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ARE RELATIONAL CAPITAL AND MARKETING IMPORTANT? THE CASE OF THE WOOD SECTOR OF GALICIA (SPAIN) AND PORTUGAL

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Abstract. This paper examines the importance of marketing and relational capital in value addition. We studied the effect that relational capital has in the timber and related industries of Galicia (Spain) and Portugal for 2002–2018. The industry is characterized by a large number of SMEs, many of them operating in the subsistence and unorganized sectors. Direct marketing and personal contacts with clients are forms of enhancing the relational capital and to add value. The wood sector was divided into three major groups, namely: extraction, conversion and finished products, and using a panel data model, the value addition created by relational capital and the effect that direct marketing can have on the business were measured. While relational capital helps in creating value, its effect is not the same in every sector, implying that much has to be done by managers and CEOs to improve company relationships with stakeholders to develop business alliances.

Keywords: intellectual capital, relational capital, wood sector, value addition, forestry, intangibles, SME, marketing, structural capital, modified ROA.

JEL Classification: O34.

Introduction

Efficiency, productivity and value addition are management terms that tend to measure the profitability of an organization and how efficacious is the use of its resources. The resources that an organization uses are not simply its tangible assets, but also the intangibles, and to a great extent, the intellectual capital. The term "Intellectual capital" is normally taken as a misnomer, often understood to be of relevance to only high-technology industries and information and communication technology companies. But it is important to understand that intellectual capital is essentially relevant to every business organization. Rapid technology advancements, fiercely competitive environments, deregulations, product innovations, etc., have made firms increasingly rely on leveraging intellectual capital, to develop strategies for sustained competitive advantage (Purohit & Tandon, 2017).

Many researchers in the area agree that intellectual capital should be classified into three types of capital: human capital, structural capital and customer/relational capital (Saint-Onge, 1996; Sveiby, 1998; Bontis, 1998; Bozbura, 2004). Relational capital was separated from the original classification of two types of capital (human capital and structural capital given by Edvinsson and Malone, 1996), namely from the relational capital and was defined as the summation of relationships, interactions, and intimacy of an organization with its customers (Stewart, 1994).

While intellectual capital has been mainly studied in high-technology industries and the banking and financial sector, it is applicable to every industry and region, including the wood and forestry industries. Forest-based industries have an unquestionable importance in the context of the economy, due to their value addition to the GDP, exports, job creation via the great number of economic agents involved in the production, conversion and marketing of the products and by its great relevance in the settling of the population in the least developed regions of the country (Sarmento & Dores, 2013).

Forestry still complements traditional agriculture production, generating income in less dense zones while giving jobs to people (Mourão & Martinho, 2016) and while the paper and pulp industries are dominated by a small number of multinationals, forests are mostly owned by local people trying to improve their livelihood (Sayer &

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Maginnis, 2015). It is still considered an important economic sector making an important economic effect in the rural areas of many EU countries (Slee, 2006). The Iberian Peninsula, comprising of two countries, Spain and Portugal, has vast forest resources. Galicia is a province in northwestern Spain characterized by a high relative percentage of its total forest area (around 11% of the total forest area of the country) (Marey-Perez et al., 2015), accounting for half the Spanish production of timber. 98% of the forests are privately owned (Caballero, 2015). Portugal was EU's third largest producer of paper and pulp in 2010 and overall, the forests and related industries accounted for 1.3% of the country's GDP in 2009 (Sarmento & Dores, 2013).

Though there have been various studies in the areas of knowledge management and intellectual capital, very few have been specifically made on the Portugal – Spain (Galicia) region on the wood sector and related industries that are dominated by SMEs with very few large, publicly traded companies. The sector employs a large number of mostly poorly qualified people as it is labor-intensive in nature. While the valuation of intangibles may seem to be a task to be undertaken only by large corporations, it is an exercise that should be performed by every type of company and business enterprise, however small it may be. SMEs should utilize knowledge efficiently to enhance their competitive advantage, thus managing their specific intellectual capital in order to report those intangible assets to customers, partners and investors as this is systematically becoming a critical factor of success in the context of globalization (Mertins et al., 2006).

