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Contemporary drivers of business growth: Evidence from US public companies

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Abstract. Achieving profitable business growth and maximizing shareholder value with limited resources are the crucial issues of doing business today. The goal of this paper is to identify endogenous factors that increase business growth by analyzing companies' annual reports. This paper contains the results of assessment on the influence tangible assets and intellectual capital (IC) have on Price-to-Earnings Ratio (P/E Ratio) as a proxy for business growth. The research methodology of this paper is based on regression analysis with panel data. Empirical results are tested on annual reports data of the 40 US companies from TOP 150 of Brand Finance Global 500 list for 2008-2020. The results reveal that the role of tangible assets in ensuring business growth is declining in contradistinction to IC, which has gained a stronger effect on business growth. Moreover, findings suggest that balanced management of tangible assets and IC could ensure a more effective internal expansion of business. Additionally, results indicate that the influence of human capital and fixed assets on business growth is declining in competitive environment. This paper integrates and complements prior studies and concepts on business growth, financial performance, IC and tangible assets management, aiming to develop an integrated framework for improving the efficiency of managing business growth drivers. Practical application of the obtained results lies in helping the companies' management to choose the right combination of endogenous factors that will ensure business growth.

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1. INTRODUCTION

Consistent achievement of the sustainable development goals improves standard of living and quality of life of a population, which is one of main determinants of political stability both in every single country and in the whole world. This encourages scientists to search for and governments to establish and provide a balanced set of institutional arrangements for economic growth at the industry or firm level that would be viable taking into account a particular country's economic conditions and its peculiarities of development. Since prosperity of any national economy directly and strongly depends on its business successfulness, the challenges of business development strategies affect many aspects of people's lives. There are two basic ways of business development: by internal expansion and through integration (mergers and acquisitions). If a company expands by creating growth internally, this process is also called organic growth as opposed to buying another company or product. Such company will create new workplaces and value added rather than reduce them, which will positively affect the socio-economic development of a country as a whole.

According to endogenous growth theory and the AK model production function, the main drivers of economic growth (measured as net national product) are human and physical capital and the level of technology (Romer, 1986; Mankiw, Romer & Weil, 1992; Romer, 1994). By extrapolating the above drivers at a firm level, we can reasonably assume that IC and tangible assets at a company disposal are the endogenous factors of business growth. Since firm's structural capital (as IC element) consists of innovation and process capital (Edvinsson & Malone, 1997), it widely indicates level of technology, which a company applies at all business processes. Thus, there is every reason to believe that IC can characterize a company's level of technology and its human capital contemporaneously.

It should be noted that the availability of proper funding and efficient financial management are the key factors for business growth and long-term performance of the company. Such financial indicators as market value of the company and its net profit demonstrate not only competitiveness of its business model, but also how it is perceived by investors. Thus, positive dynamics of the above-mentioned financial indicators accompanies the company's internal expansion, and the link found out between the key factors of organic growth and financial indicators of the company allows determining the promising endogenous directions of business growth taking into account its performance and funding trends.

The use of publicly available data from stock market and reporting of the companies enables each and every stakeholder to analyse the trends emerging at the level of both individual company and industry or region. This approach will ensure the decision-making process based on the relevant and comparable information regarding the directions of business growth in order to achieve sustainable socio-economic development.

The article consists of 5 parts. Part 1 is devoted to the research results of the factors that affect business growth as a basis for economic growth. Part 2 defines the purpose of the study, the methodology, and the description of the data used. Part 3 presents the main findings. The final part contains the conclusions, discussion aspects, and limitations of the research.

2. LITERATURE REVIEW

Economic growth is one of the economic objectives of sustainable development (Soubbotina, 2004, p. 10). Human Development Report (1996) states "human development is the end – economic growth a means" (p. 1). It should be noted that development of human capital promotes not only more efficient use of resources (e.g., physical or natural capital), but also their balanced consumption in accordance with sustainable development goals. At the same time, only intensive form of economic growth results in higher per capita income and improvement in standard of living. Technology plays a key role in intensive growth, which reveals itself in "a close correlation between the level of economic development, measured as GDP per capita, and the level of technological development, measured through R&D or patent statistics" (Fagerberg, 1987, p. 94). In addition, Miller (2001) asserts that the main driver of economic growth is technological innovations, which have an explicit potential impact on business and thrive due to variations and divergent thinking. Such relations cannot arise without a proper level of human development since only a human being is a main source of innovation and a basic holder of knowledge and skills. In turn, Bergeaud, Cette and Lecat (2018) report that the quality of labour (human capital) and the diffusion of innovation explain slightly more than half the share of total factor productivity growth in 1913–2010. Thus, "the links between human development and economic growth can make them mutually reinforcing" (Human Development Report, 1996, p. 66). Based on the foregoing, intensive growth as a quantitative expansion of the country's economy creates extra possibilities for qualitative solving of its social problems.

