective marks», «certification marks», «trade dress», «newspaper mastheads». Although we have found in reports such marketing intangibles as «brand», «brand name», «covenants not to sue», «logos», «marketed products», that are not stated in IFRS 3 Business Combinations. Considering the examples of identifiable intangible assets listed in IFRS 3 Business Combinations are not intended to be all-inclusive, it should be noted that the analysis of companies' annual reports reveals types of marketing-related intangible assets that are not listed there.

Regression analysis is a process of estimating the relationships between a dependent variable and an independent variable (or variables). We chose net income for the last reporting year as the dependent variable that could best capture the company's vision of financial performance. The authors had no difficulty with the data for the dependent variable because each annual report contains information on net income.

Intangible assets, goodwill, and marketing-related intangible assets were the first to be included in the model as independent model variables. Then the list of independent variables was expanded by adding indicators of changes in net income to a similar figure for the previous period. To increase the efficiency of the model as an indicator that can directly characterize the marketing activities of the company, we have added to the model independent variables which characterize companies' marketing expenses (costs). Since the purpose of our article is to answer the question «Do marketing-related intangible assets determine the company's net income?», so we do not remove marketing-related intangible assets from the model, although by all test results this independent variable should be removed.

Looking for marketing expenses (costs) in the reports, the authors concluded that sometimes it was not possible to separate the operating costs directly related to marketing. This situation is due to the fact that some companies don't separate marketing expenses (costs) from the general group of operating expenses (costs). But more detailed analysis of reports led to the identification of the necessary indicators. For example, «CVS Health Corp.» reports on the total amount of operating costs (Operating expenses) without indicating their structure. Although in the report we already find that «Advertising costs, which are reduced by the portion funded by vendors, are expensed when the related advertising takes place. Net advertising costs, which are included in operating expenses, were $461 million, $396 million and $364 million in 2020, 2019 and 2018, respectively» [13, p. 123].

Sometimes the name of the cost is not always immediately associated with marketing activities. For example, «Nike Inc.» reported on demand creation expense, which consists of advertising and promotion costs, including costs of endorsement contracts, complementary products, television, digital and print advertising and media costs, brand events and retail brand presentation [33, p. 66]. In Tesla's case, it is difficult to understand how much was spent on marketing needs, because the report states that marketing, promotional and advertising costs were immaterial for the years ended December 31, 2020, 2019 and 2018 [45]. It is difficult to understand what the authors of the report meant by «immaterial».

After analyzing the annual reports of the companies, included in 100 U.S. stock market leaders, we emphasize that the costs (expenses) associated with marketing activities may have a different name (Appendix 1). Given that not all of the companies report separately on marketing expenses, the sample decreased from 57 companies that report on marketing assets to 44 companies.

In accordance with the goal of our study, we came to the following initial data: 1) the sample consisted of 44 companies that report on marketing-related intangible assets and marketing expenses (costs); 2) the dependent variable is the net income for the last reporting year; 3) independent variables are goodwill, marketing-related intangible assets, change of net income (loss) compared to the previous period (+/-), change of net income (loss) compared to the previous period (%), marketing expenses (costs). These initial data were the basis for building a regression model, the purpose of which was to confirm or refute the relationship between companies' marketing-related intangible assets and their net income. To simplify the calculations, we use the software product «Gretl».

5. Main results

The regression analysis of our research was based on the next sample of companies (Table 4).

Table 4
Sample of companies for regression analysis

№	Company	№	Company	№	Company	№	Company
1	3M Co.	12	Coca-Cola Co.	23	Intuit Inc.	34	Starbucks Corp.
2	Activision Blizzard Inc.	13	Colgate-Palmolive Co.	24	Johnson & Johnson	35	T-Mobile US Inc.
3	Adobe Inc.	14	CVS Health Corp.	25	Linde plc	36	Tesla Inc.
4	Alphabet Inc.	15	Eli Lilly & Co.	26	Merck & Co. Inc.	37	Thermo Fisher Scientific Inc.
5	Amazon.com Inc.	16	Estée Lauder Cos. Inc.	27	Microsoft Corp.	38	TJX Cos. Inc.
6	Amgen Inc.	17	Facebook Inc.	28	Nike Inc.	39	UnitedHealth Group Inc.
7	Anthem Inc.	18	Gilead Sciences Inc.	29	PayPal Holdings Inc.	40	United Parcel Service Inc.
8	AT&T Inc.	19	Home Depot Inc.	30	PepsiCo Inc.	41	Visa Inc.
9	Boeing Co.	20	Illinois Tool Works Inc.	31	Pfizer Inc.	42	Walt Disney Co.
10	Booking Holdings Inc.	21	Intel Corp.	32	Procter & Gamble Co.	43	Waste Management Inc.
11	Charter Communications Inc.	22	International Business Machines Corp.	33	Sherwin-Williams Co.	44	Zoetis Inc.