1. Intellectual capital and relational capital

Gone are the days when the only assets that a company used to account for were the fixed and current assets of the balance sheet. Most accounting rules never gave much importance to intangible assets and traditionally, the only intangible assets that were reported in the financial statements of an enterprise were patents and trademarks and acquired assets such as goodwill, while internally developed intangible assets that were difficult to value were never accounted for, thus not depicting the true value of the enterprise and affecting the value of future business opportunities (Starovic & Marr, 2004).

One of the earliest definitions of intellectual capital was given by Stewart (1991) where he defined it as sum of patents, processes, management skills, technologies, information on clients and suppliers and overall experience that gives an edge to the company in the marketplace.

Intellectual capital comprises those intangible assets that may generate future benefits for the organization and that create key competitive advantages for the business and are invisible, not easily quantifiable or acquirable or valued monetarily (Lopes & Martins, 2006).

Customer (relational) capital is defined as the value of the relations that the organization has with the individuals and institutions that do business with it. It states the value of the organization's relation with customers, suppliers and the rest of the society and expresses the customer loyalty. Customer capital is like human capital; you cannot own the customers like you cannot own your employees, but a firm and its customers can develop goodwill (Kaya et al., 2010), as well as customer loyalty, trust, etc. with the suppliers, channels and partners (Bontis, 1999).

Relational capital represents the potential an organization has due to ex-firm intangibles. These intangibles include the knowledge embedded in customers, suppliers, the government and industry associations (Bontis, 1999). It has been aptly defined by Byun et al. (2018) as "who you know" that together with the specialization "what you know", becomes a key dimension of intellectual capital. It covers the relations with agents, customers, suppliers, competitors, partners, clients, shareholders, industry associations, members of the community, society, government, the state and informal networks (Bozbura, 2004).

2. Do intellectual capital and its components add value[1]?

Intellectual capital, through its three components, human capital, structural capital and relational capital, adds value to the firm. While the majority of studies was concentrated on human capital efficiency, several authors admitted the importance of structural capital and relational capital as contributors to value addition to the firm.

A study based on the first 122 Fortune Global 500 companies published by their CEOs to the shareholders between 2008 and 2012 found out that those that have a positive evolution in the ranking focused significantly on structural capital and those that had a negative evolution in the ranking focused more on the relational capital (Albertini, 2016).

Customers place high emphasis on those firms with better relational capital efficiency and firms with such efficiency have more and better changes for future growth and profitability (Raza, 2013).

Relational capital can be measured as a function of longevity (Bontis, 2002). It is an important asset, since it influences organizational performance through its impact on innovation and operational efficiency (Badaracco, 1991).

The presence of social capital[2] characterized by relationships, alliances, networks, cooperative behavior and synergies with various private and public business partners can increase efficiency and company legitimacy and can help a company achieve or maintain a sustainable competitive advantage (Peng & Luo, 2000). Further, the

[1] Our discussion here is limited to intellectual capital and relational capital.

[2] While social capital and relational capital are interrelated, the concept of social capital is more generalized and the concept of relational capital is more specifically used in the measurement of intellectual capital, being one of its main components. Most of the models of intellectual capital consider only relational capital, implying that social capital is already included in it.

relational aspects of relational quality and social capital influence the effectiveness of the supplier-key account relationship (Badawi & Battor, 2020).

Zambrano et al. (2018), in a study on Spanish companies concluded that investing in intellectual capital dimensions such as human capital and relational capital, namely in training personnel and advertising, respectively, had a positive effect on the value relevance of the intangibles of the company.

Relational capital is closely related to the competitiveness of SMEs in the long term, providing them with favorable conditions for sustainable development and the convergence of knowledge-based economy and society (Gogan et al., 2014).

