# Where did the competitive advantage of French wineries come from? Insight in the effect of intellectual capital structure on financial performances

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## Abstract

The purpose of our study is to examine efficiency of intellectual capital and its components in French wine companies in the manner of financial performance improvement. We included 548 French wine large size companies in an empirical examination in the period 2015 to 2019. The financial information was obtained from the financial database "Diane" provided by Bureau Van Dijk, Moody's analytics company. The model used in this study is the Value Added Intellectual Coefficient - VAIC™ developed by Pulic (2000). This model investigates the efficiency of intellectual capital on the financial performance within French wine companies. The efficiency of intellectual capital and its components impact both on operating profit and net income. Human Capital Efficiency (HCE) influences positively on operating profit and net income with its coefficients 0.003579 and 0.003366 respectively. Capital Employed Efficiency (CEE) has similar results with the positive impacts on operating profit and net income with coefficients 0.1953281 and 0.0012821. On the other hand, Structural Capital Efficiency (SCE) influences negatively on the financial performance, -0.012661 and -0.02107 respectively. In total, Value Added Intellectual Capital (VAIC) impacts positively on the French wine companies' financial results with coefficients 0.0038764 and 0.0032488. These results prove that French wine companies are intellectual-capital intensive and that the creation of competitive advantage is based on the knowledge and expertise in the field they operate. This study confirms that French wine companies create values and competitive advantage coming from its companies' knowledge that is seen as intellectual capital.

**Keywords:** Intellectual capital. Financial performance. Wine companies. France

## 1. Introduction

The English word “wine” and the French word “vin” constitutes the French/English word “Divine”, while the probably oldest grape family Vitaceae is composed of the Latin word “vita” which means life. This is not surprising when the role of vine/wine in the Judeo Christian traditions has been known.

Namely, according to the Aggadah (compendium of rabbinic texts), angels were bringing wine to Adam in Eden (Sanh. 59b; ARN 1,5. According: Jewish Virtual Library), while the "tree of which the first man ate was a vine”. (Sanh. 70a. According: STEINMETZ, 1994) After the flood, it is said that Noah began to farm the land (Genesis 9:20), but only planting vineyards in order to make wine has been mentioned (Genesis 9:20), although Noah undoubtedly planted many other plants as well. “Indeed, so fundamental is wine in the Bible that the nation of Israel is often compared to a vine or a vineyard” (ELZINGA, 2017). Still, the most important place to the wine has been given in Christianity. “Christian faith cannot be understood…without knowing its nexus with wine” (KREGLINGER, 2016; ELZINGA, 2017). Jesus describes himself as the “true vine” (JOHN 15:1; 15:5, New Testament), his Father as “the gardener” of the vineyard (JOHN 15:1, New Testament), while his disciples are described as “branches”. On every Devine Liturgy in Eastern Orthodox Church, the bishop is praying: “Lord, Lord, look down from heaven and behold and visit this vineyard and establish that which your right hand has planted” what has been inspired from the Book of Psalms. The first Jesus’ miracle was changing water into wine, while during the sacrament of the Lord’s supper, Jesus told his apostles that they will be drinking a new one in his Father’s Kingdom” (MATTHEW 26:29; MARK 14:25, New Testament). (ELZINGA, 2017). The theological connection with wine is deep at the measure that the salvation by itself is related to wine. According to the Orthodox Catholic and Roman Catholic dogma, during the Divine Liturgy/Mass, the wine becomes Christ’s blood and taking it people enter the community with God.

The spiritual note has been given to wine in many other ancient civilizations as well. The Mayans had their god of wine – Acan; the Mesopotamian had female divinity of beer and wine – Siduri; the Romans had their gods of wine – Bacchus and Liber Pater; while the Greeks had Dionysus (god of wine), Silenus (god of wine, wine pressing), Amphictyonis,

(goddess of wine), Ceraon (demi-god of the meal, specifically the mixing of wine) and Oenotropae/Oeno or Oino (Ancient Greek: Οἰνώ, "wine"), goddess of wine whose great-grandfather Dionysus gave the power to change anything into wine (JORDAN, 1993). Liu Ling, famous Chinese poet, and scholar wrote in the third century his famous poem titled "In Praise of the Virtue of Wine" (BLOCKER, FAHEY, TYRRELL, 2003).

