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The Influence of Intellectual Capital on Corporate Performance of The Turkish Wholesale and Retail Trade Companies

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Abstract

This study aims to discuss the influence of intellectual capital on corporate performance of the Wholesale and Retail trade companies listed in Borsa Istanbul. The study utilized data collected from 26 listed companies for the period of 2010-2015. The Value Added Intellectual Coefficient (VAIC) model has been used to calculate Intellectual Capital Efficiency (ICE), while corporate performance has been measured using traditional accounting measures, such as; Market, Productivity, and Financial performance. Market performance is represented by market to book ratio (MB) and price to earnings ratio (PE), productivity performance is measured by assets turnover ratio (ATO), and financial performance is represented by return on assets (ROA), return on equity (ROE), and earning per share (EPS) ratios. Panel data regression model is utilized to find the relationship between IC and its components; Human capital Efficiency (HCE), Structural Capital Efficiency (SCE), and Capital Employed Efficiency (CEE), with company's performance represented by Market, Productivity, and Financial performance. The findings indicated that Turkish wholesale and retail trade companies are paying good attention to the use of the VAIC components especially HCE in value creation.

Keywords: Intellectual capital, Human capital efficiency, Structural capital efficiency, Capital employed efficiency, Value added intellectual coefficient.

تأثير رأس المال الفكري على أداء شركات تجارة الجملة والتجزئة التركية

الملخص

تهدف هذه الدراسة إلى مناقشة تأثير رأس المال الفكري على أداء شركات تجارة الجملة والتجزئة التركية المدرجة في بورصة اسطنبول. حيث استخدمت الدراسة البيانات التي تم جمعها من 26 شركة مدرجة في الفترة بين 2010-2015. وقد تم استخدام نموذج معامل القيمة الفكرية المضافة (VAIC) لحساب كفاءة رأس المال الفكري (ICE) ، في حين تم قياس أداء الشركات باستخدام معايير المحاسبة التقليدية ، مثل ؛ معايير السوق والإنتاجية والأداء المالي. حيث تم تمثيل أداء السوق بنسبة القيمة السوقية إلى القيمة الدفترية (MB)، ونسبة السعر إلى العائد (PE) ، بيما تم قياس أداء الإنتاجية بنسبة دوران الأصول (ATO) ، أما الأداء المالي فقد تم قياسه من خلال العائد على الأصول (ROA) ، العائد على حقوق الملكية (ROE) ، وربح السهم (EPS). وقد استخدم الباحث نموذج الانحدار (بانل داتا) لإيجاد العلاقة بين رأس المال الفكري ومكوناته؛ كفاءة رأس المال البشري (HCE) ، وكفاءة رأس المال الهيكلي (SCE) ، وكفاءة رأس المال العامل (CEE) ، مع أداء الشركات المتمثل في أداء السوق والإنتاجية والأداء المالي. لقد أشارت النتائج إلى أن شركات تجارة الجملة والتجزئة التركية تولي اهتمامًا جيدًا لاستخدام مكونات رأس المال الفكري لا سيما رأس المال البشري في إضافة القيمة للشركات.

كلمات مفتاحية: رأس المال الفكري، كفاءة رأس المال البشري، كفاءة رأس المالي الهيكلي، كفاءة لـرأس المـال العامـل معامـل القيمـة الفكرية المضافة

1 Introduction

Organizations in a knowledge-based economy face ultra-competition. This environment of ultra-competition is characterized by mobility and volatility, increasing complexity, and globalization. Consequently, in order to avoid these challenges, organizations should pay more attention in improving their internal and external potential and skills. This can be achieved by managing intellectual assets to accomplish preferable performance in the business world (Bontis, 2001; Cariola et al., 2007). In this era, knowledge and intellectual capital management is considered a sustainable strategy for orientation and help in maintaining the competitive position of organizations.

Knowledge can be described through the realization and the use of information (Mayo, 2001). Whereas, knowledge management is defined as the company's capability to manage and control intellectual capital (Maria Mårtensson, 2000). Intellectual capital (IC), according to Sullivan (1999), is the convertible knowledge into profit by optimal exploitation of the non-financial and non-physical resources of the company. It should be noted that there are many definitions available for intellectual capital. Several researchers have defined intellectual capital from a knowledge-based economy view, and how intellectual capital contributes to value creation efficiency. Economic developments have led to significant changes in companies' operations in global markets. Nowadays, we are witnessing an increasing focus by companies to invest in intellectual resources, which enhances the competitive advantage of a company. This fact highlights the need to find a new way to manage and measure companies' performances through their intangible sources (Jurczak, 2008).

Intellectual capital plays a key role in value creation in today's economies and organizations, where organizations in knowledge-based economies have been depending on knowledge assets rather than tangible assets to enhance their competitive advantages (Hamzah & Ismail, 2008). According to the OECD (2008), new organizations are currently working to promote employees' skills through training and research and development. They invest in the development and enhancement of customer and supplier relations, technology, and information systems. Such actions, which are often called intellectual capital investments, are growing day by day at the expense of physical and financial capital investments. This shift in investment behavior is attributable to the increasing dependency on knowledge-based economies (Stewart, 2002; Zeghal & Maaloul, 2010).