Given that the wood sector is dominated by SMEs, many of them being subsistence businesses, mostly at the bottom of the pyramid, depend on relational capital as the type of the markets, the typical characteristics of the sector, and the local culture can hamper the performance of the business (Martinez et al., 2021). Relational capital is essential for the balanced information sharing in buyer-supplier relationship and firms should pay attention to having social interactions with partners to promote trust in the relationship for efficacy in information sharing (Lee & Ha, 2018). Also supply chains are affected by social-relational factors information (Yang et al., 2011).

3. Relational capital and marketing

Some authors have established a direct link between some aspects of relational capital, such as customer satisfaction and/or loyalty indicators and measures of actual market or financial performance (Allen & Willburn, 2002). The effects of relational capital can be observed in different forms such as participation, knowledge transfer, innovation and risk reduction (Hu & Randel, 2014). The higher the level of relational capital, the better will be the planning, problem solving and troubleshooting, all of which are most likely to increase production and service delivery efficiencies and, thereby, reduce organizational costs (Youndt & Snell, 2004). It has a greater effect that tangible resources on the capabilities of the organization (Martín-de-Castro et al., 2006).

Relational capital helps the organization in many ways. It reduces the cost as the knowledge flow of information from retailers, customers and suppliers may help and aid in product and process innovation and increasing output. Moreover, the high level of relational capital and its related knowledge gathered may result in problem solving, better planning and development, and troubleshooting for a firm, which in a long run is more likely to increase efficiencies and reduce organizational cost. Additionally, relational capital increases the organizational information processing ability; it enhances the trust in relations among retailers, consultants, clients, customers and suppliers, facilitates efficient exchange of information by reducing time consuming during the flow of information due to mutually built trust (Siddiqui & Asad, 2014).

Marketing strategies constitute one of the key functional strategies for SMEs to enhance their performance (Dzisi & Ofosu, 2014). A strong relationship with customers, through marketing capabilities influences business performance positively (Ryals, 2005). Some SMEs have started to value relational capital and use it to increase their performance (Xu et al., 2014). Relational capital has a positive significant effect on marketing performance (Nuryakin & Ardyan, 2018), that in turn increases sales by "improving the firm's understanding of markets and customers, or by increasing customers' willingness to pay for the firm's products" (Ahmed et al., 2014) and with repeated interactions, the parties appear to develop trust in one another, such that they may no longer need to rely on formal contracts to ensure performance (Zaheer & Venkatraman, 1995).

It is important for SMEs to foment good relations with clients, suppliers and other social agents to generate a stock of relational capital (F-Jardón & Martos, 2009), as this kind of direct marketing is essential for the SMEs in the wood sector to survive and thrive in the long run. As a competitive factor, relational capital indicates the need for firms' to cooperate with each other (Jardón & Martos, 2012).

4. Hypothesis of the study

In this study we will attempt to measure the importance of relational capital as a value creator for the wood sector of Galicia (Spain) and Portugal. We divided the timber and related industries sector into three sectors: extraction, conversion and finished products. We also undertake the study of the three sectors separately for Galicia (Spain) and Portugal, given the differences in legislation, politics, culture, company size, etc. While the hypothesis to be tested is whether relational capital has a positive correlation with value generation, it was divided into six distinct sections to test different sectors as under:

H1a: Relational capital creates value through human capital and structural capital in the extraction sector of Galicia (Spain)

and

H2a: Relational capital creates value through human capital and structural capital in the extraction sector of Portugal

or

H3a: Relational capital creates value directly in the extraction sector of Galicia (Spain)

and

H4a: Relational capital creates value directly in the extraction sector of Portugal