We used the OLS (ordinary least squares) method to test our hypothesis that marketing-related intangible assets affect a company's net income.

Model 1. Table 6 shows the analysis performed using the OLS method, more commonly referred to as linear regression. It demonstrates the extent to which the independent variable (or variables) will affect the dependent variable. Model 1 assumes such a dependent variable as the company's net income and 6 independent variables (constant, goodwill, marketing-related intangible assets, change of net income (loss) compared to the previous period (+/-), change of net income (loss) compared to the previous period (%), marketing expenses (costs)) (Table 5).

Table 5
Model 1. OLS, using the observations 1-44*

	Coefficient	*Standard error*	*T-statistics*	*P-value*	*Significance by t-statistics*
const	3641.44	1330.03	2.738	0.0094	***
G	0.109389	0.0433877	2.521	0.0160	**
MIA	0.0281848	0.145215	0.1941	0.8471	
CH	1.82542	0.261004	6.994	<0.0001	***
CHP	−36.9805	11.5693	−3.196	0.0028	***
Mcosts	0.603745	0.205551	2.937	0.0056	***

Source: G – goodwill, MIA – marketing-related intangible assets, CH – change of net income (loss) compared to the previous period (+/-), CHP – change of net income (loss) compared to the previous period (%), Mcosts – marketing expenses (costs)

The coefficient of determination (R^2) of Model 1 is 0.77, which means that the equation of Model 1 can explain the change in net income (dependent variable) by 77%. The remaining 23 % of the changes in net income are due to other factors that are not included in the presented equation as independent variables. Model 1 meets the requirements for the lack of highly correlated independent variables (multicollinearity) and the adequacy to sample data (F-test). But criticism of this model is due to such an independent variable as marketing-related intangible assets. Analysis of Table 6 immediately calls into question the appropriateness of this independent variable because this factor is considered insignificant (no asterisks in the last column, p-value=0.85, which is greater than the allowable level of significance).

According to the results of Model 1, we can reject the hypothesis that marketing-related intangible assets determine the company's net profit because this factor is considered insignificant. The factor with an insignificant coefficient should be removed from the model, and the equation itself should be recalculated.

Model 2. Logically, for the construction of Model 2, we take all the same initial data as for Model 1, except for one independent variable, which was considered insignificant (marketing-related intangible assets) (Table 6).

Table 6
Model 2. OLS, using the observations 1-44*

	Coefficient	*Standard error*	*T-statistics*	*P-value*	*Significance by t-statistics*
const	3670.25	1305.32	2.812	0.0077	***
G	0.113328	0.0378716	2.992	0.0048	***
CH	1.81945	0.255972	7.108	<0.0001	***
CHP	−37.0635	11.4179	−3.246	0.0024	***
Mcosts	0.604045	0.202993	2.976	0.0050	***

Source: G – goodwill, CH – change of net income (loss) compared to the previous period (+/-), CHP – change of net income (loss) compared to the previous period (%), Mcosts – marketing expenses (costs)

After removing from Model 1 such an independent variable as marketing assets, which was recognized as insignificant as a result of calculations, the coefficient of determination of the model remained at the same level (R^2 of Model 1 is 0.77, R^2 of Model 2 is 0.77). Model 2 meets the requirements for the lack of highly correlated independent variables (multicollinearity) and the adequacy to sample data (F-test). But criticism of this model is due to the use of two indicators that characterize the change in net income relative to the same indicator for the previous period. Since the calculation of these indicators uses the indicator of net income, we consider it appropriate to eliminate these two indicators that do not relate to marketing activities in particular.

Model 3. Logically, for the construction of Model 3 we take all the same initial data as for Model 2, except for two independent variables, which was considered not related to marketing activities and directly related to dependent variable (change of net income (loss) compared to the previous period (+/-), change of net income (loss) compared to the previous period (%)) (Table 7).

Table 7
Model 3. OLS, using the observations 1-44*

	Coefficient	*Standard error*	*T-statistics*	*P-value*	*Significance by t-statistics*
const	2673.55	1848.08	1.447	0.1556	
G	0.0159967	0.0484567	0.3301	0.7430	
Mcosts	1.43185	0.235976	6.068	<0.0001	***

Source: G – goodwill, Mcosts – marketing expenses (costs)

After removing from Model 2 such independent variables as a change of net income (loss) compared to the previous period (+/-), change of net income (loss) compared to the previous period (%), which were recognized as not objective as control independent variables, the coefficient of determination of the model (R^2) is 0.48. But criticism of this model is due to its use of such an independent variable as goodwill. Analysis of Table 8 immediately calls into question the appropriateness of this independent variable because this factor is considered insignificant (no asterisks in the last column, p-value=0.74, which is greater than the allowable level of significance).