On the other hand, science tells that the general framework that brings human and grapevine together for the first time descend from the paleolithic period (McGOVERN, 2019), while fossil seeds and leaf impressions of the family of *Vitaceae*, shared more physical features during the late Tertiary period, 50 million years ago, than now. Possibly, this plant even traces in ancestry much earlier - to Ampelopsis, a climbing vine of 500 million years ago (McGOVERN, 2019). Vavilov (1926) specified two main centers of vine origin: Central Asian (northwestern India, Afghanistan, Tajikistan, and Uzbekistan) and Western Asian (Iran, inner Asia Minor, and Transcaucasia). (EGOROV, 2016). Interestingly, from this area, the wine still remained important only for the region of Transcaucasia (modern Georgia and Armenia and Azerbaijan).

However, for centuries France has been seen as the "county of wine". Dion (1959) wrote that ancient Greece and Rome bequeathed elite vineyards to France, which becomes one of the most glorious expressions of French civilization (GUY, 2003). For Dion (1959) as well as many other French historians, to "write the history of wine is to write the history of French people" (GUY, 2003). While it seems obvious as to be an exaggeration, Guy (2003) claims that "the wine can be seen as an objective manifestation of the French 'soul', the guardian of supreme spiritual values."

"For hundreds of years, France basked in the reputation of being the world's greatest producer of wines" (STILE BRANDS, 2018), but it seems that using "methods elaborated over centuries of practice" (GUY, 2003) for making fine and quality wines is not enough. "That reputation is being rivaled by other wine-growing nations on four continents, and the French wine industry is facing new challenges. Since the low of 2003, the French wine industry has been trying to reinvent itself, producing new wines for a changing world and European market". (STILE BRANDS, 2018). As Robinson (2020) stated, "it has been difficult, however, for France to come to grips with the modern, fiercely competitive, tirelessly iconoclastic and innovative wine world." Successful change implies knowledge, and knowledge required investments in knowledge. In other words, tradition is not sufficient to keep the leading position of the French wine industry in the changing world. Investment in intellectual capital is necessary.

Today, the wine sector constitutes not just a source of proud and reputation (PACHECO, 2019), grape growing and winemaking and related support activities impact other high value-added agricultural sectors (REMAUD, ATKIN, GILINSKY, NEWTON, 2012), but also a growth's driver in tourism and hospitality with huge potential on GDP (LI, GÓMEZ, BRENT ROSS, CHADDAD, 2019).

The aim of this study is to make an empirical investigation of the efficiency of intellectual capital components and value added coming from intellectual capital (VAIC) on the company's financial performances by implementing (VAIC™) method developed by Pulic (2000).

## 2. Few words on the position of the French wine industry in the global market

In 2018, France was the second leading producer of wine worldwide, behind Italy and followed by Spain. Each of them increased the production of wine with between 22% and 26% comparing to 2017. These three countries together produce more than half of all world wine production. Spain (969 thousand hectares) has the biggest vineyard surface, followed by China (875 thousand hectares) and France (702 thousand hectares). The wine production in the European Union has a declining share. One reason for this is that it is much easier to plant new vineyards in countries outside of Europe owing to the very restrictive regulations in Europe (KARLSSON, KARLSSON, 2019).

"Wine consumption is stable and estimated at 246 million hectoliters. In the early 2000s, global wine consumption increased significantly and reached a peak in 2007-2008. Since 2009 consumption has been relatively stable" (KARLSSON, KARLSSON, 2019). Increasing consumption as expected had as consequences an explosion of international trade in wine. In 2018, France was the second leading consumer of wine worldwide (26.8 million hectoliters), behind the USA which is since 2011 the biggest wine market, and followed by Italy and Germany (KARLSSON, KARLSSON, 2019). The five biggest consumers, USA, France, Italy, Germany, and China, together represent half of the world's consumption (49%) (KARLSSON, KARLSSON, 2019). Despite forecasts from 2017 that France will move into first place instead of Italy in wine consumption per capita (STATISTA RESEARCH DEPARTMENT, 2015), France remained in 2018. in the second leading consumer of wine per capita (followed by Italy, Switzerland, and Belgium) but behind Portugal who took the

leading place. Apparently, the wine industry is dynamic and hardly predictable (KARLSSON, KARLSSON, 2019).

The value of exports has grown from 13.4 billion euros in 2000 to 31.3 billion euro in 2018, and it has been seen an increase in trading in more expensive wines (KARLSSON, KARLSSON, 2019). France was in 2018. the third leading exporter of wine in volume, behind Spain and Italy followed by Chile and Australia, but the leading wine exporter of wine in value, followed by Italy, Spain, Australia, and Chile (KARLSSON, KARLSSON, 2019). France import wines as well, mostly low price wines. Namely, France is the fourth leading importer of wine by volume (behind Germany, Great Britain, and USA and followed by China), but the eleventh wine importer by value participating with 3% of total wine import. However, France is among the fastest-growing market for wine since 2014 with an increase of 36.2% (WORKMAN, 2020).