Prasetyo and Kistanti (2020) consider that sustainable economic growth must be built on human, social, institutional capital and entrepreneurship in order to be more successful in reducing development problems. The researchers believe that it is human and social capital that will further encourage new economic institutions, the competitiveness of productive entrepreneurship and quality economic growth. In many cases, researchers detect a very strong relation between the entrepreneurial environment characteristics, including entrepreneurial activity boosting policies and economic growth with a differentiating correction for the country's stage of economic development (Martínez-Fierro, Biedma-Ferrer & Ruiz-Navarro, 2016; Almodóvar-Gonzáleza, Fernández-Portilloa & Díaz-Caserob, 2020). At the same time, Cepel et al. (2019) are right to note that a key factor for economic growth of the countries is the quality of business environment to successfully solve the problems of development. Thus, a successful entrepreneurial activity is the main component in driving economic growth in both developed economies and developing economies, while its most prominent indicator is business (or corporate, firm) growth.

Frešer, Širec and Tominc (2020) define corporate growth as a very complex phenomenon, which may be rooted in the demographic characteristics of the companies, sufficient financial resources, the intensity of entrepreneurial orientation or their intangible capital that leads to greater heterogeneity and diversity in the definition of high-growth companies. Vaz (2021) states that according to empirical studies the key internal factors that may bring an advantage to the firm's growth are vision and mission, the objective(s) of the firm, strategic planning, size, localization, human resources, financial resources, and organizational structure.

It is often argued that contemporary business doing has permanently to deal with scarcity of required resources of all types – from financial and physical to natural and human ones (Barney, 1991; Sirmon, Hitt & Ireland, 2007). Therefore, resource management efficiency becomes a matter of not only a company's success, but also of its survival in a highly competitive business environment. Zimmermann (2017) believes that fast-growing enterprises stand for economic growth and job creation. Therefore, they need support in the form of open markets, an adequate supply of skilled workers, the provision of sufficient funding, and lower barriers to innovation. In turn, based on the research results of the growth effects of business environment, Reyes, Roberts and Xu (2021) report a relative insignificance of the factors related to labour

resources and human capital in explaining firm employment and productivity growth, whereas access to finance and infrastructure is found to be critically important. The results obtained by Katila and Shane (2005) prove that in case of lack of resources the efforts of new firms to commercialize technological inventions tend to succeed more in competitive and small markets. Bicen and Johnson (2015) state that resource-limited innovations are managed by building frugal innovation capabilities with a thoughtfully analysed feedback from innovation performance. Thus, in contemporary business environment only comprehensive and accelerated development of of the internal potential of the country will ensure its long-term performance and expansion regardless of resource market conditions.

Despite the fact that firm growth and firm performance are two separate concepts, it is often believed that growth indicates success of the firm measured by relative sales growth or profitability (Shepherd & Wiklund, 2009; Steffens, Davidsson & Fitzsimmons, 2009; Achtenagen, Naldi & Melin, 2010; Kiviluoto, Brännback & Carsrud, 2011). However, stakeholders (especially investors) need more than single- or double-measure assessment. Moreover, they are interested not only in the firm's previous performance, but in the assessment of the prerequisites for the firm's value-creating processes and its future growth, a large share of which in modern economy based on knowledge comes from intangible assets of the firm and other IC elements, e.g., human resources, organizational structure and customer relationships (Ghosh & Wu, 2007; Kiviluoto, 2013).

An active scientific debate about the importance of IC as an essential source of the company's competitive advantage, which significantly affects its reputation, performance and market value, began in the 1990s (Edvinsson & Malone, 1997; Roos et al., 1997; Sveiby, 1998). Despite numerous extensive studies on IC essence, structure, evaluation and disclosure (Stewart, 1997; Bontis, 1998; Pulic, 2000; García-Ayuso, 2003; Gu & Lev, 2003; O'Donnell, 2004; Roslender & Fincham, 2004; Marr, 2007; Alcaniz, Gomez-Bezares & Roslender, 2011; Berezinets, Garanina & Ilina, 2016; Dumay, 2016), this economic phenomenon is still in focus of scientists and practitioners. For about two last decades, there has been an exponential growth in researching an influence of the company's IC on its market value (Abdolmohammadi, 2005; Chen, Cheng & Hwang, 2005; Ghosh & Wu, 2007; Wang, 2008; Haji & Ghazali, 2014; Nimtrakoon, 2015; Yu, Wang & Chang, 2014) and interaction of the company's IC and its financial performance (Riahi-Belkaoui, 2003; Wang & Chang, 2005; Joshi et al., 2013; Dadashinasab & Sofian, 2014; Ozkan, Cakan & Kayacan, 2017; Ginesti, Caldarelli & Zampella, 2018; Gunawan & Ramadhani, 2018; Xu & Wang, 2018).