The factor with an insignificant coefficient should be removed from the model, and the equation itself should be recalculated.

Model 4. Logically, for the construction of Model 4 we take all the same initial data as for Model 3, except for one independent variable, which was considered insignificant (goodwill) (Table 8).

Table 8

Model 4. OLS, using the observations 1-44*

	Coefficient	*Standard error*	*T-statistics*	*P-value*	*Significance by t-statistics*
const	3002.94	1539,00	1,951	0,0577	*
Mcosts	1,44134	0,231722	6,220	1.92e-07	***

Source: Mcosts – marketing expenses (costs)

After removing from Model 3 such an independent variable as goodwill, which was recognized as insignificant as a result of calculations, the coefficient of determination remained of the model at the same level (R2 of Model 3 is 0.48, R2 of Model 4 is 0.48). Model 4 meets the requirements for the adequacy of sample data (F-test).

Model 4 looks like the following regression equation (1):

$$\hat{y} = 3002.94 + 1.44134x_1 \quad (1)$$

where y – net income;

x_1 – marketing expenses (costs).

The authors do not criticize Model 4, as it clearly demonstrates the correlation between net income and costs associated with marketing activities. Equation Model 4 can be used to simulate models with different levels of marketing expenses (costs) because it explains the change in net income by 48%. It will be promising to look for other independent variables that affect net income in accordance with the requirements of regression analysis.

Table 9 shows general conclusions about the four models that were analyzed through regression analysis.

Table 9

Results of examining of Model 1-4

Model	Model 1	Model 2	Model 3	Model 4
Sample	Reporting data of 44 companies (U.S. stock market leaders), that report on marketing-related intangible assets and marketing expenses (costs)			
Depend. variable	Net income for the last reporting year			
Independ. variable/ variables	Goodwill	Goodwill	Goodwill	Marketing expenses (costs)
	Marketing-related intangible assets	Change of net income (loss) compared to the previous period (+/-)	Marketing expenses (costs)	
	Change of net income (loss) compared to the previous period (+/-)	Change of net income (loss) compared to the previous period (%)		
	Change of net income (loss) compared to the previous period (%)	Marketing expenses (costs)		
	Marketing expenses (costs)			
Conclusion	rejected	rejected	rejected	confirmed

According to the results of testing four models, only Model 4 was confirmed. The main hypothesis of this study, that marketing-related intangible assets affect the net income of companies, was rejected by the results of Model 1. But the promising conclusions from testing the models were the recognition of the significance of such control (independent) variables as marketing expenses (costs). According to the results of Model 4, which were confirmed before further use, marketing expenses (costs) explain the change in net income by 48%.

6. Concluding remarks

This study aims to confirm or refute the significance of such a parameter as marketing-related intangible assets for such a financial indicator as net income. The hypothesis of this study was that marketing-related intangible assets affect a company's net income.

The initial data for regression analysis were: the sample consisted of 44 companies (U.S. stock market leaders) that report on marketing-related intangible assets and marketing expenses (costs); the dependent variable is the net income for the last reporting year; independent variables are goodwill, marketing-related intangible assets, change of net income (loss) compared to the previous period (+/), change of net income (loss) compared to the previous period (%), marketing expenses (costs).

We tested 4 models – the next on the basis of the previous one with the corresponding optimization of independent variables. The main hypothesis of this study, that marketing-related intangible assets affect the net income of companies, was rejected by the results of Model 1. Criticism of Model 2 is due to the use of two indicators that characterize the change in net income relative to the same indicator for the previous period (change of net income (loss) compared to the previous period (+/-), change of net income (loss) compared to the previous period (%)). Criticism of Model 3 was due to the use of such an independent variable as goodwill, which was considered insignificant. But the promising conclusions from testing the models were the recognition of the significance of such control (independent) variables as marketing expenses (costs). According to the results of Model 4, which were confirmed before further use, marketing expenses (costs) explain the change in net income by 48%.

This study has some limitations. The authors believe that leading companies should have a more transparent policy on the presentation of information on intangible assets in their reporting. This assumption became the basis for the selection of a sample of companies, namely U.S. stock market leaders. But even of the 102 companies taken into account, only 44 companies report the lines we took for independent variables (marketing-related intangible assets, marketing expenses (costs)). Therefore, *the first limitation* of our study is a limited sample of 44 companies. Of course, a larger sample of companies with the necessary reporting data would contribute to more accurate results.