## 3. Literature Review

While many studies found a positive relationship between intellectual capital and a company's performance in different industries including manufacturing industry (SHOU, PRESTER, LI, 2020; YUSLIZA, YONG, TANVEER, RAMAYAH, FAEZAH, MUHAMMAD, 2020; WANG, SU, WANG, ZOU, 2019; XU, SHANG, YU, LIU, 2019; XU, LI, 2019), hotel industry (BABAJEE, SEETANAH, NUNKOO, 2020), automotive industry (CAGÁŇOVÁ, HLÁSNIKOVÁ,VRAŇAKOVÁ, CHLPEKOVÁ, 2019), financial and banking industry (VIDYARTHI,TIWARI, 2019; XU, HARIS, YAO, 2019; ADESINA, 2019; JOSHI, CAHILL, SIDHU, KANSAL, 2013; MUHAMMAD, ISMAIL, 2009), the insurance industry (OPPONG, PATTANAYAK, IRFAN, 2019; NOURANI, CHANDRAN, KWEH, LU, 2018), energy industry (XU, LIU, 2019), pharmaceutical industry (CHOWDHURY, RANA, AZIM, 2019; BHARATHI, 2008), textile industry (XU, WANG, 2019a), engineering consulting industry (HUANG, HSUEH, 2007), agricultural industry (XU, WANG, 2019b), etc. But, as expected the impact of different components of VOICE™ on financial performances showed different results. The different strengths of the relationship among intellectual capital components are expected in different industries.

Despite numerous studies on the effect of intellectual capital on the financial performance that have been published in the world-leading journal, just one of them refers to the agriculture sector.

The absence of studies in the agricultural sector or more specified in the wine industry, where intellectual capital measurement methods (OSINSKI, SELIG, MATOS, ROMAN, 2017) have been applied does not mean that different aspects of intellectual capital have not been explored in this sector, i.e. in the wine industry. Holloway, Nicholson, Delgado, Staal, and Ehui (2000) throw light into the effect of three intellectual-capital-forming variables (experience, education, extension) on peri-urban milk producers in the Ethiopian highlands, while many studies deal with different aspects of intellectual capital in the wine industry. "Although the wine industry is seen as very traditional, the current situation has made it to continuously innovate in products, services, production processes, management, and business model." (PRADANA, PÉREZ-LUÑO, FUENTES-BLASCO, 2020) "In relationship to product innovation, wineries, both large and small, are not only changing the alcoholic graduation of their wines, but also their flavors, to make them softer, and are introducing new products related to wine" (PRADANA, ET AL, 2020). Remaud, et al. (2012) almost one decade ago state that the EMS process and product innovations in wine industry may be positively related to business performance, while implementing an environmental management system (EMS) requires significant investments of de stewine industry has gradually increased over the last decade as well. (DE STEUR, TEMMERMAN, GELLYNCK, CANAVARI, 2020) "The growing need to address sustainability is reinforced by the high degree of competitiveness in the globalized wine sector and consumers' and policy makers' awareness of the sustainability challenges in wine production" (Fiore *et al.*, 2017; NAZZARO *et al.*, 2016; According: DE STEUR, ET AL, 2020, p.2)

De Steur, et al. (2020) have systematized the sustainability practices in the wine industry in a range of management domains (1. Marketing: Organic certification, Bio-dynamic certification, Quality label (DOC/DOCG), Promotion/advertising tools, Using a specific distribution channel, Premium price for sustainability; 2. Chain: Efficient transport, Efficient packaging, Sharing experiences and knowledge about sustainability among stakeholders; 3. Operational: Precision agriculture, Integrated agriculture, Italian sustainability projects, Reduced use of agrochemicals, Protection of biodiversity, Recycling, Reduction of greenhouse gas emissions, 4 Innovation: Renewable energy sources, Green constructions in the vineyard, Green constructions in the cellar, Green constructions in packaging and Collaboration with universities and research centers on innovation) and point out that wine producers' decision to adopt sustainable practices is determined by a variety of drivers.

On a sample of Spanish wineries, Pradana, et al. (2020) recently find that company's absorptive capacity (ACAP), human capital (HC) and innovation can be seen as good drivers of performance and, by extension, of competitive advantage, while company's absorptive capacity (ACAP) and human capital (HC) allow businesses to fully capture the benefits of innovation.

Despite recent researches, activities that create competitive advantages for wine businesses are still little known especially having in mind how wine is big business (REMAUD, ET AL., 2012).

