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Human capital efficiency and company performance: empirical evidence from Macedonian companies

Andrijana Bojadzievska Danevska[a*], Savica Dimitrieska[a], Elena Parnardzieva Stanoevska[a]

[a] International Balkan University, Skopje, Macedonia

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Abstract

With the saturation of the labor market due to global competition, information technology, and recent downturns in economies around the world, human capital is gaining particular attention. Humans can learn, change, and innovate and thus enable the organization to survive in the long run. The main reason people are employed in a particular organization is to produce and sell products or services that will generate revenues higher than costs. The generation of higher income than expenses, as well as the reduction of the number of resources consumed for production and other operating processes, makes them contributors to the companies' profits. The purpose of this paper is to investigate the relationship between human capital and company performance in the Macedonian real sector, by using pooled OLS regression and Fixed and Random Effect models to analyze a cross-sectional sample of 42 Macedonian companies listed on the Macedonian Stock Exchange during 2016-2021(N=252).
***Keywords*:** *human capital, human capital efficiency, company performance*

1. Introduction

The positive gap between the company market and its book value represents the value of intangible assets. The value of intangible assets is created through their potential impact on future earnings. The price of shares in the securities market is stable or increases only if potential investors and/or shareholders expect future earnings, whether in the form of dividends or an increase in the share price. There are lots of factors that affect company's ability to generate earnings, but in the long run it is influenced by a great strategy, continuous innovation in products and services, reliable employees, loyal and satisfied customers, reputation, image of the company that helps the society etc. Expectations are more influenced by intangibles than tangibles because the market believes that intangibles have a far greater impact on future earnings. Furthermore, all intangibles that enable the sustainability of the businesses create intellectual capital. (Çalan et al.2020).

The threefold concept of intellectual capital shows that, as individuals create, expand, and use knowledge (human capital), this knowledge is augmented by interactions outside the organization (customer capital), to create institutionalized knowledge held by the organization (structural capital). (Edvinson&Malone, 1997; Pulic, 1998; Werner, 2002; Batubara et al.2021). Intellectual capital can be defined as knowledge, information, intellectual property, and experience that can be used to create wealth for a firm. According to Stewart (2001), organizations reduce their dependence on physical assets because they realize that intangible assets have a different and more significant ability to leverage physical assets beyond the current level of productivity. Simply stated, if new informational systems are implemented in two equally equipped competitive enterprises, then their competitive advantage will depend on the way these systems are used to create a benefit for the consumer.

Human capital, as part of intellectual capital, exists as a resource and capability, at an individual and organizational level. Companies acquire individual human capital by attracting and selecting staff with the necessary skills and experience, which can be further developed through learning, and further turned into an organizational resource by connecting employees with the organization, the owners, and the investors. When this is added to the requirements of the company to achieve its goals, it becomes clear how human capital increases its power and influence. Becker (1993), by emphasizing the economic and social significance of the theory of human capital, notes that the most valuable capital is the investment

*Corresponding author
E-mail address: andrijanab.danevska@ibu.edu.mk

in the human being. The key relationships in human capital theory are as follows: i) increased learning through education and training results in greater learning; ii) the results from greater learning led to increased productivity; and iii) increased productivity results in increased compensation for employees and profits for businesses.

The human capital approach implies that the actual strategy of the company is based on human capital data. That is, when formulating the strategy, the company considers all available resources, including human resources. However, on the other hand, the crucial characteristics of human capital for the performance of the organization, such as flexibility and creativity of individuals, their ability to develop their skills over time, as well as motivation, make its evaluation difficult. Because of this, we can safely say that companies are still skeptical and distrustful of using data and measures of human capital in the planning and decision-making process. Thus, they continue to trust mostly traditional accounting records, which record tangible and intangible assets whose value can be expressed in monetary units. Therefore, the closest approach that companies may use to acknowledge the added value that human capital creates is to perceive it on an institutional level, by using the data recorded in financial statements for calculating human capital ratios. Furthermore, human capital measurements on the organizational level are widely used by academic scholars, researchers, and practitioners to determine the impact that human capital has on the company's performance. However, the literature is very destitute when investigating the human capital impact on Macedonian companies' performance.

Therefore, this paper tries to narrow this gap and provide the basis for further research in the related area and to examine the relationship between human capital and a company's performance in the Republic of North Macedonia. The investigation will encompass a sample of 42 Macedonian companies listed on the mandatory listing on the Macedonian Stock Exchange (MSE). Mandatory listing of shares is a feature of the capital market development of certain transition countries (Berglöf & Pajuste, 2005), and here are the companies that are legally obliged to be listed, due to fulfillment of certain criteria of the Regulatory body. Cross Sectional and Longitudinal Panel Data analysis is utilized to determine the impact of human capital on a company's performance. As for the variables used, this research paper focuses on utilizing the data on human capital efficiency (HCE) and investigating its relationship with profit ratio, i.e. Return on Equity (ROE).