Separation of purely marketing-related intangible assets from the total intangible assets of the company, in practice, was sometimes almost impossible. It should be noted that although 57 out of 102 companies report on marketing intangible assets, only 3 companies (Amazon, Microsoft, Paypal Holding) report marketing-related intangible assets (literally). In some cases, information on marketing assets was presented in groups with other types of intangible assets. That is, when marketing-related intangible assets were reported with other intangible assets (customer-related or technology-based), we took the total amount of the reporting line for building the regression model. When the company provided information in reports on certain types of marketing assets (trademarks, trade names, brands, etc.), the authors tried to summarize the total value based on reporting data. But the objectivity of the prepared results regarding the size of the company marketing intangibles is still in doubt. Thus, *the second limitation* of our study is a risk of exaggeration or decrease in the value of marketing-related intangible assets based on available reporting information.

Of course, focusing on marketing-related intangible assets, we can only consider the information that is available in the company's reports. Although actual marketing-related intangible assets and marketing-related intangible assets, reported by the company, are usually not the same due to current regulatory requirements for the recognition of intangible assets. Therefore, *the third limitation* is the regulatory regulation of the preparation and publication of reports, which reflect only intangible assets that meet the prescribed requirements.

The authors' regression analysis based on the reporting data of companies, refutes the hypothesis that marketing-related intangible assets affect the company's net income. A negative result is also a result. But the positive point of the study is that the proposed model (Model 4) confirms the significant impact of marketing expenses (costs) on net income, which leads to appropriate recommendations for further improvement of this model and its testing in practice. Further research should be related to 1) the problem of incomplete reporting of marketing-related intangible assets, which may be caused by different policies of companies on the disclosure of information and current reporting requirements; 2) an in-depth study of the impact of marketing expenses (costs) on the financial performance of companies.

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Appendix 1
Possible variants of marketing expenses's names of reporting lines

Types of costs	Interpretation
Advertising Expense	Amount charged to advertising expense for the period, which are expenses incurred with the objective of increasing revenue for a specified brand, product or product line
Communications and Information Technology	The amount of expense in the period for communications and data processing expense
General and Administrative Expense	The aggregate total of expenses of managing and administering the affairs of an entity, including affiliates of the reporting entity, which are not directly or indirectly associated with the manufacture, sale or creation of a product or product line
Marketing and Advertising Expense	The total expense recognized in the period for promotion, public relations, and brand or product advertising
Marketing Expense	Expenditures for planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services. Costs of public relations and corporate promotions are typically considered to be marketing costs
Operating Costs and Expenses	Generally recurring costs associated with normal operations except for the portion of these expenses which can be clearly related to production and included in cost of sales or services. Excludes Selling, General and Administrative Expense
Operating Expenses	Generally recurring costs associated with normal operations except for the portion of these expenses which can be clearly related to production and included in cost of sales or services. Includes selling, general and administrative expense
Other General and Administrative Expense	The sum of expenses not otherwise specified for managing and administering the affairs of an entity, including affiliates of the reporting entity, which are not directly or indirectly associated with the manufacture, sale or creation of a product or product line
Other Selling, General and Administrative Expense	Other generally recurring costs associated with normal operations excluding those directly related to the marketing or selling of products and services not otherwise defined
Other Selling and Marketing Expense	Other expenses directly related to the marketing or selling of products or services not otherwise defined
Pre-Opening Costs	Expenditures associated with opening new locations which are noncapital in nature and expensed as incurred
Product Warranty Expense	The expense charged against earnings for the period pertaining to standard and extended warranties on the entity's goods and services granted to customers
Refining and Marketing Costs	Cost incurred related to the downstream oil and gas activities, including refining of crude oil and marketing and distribution of crude oil, refined petroleum products, and natural gas
Sales Commissions and Fees	Primarily represents commissions incurred in the period based upon the sale by commissioned employees or third parties of the entity's goods or services, and fees for sales assistance or product enhancements performed by third parties (such as a distributor or value added reseller)
Selling, General and Administrative Expense	The aggregate total costs related to selling a firm's product and services, as well as all other general and administrative expenses. Direct selling expenses (for example, credit, warranty, and advertising) are expenses that can be directly linked to the sale of specific products. Indirect selling expenses are expenses that cannot be directly linked to the sale of specific products, for example telephone expenses, Internet, and postal charges. General and administrative expenses include salaries of non-sales personnel, rent, utilities, communication, etc.
Selling and Marketing Expense	The aggregate total amount of expenses directly related to the marketing or selling of products or services
Selling Expense	Expenses recognized in the period that are directly related to the selling and distribution of products or services

Source: [42]