The main objective of this study is to examine the relationship between intellectual capital and corporate performance of Wholesale and Retail Trade companies listed on Borsa Istanbul. The Wholesale and Retail Trade sector is considered one of the important sectors in Turkey. The wholesale and retail sales account for about 12% of the Turkish GDP, this share in GDP make the steady contribution of the retail industry very obvious which refers to a vital role in the Turkish economic development (see Table 1). This study try to address the deficiencies in studying the relationship between intellectual capital and the performance of Wholesale and Retail Trade Turkish companies, where none of the studies that conducting in Turkey takes into consideration the effect of IC on Wholesale and Retail Trade companies' financial performance. The broad area of the study, under which the paper falls under, is the area of market, productivity, and financial performance within the Intellectual Capital context. The results of this study may provide a comprehensive view of the use of intellectual capital in the Turkish wholesale and retail companies and the possibility of developing it.

Table 1 The contribution of Wholesale and retail sector in Turkish GDP

	2009	2010	2011	2012	2013	2014	2015	2016
Wholesale and retail trade	106793.6	128297.2	161627.1	176323.9	201817.2	234133.3	268544.5	296142.1
GDP	999191.8	1160014	1394477.2	1569672.1	1809713.1	2044465.9	2338647.5	2608525.7
Contribution rate	10.69 %	11.06 %	11.59%	11.23%	11.15%	11.45%	11.48%	11.35%

Source: https://www.hazine.gov.tr/File/Index?id=3D459789-815C-41C7-ACEA-8B4525ECBC81 (09/08/2018)

2. LITERATURE REVIEW

In 1969, Jon Kenneth Galbraith was the first to introduce the concept of intellectual capital (Khalique, Shaari, Abdul, & Isa, 2011). Although an extended period has elapsed since its introduction, no consensus exists about its definition. However, the existing definitions are not considerably different from each other (Tayles et al., 2007). The vast majority of definitions are basically based on identical concepts such as knowledge, information, customers and employees' loyalty and satisfaction, experiences and skills of employees, business reputation, organizational cultures, organizational systems and procedures, and value creation (Barathi Kamath, 2007; Brooking, 1996; Edvinsson & Malone, 1997; Roos & Roos, 1997; Sullivan, 1999; Yalama & Coskun, 2007).

According to Edvinsson (1997); Kamath (2007); Pulic (2000); Roos et al. (1997); Stewart (1997); Sullivan (1999); Zeghal & Maaloul (2010), IC is the organization's intellectual capability, which identifies how efficiently physical capital and intellectual potential is used to create value, and how efficiently knowledge is transformed into value. Moreover, Bontis et al. (2000); Brooking (1996); Roos & Roos (1997); Sveiby (1997); Yalama & Coskun (2007) state that IC represents the company's hidden resources which are not recognized in the financial statements. These resources are, most probably, utilized to generate a competitive advantage and maximize the company's future value. In general, most IC definitions revolve around how companies use their intangible sources effectively to improve their competitive advantage and value creation.

The deep review of IC literature has shown several IC studies conducted recently to investigate its relationship with organizational financial performance, and one can clearly state that VAIC is a popular model that is used as a measurement of IC and its components. This argument can be proved by the widespread use of the VAIC method around the world and in various economic sectors; such as, banking, industrial, pharmaceutical, wholesale and retail, hospitality sectors, etc.

Pulic (1998) introduced the VAIC approach to measure a company's efficiency in adding value from both intangible and tangible assets. Pulic (2000) study the relationship between the IC and its components and firms' market value. He Uses data from thirty companies selected randomly from the FTSE 250 (UK) over the period 1992 to1998. The findings indicate a significant high degree of association between the average values of VAIC and corporate market value. Firer & Williams (2003) use the VAIC model to investigate the effect of intellectual capital on companies' performances. They apply their study on 75 publicly listed companies in South Africa. By using traditional measures of corporate performance involving profitability (ROA), productivity (ATO), and market value (MB), they indicate that only CEE has a significant positive impact on MB.

Komnenic & Pokrajčić, (2012) study the influence of IC on the performance of 37 multinational companies working in Serbia for the period of 2006-2008. They apply the VAIC model as a measure of IC. They use the VAIC components as independent variables to clarify which of them could be the driver of organizational success. Company performance (dependent variables) is measured by profitability and productivity. They find a positive impact of HC on all three performance variables. In addition, they find a significant relationship between SC and ROE. These results are mostly supported by the findings of Janošević et al. (2013), which is conducted on 100 Serbian companies except banks and insurance companies for the year 2010. They find a significant impact of HC and SC on ROE and ROA, whereas CE affects ROE only. The findings of the two previous studies are not compatible with the study of Dženopoljac et al. (2016), which is applied on Serbian information communication technology (ICT) companies over the period of 2009-2013. They do not find a significant impact of IC components on firm financial performance except for CEE, which has a positive impact on financial performance, especially when using leverage and firm size as control variables.