2. Literature Review

The approach used in this article is based on the premise that people are value creators in the company and that in the modern knowledge economy, employees should not be treated as costs but as income creators and that knowledge and skills are sources of wealth. Because employees' knowledge and abilities are crucial in the context of a continuously changing company environment, human capital is a fundamental strategic resource that supports success and is required for it (Subramaniam & Youndt, 2005). From here, the metric that this paper uses to capture the human capital variable is human capital efficiency (HCE), which measures employees' knowledge and skills that give them greater cognitive capacity, and finally increase their efficiency. More specifically, HCE is the main element of the VAIC (Value Added Intellectual Capital) model, which may be summed up as employees' abilities, general and specific knowledge, and skills. (Bontis et al., 2000). It is regarded as the additional/marginal contribution of each additional input of human capital employed into the added value of the company (Pulic, 1998).

When analyzing the literature review on this topic, it can be noted that academic scholars and practitioners have used different approaches, and/or metrics of human capital for the purpose of defining the impact that human capital has on a company's performance. Some of them include the following:

- Yarovaya et al. (2021) examined the impact of HCE on equity funds' performance from selected EU countries during the three stages of COVID-19 and found that equity funds with higher HCE have had greater performance.
- Rahman & Akhter (2021) investigated various features of investing in human capital, such as the education and training of employees, level of knowledge, and skills that impact banks' performances. Their findings were that level of knowledge, skills and training have positive and statistically significant relation to bank performance, while level of education does not have a statistically significant impact on banks' performances.
- Mehdi's research (2021) was focused on examining the impact of knowledge, innovation, and employee satisfaction on a company's profitability in top world companies for the 2013-2019 period. The results have shown that the knowledge index, innovation index and employee salary satisfaction have a positive relation with the company's profit ratios.
- Lambe et al. (2021) investigated the impact of training and development costs on 12 oil and gas companies' performances in Nigeria for the time spin 2011-2021. Their findings concluded that investments in training in the development of a company's staff members has a statistically significant and positive impact on companies' performances.
- By considering the emphasized role of SMEs for economic development in emerging countries, Chinyamurindi et al. (2021) investigated 401 small companies in the Eastern Province of South Africa, from the aspect of the influence of human resource management practices on a company's operational and organizational level. More precisely, human resources management is investigated as a mediator between exploitation and exploration strategies and a company's financial performance, by using a hierarchical regression method. It was found that

there is a direct link between strategy and a company's performance, and what is more, this relationship is significant only through the effect of conciliation of HRM practices.

- Tran & Vo (2020) investigated the impact of human capital efficiency on company performance in 12 economy sectors in Vietnam and concluded that HCE has a positive and statistically significant impact on companies' performance.
- By utilizing data on 25 companies from manufacturing and 25 companies from the service sector in Sri Lanka, Wanigasekara and Deshika (2020), investigated the impact of human capital (HCE) on employee productivity (EP) for the period 2015-2019. Their results have shown that there exists a significant relationship between HCE and EP in the service sector companies, but insignificant in the manufacturing sector.
- Xu and Wang (2019) used the VAIC model to examine the impact of intellectual capital on an agricultural company's financial performance. By analyzing intellectual capital's three components, i.e., human, structural and capital employed, measured by capital employed efficiency (CEE), human capital efficiency (HCE) and structural capital efficiency (SCE), they have found that HCE and CEE have a positive and statistically significant relationship with profitability, measured by earnings before interest and taxes (EBIT).
- The purpose of Savitri and Syahza's study (2019), was to examine the effect of human capital on 68 SMEs manufacturing companies' financial performances, through the effect of human capital on choosing a valid competitive strategy. Their results have shown that human capital affects the choice of the right competitive strategy, while the right competitive strategy has a positive effect on the company's performance.
- Kertpitak & Jermsittiparsert (2019) when exploring the relationship between human resources and financial performance in Thailand pharmaceutical companies, have found that skilled, innovative, training competent, and human resources commitment have a positive impact on financial performance.
- By utilizing the VAIC methodology, Gunawan and Tartila (2019) investigated the impact of intellectual capital on financial performance in 51 manufacturing companies listed on the Indonesia Stock Exchange for the period 2010-2014. They have found that value added intellectual, human and structure capital have positive and statistically significant effects on a company's performance, measured by all four indicators, ROA, ROE, GR and EVA.
- Parham, S., & Heling, G., W., J. (2015) investigated human capital as a key factor in reinforcing a company's performance in the Dutch production sector. By using the human capital component, as suggested by the VAIC model, the company's performance measures of EP, ROE, and ROTA, the authors have found that there exists a statistically significant and positive relationship between HCE and all three performance ratios.
- Yusuf (2013) led by the repeated phrase of banks, that people are the greatest assets, investigated the impact of human capital efficiency on Nigerian banks' performances. His study concluded that HCE does not have a statistically significant impact on the bank's performance indicators.
- Carmeli (2004) used a behavioral approach when inquiring into the relationship between human capital and the financial performance of Israeli local government authorities. It was found that local government authorities with highly educated human capital with specific competencies and backgrounds have higher financial performance.