The results of the above studies are quite ambiguous. Although, basically, IC has a positive impact on the company's financial performance and its market value, the results of some studies indicate that IC fails to fully explain the variations in financial performance indicators or the gap between market value and book value. In our opinion, this can be explained both by research methodology limitations and companies' samples data collected from different industries, countries and sources. It is worth noting that most of the aforementioned studies were conducted with a VAIC method. As a result, they had the limitations inherent in this method (Stahle, Stahle & Aho, 2011).

Haji and Ghazali (2014) assert that different capital markets assess the information about companies' IC elements differently. Their findings are based on the comparative analysis of the results of the study on sensitivity of the Malaysian stock market to the information on human capital and the information on external capital information and the results obtained by Dumay and Tull (2007), which found out that the Australian market of capital tends most to value the information on internal capital. Haji and Ghazali (2014) also suggest that the response of the stock market to the information about companies' IC elements can change along with the changes in the overall economy. Their results are in line with those of Yu et al. (2014) who revealed that Taiwan stock market responds to IC elements differently. Moreover, they discovered that it was domestic investors who overestimated innovation capital of the Taiwan IT companies and substantially underestimated their human capital, not foreign institutional investors. Wang (2008) also

proves a significant relationship between IC and market value of the company. Using the example of the US electronic companies, he shows that investments made in the company's IC can create over 50% of its market value. Furthermore, customer capital and innovation capital are major determinants for the company's competitiveness and long-term survival.

Abdolmohammadi (2005) points to a highly significant impact of disclosure of IC information on market capitalization and distinguishes different patterns in IC disclosure by "old" and "new" economy sectors. Specifically, the "old" economy sector discloses more information about its external IC (e.g., partnerships and brands) than the "new" economy sector. However, the "new" economy sector discloses more information about its internal IC (e.g., intellectual capital and IT technology) than the "old" economy sector. The researcher also reports the increasing frequency of disclosure of information about the brand and proprietary processes in the annual reports of a sample of 58 Fortune 500 companies over the five-year period of 1993-1997. He relates this trend with mutual efforts of the Securities and Exchange Commission (SEC) and the Financial Accounting Standards Board (FASB) to disclose the information on IC by public companies in response to societal and political requirements for business to disclose more information.

At the same time, the problem of reliable assessment and disclosure of IC elements in companies' financial statement (or annual report) has not been solved yet. Authors of several studies (Chen, Cheng, & Hwang, 2005; Ghosh & Wu, 2007; Nimtrakoon, 2015) state that accounting standards restrain most of the IC elements from being recognized in financial reporting. However, investors grasp the exceptional value of IC and are willing to pay a higher price for shares of the firms with greater IC efficiency, because these firms yield greater market value growth and profitability in the years to come. In this regard, the use of integrated reporting as IC data source has become quite popular. At the same time recent studies (Cuozzo et al., 2017; Dumay, La Torre & Farneti, 2019) suggest that application of this reporting for IC research has substantial limitations, e.g., lack of statutory independent verification and validation of reporting data, combination of mandatory disclosure requirements with voluntary aspects and subsequent analytic data incomparability.

Riahi-Belkaoui (2003) declares that IC as a strategic asset will be positively associated with future performance of the firm which is measured by the created net value added. His findings are based on the study of the US multinational firms. Wang and Chang (2005) studied how the IC elements affect business performance in the Taiwan high-tech IT industry. They suggest the existence of interrelation between the IC elements amongst which human capital is a primary factor than has a direct impact on the other elements of the capital, which also affect performance. Joshi et al. (2013) examined the impact of value creation factors on firms' financial performance in the Australian financial sector and found out that a high level of efficiency of human and structural capital does not lead to a higher level of financial performance. At the same time, they state that physical capital determines ROA of the companies. Ozkan et al. (2017) report that generally IC has a positive impact on financial performance of Turkish banks. On the other hand, another interesting conclusion of these scientists lies in thew fact that capital employed (as book value of the company's net assets) has a greater influence on financial performance than such IC elements as human capital and structural capital.

Based on the analysis of investors' motives, Chung et al. (2005) substantiate in their study the role of growth opportunities in pricing of initial public offering (IPO) as an initial market value of the company. The obtained results allow the authors to state that "initial return to be positively related to both the fraction of the offer price that is accounted for by the present value of growth opportunities and various proxies of issue uncertainty»" (Chung et al., 2005, p. 65). The researchers also assert that IPO investors equate one US dollar of growth opportunities to approximately three quarters of a US dollar of tangible assets. Thus, the results of this study show a direct link between the company's tangible assets, its market value and growth opportunities. To survive in the global competitive environment the companies must not only seize every

growth opportunity found on their way, but also create it by being engaged in the existing and new product research and development activities. Makris (2008) discovered that investment in intangible assets contributes more to the firms' performance and growth than investment in tangible assets in the Greek pharmaceutical industry. In addition, the researcher also asserts that only real innovative activity, when the innovative process is organized by in-house Research and Development, has a positive impact on the firm growth as opposed to outsourcing and acquisition of intellectual property rights.