Joshi et al. (2013) evaluate the association amongst IC components and the influence of IC on financial performance of banks in the Australian Financial Sector. They use Pulic's model (VAIC) to determine the relationship among IC constituents and ROA as a measure of bank financial performance for the period of 2006-2008. The findings point out a significant positive relationship between IC and ROA. Moreover, they state that HCE plays a more important role in all Australian national banks than SCE and CEE. In addition, there is no effect of bank size, total assets, employees' number, and shareholders' equity on IC performance. These findings are completely compatible with the results of the study conducted in Australia over the period of 2005-2007 by Joshi et al. (2010). The study depicts a significant relation between HC and value creation efficiency of the banks. In addition, it does not show an impact of CE and SC on value creation efficiency of Australian banks. On the other hand, different results are shown when studying the effect of IC and its elements on the performance of Australian listed companies over the period 2004-2008. These differences have been shown in the study conducted by Clarke et al. (2011), where it indicates that there is a positive effect of IC on firm performance, with CE more than HC. This means that Australian listed companies depend on physical and financial capital in driving their performance more than human capital. However, the previous findings by Clarke et al. (2011) is entirely incompatible with the results of Laing et al. (2010). They conducted a study on Service Companies' performances represented by hotel companies listed on the Australian Stock Exchange over the period 2004-2007. They find a significant association between HCE and ROA. In addition, they find a negative relation between CEE with ROA. This indicates that hotel companies depend on their staff contributions more than physical and financial capital.

In Turkey, Ozkan, et. al. (2016) study intellectual capital and bank financial performance (ROA) relation over the period 2005 and 2014 using the VAIC model. The findings indicate that HC and CE both have a positive influence on financial performance of banks (ROA). However, CE affects banks' financial performance more than HC. Yalama & Coskun (2007) reach to a similar result to some extent, where they show a positive influence of IC on banks profitability (ROA and ROE) in Turkish banks listed on Istanbul stock exchange (ISE) over the period from 1995 to 2004. Calisir et al. (2011) study the trend of IC performance in both investment and development banks in Turkey over the period 2003-2007. The results show a decreasing trend of VAIC efficiency starting in

2003, which then began to increase in 2005 and 2006. Avci & Nassar (2017) examine the effect of IC on corporate performance of 44 financial companies listed on Borsa Istanbul before and after the crisis. The period from 2004 till 2007 represents the pre-crisis period while the period from 2010 to 2015 represents the post-crisis period. The findings show that HCE is positively and significantly impact ROA after the crisis, and the same for ROE but before and after the crisis. SCE shows a significant and positive relationship with PE and ROE after the crisis. In addition, CEE has a positive significant influence on MB after the crisis. In general, VAIC shows a significant association with ROA after the crisis, and a significant association with ROE before and after the crisis. These results are mostly compatible with Nassar (2018). It examines the influence of IC on corporate performance of 27 Real Estate listed companies on Borsa Istanbul for the period 2004-2015.

From the above discussion of literature, it is clear that only a limited number of studies were conducted in Turkey to explore the relationship between intellectual capital and corporate performance, as compared with international studies. The studies conducted in Turkey, which were mentioned above, did not focus on all listed companies. They focused more on the banking sector leaving out many other sectors listed on Borsa Istanbul. Moreover, none of these studies take into consideration the effect of IC on Wholesale and Retail Trade companies' financial performance. This gap will be discussed in the present study through the following hypotheses.

H1: There is a significant positive impact of IC on firms' market performance (MB, PE).

H2: There is a significant positive impact of IC on firms' productivity (ATO).

H3: There is a significant positive impact of IC on firms' financial performance (ROA, ROE, EPS).

3. METHODOLOGY

The main aim of this study is to examine the impact of IC on market, productivity, and financial performance of the wholesale and retail trade companies listed on Borsa Istanbul. To measure IC, the VAIC (Value Added Intellectual Coefficient) method, suggested first by Pulic (1998), is used. The VAIC model depends on the accounting information that can be extracted from companies' financial statements. This indicates that the computation of VAIC is based on audited and publicly published financial data. It provides a good degree of validity for the findings obtained. In addition, the VAIC model is easy to apply and interpret. It also, being a quantitative method, can be utilized for the comparisons between different companies, sectors, and nations. Moreover, the VAIC approach is significant in this setting as it provides the ability to examine the contribution of both intellectual resources; human and structural capital, and tangible resources; physical and financial assets, in value creation (Al-Shubiri, 2013; Chen Goh, 2005; Chen et al., 2005; Deris et al., 2013; Djamil et al., 2013; Ho & Williams, 2003; Joshi et al., 2010; Kamath, 2007; Kujansivu & Lönnqvist, 2007; Latif et al., 2012; Pew Tan et al., 2007; Wang, 2011; Yalama & Coskun, 2007).