The extraction sector in our study comprises of activities of forestry and logging, cork extraction, silviculture, and other related industries. In Portugal, forest ownership

is characterized by small property dimensions, elderly and/or absent owners (Martins et al., 2014) and while in Galicia (Spain) the picture is not much different, the property rights of Galician communal forests are private but collective with the passing of the Galician Act of Communal Forests of 1989 (Caballero, 2015). Nevertheless, the forestry (extraction) sector is still dominated by small and medium enterprises, and even by subsistence small businesses (Jardón & Silva, 2017). Intellectual capital is more important as a source of competitive advantage in the case of small and medium enterprises than large companies because the tangible resources are often lower, and SMEs should compete through intangible resources (Jardón & Martos, 2012). Forests in Portugal and Spain even if sharing similar environmental conditions, fire propensity, stand structure characteristics and common species, have always had been influenced by different historical, cultural, political and economic contexts (Nunes et al., 2020) and as such have to be studies separately from each other. Similarly, relational capital is important for the extraction sector, as most of the sector is unorganized and depends on the relationship with the customers in order to trade its products. As said by Kavida and Sivakoumar (2009), relational (customer) capital is the strength of the relationships with customers and the loyalty of the customers. There is a central significance in influencing the organizational value of client capital in comparison to human capital and structural capital. So, it was essential to segregate the extraction sector in this study. Most of the companies under this sector are SMEs.

H1b: Relational capital creates value through human capital and structural capital in the conversion sector of Galicia (Spain)

and

H2b: Relational capital creates value through human capital and structural capital in the conversion sector of Portugal

or

H3b: Relational capital creates value directly in the conversion sector of Galicia (Spain)

and

H4b: Relational capital creates value directly in the conversion sector of Portugal

The conversion sector in Galicia (Spain) comprises of construction carpentry, pulp and timber mills, which is mainly dominated by large companies, some of them not listed. In Portugal, it comprises of carpentry activities, pulp and timber mills, but most of them are SMEs with the prominence of some large companies, especially in the pulp manufacture. In general, the dimension of the companies is larger in Spain. It was necessary to segregate the conversion sector from the other two as it has a mixture of small and medium enterprises with large companies mainly operating in the pulp manufacture. Again, given the diversity of sizes between both countries under study, it was not possible to combine them into one. The sector depends heavily on relational capital and on customers' trust in and commitment to the firm. Customer trust and commitment reduce customer transaction uncertainty (e.g. customer avoidance of performance unpredictability, favorable interactions, etc.) and enhance meaningful affiliations, such as customers' bond to a firm's brand, which binds the customer to future interactions (Luo et al., 2004). In order to evacuate its products, the conversion sector needs to have a very good interaction with its customers, mainly because it produces products that are raw materials to other industries, and thus, relational capital is of utmost importance.

H1c: Relational capital creates value through human capital and structural capital in the finished products sector of Galicia (Spain)

and

H2c: Relational capital creates value through human capital and structural capital in the finished products sector of Portugal

or

H3c: Relational capital creates value directly in the finished products sector of Galicia (Spain)

and

H4c: Relational capital creates value directly in the finished products sector of Portugal

The finished products include every industry that is dependent on wood and that is not part of extraction or conversion, namely paper and its articles, cardboard, wood and its articles, wooden furniture. Both for Spain as well as for Portugal, the sector is characterized by the existence of large multinational companies as well as small players in the unorganized sector, better fitted under the small and medium enterprises. Here too, the prevalence of larger players is seen in Spain with smaller ones in Portugal, mandating us to separate both the countries in this study. Another remarkable point is that manufacturing companies are intertwined with the environment in which they are embedded, and workers are provided with the necessary technical skills that they can have great difficulty in finding in other places (Barzotto et al., 2016), thus implying that the segregation of the study into Portugal and Galicia (Spain) had to be done while examining each component of intellectual capital contribution. Given the intense competition existing in the finished products sector, these companies have to depend on relational capital in order to survive and thrive. All resources linked to a firm's relationships with external stakeholders, including suppliers, customers, partners, government and the community plus the perceptions held about the firm by these stakeholders that can benefit the firm (Abhayawansa & Guthrie, 2014).

Using the data from the SABI[3] database for all the companies in the industries related to the wood and ancillary sector for the financial years 2002–2018, but only considering companies that had financial data for 2016–2018, the human capital and its efficiency were calculated for every company that had positive values (where VA[4] > RC), year wise. All outliers (5%) were eliminated to get lesser skewed results. The data was divided country-wise into three main sectors: extraction, conversion and finished products, to facilitate and segregate interpretation.