If a company makes optimal investment decisions, this leads to an increase in its current and future financial performance, including its assets value and business growth opportunities. When studying the impact of growth opportunities of the firm on its systematic risk, Chung and Charoenwong (1991) found out a positive empirical relation between firm's equity beta and various measures of growth opportunities, including Earnings-to-Price Ratio and P/B Ratio. At the same time, they state that the impact of growth on stock risk does not depend on the firm's size, whereas income generated by the available assets allow reducing a stock risk. Berk et al. (1999) assume that predictability of changes in the firm's assets and growth options makes the changes in the firm's systematic risk and its expected revenues predictable. Based on this implication, the researchers developed a dynamic model of expected returns with market value as a state variable that describes the importance of firm's assets and growth options. Thus, various indicators based on firm's market value, its assets and income are widely used to assess business growth potential.

While studying the effect of investment made in tangible and intangible assets on value of the manufacturing companies listed on the Indonesia Stock Exchange, Saleh (2018) discovered that investment in tangible assets has a significant negative impact on the company's short-term returns. This leads to a decrease in corporate value since investors tend to believe that such companies may not pay dividends, because most of the profits will be used for investment in tangible assets. It also should be noted that the growth in the company's assets results in a complex financial phenomenon called "the growth effect", and it is accompanied by unprofitability of investment in the future.. Traditionally, the total assets growth is considered as the main indicator for growth effect. Cao (2015) studies the growth effects and states that the components of growth should be treated differently. In particular, he empirically tests and proves that a negative effect of growth on future performance is produced by the net operating assets growth, while growth financed by suppliers and cash growth lead to future positive performance. Since future expected cash flows are a key feature of efficiency of the firm's investment decision-making, the money supply is sensitive to tangible assets. Lei et al. (2018) study financial development as a basic prerequisite to promote the firm growth. Based on the results obtained, the researchers declare that in the countries with well-developed financial markets sectors with a smaller proportion of tangible assets grow faster. They state that such country-level factors as financial development and institutional quality may limit the dependence of corporate financial and investment policies on the stock of tangible assets. Thus, choosing the right growth strategy is one of the most important issues in managerial decisions.

There are two differences distinguishing the authors' approach from those presented in the previous studies in the literature. First, it is argued that business growth is based mostly on successful management of such endogenous recourses as IC and tangible assets that are possessed by the company. Second, the system of financial ratios used reflects the specifics of IC and tangible assets for the quantitative measurement of their impact on P/E Ratio as a proxy for business growth. The corporate performance is calculated based on annual report data and information on the companies' market capitalization.

3. METHODOLOGY

Market capitalization is a basic external acknowledgement of success of the company's business model, while profits are an internally generated financial indicator of successful business activity of the company and its growth perspectives. Since corporate growth is a key driver of company value, investors demonstrate through P/E Ratio their attitude towards companies' growth strategies and financial policies that ensure these strategies (Ramcharran, 2002; Estrada, 2005). Taking into account the things mentioned above, for the purpose of this study, we consider P/E Ratio as a suitable objective measure to assess the public company's growth determinants in contemporary economy. Therefore, we propose the following hypotheses to examine the relationship between business growth and its endogenous factors:

- *H1: company's tangible assets tend to have a significant influence on P/E Ratio, ceteris paribus.*
- *H2: company's IC tends to have a significant influence on P/E Ratio, ceteris paribus.*
- *H3: company's tangible assets and IC in conjunction tend to enhance influence on P/E Ratio, ceteris paribus.*

To test the hypotheses, we have selected two sets of corporate performance indicators that represent independent variables for company's tangible assets (1) and IC (2) and constructed three econometric models that determine the impact of these indicators on P/E Ratio as a proxy for business growth, based on panel data. The model (3) determines the conjoint impact of both sets of independent variables of company's tangible assets and IC on P/E Ratio. The novelty of the proposed approach is to determine the impact on business growth of endogenous factors that reflect the specifics of company's tangible assets and IC, both separately and in combination.

$$\ln(y_{it})=a_0+a_1\ln(z_{1it})+a_2\ln(z_{2it})+a_3\ln(z_{3it})+a_4\ln(z_{4it})+a_5\ln(z_{5it})+\varepsilon_{it} \quad (1)$$

where: y_{it} – P/E Ratio; z_{1it} – Fixed Assets Turnover; z_{2it}– Fixed Assets Ratio; z_{3it}– Return on Working Capital Ratio; z_{4it} – Working Capital to Current Assets Ratio; z_{5it} – Working Capital to Total Assets; a_0, a_1, a_2, a_3, a_4, a_5 – parameters of the econometric model; ε_{it} – stochastic remnants.

$$\ln(y_{it})=\beta_0+\beta_1\ln(x_{1it})+\beta_2\ln(x_{2it})+\beta_3\ln(x_{3it})+\beta_4\ln(x_{4it})+\beta_5\ln(x_{5it})+\varepsilon_{it} \quad (2)$$

where: x_{1it} – Revenue per Employee; x_{2it}– Defined Contribution Plan per Employee; x_{3it}– Return on Intangible Assets; x_{4it} – R&D costs to Operating Expenses Ratio; x_{5it}– Price-to-Book Ratio (P/B Ratio); β_0, β_1, β_2, β_3, β_4, β_5– parameters of the econometric model; ε_{it} – stochastic remnants.