Pulic's approach is composed of three main components that measure the efficiency of Human Capital (HC), Structural Capital (SC), and Capital Employed (CE). Human Capital (HC) is the value of invested capital in employees' knowledge (training, R&D, wages, salaries, skills, and experiences of individual workers) which a company can lose if the employees decided to leave (Chang, 2010; Edvinsson & Malone, 1997; Meihami et al., 2013; Muhammad & Ismail, 2009; Sullivan, 1999). Structural capital (SC) is a non-human stock of knowledge, which includes but not restricted to; information, technology, trademarks, and patents. It is the intellectual asset which remains even after employees leave the company (Al-Zoubi, 2013; Chen, et. al., 2005; Moradi et

al., 2013). Capital Employed (CE) is the tangible assets part of capital and contains both physical and financial assets (Pulic, 2004). CE is calculated as the sum of physical and financial assets, or by deducting intangible assets from total assets (Chen, et. al. (2005); Mosavi et. al. (2012); Rehman, et. al. (2014); Rehman, et. al. (2012)).

3.1 Data source

To perform the analysis which examines the relationship between intellectual capital and corporate performance, financial data for 26 from a total of 32 Wholesale and Retail trade companies listed on Borsa Istanbul is obtained. The data covers the period 2010 – 2015 and was obtained from several sources (i) Finnet Analysis Expert database (main source) (ii) companies' annual reports (2010 to 2015), which are publicly available on companies' and Borsa Istanbul websites. Companies with missing relevant information are excluded from the sample.

3.2 Measures

To measure corporate performance, a set of indicators for market performance (Market to Book value and Price-Earnings ratio), productivity performance (Assets Turnover), and financial performance (Return on Assets, Return on Equity, and Earning per Share) have been used. In addition, several predictor variables; firm age (FAGE), firm size (FSIZE), and firm leverage (FLEV), are also incorporated into the analysis.These variables are represented in Table 2.

Table 2 Summaries all variables have used in the study.

Variables	Equation	Explanation
Independent Variables		
Human Capital Efficiency **(HCE)**	**VA / HC**	**VA** is the value added of the company can be calculated out of the difference between a company's OUTPUT and INPUT. OUTPUT represents the overall income of the company from all products and services sold on the market. INPUT represents all expenses of resources incurred by the company except employee expenses. **HC** means human capital that is all employee expenses and compensations such; salaries and wages, training, and development that a company incurred on them.
Structural Capital Efficiency **(SCE)**	**SC / VA**	**SC** as (Pulic, 2004) can be calculated by deducting human capital (HC) from value added (VA)
Capital Employed Efficiency **(CEE)**	**VA / CE**	**CE** refers to the physical and financial capital of the company, can be calculated by deducting intangible assets from total assets.
Value Added Intellectual Coefficient **(VAIC)**	**HCE + SCE + CEE**	Value Added Intellectual Coefficient is the summation of Human Capital Efficiency, Structural Capital Efficiency, and Capital Employed Efficiency

Dependent Variables		
MB	Market to Book value	Market Capitalization / Book Value
PE	Price-Earnings ratio	Market value per share / Earning per share
ATO	Assets Turn Over	Total Revenue / Total Book Value
ROA	Return on Assets	Net Income / Total Assets
ROE	Return on Equity	Net Income / Total Equity
EPS	Earnings per Share	(Net Income-Preferred Dividends)/ (Average Outstanding Shares)
Control Variables		
FAGE	Firm Age	Age of the company from its establishment time
FSIZE	Firm Size	Log of firm's total assets
FLEV	Firm Leverage	Total debt / Book value of total assets

3.3 Descriptive Statistics

Table 3 presents the descriptive statistics of independent, dependent, and control variables of the 26 companies included in the study.

Table 3 Descriptive statistics

	Independent Variables			Dependent Variables						Control variables		
	HCE	SCE	CEE	MB	PE	ATO	ROA	ROE	EPS	FAGE	FSIZE	FLEV
N	156	156	156	156	156	156	156	156	156	156	156	156
Mean	4.39	0.70	0.03	2.27	14.01	1.50	0.01	3.19	0.09	27.92	19.40	3.34
SD	2.03	0.41	1.02	3.02	15.56	1.49	0.08	18.52	0.72	15.57	2.35	6.98

HCE is human capital efficiency, SCE is structural capital efficiency, CEE is capital employed efficiency, MB is market to book ratio, PE is price-earnings ratio, ATO is assets turnover, ROA is return on assets, ROE is return on equity, EPS is earnings per share, FAGE is firm age, FSIZE is firm size, FLEV is firm leverage.

Table 3 shows that all components of VAIC (HCE, SCE, and CEE) have a respective mean value of (4.39, 0.70, 0.03) for the wholesale and retail trade companies. HCE is the most effective component in value creation, in comparison with SCE and CEE. The market performance variables (MB and PE) do not show any specific trend. Likewise, the productivity ratio (ATO) does not appear to have any specific trend. Financial performance ratios (ROA and EPS) show a good average of 0.08 and 0.72, respectively. The standard deviation for the independent variables is the highest in HCE, and for dependent variables is the highest in ROE.

3.3 Regression analysis

To achieve the study objective, the Panel data method; including fixed and random effect models, is applied using the Gretl program. Table 4 shows the results of the Hausman test, where the table provides the P-value of test for each case. If the p-value less than 0.05 we can conclude the Random effect model is appropriate for data, otherwise the Fixed effect model is appropriate.