## 4. Data Sample and Methodology of the Research

The study is based on the financial information gathered from the financial database "Diane" provided by Bureau Van Dijk, Moody's analytics company. It comprises of financial information from the financial statements of French wine companies during the period 2015-2019. The sample is only including large size wine companies with all required variables. The starting data sample contains 752 French wine companies. After a reduction of 204 that did not have all the required financial information, the final sample is composed of 548 companies.

**Table 1: Sample of Companies**

| Table of Sample Companies | |
|---|---|
| Starting Number of Observed Companies | 752 |
| Companies With Uncompleted Data | 204 |
| **Final Sample of Companies** | **548** |

Like numerous studies which has been recently published in leading academic journals (HSIEH, TING, ASIF, LE 2019; BABAJEE, ET AL, 2020; VIDYARTHI, TIWARI, 2020; WANG, ET AL., 2019; ADESINA, 2019; XU, LIU, 2019; XU, WANG, 2019; NOURANI, ET AL, 2018; CHU, ET AL., 2011), this one is also based on the Pulic approach (2000). The Value Added Intellectual Coefficient - VAIC™ method (2000) measures the efficiency of intellectual capital and its components on the company's performance and value creation processes. Value Added Intellectual Capital (VAIC) shows how much the new value is created from intangible and tangible investments within a company and represented as the

sum of Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE) (PULIC, 2000).

$$VAIC = HCE + SCE + CEE$$
$$VAIC = ICE + CEE$$
$$VA = OP + EC + A + D$$
$$HCE = VA/HC$$
$$SCE = SC/VA$$
$$ICE = HCE + SCE$$
$$CEE = VA/CE$$

where:
VA - Value Added
OP – Operating Profit
EC – Employee Costs
A – Amortization
D – Depreciation
HCE – Human Capital Efficiency
HC – Human capital
SCE - Structural Capital Efficiency
SC – Structural capital (all related intangible assets values)
ICE – Intellectual Capital Efficiency
CEE - Employed Efficiency
CE - Capital Employed
VAIC - Value Added Intellectual Capital

## 5. Variable description and Hypotheses development

The main variables in the research conceptual framework are coming from the previous explanation of the Value Added Intellectual Coefficient (VAIC™). The dependent variables are Operating Profit and Net Income, whereas the independent variables are Human Capital Efficiency, Structural Capital Efficiency, Capital Employed Efficiency, and Value Added Intellectual Capital (PULIC, 2000). All variables are calculated on average (KUJANSIVU, LÖNNQVIST, 2007). In the study, the model of transformation of intellectual capital developed by Molodchik, Shakina and Bykova (2012) was implemented. The selected model does not require control variables.

The main goal of the study is to investigate where did the competitive advantage of French wineries come from? i.e. what are the drivers of profitability looking through the intellectual capital efficiency prism? The research goals came from the main goal: Insight in the effect of intellectual capital structure on financial performances.

- Investigate how the intellectual capital efficiency impacts on companies' Operating Profit and Net Income;

- Investigate how the intellectual capital components efficiencies calculated in the forms of Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE) impact companies' Operating Profit and Net Income;

In the study, the following hypotheses are tested:

***H1:*** *Intellectual Capital Efficiency seen in the form of the Value Added Intellectual Capital (VAIC) of French wine companies improves on the Operating Profit;*

***H1.1:*** *Human Capital Efficiency (HCE) impacts positively on companies' Operating Profit;*

***H1.2:*** *Structural Capital Efficiency (HCE) impacts positively on companies' Operating Profit;*

***H1.3:*** *Capital Employed Efficiency (HCE) impacts positively on companies' Operating Profit;*

***H2:*** *Intellectual Capital Efficiency seen in the form of the Value Added Intellectual Capital (VAIC) of French wine companies improves on the Net Income;*

***H2.1:*** *Human Capital Efficiency (HCE) impacts positively on companies' final Net Income;*

***H2.2:*** *Structural Capital Efficiency (HCE) impacts positively on companies' final Net Income;*

***H2.3:*** *Capital Employed Efficiency (HCE) impacts positively on companies' final Net Income;*

## 6. Research Results

### 6.1. Research models

The research models (1)–(2) examine the relationship between intellectual capital and its components, and Operating profit as financial performance in the French wine companies sample.

$$OPRO_{i,t} = \beta_0 + \beta_1 VAIC_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$OPRO_{i,t} = \beta_0 + \beta_1 HCE_{i,t} + \beta_2 SCE_{i,t} + \beta_3 CEE_{i,t} + \varepsilon_{i,t} \quad (2)$$

On the other side, the models (3)–(4) are utilized to examine the relationship between intellectual capital and its components, and Net Income as a financial performance in the French wine companies sample.

$$NINC_{i,t} = \beta_0 + \beta_1 VAIC_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$NINC_{i,t} = \beta_0 + \beta_1 HCE_{i,t} + \beta_2 SCE_{i,t} + \beta_3 CEE_{i,t} + \varepsilon_{i,t} \quad (4)$$

where $i$=1, …n and $t$=1, … t represent firm and year, respectively; $\varepsilon$ denotes the disturbance.