$$\ln(y_{it})=\delta_0+\delta_1\ln(z_{1it})+\delta_2\ln(z_{2it})+\delta_3\ln(z_{3it})+\delta_4\ln(z_{4it})+\delta_5\ln(z_{5it})+ \quad (3)$$
$$+\delta_6\ln(x_{1it})+\delta_7\ln(x_{2it})+\delta_8\ln(x_{3it})+\delta_9\ln(x_{4it})+\delta_{10}\ln(x_{5it})+\varepsilon_{it}$$

where: δ_0, δ_1, δ_2, δ_3, δ_4, δ_5, δ_6, δ_7, δ_8, δ_9, δ_{10} – parameters of the econometric model; ε_{it} – stochastic remnants.

All values of the independent and dependent variables were logarithmic for the purpose of providing a normal distribution of the dependent variable (P/E Ratio). In addition, this will make it possible to reduce distortion of the econometric models' parameters.

The choice of indicators for including them in the models was due to their significance and relevance for characterizing the company's tangible assets and IC in the process of estimation of variables influencing P/E Ratio. Thus, Fixed Assets Turnover (z_{1it}) and Revenue per Employee (x_{1it}) are operating performance ratios characterizing usage efficiency of two main types of the company's resources. While Fixed Assets Ratio (z_{2it}) and Defined Contribution Plan per Employee (x_{2it}) describe the company's financial policy regarding these resources. Return on Working Capital Ratio (z_{3it}) and Return on Intangible Assets (x_{3it}) are additional indicators of tangible assets efficiency and IC efficiency, respectively. They also allow assessing the company's policy of investing in these components of tangible assets and IC. Working Capital to Current Assets Ratio (z_{4it}) and R&D costs to Operating Expenses Ratio (x_{4it}) indicate how much of these particular components of tangible assets and IC are in the two important financial statements' items. Working Capital to Total Assets (z_{5it}) and P/B Ratio (x_{5it}) allow to compare the company's operational efficiency with its relative size in stock market.

We created a sample of 40 US companies from the TOP 150 of Brand Finance Global 500 ranking for content analysis of their annual reports over the thirteen-year period (2008-2020). The choice of Brand Finance Global 500 was due to the fact that this independent ranking is based on detailed research of the world's most valuable brands and other intangibles not reflected in financial statements. By using Brand Finance Global 500 the analysis is limited only to the largest companies, thus reducing the possibility of a size effect. The US companies accounted for more than a quarter of the TOP 150 of Brand Finance Global 500 during the research period. Including only the US companies in the sample is based on uniform requirements of the Securities and Exchange Commission (SEC) and the Financial Accounting Standards Board (FASB), thus eliminating the chances of analytic data incomparability. The main criterion of the sample was to have a sample small enough to conduct the highly time-consuming content analysis and large enough to render a reasonable size for statistical analysis. Accordingly, the sample of 40 companies with 520 usable annual reports was created.

Research platform *Macrotrends.com* and financial portal *YChart.com* were the data sources of the companies' annual reports and their market capitalization. *Brightscope.com* was used to search for data from 401(k) that is the retirement savings plan sponsored by an employer in the USA for calculating the ratio that characterizes companies' human capital.

So, the created sample consists of three dimensions, which are typical for panel data, namely: signs (independent variables) – business performance, objects – public companies, time – reporting periods. The use of multi-factor regression with panel data provides levelling of individual heterogeneity of objects (public companies) and allows obtaining more accurate estimates of model parameters. EViews 10 was used for estimating the panel equations.

4. EMPIRICAL RESULTS

Before applying these econometric models all dynamical rows of independent variables were investigated for stationary using the Dickey-Fuller test. According to the obtained results, all the dynamic series are stationary, which enables them to be taken into account in the proposed models for assessing the influence of company's tangible assets and IC on its P/E Ratio. This gives grounds for calculation of the linear multiple regressions using the panel data of annual reports of the 40 US public companies. Table 1 contains the parameters of model (1) to test *H1*. Table 2 contains the parameters of model (2) to test *H2*. Table 3 and Table 4 contain the parameters of model (3) and adjusted model (3) parameters, respectively, to test *H3*.