Table 4 Hausman test

	###	MB	PE	ATO	ROA	ROE	EPS
Hausman Test	Model1 (HCE, SCE, CEE)	0.548	0.685	0.0004	0.145	0.0001	0.049
	Model2 (VAIC)	0.238	0.772	0.0001	0.087	0.0002	0.047

Table 5 presents the results of the Panel data statistics for each dependent, control, and independent variables. The VAIC and its components are considered as the independent variables, while as, the performance measures and control variables are considered as the dependent variables. The following is the general model that is divided into two different models; the first measures the impact of VAIC on performance, while the second measures the impact of the components of VAIC on performance.

$$Y_{it} = \beta + \beta_1 X_{it} + \beta_2 C_{it} + \varepsilon$$

Where; Yit refers to the dependent variables (Market (MB; PE), Productivity (ATO), and Financial (ROA; ROE; EPS)), Xit refers to independent variables (VAIC; HCE; SCE; CEE), and Cit represents control variables (FAGE; FSIZE; FLEV).

Model 1 presents the regression statistics between dependent variables and the components of VAIC and control variables.

$$Y_{it} = \beta + \beta_1 HCE + \beta_2 SCE + \beta_3 CEE + \beta_4 C_{it} + \varepsilon$$

Model 2 depicts the regression statistics between dependent variables and VAIC and control variables.

$$Y_{it} = \beta + \beta_1 VAIC + \beta_2 C_{it} + \varepsilon$$

Table 5 Regression analysis

Variables	MB		PE		ATO		ROA		ROE		EPS	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Constant	-2.514	−2.540	3.961	3.156	1.55	1.488	0.334	0.318	4.58**	3.99**	2.676	2.691
Control variables												
FAGE	0.0403	0.042	0.333	0.087	−0.016**	−0.022**	0.001	0.002	-0.571	-0.455	-0.018	-0.006
FSIZE	0.164	0.159	-1.321	−0.911	0.015	0.031	−0.020	-0.020	-3.312	-3.505	-0.088	-0.114
FLEV	−0.016	-0.016	0.879	0.990	0.001	0.001	−0.006***	-0.006***	-0.432	-0.428	-0.068***	-0.0672***
Independent variables												
HCE	0.077**		0.337		0.033***		0.007**		0.017*		-0.006	

Variables	MB		PE		ATO		ROA		ROE		EPS	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
SCE	0.003		0.078**		0.031***		0.011**		0.098		-0.005	
CEE	0.099		0.089*		−0.030		0.009		0.095		0.109	
VAIC		0.075**		−0.713		0.019***		0.006**		0.030**		0.011
F-Stat.	15.12	4.04	3.33	5.724	16.013	26.648	19.73	26.29	3.52	5.142	7.692	8.564
Prob.(F)	0.000	0.023	0.012	0.006	0.000	0.0000	0.000	0.000	0.026	0.010	0.001	0.001
R-square	0.28	0.28	0.18	0.16	0.63	0.62	0.19	0.19	0.26	0.26	0.17	0.17
Obs.	156	156	156	156	156	156	156	156	156	156	156	156

Coefficients of regression reported as standardized coefficients. * significant at the 0.01 level, ** significant at the 0.05 level and *** significant at the 0.10 level. VIF value for all control and independents variables are less than 3, means there is no Multicollinearity.

The results of table 5 show that VAIC has a significant positive effect on firm's market performance through market to book value (MB). In addition, it has a significant positive impact on firm's productivity performance (ATO). Moreover, VAIC has a significant positive influence on firm's financial performance through return on assets (ROA) and return on equity (ROE). This result supports the previous studies results, where most of them show a significant positive association between VAIC and corporate financial performance (Calisir et al., 2010; Chan, 2009; Chen Goh, 2005b; Chen et al. 2005b; Firer and Williams, 2003; Kamath, 2008; Maditinoset al. 2011; Mavridis, 2004; Mehralian et al. 2012; Mondal and Ghosh, 2012; Ting and Lean, 2009; Zeghal and Maaloul, 2010).

Regarding VAIC components, the results show that HCE has the most effect on firm's market, productivity, and financial performance. It has a significant impact on MB, ATO, ROA, and ROE. This result corroborates what Pulic and others have stated, that HC plays a key role in companies' value creation (Roos and Roos, 1997; Bozbura, 2004; Pulic, 2004; Shaari et al., 2011). In addition, SCE has a significant positive effect on PE, ATO, and ROA. Moreover, CEE has only a significant positive impact on market performance through Price-Earnings ratio (PE).