### 6.2. Descriptive statistics

Table 2 presents the descriptive statistics of the sample. The mean values of dependent variables are 0.209 and 0.133 respectively for Operating profit and Net Income. The mean value of the VAIC variable is 2.953. The mean values of independent variables are 2.591, 0.042 and 0.318, respectively for variables HCE, SCE and CEE. Human components have the greatest mean value, compared to CEE and SCE. This is consistent because human capital employed is the most effective driver of value creation processes.

**Table 2: Descriptive statistics**

| Variable | Obs. | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| HCE | 548 | 2.59153 | 5.525715 | -4.206615 | 87.40022 |

| | | | | | |
|---|---|---|---|---|---|
| SCE | 548 | 0.042944 | 0.2977117 | -0.453772 | 5.904843 |
| CEE | 548 | 0.3188876 | 0.8825065 | -8.256942 | 13.1984 |
| VAIC | 548 | 2.953362 | 5.593491 | -12.62027 | 87.20109 |
| OPERAPROFIT | 548 | 0.2098902 | 1.722626 | -1.293143 | 34.77427 |
| NETINCOME | 548 | 0.1334674 | 1.122542 | -1.557857 | 23.93604 |

Source: Authors' calculation

### 6.3. Correlation analysis

The results of the correlation analysis are in Table 3 below. Table 3 shows that Operating profit correlates positively with HCE, CEE and VAIC, whereas with SCE the correlation is negative. The same correlation results are with the Net income variable. These correlation results will be taken into consideration in multiple regression analysis.

**Table 3: Pearson Correlation**

| | HCE | SCE | CEE | VAIC | OPERAPROFIT | NETINCOME |
|---|---|---|---|---|---|---|
| HCE | 1 | | | | | |
| SCE | -0.0048 | 1 | | | | |
| CEE | -0.0115 | 0.0273 | 1 | | | |
| VAIC | 0.9858 | 0.0528 | 0.1479 | 1 | | |
| OPERAPROFIT | 0.0114 | -0.002 | 0.0092 | 0.0126 | 1 | |
| NETINCOME | 0.0166 | -0.0056 | 0.0007 | 0.0162 | 0.9792 | 1 |

Source: Authors' calculation

### 6.4. Regression analysis

The regression analysis results are shown in Table 4. Model (1) proves a slight positive impact of VAIC on the companies' Operating Profit. The given results are consistent with previously examined results in our study. Hypotheses 1 is confirmed.

In model (2), there are positive impacts of HCE and CEE on the companies' Operating Profit, whereas SCE impacts negatively. The hypothesis 2 is partly confirmed.

In model (3), there is a positive impact of VAIC on the companies' final net income, which fully confirms the hypotheses 3.

The final model (4) shows similar results like model 2, where the variables HCE and CEE impact positively, where on the other side, SCE impacts negatively on the companies' final net result. Also, the hypothesis 4 is partly confirmed.

**Table 4: Regression results of models (1)-(4)**

| Variables | Model (1) | Model (2) | Model (3) | Model (4) |
|---|---|---|---|---|
| Constant | 0.1984417 | 0.1953281 | 0.1238726 | 0.1252403 |
| VAIC | 0.0038764 | - | 0.0032488 | - |
| HCE | - | 0.003579 | - | 0.003366 |
| SCE | - | -0.012661 | - | -0.02107 |
| CEE | - | 0.1953281 | - | 0.0012821 |

Source: Authors' calculation

## 7. Discussion about Findings

Intellectual capital is seen as a strategic resource that creates value and improves a company's competitive advantage. This paper of French wine companies examines the efficiency and impact of added value coming from intellectual capital (VAIC) and its components (HCE, SCE, and CEE), on the final results, such as operating profit and net income. In both models (1) and (3), VAIC impacted positively in operating profit and net income, respectively, which is a sign that value created from intellectual capital resulted in improvement of operating profit, or profit coming from the main business activities of French wine companies, but also on the final net result.

On the other side, in models (2) and (4), the results are similar. HCE and CEE influenced positively on chosen dependent variables, which shows us that human capital and capital employed improve operating profits and net results. That means that human competences, knowledge and experience, in a combination with invested capital are the keys driver for the actual competitive advantage of French wineries.