Table 1

Regression results of measuring the influence of tangible assets

Variable	Coefficient	Std. Error	t-Statistic	Prob.
z_{1it}	0.532684	0.071938	7.404743	0.0000
z_{2it}	0.295410	0.043365	6.812128	0.0000
z_{3it}	-0.502631	0.046712	-10.76014	0.0000
z_{4it}	0.654531	0.140678	4.652688	0.0000
z_{5it}	-1.018604	0.136308	-7.472816	0.0000
ε_{it}	0.727730	0.235730	3.087130	0.0022
R-squared	0.260309		Mean dependent var	2.960888
Adjusted R-squared	0.250176		S.D. dependent var	0.827243
S.E. of regression	0.716330		Akaike info criterion	2.186688
Sum squared resid	187.2917		Schwarz criterion	2.250022
Log likelihood	-399.6305		Hannan-Quinn criter.	2.211842
F-statistic	25.68982		Durbin-Watson stat	0.415399
Prob(F-statistic)	0.000000			

Source: own calculations.

The obtained results give grounds to assert that the model (1) is adequate, according to the Fisher criterion, and all parameters are significant, since their Prob. (F-statistic)<0.05. However, the density of the link between the model (1) components is 25.02%, which indicates the insignificance of the influence of tangible assets on P/E Ratio as a proxy for business growth (see Table 1). It should be noted that P/E Ratio undergoes the most significant changes under the influence of the working capital indicators. At the same time there is a negative correlation between P/E Ratio and two of these three indicators, while the indicators of fixed assets show a low but direct relationship with a proxy for business growth. This can be interpreted as evidence of the retained importance of fixed assets, first of all, for production purposes, despite the overall decline in the role of tangible assets in ensuring business growth. Since the research sample includes the companies with the most highly-rated brands, an inverse correlation between the indicators of working capital (Return on Working Capital Ratio and Working Capital to Total Assets) and P/E Ratio, obviously, is the result of faster growth in market value of the company (as an external indicator of business success) over profit growth (as an internal indicator of business success). Thus, the company's profit growth as result of increased efficiency of its working capital leads to a decrease in the effective indicator against the background of the global economic slowdown and the stock market crisis of 2008.

Table 2

Regression analysis results on measuring the influence of IC

Variable	Coefficient	Std. Error	t-Statistic	Prob.
x_{1it}	0.747461	0.084713	8.823474	0.0000
x_{2it}	-0.232145	0.037078	-6.261021	0.0000
x_{3it}	-0.394716	0.050531	-7.811397	0.0000
x_{4it}	0.209521	0.054148	3.869376	0.0002
x_{5it}	0.327358	0.041575	7.874013	0.0000
ε_{it}	-1.947320	0.587206	-3.316249	0.0011
R-squared	0.566646		Mean dependent var	2.943867
Adjusted R-squared	0.553187		S.D. dependent var	0.874705
S.E. of regression	0.584688		Akaike info criterion	1.799790
Sum squared resid	55.03949		Schwarz criterion	1.911814
Log likelihood	-144.2825		Hannan-Quinn criter.	1.845258
F-statistic	42.10407		Durbin-Watson stat	0.662653
Prob(F-statistic)	0.000000			

Source: own calculations.

The model (2) is also adequate to the Fischer criterion, and all parameters are significant, since their Prob. (F-statistic)<0.05. The density of the link between the model (2) components is 55.32%, which indicates the noticeable correlation between IC and P/E Ratio as a proxy for business growth (see Table 2). Further analysis of the parameters of the model (2) allows us to draw the following conclusions and assumptions:

1. Since a company does not own its employees, investment in human capital has an additional risk in the long run due to their possible dismissal. In the short run, investment in human capital can improve the company's financial performance and ensure its business growth. Thus, P/E Ratio undergoes the most significant changes under the direct correlation of Revenue per Employee as an indicator of human capital efficiency, while another indicator of human capital (Defined Contribution Plan per Employee) shows low and inverse influence on the effective indicator.
2. Structural capital indicators (Return on Intangible Assets and R&D costs to Operating Expenses Ratio) together have a less significant impact on P/E Ratio than human capital indicators. It is worth noting that an indicator of IC efficiency (Return on Intangible Assets) demonstrates a negative correlation with P/E Ratio like an indicator of tangible assets efficiency in the model (1). R&D costs to Operating Expenses Ratio shows a low but direct correlation with a proxy for business growth. This is a consequence of double interpretation of R&D costs, since the high level of costs allocated to innovation does not guarantee their commercial success in the future, but generally indicates a company's innovating endeavour.
3. Since an inadequate reflection of the company's IC elements in the annual report is one of the main causes for deviation of its market capitalization from its net assets' book value, P/B Ratio is the second most significant factor of the model (2) with a direct influence on the effective indicator. This is additional evidence of the importance of the role of IC in ensuring Return on Intangible Assets in contemporary economic conditions.