3. Research Methodology and Data

The research methodology in this paper is panel data analysis, where three approaches will be used: pooled OLS panels, fixed effects, and random effects model. Panel data regression models investigate two dimensions of the data, cross-sectional and longitudinal, i.e., multiple companies over even intervals of time. The fixed effect model investigates the causes of variability in ROE within companies in a particular sector, while the random effects model examines whether differences across companies in the same sector have an influence on ROE, but they are not in correlation with the explanatory variables. Furthermore, three panel data analyses will be performed, namely in manufacturing, in the service sector and one panel model incorporating companies from both sectors. Each analysis uses the same dependent variable, ROE, and the same explanatory variables, net profit margin, current ratio, main variable of concern - human capital efficiency, debt to total assets, total sales, and GDP growth rate (see Table 1). The sample data for the manufacturing sector refers to 29 companies during 2016–2021-time span, and the service sector data is deprived from 13 companies, also during those 6 years period. All these companies are part of the mandatory listing companies listed on the Macedonian Stock Exchange. The data are secondary and obtained from the System for Electronic Information from Listed Companies.

Summary statistics of the variables used in the three-panel data analysis are shown in Appendix, Table 1 (for the manufacturing sector), Table 2 (for the service sector), and Table 3 (for manufacturing and service sector altogether) in the Appendix. From the descriptive statistics of this data, the within variation is greater than the between variation in the sample of manufacturing companies, when examining the dependent variable ROE and the main explanatory variable of concern, HCE (see Table 1-Appendix). In the case of service sector companies, the within variation of ROE is greater than the between, and within variation of HCE is smaller than its between variation (see Table 2 - Appendix). In Table 3 - Appendix the sample of companies from both sectors exhibits the same variation as in the case of service sector companies.

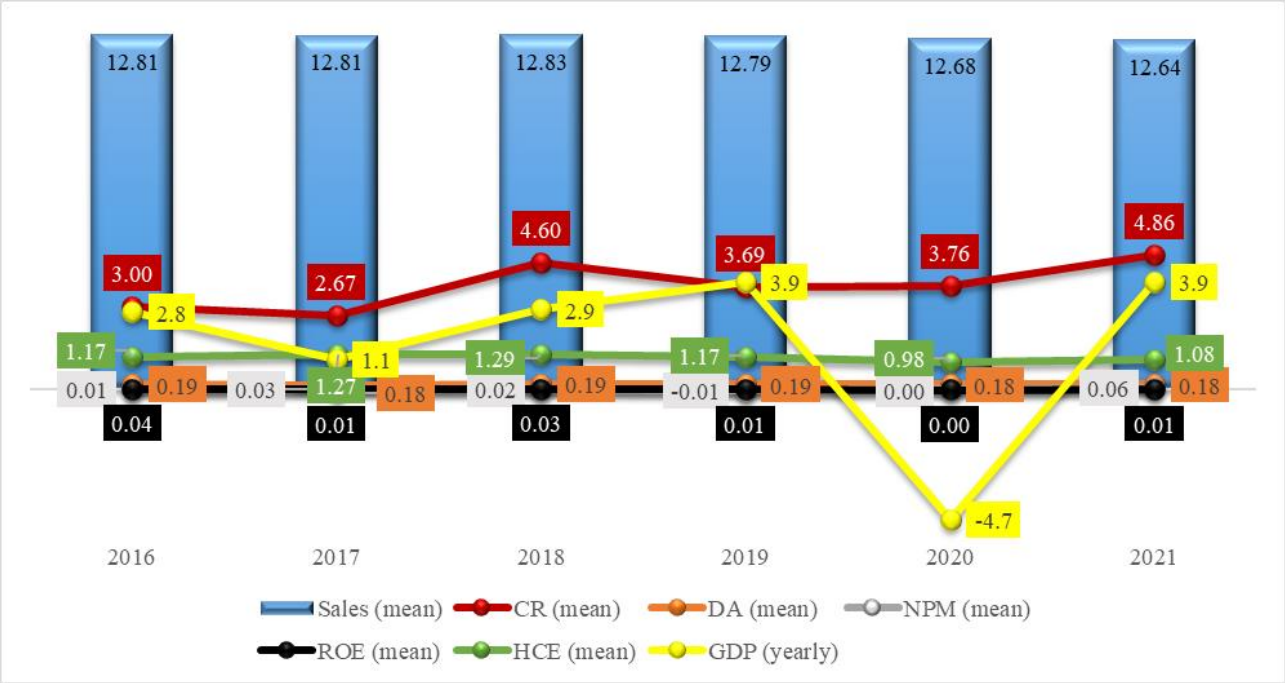
Table 1. Variables Description

Dependent Variable	Abbreviation	Measurement
Return on equity	ROE	Net income/Shareholders' equity
Independent Variables		
Human capital efficiency	HCE	Value added/human capital expenditures
Net profit margin	NPM	Net income/Total Sales
Firm size	FS	Natural logarithm of sales
Current ratio	CR	Current assets/Current liabilities
Financialleverage	DA	Total debt/Total assets
Economic growth	GDP	GDP growth rate

4. Empirical Findings and Discussion

The investigation in this research is separated into two sectors, manufacturing, and service sector companies to detect differences between the results of the panel data regression models. Additionally, the second investigation encompasses research in both sectors altogether.