The positive effect of investing in human capital on financial performance in Chinese agricultural companies has been also documented by Xu and Wang (2019). Xu, et al. (2019) show the importance of investing in human capital in the manufacturing industry while Xu, et al. (2019) documented the positive influence on financial performances in the financial sector.

Having in mind that it is well known that wine industry is a very capital intensive business (KENKEL, HILL, HOLCOMB, 2008), the positively influence of capital employed efficiency (CEE) on financial performances was expected. This finding in line with Xu et al. (2019) finding concerning the banking sector what was as well expected.

Xu and Wang (2019) wrote that agricultural companies should pay more attention to the role of structural capital. Our finding confirms that states in the case of French wineries as well.

Results show that structural capital and financial performances are negatively connected. This result is not supported by Xu, et al. (2019) who find that structural capital (SC) exerts a positive impact on firm performance. It could be that French wineries should more effectively and efficiently manage structural capital. But that not necessarily means that investment in organizational structure, systems, procedures, software, R&D activities will not a have positive impact on profitability in the longer term.

## 8. Conclusion

This study examined whether intellectual capital improves company's profitability. We use French wine industry to investigate this issue. The research covered in total 548 French wine companies over the period from 2015 to 2019. For the purpose of this study four regression models were developed in order to provide the empirical investigation of the correlation between intellectual capital and its components, and companies' profitability performance.

Results from this research confirm the findings from previous studies that show that intellectual capital and its components positively effects and lead to improvement of Operating Profit and Net Income. These findings prove high efficiency of intellectual capital and competitiveness of French wine companies in the observed period. This is a sign to less competitive wineries that they can increase profitability by stimulating managers to invest more in its intellectual capital, especially in improving HC and ECC.

## 9. References

ADESINA, K. S. Bank technical, allocative and cost efficiencies in Africa: The influence of intellectual capital. *The North American Journal of Economics and Finance*, v. 48, 2019, pp. 419-433.

AKHAVAN, P., MEHRALIAN, G., RASEKH, H. R., SADEH, M. R. The impact of intellectual capital efficiency on market value: An Empirical Study from Iranian Pharmaceutical Companies, *Iranian Journal of Pharmaceutical Research*, v. 11, 2012, pp. 195-207.

BABAJEE, R. B., SEETANAH, B., NUNKOO, R. The determinants of hotel financial performance: an intellectual capital perspective, *Journal of Hospitality Marketing & Management*, 2020. Published online: 21 Jan 2020. DOI: 10.1080/19368623.2020.1703870

BHARATHI, K.G. Intellectual capital and corporate performance in Indian pharmaceutical industry. *Journal of Intellectual Capital*, v. 9, n. 4, 2008, pp. 684–704. https://doi.org/10.1108/14691930810913221

BLOCKER, J. S., FAHEY, D. M., TYRRELL, I. R. Alcohol and temperance in modern history: an international encyclopedia, Vol. 1, ABC-CLIO, 2003.

CAGÁŇOVÁ, D., HLÁSNIKOVÁ, P. R., VRAŇAKOVÁ, N., CHLPEKOVÁ, A. Intellectual Capital as a Key Factor in the Automotive Industry, *Mobile Networks and Applications*, v. 24, n. 6, 2019, pp. 2024-2031. https://doi.org/10.1007/s11036-018-01206-2

CHOWDHURY, L.A.M., RANA, T., AZIM, M. I. Intellectual capital efficiency and organisational performance, *Journal of Intellectual Capital*, v. 20, n. 6, 2019, pp. 784-806.

CHU, S. K. W., CHAN, K. H., WU, W. W. Charting intellectual capital performance of the gateway to China, *Journal of Intellectual capital*, v. 12, n. 2, 2011, pp. 249-276.

CLARKE, M., SENG, D., WHITING, R. H. Intellectual capital and firm performance in Australia, *Journal of Intellectual Capital*, v. 12, n. 4, 2011, pp. 505–530. https://doi.org/10.1108/14691931111181706

DE STEUR, H., TEMMERMAN, H., GELLYNCK, X., CANAVARI, M. Drivers, adoption, and evaluation of sustainability practices in Italian wine SMEs', *Business Strategy and the Environment*, v. 29, n. 2, 2020, pp. 744-762. https://doi.org/10.1002/bse.2436

EGOROV, E. A. Scientific support of the viticulture–winemaking industry of Russia's agroindustrial complex, *Herald of the Russian Academy of Sciences*, v. 86, n. 3, 2016, pp. 242-247.