4. Conclusion

Intellectual capital is considered as the main driver of value creation in the new era of a knowledge-based economy, where the value added of companies and individuals has direct association with their knowledge and intellectual capital (Bontis, 2001). The main objective of this study is to examine the relationship of intellectual capital and its components (human capital, structural capital, and capital employed) on market, productivity, and financial performance of wholesale and retail trade companies listed on Borsa Istanbul. The study is conducted using data from 26 companies' annual reports listed on Borsa Istanbul for the period of 2010 - 2015. Pulic's VAIC method has

been used as a measurement of intellectual capital. MB and PE ratios are used as indicators of market performance, ATO ratio is used as an indicator of productivity performance, while ROA, ROE and EPS ratios are used as indicators of financial performance. The findings show that HCE is the most effective factor in value creation than SCE and CEE. SCE plays a considerable role in value creation as it has a significant positive effect on market, productivity, and financial performance indicators PE, ATO and ROA. CEE is not considered as a driver of value creation as it has a significant impact only on PE ratio. This indicates that the wholesale and retail trade Turkish companies depend on intellectual assets rather than physical assets in their value creation. VAIC shows a good association with market, productivity, and financial performances of the wholesale and retail trade companies. The study's findings are completely compatible with most previous studies (e.g. Narwal & Yadav, (2017); Bontis et al., (2000); Muhammad & Ismail, (2009); Goh (2005); El- Bannany, (2012); Mondal & Ghosh, (2012); Mention & Bontis, (2013); Joshi et al., (2010); Yalama & Coskun, (2007)), and partly consistent with other previous studies (e.g. Holienka & Pilková, (2014); Sumedrea, (2013) and Radianto, (2011)). On the other hand, the study's results are fully inconsistent with Pitelli Britto et al., (2014). The study has limitations due to the lack of data sources because of missing values during the study's period. In addition, the findings of this study cannot be generalized for other sectors because of the differences in the nature of those sectors.

References:

Al-Shubiri, F. N. (2013). The Impact of Value Added Intellectual Coefficient Components on Financial Health. *Revista de Management Comparat International*, *14*(3), 459.

Al-Zoubi, M. R. (2013). The Impact of Intellectual Capital on SWOT Analysis among Jordanian Banking Industry" Empirical Study". *International Journal of Business and Social Science*, *4*(2).

Arafat, N. M., & Shahimi, M. (2013). An exploratory of the intangible assets: Methods of measuring intellectual capital. Presented at the 3rd International Conference on Business, Economics, Management and Behavioral Sciences (ICBEMBS'2013), Singapore.

Avci, E., & Nassar, S. (2017). Intellectual Capital and Its Impact on Firm Performance of The Turkish Financial Sector Before and After Financial Crisis (Vol. 3, pp. 916–924). Presented at the Global Business Research Congress (GBRC), Turkey, Istanbul: PressAcademia Procedia (PAP).

Bontis, N. (2001). Assessing knowledge assets: a review of the models used to measure intellectual capital. *International Journal of Management Reviews*, *3*(1), 41–60.

Bontis, N., Chua Chong Keow, W., & Richardson, S. (2000). Intellectual capital and business performance in Malaysian industries. *Journal of Intellectual Capital*, *1*(1), 85–100.

Brooking, A. (1996). *Intellectual Capital: Core Assets for the Third Millennium Enterprise*. London, UK: Thomson Business Press.

Calisir, F., Altin Gumussoy, C., Bayraktaroğlu, A. E., & Deniz, E. (2010). Intellectual capital in the quoted Turkish ITC sector. *Journal of Intellectual Capital*, *11*(4), 538–554. https://doi.org/10.1108/14691931011085678

Calisir, F., Gumussoy, C. A., Cirit, F., & Bayraktaroglu, A. E. (2011). Intellectual capital in development and investment banks of Turkey. In *International Conference on Industrial Engineering and Operations Management, Kuala Lumpur* (pp. 22–24).

Chan, K. H. (2009). Impact of intellectual capital on organisational performance: An empirical study of companies in the Hang Seng Index (Part 2). *The Learning Organization*, *16*(1), 22–39. https://doi.org/10.1108/09696470910927650

Chang, W. S. (2010). The Different Proportion of IC Components and Firms' Market Performance: Evidence from Taiwan. *The International Journal of Business and Finance Research*, *4*(4), 121–134.

Chen Goh, P. (2005). Intellectual capital performance of commercial banks in Malaysia. *Journal of Intellectual Capital*, *6*(3), 385–396. https://doi.org/10.1108/14691930510611120

Chen, M., Cheng, S., & Hwang, Y. (2005a). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. *Journal of Intellectual Capital*, *6*(2), 159–176. https://doi.org/10.1108/14691930510592771

Chen, M., Cheng, S., & Hwang, Y. (2005b). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. *Journal of Intellectual Capital*, *6*(2), 159–176. https://doi.org/10.1108/14691930510592771

Clarke, M., Seng, D., & Whiting, R. H. (2011). Intellectual capital and firm performance in Australia. *Journal of Intellectual Capital*, *12*(4), 505–530.

Deris, A., Jabbari, H., & Jerjerzadeh, A. (2013). An Investigation Of The Impact Of Intellectual Capital Elements On Stock Returns Of Companies Listed ON Tehran Stock Exchange. *New York Science Journal*, *6*(1), 133–138.

Djamil, A. B., Razafindrambinina, D., & Tandeans, C. (2013). The Impact of Intellectual Capital on a Firm's Stock Return: Evidence from Indonesia. *Journal of Business Studies Quarterly*, *5*(2), 176.