Table 3

Regression analysis results on measuring the conjoint influence of tangible assets and IC

Variable	Coefficient	Std. Error	t-Statistic	Prob.
z_{1it}	0.236353	0.108129	2.185852	0.0303
z_{2it}	0.251279	0.068463	3.670300	0.0003
z_{3it}	-0.786000	0.089711	-8.761515	0.0000
z_{4it}	0.458280	0.194574	2.355304	0.0198
z_{5it}	-1.204251	0.208994	-5.762119	0.0000
x_{1it}	0.260885	0.087703	2.974633	0.0034
x_{2it}	-0.141792	0.030901	-4.588633	0.0000
x_{3it}	0.046929	0.070312	0.667431	0.5055
x_{4it}	0.500811	0.065992	7.589026	0.0000
x_{5it}	0.303351	0.036003	8.425670	0.0000
ε_{it}	-0.352741	0.547069	-0.644783	0.5200
R-squared	0.741395		Mean dependent var	2.947157
Adjusted R-squared	0.724493		S.D. dependent var	0.870643
S.E. of regression	0.456990		Akaike info criterion	1.336407
Sum squared resid	31.95249		Schwarz criterion	1.544325
Log likelihood	-98.58539		Hannan-Quinn criter.	1.420814
F-statistic	43.86357		Durbin-Watson stat	0.720555
Prob(F-statistic)	0.000000			

Source: own calculations.

The model (3) is also adequate to the Fischer criterion, but the variable x_{3it} (Return on Intangible Assets) is not significant as it has Prob. (F-statistic)>0.05 (see Table 3). This is a very impressive finding on the model (3) that Return on Intangible Assets (x_{3it}) seems not to affect business growth, being contrary to the dominant beliefs. This result suggests that the companies in this sample do not depend on IC efficiency as much as high-tech European firms (Sardo & Serrasqueiro, 2018).

Therefore, in order to adjust the model (3), the insignificant factor was excluded. The results of the regression of the adjusted model (3) are shown in Table 4.

Table 4

Results of the adjusted regression on measuring the conjoint influence of tangible assets and IC

Variable	Coefficient	Std. Error	t-Statistic	Prob.
z_{1it}	0.339147	0.094624	3.584137	0.0004
z_{2it}	0.256170	0.061033	4.197224	0.0000
z_{3it}	-0.783887	0.047341	-16.55847	0.0000
z_{4it}	0.572242	0.167897	3.408300	0.0008
z_{5it}	-1.300148	0.154365	-8.422578	0.0000
x_{1it}	0.378953	0.055251	6.858785	0.0000
x_{2it}	-0.138603	0.030017	-4.617487	0.0000
x_{4it}	0.496105	0.050738	9.777718	0.0000
x_{5it}	0.338534	0.033344	10.15264	0.0000
ε_{it}	-1.410661	0.334990	-4.211051	0.0000
R-squared	0.791856		Mean dependent var	3.037231
Adjusted R-squared	0.781028		S.D. dependent var	0.962318
S.E. of regression	0.450312		Akaike info criterion	1.295341
Sum squared resid	35.08105		Schwarz criterion	1.470723
Log likelihood	-108.5237		Hannan-Quinn criter.	1.366432
F-statistic	73.12843		Durbin-Watson stat	0.848734
Prob(F-statistic)	0.000000			

Source: own calculations.

As a result of the adjustment, the model (3) retained the adequacy, according to Fisher criterion, and all the remained parameters are significant, since their Prob. (F-statistic)<0.05. At the same time, the exclusion of insignificant factor led to a slight increase in the density of the link between its components from 72.45% to 78.10%. Thus, it still indicates the significance of conjoint influence of tangible assets and IC on P/E Ratio as a proxy for business growth (see Table 4). This can be explained by the fact that the company can ensure its business growth through an essential increase in tangible assets efficiency due to such elements of IC as technology, qualifications and employee motivation, customer base, corporate culture and reputation, etc. It is worth mentioning that the corresponding pair indicators of tangible assets and IC show identical trends in the strength of influence on the effective indicator in comparison with the parameters of the models (1) and (2), respectively. Thus, there is a decrease in the strength of influence on P/E Ratio of such pair indicators as Fixed Assets Turnover (z_{1it}) and Revenue per Employee (x_{1it}), Fixed Assets Ratio (z_{2it}) and Defined Contribution Plan per Employee (x_{2it}). Such indicators as Working Capital to Total Assets (z_{5it}) and P/B Ratio (x_{5it}) demonstrate an increase in the strength of their influence on P/E Ratio. Whereas, in the fourth pair of indicators of model 3, the strength of influence of R&D costs to Operating Expenses Ratio (x_{4it}) increases, while the strength of influence of Working Capital to Current Assets Ratio (z_{4it}) decreases relatively with the model (2) and (1) results, respectively.

Like in case with the model (1) results, P/E Ratio undergoes the most significant changes under the inverse influence of working capital indicators (as Return on Working Capital Ratio and Working Capital to Total Assets) and a direct influence of Working Capital to Current Assets Ratio. In our opinion, a significant impact of working capital indicators on business growth proxy can be explained by the role of provision of proper funding and efficient financial management for the company's internal growth and its overall long-term performance in contemporary economic conditions of a highly competitive environment and limited financing opportunities. At the same time, the indicators of fixed assets and human capital indicators show a relatively low but direct (except Defined Contribution Plan per Employee) impact on the effective indicator. Thus, we can conclude that the role of fixed assets and human capital in business growth ensuring is reduced. It should also be mentioned that such IC factors as R&D costs to Operating Expenses Ratio and P/B Ratio have a noticeable direct effect on P/E Ratio. These results indicate, in particular, that a higher level of R&D costs can lead to the company's business growth in contrast to financial incentives for staff in the form of Defined Contribution Plans.