ELZINGA, K. G. Gisela H. Kreglinger: The Spirituality of Wine. Eerdmans, Grand Rapids', *Journal of Wine Economics*, v. 12, n. 1, 2017, pp. 109-113.

FIRER, S., MITCHEL WILLIAMS, S. Intellectual capital and traditional measures of corporate performance, *Journal of Intellectual Capital*, v. 4, n. 3, 2003, pp. 348–360. https://doi.org/10.1108/14691930310487806

France – Stile Brands. (n.d.). Retrieved March 24, 2020, from https://stilebrands.com/stilebrands/france/

France | JancisRobinson.com. (n.d.). Retrieved March 24, 2020, from https://www.jancisrobinson.com/learn/wine-regions/france

GAN, K., SALEH, Z. Intellectual capital and corporate performance of technology-intensive companies: Malaysia evidence, *Asian Journal of Business and Accounting*, v. 1, n.1, 2008, pp. 113-130.

Garden of Eden. (n.d.). Retrieved March 24, 2020, from https://www.jewishvirtuallibrary.org/garden-of-eden

GUY, K. M. When champagne became French: Wine and the making of a national identity (No. 1). Baltimore, Maryland: Johns Hopkins University Press, 2003.

HOLLOWAY, G., NICHOLSON, C., DELGADO, C., STAAL, S., EHUI, S. Agroindustrialization through institutional innovation Transaction costs, cooperatives and milk market development in the east African highlands, *Agricultural economics*, v. 23, n 3, 2000, pp. 279-288. https://doi.org/10.1111/j.1574-0862.2000.tb00279.x

HSIEH, C.H., TING, I. W.K., ASIF, J., LE, H.T.M. The role of controlling shareholders in determining investments of intellectual capital among Taiwanese semiconductor companies, *Journal of Intellectual Capital*, v. 21, n. 1, 2019, pp. 62-86. https://doi.org/10.1108/JIC-05-2019-0091

HUANG, C. F., HSUEH, S. L. A study on the relationship between intellectual capital and business performance in the engineering consulting industry: A path analysis, *Journal of civil engineering and management*, v. 13, n. 4, 2007, pp. 265-271.

International Organisation of Vine and Wine. (n.d.). oiv.int. Retrieved March 24, 2020, from http://www.oiv.int/en/

JOSHI, M., CAHILL, D., SIDHU, J., KANSAL, M. Intellectual capital and financial performance: An evaluation of the Australian financial sector, *Journal of Intellectual Capital*, v. 14, n. 2, 2013, pp. 264–285. https://doi.org/10.1108/14691931311323887

KARLSSON, P., KARLSSON, B. Record Global Wine Harvest In 2018, Stable Consumption, 2019. Retrieved March 24, 2020, from https://www.forbes.com/sites/karlsson/2019/04/14/record-global-wine-harvest-in-2018-stable-consumption/#76e15477266b

KENKEL, P. L., HOLCOMB, R. B., HILL, A. Feasibility of a Co-operative Winery, *Journal of Agribusiness*, v. 26, 2008, pp. 199-215.

KREGLINGER, G. H. The spirituality of wine. Wm. B. Eerdmans Publishing, 2016.

KUJANSIVU, P., LÖNNQVIST, A. Investigating the value and efficiency of intellectual capital, *Journal of Intellectual Capital*, v. 8, n. 2, 2007, pp. 272–287. https://doi.org/10.1108/14691930710742844

LI, J., GÓMEZ, M. I., BRENT ROSS, R., CHADDAD, F. R. Does passion for wine matter? The effects of owner motivation on pricing and quality decisions in emerging US wine regions, *Agribusiness*, v. 35, n. 4, 2019, pp. 574-592.

MCGOVERN, P. E. Ancient wine: the search for the origins of viniculture. Princeton University Press, 2019.

MOLODCHIK, M., SHAKINA, E., BYKOVA, A. Intellectual capital transformation evaluating model, *Journal of Intellectual Capital*, v. 13, n. 4, 2012, pp. 444-461. https://doi.org/10.1108/14691931211276089

MUHAMMAD, N. M. N., ISMAIL, M. K. A. Intellectual Capital Efficiency and Firm's Performance: Study on Malaysian Financial Sectors, *International Journal of Economics and Finance*, v. 1, n. 2, 2009, pp. 206-212. https://doi.org/10.5539/ijef.v1n2p206

NOURANI, M., CHANDRAN, V. G. R., KWEH, Q. L., LU, W. M. Measuring human, physical and structural capital efficiency performance of insurance companies, *Social Indicators Research*, v. 137, 2018, pp. 281-315. https://doi.org/10.1007/s11205-017-1584-6