5. Methodology

We used a modified ROA[5] model to study the relational capital value addition in the timber and related sectors.

We have defined HC[6] as the total cost of wages and other employee benefits paid by the company, SC[7] as the difference between the intangible assets between two consecutive years ($t - t_{-1}$) and RC[8] as the value of the stakeholders disclosed in the balance sheet, namely the clients and suppliers (while the government is also a stakeholder, it is not possible to measure it, as the taxes paid are not a relationship with it but an obligation) and other stakeholders are mostly not disclosed by SMEs.

Where there was no direct relationship between the components of intellectual capital and value addition, we tried to measure the indirect relationship, by using modified formulae for the regression, as under:

Relational Capital Returns

$$\frac{RC}{TA} = \beta_0 + \beta_1 \frac{HC}{TA} + \beta_2 \frac{SC}{TA} + \varepsilon \quad (1)$$

and

Value Addition

$$\frac{VA}{TA} = \beta_0 + \beta_1 \frac{RC}{TA} + \varepsilon, \quad (2)$$

where: *RC/TA*: Relational Capital / Total Assets; *HC / TA*: Human Capital / Total Assets; *SC/TA*: Structural Capital / Total Assets; *VA / TA*: Value Addition / Total Assets.

With this model, it is aimed to answer two questions:

- Is the efficiency of intellectual capital significant in the timber and related industries?
- Does relational capital have any significance for each of the three main sectors of timber and related industries?

The advantages of this suggested model are:

- The model can be used for both listed as well as unlisted companies and SMEs.
- It calculates the value addition considering each of the components of intellectual capital separately, and thus surpassing the limitation of using a single numerator to calculate the efficiency of each component.
- Value added is considered as the sum of the intellectual capital of last year and the efficiency of each component in the current year.
- It does not require the market values, averages or listed prices in order to calculate the intellectual capital efficiency.
- It enables comparison between companies and industries.

Table 1. Regression results of extraction sector (Galicia (Spain)) (source: own elaboration)

	Estimate	Std. Error	t-value	Pr(>|t|)
`RC/TA`	–0.194500	0.144522	–1.3458	0.1785

Note: Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

In the case of the extraction sector of Galicia (Spain), in Table 1 and Table 2:

Hypothesis H1a: Relational capital creates value in the extraction sector is not satisfied, implying that relational capital does not directly affect value creation to the sector. In order to study whether relational capital indirectly affects value creation in the extraction sector of Galicia (Spain), the following regression is run:

$$\frac{RC}{TA} = \beta_0 + \beta_1 \frac{HC}{TA} + \beta_2 \frac{SC}{TA} + \varepsilon.$$

Table 2. Regression results of extraction sector (Galiza (Spain)) (source: own elaboration)

	Estimate	Std. Error	t-value	Pr(>|t|)
`HC/TA`	0.00041075	0.00219002	0.1876	0.8512
`SC/TA`	–0.00075405	0.01356954	–0.0556	0.9557

Note: Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

Based on these results, it is seen that the relational capital creates value is not satisfied, implying that relational capital does not indirectly affect value creation through human capital and structural capital to the sector.

A further analysis is made in order to see if relational capital creates value directly to the sector, using the following regression:

$$\frac{VA}{TA} = \beta_0 + \beta_1 \frac{RC}{TA} + \varepsilon.$$

The results of the regression are depicted below, in Table 3.

Based on these results, it is seen that the relational capital creates value directly is not satisfied, implying that relational capital does not affect at all value creation.

[3] SABI: Sistema de Análise de Balanços Ibéricos (Iberian Balance-sheet Analysis System) is a database of 2.900.000 Spanish and 900.000 Portuguese companies (https://sabi.bvdinfo.com).
[4] VA: Value Addition.
[5] ROA model: Return On Assets model (net profit/average total assets) (https://investopedia.com/terms/r/returnonassets.asp).
[6] HC: Human capital.
[7] SC: Structural capital.
[8] RC: Relational capital.