Figure 1. Mean value of ROE and explanatory variables during 2016-2021 in the manufacturing sector



Source: Authors owns research

In Figure 1 the movement of mean values of all model's variables (manufacturing sector) are shown. The movement of the mean value of ROE for the manufacturing sector shows that ROE value is around 2% (0.02) and this means that on average for every denar invested in shareholders' equity, shareholders note 0.02 denars as net income. This score is very low and shows that, on average, these companies earn a relatively small amount when compared with the invested shareholder equity. In the case of the selected manufacturing companies listed on the mandatory listing on the Macedonian Stock Exchange, ROE decreased by 2.7 pp in 2017 (when compared to 2016). In 2018 it increased by 1.69 pp., and it decreased again in 2019, and in 2020 by 1.46 and 1.47, respectively, so that by 1.34 pp it can rise in 2021. The average value of ROE in 2020 is negative, i.e., 0, which actually reflects the financial situation of the investigated companies which record not only net loss but also negative value of the shareholders' equity.

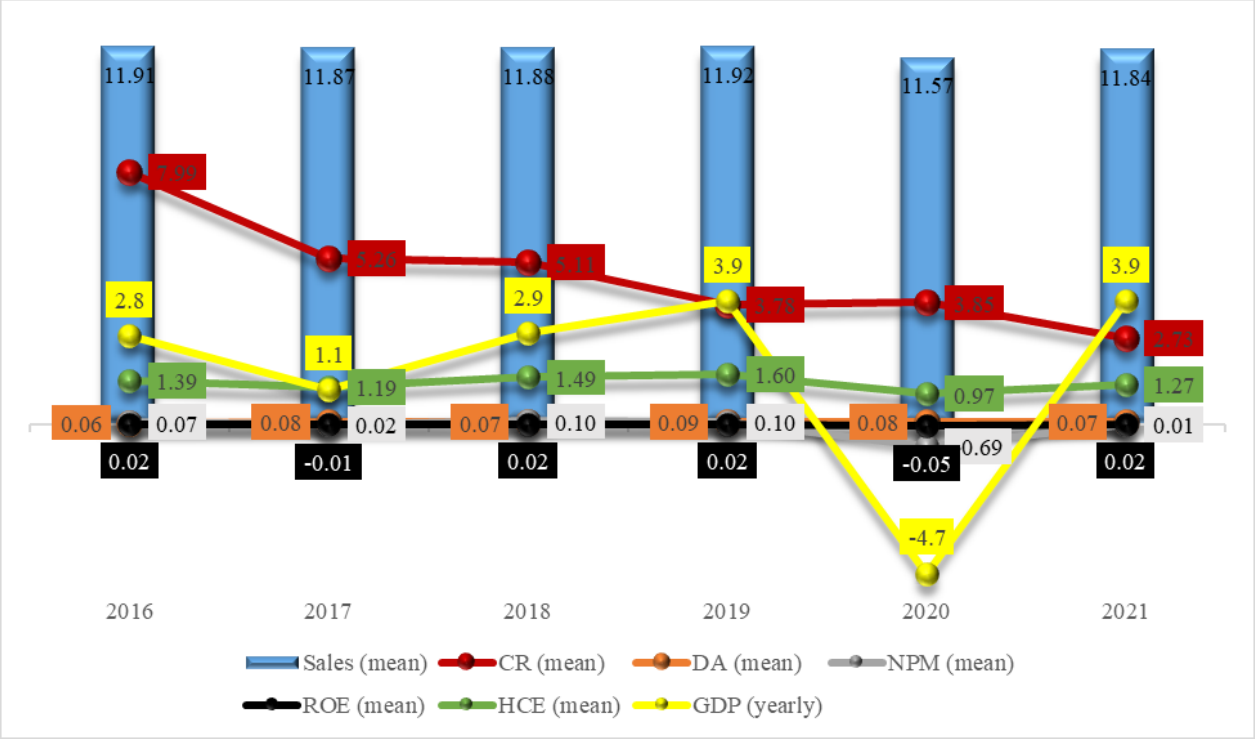
If the mean values of the independent variables are analyzed throughout the years, the following remarks can be stated:

- Liquidity measured by CR, shows on average decrease in 2017 (mean value of 2.67), in 2019 (falls from 4.60 in 2018 to 3.69) whereas from 2020 it starts increasing to reach its mean value for 2021 by 4.86.
- HCE on average increases its value in 2017 and 2018 (from 1.17 in 2016 to 1.27 and 1.29, respectively), and the decline from 2019 (mean value of 1.17) reaches the bottom line in 2020 (0.98 – the marginal contribution of the human capital is lower than one denar invested in it). In 2021, HCE rises to 1.08. The mean value of HCE for the selected companies in this sample is 1.16.
- Financial leverage, measured by the Total debt to Total assets ratio is on average 19%, showing that shareholders' equity contributes more to the financing of assets in the company. However, when analyzing the

data, it can be noted that DA ratio decreased in 2017 and again in 2020, i.e., during these years companies were reducing their debt financing.