5. CONCLUSION AND DISCUSSION

The results of this study have implications for the US largest companies as they give them an opportunity to analyse the impact of various components of tangible assets and IC on their business growth and will help them develop the strategies to enhance corporate performance and to increase its market value. It will also help the management of the companies in other countries to be aware of the influence of various components of tangible assets and IC on their business growth to maintain their competitive advantages.

This study makes a significant contribution to researching the impact of endogenous factors on business growth of the US largest companies of Brand Finance Global 500 ranking. Since business growth is the main economic objective of corporate sustainable development, we consider it necessary to explore the significance of the influence of tangible assets and IC on the firm's P/E Ratio as a proxy for business growth in the conditions of competition and financing limitations. Using regression analysis of financial performance of the sample of 40 US companies in 2008-2020, a separate effect of tangible assets and IC on the firm's P/E Ratio was studied. The research findings indicate that the role of tangible assets in ensuring business growth is declining unlike IC, where indicators have a noticeable correlation with a proxy for business growth.

These findings are consistent with the results of the recent study on the impact of IC on growth opportunities in European firms conducted by Sardo and Serrasqueiro (2018). The researchers point out that the efficient use of IC has a positive impact on growth opportunities in high-tech firms and a negative impact on growth opportunities in low-tech firms. Furthermore, they found out that the efficient use of firms' IC enhances the positive relationship between growth opportunities and financial performance. Makrominas (2016) draws a similar conclusion about the US firms and states that the current practice of capitalizing the purchased intangibles has been successful in fostering firm growth. He also reveals that the impact of recognized intangibles on the market's perception of firm growth options is highly non-linear (negatively skewed) as a consequence of a negative correlation between recognized intangibles and un-reported intangibles which form a significant part of the company's IC.

It should be noted that the authors of contemporary studies on firm growth determinants (Denicolai, Cotta Ramusino & Sotti, 2014; Patel, Guedes, Soares & da Conceição Gonçalves, 2018) in their findings also emphasize the influence of the studied factors on enhancing the firm performance. Thus, Denicolai et al. (2014) assert that intangibles are crucial for fostering firm performance, especially externally generated ones, however this effect varies with firm size. At the same time, the researchers specify that they focus only on intangible assets recorded in firms' accounting records in compliance with international accounting

standards. So, their study does not cover the influence of a significant part of IC on firm growth and performance. Patel et al. (2018) explored the relation between R&D volatility and firm growth, as well as the opportunities to improve the returns from firms' R&D volatility. They found out that the volatility of tangible assets improves the returns from R&D volatility, while volatility of intangible assets does not influence this relation. The main conclusion made by these researchers is that by increasing R&D volatility, firms with more effective corporate governance achieve higher performance. This proves the role of tangible assets volatility in enhancing firm performance and ensuring business growth.

In this study, we also found evidence confirming that balanced management of tangible assets of the company and its IC can ensure business growth more effectively due to internal factors. Further regression analysis indicates the increasing significance of the conjoint influence of tangible assets and IC on P/E Ratio. Thus, only the model (3) out of the three models used in this study was able to statistically explain variations between the independent variables and the dependent variable. This gives an opportunity to accumulate knowledge across specific studies. Working capital as a component of tangible assets has the most substantial impact on business growth. The influence of human capital and fixed assets on business growth is declining in a highly competitive environment. With the exception of intangible assets as the element of IC structural capital it increases effects on company's business growth.

These additional findings are also concordant with the study results obtained by Gunawan and Ramadhani (2018) regarding the impact of IC elements on financial performance of non-financial companies listed on the Indonesian Stock Exchange. Their results suggest that human capital efficiency has negative effect on financial performance, while structural capital efficiency has a significant positive effect on financial performance. At the same time, their findings on the significant positive effect of capital employed efficiency on financial performance only partially coincide with our results which demonstrate significant negative impact two out of five indicators of tangible assets on business growth. But, to some extent, the obtained results contradict Xu and Wang (2018), who state that physical capital and human capital positively affect profitability and sustainable growth of Korean manufacturing companies, but their structural capital efficiency has insignificant impact on financial performance.

The findings of this study are limited to the sample of 40 US companies that follow the FASB accounting rules and the SEC disclosure requirements. Companies in other countries are guided by different regulatory rules that may result in differential disclosure and valuation of IC components. Therefore, it would be interesting to see if the results obtained are held in other developed countries. The research findings cannot be applied to smaller companies with insignificant IC. Another issue for future research is a focus on financial decisions of the companies on investment in tangible assets and investment in IC as the main endogenous drivers of their financial performance and business growth.

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