Dženopoljac, V., Janoševic, S., & Bontis, N. (2016). Intellectual capital and financial performance in the Serbian ICT industry. *Journal of Intellectual Capital*, *17*(2), 373–396. https://doi.org/10.1108/JIC-07-2015-0068

Edvinsson, L. (1997). Developing intellectual capital at Skandia. *Long Range Planning*, *30*(3), 366–373.

Edvinsson, L., & Malone, M. S. (1997). *Intellectual Capital: Realizing Your Company's True Value by Finding Its Hidden Brainpower* (1st edition). New York: HarperBusiness.

Firer, S., & Williams, S. M. (2003). Intellectual capital and traditional measures of corporate performance. *Journal of Intellectual Capital*, *4*(3), 348–360. https://doi.org/10.1108/14691930310487806

Hamzah, N., & Ismail, M. N. (2008). The importance of intellectual capital management in the knowledge-based economy. *Contemporary Management Research*, *4*(3).

Ho, C.-A., & Williams, S. M. (2003). International comparative analysis of the association between board structure and the efficiency of value added by a firm from its physical capital and intellectual capital resources. *The International Journal of Accounting*, *38*(4), 465–491. https://doi.org/10.1016/j.intacc.2003.09.001

Janosevic, S., Dzenopoljac, V., & Bontis, N. (2013). Intellectual Capital and Financial Performance in Serbia: Intellectual Capital in Serbia. *Knowledge and Process Management*, *20*(1), 1–11. https://doi.org/10.1002/kpm.1404

Joshi, M., Cahill, D., & Sidhu, J. (2010). Intellectual capital performance in the banking sector: An assessment of Australian owned banks. *Journal of Human Resource Costing & Accounting*, *14*(2), 151–170. https://doi.org/10.1108/14013381011062649

Joshi, M., Cahill, D., Sidhu, J., & Kansal, M. (2013). Intellectual capital and financial performance: an evaluation of the Australian financial sector. *Journal of Intellectual Capital*, *14*(2), 264–285. https://doi.org/10.1108/14691931311323887

Jurczak, J. (2008). Intellectual Capital Measurement Methods. *Economics and Organization of Enterprise*, *1*(1), 37–45. https://doi.org/10.2478/v10061-008-0005-y

Kamath, G. B. (2007). The intellectual capital performance of the Indian banking sector. *Journal of Intellectual Capital*, *8*(1), 96–123. https://doi.org/10.1108/14691930710715088

Kamath, G. B. (2008). Intellectual capital and corporate performance in Indian pharmaceutical industry. *Journal of Intellectual Capital*, *9*(4), 684–704. https://doi.org/10.1108/14691930810913221

Khalique, M., Shaari, N., Abdul, J., & Isa, A. H. B. M. (2011). Intellectual capital and its major components. *International Journal of Current Research*, *3*(6), 343–347.

Komnenic, B., & Pokrajčić, D. (2012). Intellectual capital and corporate performance of MNCs in Serbia. *Journal of Intellectual Capital*, *13*(1), 106–119. https://doi.org/10.1108/14691931211196231

Kujansivu, P., & Lönnqvist, A. (2007). Investigating the value and efficiency of intellectual capital. *Journal of Intellectual Capital*, *8*(2), 272–287. https://doi.org/10.1108/14691930710742844

Laing, G., Dunn, J., & Hughes- Lucas, S. (2010). Applying the VAIC™ model to Australian hotels. *Journal of Intellectual Capital*, *11*(3), 269–283. https://doi.org/10.1108/14691931011064545

Latif, M., Malik, M. S., & Aslam, S. (2012). Intellectual capital efficiency and corporate performance in developing countries: a comparison between Islamic and conventional banks of Pakistan. *Interdisciplinary Journal of Contemporary Research in Business*, *4*(1), 405.

Maditinos, D., Chatzoudes, D., Tsairidis, C., & Theriou, G. (2011). The impact of intellectual capital on firms' market value and financial performance. *Journal of Intellectual Capital*, *12*(1), 132–151. https://doi.org/10.1108/14691931111097944

Maria Mårtensson. (2000). A critical review of knowledge management as a management tool. *Journal of Knowledge Management*, *4*(3), 204–216. https://doi.org/10.1108/13673270010350002

Mavridis, D. G. (2004). The intellectual capital performance of the Japanese banking sector. *Journal of Intellectual Capital*, *5*(1), 92–115. https://doi.org/10.1108/14691930410512941

Mayo, A. (2001). *The human value of the enterprise: valuing people as assets: monitoring, measuring, managing*. London, UK: Nicholas Brealey.

Mehralian, G., Rasekh, H. R., Akhavan, P., & Sadeh, M. R. (2012). The impact of intellectual capital efficiency on market value: An Empirical Study from Iranian Pharmaceutical Companies. *Iranian Journal of Pharmaceutical Research*, *11*(1), 195–207.