- The average value of NPM is 1.7%, meaning that for every denar as revenue, the companies on average earn 0.017 denars. The movement of the average value shows a decrease in 2018 (mean value of 1.5%) and thus reaches a negative value of -1.4% in 2019. The mean value of NPM during 2020 and 2021 is increasing to 0.1% and 6.2%, respectively.
- Total sales on average decline in 2017, 2019, 2020 and reach the lowest point in 2021.
- The GDP growth rate declined in 2017, by 1.7pp, and increased during the period 2018-2019, so that it becomes negative with the value of -4.7% in 2020. In 2021, the GDP growth rate increased to 3.9%.

Figure 2. Mean value of ROE and explanatory variables during 2016-2021 in the service sector.



Source: Authors owns research

The movement of the mean value of ROE for the service sector shows that ROE value is around 0.4% and this means that, on average, for every denar invested in shareholders' equity, shareholders note 0.004 denars as net income (see Figure 2). This score is very close to zero, showing that shareholders do not earn on their invested capital. However, when analyzing the average value of ROE throughout the examined time period, it can be seen that it decreased in 2017, 2019, and 2021, by 2.5, 0.62, and 0.62 pp, respectively.

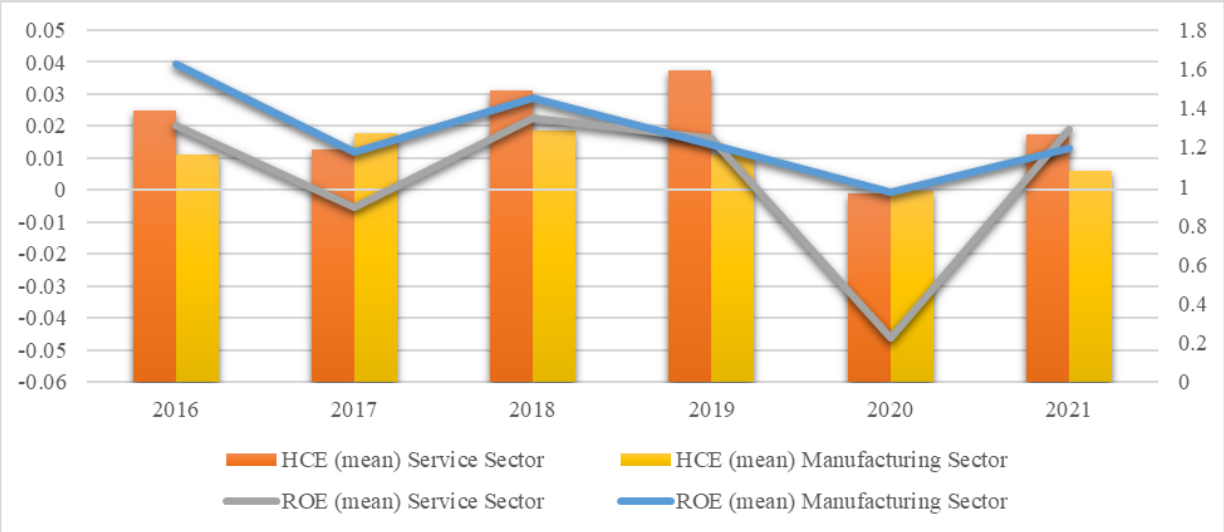
If the mean values of the independent variables are analyzed throughout the years, the following remarks can be stated:

- Liquidity measured by CR shows an average decrease throughout the whole time period, subject of investigation, from 7.99 in 2016 to 2.73 in 2021.
- HCE on average decreased its value in 2017 from 1.39 in 2016 to 1.18). In 2018 and 2018, the marginal contribution of the human capital increased in 2018, and 2019 (mean value of 1.49, and 1.59, respectively), and thus it declined to 0.97 in 2020. In 2021, HCE rises to 1.26. On average companies from the service sector HCE with an average value of 1.32.
- Financial leverage, measured by the total debt to total assets ratio is on average 7.5%, showing that shareholders' equity contributes even more to the financing of assets in the service companies when compared to the one of the manufacturing companies. However, when analyzing the data, it can be noted that the DA ratio increased in 2017, 2019, and in 2021, i.e., during these years companies were increasing their debt financing.
- The average value of NPM is 6.4%, meaning that for every denar as revenue, the companies on average earn 0.064 denars. The movement of the average value shows a decrease in 2017 (mean value of 2%), but in 2018 increases to 10%, and falls back in 2019 to 9%. In 2020, the lowest average value of NPM is recorded, i.e. -68%, so that in 2021 increasing to 1.3%.
- Total sales on average declined in 2017, 2018 and 2020 when they reached their lowest point. In 2021, sales increased again.