OPPONG, G. K., PATTANAYAK, J. K., IRFAN, M. Impact of intellectual capital on productivity of insurance companies in Ghana, *Journal of Intellectual Capital*, v. 20, n. 6, 2019, pp. 763-783. ttps://doi.org/10.1108/JIC-12-2018-0220

OSINSKI, M., SELIG, P., MATOS, F., ROMAN, D. Methods of evaluation of intangible assets and intellectual capital, *Journal of Intellectual Capital*, v. 18, n. 3, 2017, pp. 470-485. https://doi.org/10.1108/JIC-12-2016-0138

PACHECO, L. Performance vs. Family Ownership and Management: The Case of Portuguese Wine Firms, *Entrepreneurial Business and Economics Review*, pp. 7, n. 3, 2019, p. 7-24. 10.15678/EBER.2019.070301

PRADANA, M., PÉREZ-LUÑO, A., FUENTES-BLASCO, M. Innovation as the key to gain performance from absorptive capacity and human capital, *Technology Analysis & Strategic Management*, 2020. Published online: 20 January 2020. https://doi.org/10.1080/09537325.2020.1714578

PULIC, A. VAIC an accounting tool for IC management, *International Journal of Technology Management*, v. 20, n. 5-8, 2000, pp. 702–714.https://doi.org/10.1504/IJTM.2000.002891

REMAUD, H., ATKIN, T., GILINSKY, A., NEWTON, S. K. Environmental strategy: does it lead to competitive advantage in the US wine industry? *International Journal of Wine Business Research*, v. 24, n. 2, 2012, pp. 115–133. https://doi.org/10.1108/17511061211238911

SHOU, Y., PRESTER, J., LI, Y. The impact of intellectual capital on supply chain collaboration and business performance, *IEEE Transactions on Engineering Management*, v. 67, n. 1, 2020, pp. 92-104.

STEINMETZ, D. Vineyard, farm, and garden: The drunkenness of Noah in the context of primeval history, *Journal of Biblical Literature*, v. 113, n. 2, 1994, pp. 193-207.

VIDYARTHI, H., TIWARI, R. Cost, revenue, and profit efficiency characteristics, and intellectual capital in Indian Banks, *Journal of Intellectual Capital*, v. 21, n.1, 2020, pp. 1-22. https://doi.org/10.1108/JIC-05-2019-0107

WANG, Y., SU, X., WANG, H., ZOU, R. Intellectual capital and technological dynamic capability: evidence from Chinese enterprises, *Journal of Intellectual Capital*, v. 20, n. 4, 2019, pp. 453-471. https://doi.org/10.1108/JIC-06-2018-0096

WORKMAN, D. Top Wine Importing Countries, January 15, 2020. http://www.worldstopexports.com/top-wine-importing-countries/

XU, J., WANG, B. Intellectual capital and financial performance of Chinese agricultural listed companies, *Custos Agronegocio On Line*, v. 15, n. 1, 2019, pp. 273-290.

XU, J., LI, J. The impact of intellectual capital on SMEs' performance in China, *Journal of Intellectual Capital*, v. 20, n. 4, 2019, pp. 488-509. https://doi.org/10.1108/JIC-04-2018-0074

XU, J., WANG, B. Intellectual capital performance of the textile industry in emerging markets: A comparison with China and South Korea, *Sustainability*, v. 11, n. 8, 2019, Article 2354. https://doi.org/10.3390/su11082354

XU, J., HARIS, M., YAO, H. Should Listed Banks Be Concerned with Intellectual Capital in Emerging Asian Markets? A Comparison between China and Pakistan, *Sustainability*, v.11, n. 23, 2019, Article 6582. https://doi.org/10.3390/su11236582

XU, J., SHANG, Y., YU, W., LIU, F. Intellectual Capital, Technological Innovation and Firm Performance: Evidence from China's Manufacturing Sector, *Sustainability*, v. 11, n. 19, 2019, Article 5328; https://doi.org/10.3390/su11195328

XU, X. L., LIU, C. K. How to keep renewable energy enterprises to reach economic sustainable performance: from the views of intellectual capital and life cycle, *Energy, Sustainability and Society*, v. 9, 2019, Article 7. https://doi.org/10.1186/s13705-019-0187-2

YUSLIZA, M. Y., YONG, J. Y., TANVEER, M. I., RAMAYAH, T., FAEZAH, J. N., MUHAMMAD, Z. A structural model of the impact of green intellectual capital on sustainable performance, *Journal of Cleaner Production*, v. 249, 2020, Article 119334. https://doi.org/10.1016/j.jclepro.2019.119334

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