Meihami, B., Varmaghani, Z., & Meihami, H. (2013). Role of Intellectual Capital on Firm Performance (Evidence from Iranian Companies). *International Letters of Social and Humanistic Sciences*, *12*, 43–50. https://doi.org/10.18052/www.scipress.com/ILSHS.12.43

Mondal, A., & Ghosh, S. K. (2012). Intellectual capital and financial performance of Indian banks. *Journal of Intellectual Capital*, *13*(4), 515–530. https://doi.org/10.1108/14691931211276115

Moradi, M., Saeedi, M., Hajizadeh, H., & Mohammadi, M. (2013). The Influence of Intellectual Capital on the Improvement of Companies' Financial Performance. *International Journal of Economics, Business and Finance*, *1*(5), 120–139.

Mosavi, S. A., Nekoueizadeh, S., & Ghaedi, M. (2012). A study of relations between intellectual capital components, market value and finance performance. *African Journal of Business Management*, *6*(4). https://doi.org/10.5897/AJBM11.1466

Muhammad, N. M. N., & Ismail, M. K. A. (2009). Intellectual capital efficiency and firm's performance: study on Malaysian financial sectors. *International Journal of Economics and Finance*, *1*(2), 206.

Nassar, S. (2018). The Impact of Intellectual Capital on Firm Performance of the Turkish Real Estate Companies Before and After the Crisis. *European Scientific Journal*, *14*(1). https://doi.org/10.19044/esj.2018.v14n1p29

Ozkan, N., Cakan, S., & Kayacan, M. (2016). Intellectual Capital and Financial Performance: A Study of the Turkish Banking Sector. *Borsa Istanbul Review*. https://doi.org/10.1016/j.bir.2016.03.001

Pew Tan, H., Plowman, D., & Hancock, P. (2007). Intellectual capital and financial returns of companies. *Journal of Intellectual Capital*, *8*(1), 76–95. https://doi.org/10.1108/14691930710715079

Pulic, A. (2000). VAIC™–an accounting tool for IC management. *International Journal of Technology Management*, *20*(5–8), 702–714.

Pulic, A. (2004). Intellectual capital – does it create or destroy value? *Measuring Business Excellence*, *8*(1), 62–68. https://doi.org/10.1108/13683040410524757

Rehman, M. U., Ahmed, K., & Qazi, A. Q. (2014). A study of causality between disintegrated intellectual capital and firm performance.

Rehman, W. U., Rehman, H. U., Usman, M., & Asghar, N. (2012). A Link of intellectual capital performance with corporate performance: comparative study from banking sector in Pakistan. *International Journal of Business and Social Science*, *3*(12).

Roos, G., & Roos, J. (1997). Measuring your company's intellectual performance. *International Journal of Strategic Management, Long Range Planning*, *30*(3), 413–426.

Roos, G., Roos, J., Dragonetti, N. C., & Edvinsson, L. (1997). *Intellectual Capital: Navigating in the New Business Landscape*. London, UK: Macmillan Publications.

Shaari, N., Abdul, J., Khalique, M., & Isa, A. H. B. M. (2011). Ranking of public and domestic private sector commercial banks in Pakistan on the basis of the intellectual capital performance. *KASBIT Business Journal*, *4*, 61–68.

Stewart, T. (1997). *Intellectual Capital: The New Wealth Of Organizations* (illustrated, reprint). Business Digest, New York: Doubleday / Currency.

Stewart, T. (2002). *The Wealth of Knowledge: Intellectual Capital and the Twenty-First Century Organization*. London: Nicholas Brealey Publishing Limited.

Sullivan, P. H. (1999). Profiting from intellectual capital. *Journal of Knowledge Management*, *3*(2), 132–143. https://doi.org/10.1108/13673279910275585

Sveiby, K. E. (1997). *The new organizational wealth: managing & measuring knowledge-based assets* (1st ed). San Francisco: Berrett-Koehler Publishers.

Tayles, M., Pike, R. H., & Sofian, S. (2007). Intellectual capital, management accounting practices and corporate performance: Perceptions of managers. *Accounting, Auditing & Accountability Journal*, *20*(4), 522–548. https://doi.org/10.1108/09513570710762575

Ting, I. W. K., & Lean, H. H. (2009). Intellectual capital performance of financial institutions in Malaysia. *Journal of Intellectual Capital*, *10*(4), 588–599. https://doi.org/10.1108/14691930910996661

Wang, M. S. (2011). Intellectual Capital and Firm Performance. In *Annual Conference on Innovations in Business & Management* (pp. 1–26). London, UK.

Yalama, A., & Coskun, M. (2007). Intellectual capital performance of quoted banks on the Istanbul stock exchange market. *Journal of Intellectual Capital*, *8*(2), 256–271. https://doi.org/10.1108/14691930710742835

Zeghal, D., & Maaloul, A. (2010). Analysing value added as an indicator of intellectual capital and its consequences on company performance. *Journal of Intellectual Capital*, *11*(1), 39–60. https://doi.org/10.1108/14691931011013325

Turkish Ministry of Treasury and Finance, Monthly Economic Indicators, September 2018. https://www.hazine.gov.tr/File/Index?id=3D459789-815C-41C7-ACEA-8B4525ECBC81 (09/08/2018)