From Figure 3 it can be derived that HCE in the service sector is greater than the HCE in the manufacturing companies, except for the years 2017 and 2020, when ROE for service companies falls at its lowest point, -.005 and -0.05 (zero).

HCE for the service companies increased in 2018 and in 2021 and surpassed HCE for the manufacturing sector by roughly 0.2 points. Furthermore, in 2018 and 2021, ROE in the services sector fiercely increased by 2.77 pp and 6.5 pp, respectively. At the same time, in Figure 3 a graphic comparison is made between the mean values of HCE and ROE in the manufacturing and service sector, to put an accent on the main explanatory variable, HCE and company's profitability. It can be concluded that the mean value of HCE in the manufacturing sector does not vary as much as it does in the service sector. Also, the annual mean value of ROE for manufacturing companies has a smaller variation than the annual mean value of ROE for service companies, leading us to agree that the change in HCE causes changes in ROE, especially in the service sector companies.

Figure 3. Comparison of mean values of ROE and HCE during 2016-2021 in the manufacturing sector vs. service sector



Source: Authors owns research

Furthermore, the results from the three approaches of the panel data analysis in the manufacturing sector are shown in Table 2. NPM has a statistically significant and positive impact over ROE, only when using the fixed effect estimator, while total sales have a statistically significant and positive correlation with ROE in the three of the estimators, at a confidence level of 1% in the pooled OLS and FE model, and at 5% in RE model. HCE has a statistically significant and positive impact on ROE, at a significance level of 1% in pooled OLS regression, and at a 5% significance level in the RE model. When using a fixed effect estimator, HCE has a positive, but not a statistically significant impact over ROE. Liquidity does not have a statistically significant influence over ROE in any of the estimators, while financial leverage has a negative and statistically significant impact over ROE at 10% significance level only when using a fixed effect estimator.

Table 2. Panel Data Model for the manufacturing sector

	Pooled OLS Model	Fixed Effect Model	Random Effect Model	VIF collinearity statistics	
Dependent Variable ROE				VIF	1/VIF
NPM	.0230425 (.0295361)	.0944556** (.0408637)	.03472 (.0316538)	2.62	0.38
SLLN	.0117132*** (.0046878)	.0639398*** (.0230702)	.0136465** (.0060516)	1.17	0.86
HCE	.0220248*** (.0075313)	.0062759 (.0108454)	.0201058* (.008171)	2.75	0.36
CR	.0009611 (.0007997)	-.002136 (.0017109)	.0003827 (.0009684)	1.21	0.83
DA	.0176505 (.0338902)	-.1554626* (.0909837)	-.0066037 (.0423563)	1.08	0.92
GDP	.0019263 (.0022506)	.0019709 (.0020627)	.0019758 (.0021046)	1	0.99
Number of obs.	**174**	**174**	**174**		
R^2	0.2541				
Root MSE	.08864				
Rho		.61	.15		

Notes: Standard errors are reported in the parenthesis
*, **, *** show significance levels of 10 %, 5 %, and 1 %, respectively

Source: Authors owns research based on Stata

After running the Hausman Fixed Random test, to check if the differences between companies are correlated with the regressors, the null hypothesis was not rejected, indicating that the fixed effects model produces more appropriate findings

than the random effects model. According to this finding HCE does not have a statistically significant impact on ROE in the sample of manufacturing companies. Determinants that have a statistically significant, but positive impact on ROE are net profit margin, and total sales, and a negative impact is debt financing. Rho shows that 61% of the variation in ROE is explained by the differences across companies. The explanatory variables' mean variance inflation factor (VIF) is less than 2, indicating that there is no multicollinearity among them in the multiple regression model.

Related to the panel data analysis in the service sector, the findings from using the three approaches are shown in Table 6. NPM and HCE have a statistically significant and positive impact (at a significant level of 1%) on ROE when using all three estimators. Total sales have a statistically significant and positive impact over ROE, in both the FE and RE models, at 1% and 10% significance levels, respectively. Liquidity has a negative and statistically significant (5% significance level) impact over ROE in pooled OLS regression, while in the other two regressions, its influence is insignificant. Financial leverage has a statistically significant and negative impact only in pooled OLS and RE models, at 1% and 10% significance levels, respectfully. GDP growth rate has positive, but statistically insignificant over ROE in all of the three estimators used.

Table 3. Panel Data Model for service sector

	Pooled OLS Model	Fixed Effect Model	Random Effect Model	VIF collinearity statistics	
Dependent Variable ROE				VIF	1/VIF
NPM	.0268673***	.0275984***	.0276277***	1.84	0.543711
	(.0076245)	(.006623)	(.0065319)		
SLLN	.0028289	.0288679***	.0126198*	1.18	0.84651
	(.0041021)	(.0096703)	(.0064688)		
HCE	.0530145***	.0401457***	.0496587***	1.89	0.529757
	(.0083262)	(.0109296)	(.009247)		
CR	-.0014425**	-.0004104	-.0007624	1.22	0.816650
	(.0006749)	(.0008375)	(.0007549)		
DA	-.1857287***	-.1227795	-.1384058*	1.11	0.899704
	(.0614853)	(.088895)	(.0753539)		
GDP	.0023256	.0020122	.0020752	1	0.99
	(.0017046)	(.0013427)	(.0013506)		
Number of obs.	**78**	**78**	**78**		
R^2	0.7221				
Root MSE	.04269				
Rho		.65	.48		

Notes: Standard errors are reported in the parenthesis
*, **, *** show significance levels of 10 %, 5 %, and 1 %, respectively
Source: Authors owns research based on Stata

After running the Hausman Fixed Random test, to check if the differences between companies are correlated with the regressors, the null hypothesis was rejected, indicating that the random effects model produces more appropriate findings than the fixed effects model. Furthermore, when the Breusch and Pagan Lagrange multiplier test for random effects was conducted the null hypothesis was rejected, from where it can be agreed that there are significant changes between companies, and that the panel effect is present. According to this finding, HCE does have a statistically significant and positive impact on ROE (at a significant level of 1%) in the sample of service companies. Determinants that have a statistically significant, but positive impact over ROE are net profit margin (at 1% significance level), and total sales (at 10% significance level), while debt financing has a negative and statistically significant impact. Rho shows that 48% of the variation in the ROE is explained by the differences between companies.

Related to the panel data analysis in the service sector and manufacturing sector altogether the findings from using the three approaches are shown in Table 7. NPM, SLLN and HCE have a statistically significant and positive impact (at a significant level of 1%) on ROE when using all three estimators. Liquidity and GDP growth rate have a statistically insignificant impact over ROE in the case of all three estimators, while debt financing has a negative and statistically significant (at 5% significance level) only when using a fixed effect estimator.

In the Hausman Fixed Random test on this sample of data, the null hypothesis was not rejected, indicating that the fixed effects estimator is better than random effects. According to this finding, HCE does have a statistically significant and positive impact on ROE (at a significant level of 1%). Other determinants that have a statistically significant, but positive impact over ROE is net profit margin (at 1% significance level), and total sales (at 1% significance level), while debt financing has a negative and statistically significant impact (at 5% significance level). Rho shows that 52% of the variation in the ROE is explained by the differences between companies.

Table 4. Panel Data Model for service and manufacturing companies

	Pooled OLS Model	Fixed Effect Model	Random Effect Model	VIF collinearity statistics	
Dependent Variable ROE				VIF	1/VIF
NPM	. 0392608 ***	.0362715***	.040118***	1.50	0.664969
	(.0105981)	(.0110458)	(.01039)		
SLLN	.0108844***	.0444826***	.0137225***	1.11	0.897852
	(.0033863)	(.0124376)	(.0045219)		
HCE	.0219561***	.0198641***	.0215066***	1.61	0.619551
	(.0047727)	(.0059335)	(.0050693)		
CR	.0004409	-.0004104	-.0000307 (.000717)	1.16	0.864286
	(.0005967)	(.0008375)			
DA	.0083007	-.1551055**	-.0206785	1.10	0.909103
	(.0278416)	(.0723142)	(.0358187)		
GDP	.002182	.0018891	.002159 (.0015219)	1.02	0.975700
	(0016656)	(.0015002)			
Number of obs.	**252**	**252**	**252**		
R^2	0.3315				
Root MSE	.07809				
Rho		.52	.18		

Notes: Standard errors are reported in the parenthesis
*, **, *** show significance levels of 10 %, 5 %, and 1 %, respectively
Source: Authors owns research based on Stata

5. Conclusion

Determining the impact of human capital on company's performance, by using the indicator human capital efficiency as explained by Pulic (1998) in his VAIC model, tries to examine the relation between the marginal contribution to the company's value added of each additional unit of human capital and the net income per shareholders' invested capital. This paper made an overall examination of a sample of 42 Macedonian shareholder companies on this relation, and it filled a gap in the literature when considering the investigation of Macedonian companies listed on MSE.

Human capital, and its efficiency in general on the sample of investigated Macedonian companies, has a statistically significant and positive impact on the company's performance. Furthermore, human capital's impact on company's performance is more enhanced in the case of the service sector rather than the manufacturing. This finding is in line with the fact that service sector companies are more knowledge intensive, and ask for higher efficiency, flexibility, and building long lasting relations with customers.

Since this research is dedicated to the examination of companies that are on the mandatory listing on MSE, the results (mean values and standard deviations) from the descriptive statistics of the variables were expected. It is of great importance to conclude that within companies that do not fulfill the criteria to be on the super or exchange listing, HCE has a statistically significant and positive impact on their performance. Therefore, this paper should be used by practitioners and managers when considering the role of human capital in their companies and their contribution to wealth creation. What is even more important is that human capital should not be left out when companies make long term decisions or when formulating strategic plans.

The recommendation for further research in this area is to widen the scope of investigated companies in additional service sectors, such as the financial sector.

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Appendix

Table 1. Descriptive summary of variables for the manufacturing sector, subject of investigation

Variable		Mean	Std. Dev.	Min	Max	Observations
	overall	.0178387	.1008419	-.6150151	.3608006	N=174
ROE	between		.0589897	-.0953371	.114907	n=29
	within		.0824008	-.5270267	.3521821	T=6
	overall	3.763965	9.267508	.14	77.09	N=174
CR	between		8.420363	.2633333	44.14	n=29
	within		4.127155	-18.08603	36.71396	T=6
	overall	.1866724	.2067668	0	1.194	N=174
DA	between		.1981488	0	1.007	n=29
	within		.0680023	-.1473276	.3796724	T=6
	overall	12.75915	1.554119	9.609251	16.23098	N=174
SLLN	between		1.547656	9.810996	16.18958	n=29
	within		.2987837	11.04556	14.14827	T=6
	overall	.0170345	.3695137	-2.039	3.382	N=174
NPM	between		.2392734	-.5503333	.9816667	n=29
	within		.2845054	-1.471632	2.417368	T=6
	overall	1.158161	1.484151	-9.78	6.84	N=174
HCE	between		1.071915	-2.285	3.58	n=29
	within		1.042549	-6.336839	5.189828	T=6
	overall	1.65	2.998473	-4.7	3.9	N=174
GDP	between		0	1.65	1.65	n=29
	within		2.998473	-4.7	3.9	T=6

Source: Authors owns research based on Stata

Table 2. Descriptive summary of variables for service sector, subject of investigation

Variable		Mean	Std. Dev.	Min	Max	Observations
	overall	.0043524	.0777616	-.3984316	.2028383	N=78
ROE	between		.0488208	-.0725782	.1013152	n=13
	within		.0617912	-.3225343	.1058755	T=6
	overall	4.788333	7.977673	.32	37.36	N=78
CR	between		6.751653	.7533333	24.58833	n=13
	within		4.584594	-12.2	30.41333	T=6
	overall	.0751026	.0872536	0	.438	N=78
DA	between		.0783825	0	.2116667	n=13
	within		.043224	-.0568974	.3212692	T=6
	overall	11.83061	1.289086	9.126633	15.33843	N=78
SLLN	between		1.211839	10.47054	15.06588	n=13
	within		.5371686	10.06051	13.76605	T=6
	overall	-.0635769	.8654135	-7.393	.671	N=78
NPM	between		.380784	-1.261667	.2698333	n=13
	within		.7831727	-6.19491	1.26309	T=6
	overall	1.317308	.8028483	-2.05	3.25	N=78
HCE	between		.5824527	.41	2.276667	n=13
	within		.5721394	-1.142692	2.402308	T=6
	overall	1.65	3.009196	-4.7	3.9	N=78
GDP	between		0	1.65	1.65	n=13
	within		3.009196	-4.7	3.9	T=6

Source: Authors owns research based on Stata

Table 3. Descriptive summary of variables for service and manufacturing sector, subject of investigation

Variable		Mean	Std. Dev.	Min	Max	Observations
	overall	.0136643	.0943558	-.6150151	.3608006	N = 252
ROE	between		.0558019	-.0953371	.114907	n = 42
	within		.0764931	-.531201	.3480078	T = 6
	overall	4.081032	8.885156	.14	77.09	N = 252
CR	between		7.873554	.2633333	44.14	n = 42
	within		4.264747	-17.76897	37.03103	T = 6
	overall	.1521389	.1856699	0	1.194	N = 252
DA	between		.177023	0	1.007	n = 42
	within		.0613223	-.1818611	.3983055	T = 6
	overall	12.47175	1.536065	9.126633	16.23098	N = 252
SLLN	between		1.501451	9.810996	16.18958	n = 42
	within		.3873619	10.70164	14.40718	T = 6
	overall	-.0079167	.5703144	-7.393	3.382	N = 252
NPM	between		.2880267	-1.261667	.9816667	n = 42
	within		.4939147	-6.13925	2.392417	T = 6
	overall	1.207421	1.312009	-9.78	6.84	N = 252
HCE	between		.9431449	-2.285	3.58	n = 42
	within		.9217183	-6.287579	5.239087	T = 6
	overall	1.65	2.995794	-4.7	3.9	N = 252
GDP	between		0	1.65	1.65	n = 42
	within		2.995794	-4.7	3.9	T = 6

Source: Authors owns research based on Stata