Table 3. Regression results of extraction sector (Galiza (Spain)) (source: own elaboration)

	Estimate	Std. Error	t-value	Pr(>|t|)
`RC/TA`	–0.18442	0.15499	–1.1899	0.2342

Note: Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

Table 4. Regression results of conversion sector (Galicia (Spain)) (source: own elaboration)

	Estimate	Std. Error	t-value	Pr(>|t|)
`RC/TA`	0.863595	0.179671	4.8065	1.586e-06 ***

Note: Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

In the case of the conversion sector of Galicia (Spain), in Table 4 and Table 5.

Hypothesis H1b: Relational capital creates value in the conversion sector is satisfied with significance code of 0, implying that relational capital creates value directly to the sector.

Table 5. Regression results of finished products sector (Galicia (Spain)) (source: own elaboration)

	Estimate	Std. Error	t-value	Pr(>|t|)
`RC/TA`	1.7685395	0.1421810	12.4387	< 2e-16 ***

Note: Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

In the case of the finished products sector of Galicia (Spain) in Table 6, Table 7 and Table 8:

Hypothesis H1c: Relational capital creates value in the finished products sector is satisfied with significance code of 0, implying that relational capital creates value directly to the sector.

Table 6. Regression results of extraction sector (Portugal) (source: own elaboration)

	Estimate	Std. Error	t-value	Pr(>|t|)
`RC/TA`	–5.9022e-03	3.3028e-03	–1.7870	0.07396.

Note: Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

In the case of the extraction sector of Portugal:

Hypothesis H2a: Relational capital creates value in the extraction sector is satisfied with significance code of 0.05, implying that relational capital creates value directly to the sector.

Table 7. Regression results of conversion sector (Portugal) (source: own elaboration)

	Estimate	Std. Error	t-value	Pr(>|t|)
`RC/TA`	–0.00025609	0.00012754	–2.0080	0.04466 *

Note: Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

In the case of the conversion sector of Portugal:

Hypothesis H2b: Relational capital creates value in the conversion sector is satisfied with significance code of 0.01, implying that relational capital creates value directly to the sector.

Table 8. Regression results of finished products sector (Portugal) (source: own elaboration)

	Estimate	Std. Error	t-value	Pr(>|t|)
`RC/TA`	0.145433	0.021573	6.7415	1.632e-11***

Note: Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

In the case of the finished products sector of Portugal:

Hypothesis H2c: Relational capital creates value in the finished products sector is satisfied with significance code of 0, implying that relational capital creates value directly to the sector.

6. Analysis

Based on the regression results above, it can be seen that relational capital creates value directly in all the sectors, except the extraction sector of Galicia (Spain). This implies that relationship with customers, suppliers and other stakeholders is essential and can be observed. Probably in the case of Galicia, the extraction sector is undertaken on contractual basis and thus there is not much interaction with the final customers. In the case of the timber and related industries of Galicia (Spain), it is seen that human capital is the primary component of intellectual capital in the case of labor intensive industries like extraction and conversion (Bontis & Fitz-Enz, 2002; Jardón & Martos, 2012), which are mainly SMEs and thus rely more on manual work rather than on computerized mechanized tools. In the case of conversion sector and finished products sector, the value addition created by relational capital is positive, implying that the interaction with final customers is there and direct marketing plays an important role in enhancing the business prospects.

Our results match the conclusions found by other authors in several other studies, where the presence of a significant, positive relationship between intellectual capital and business performance was found to exist. However, our study was more exhaustive given the number of company years and sectors used.

Andreeva and Garanina (2016) in the case of Russian manufacturing companies found out that human and structural capital positively influenced organizational performance explaining a quarter of its variation, while relational capital did not have any significant influence. This was a similar study to ours, as it measured three components of intellectual capital instead of concentration only on human capital. The extraction sector of Galicia is also directly affected by human capital and structural capital, making it similar to the Russian manufacturing sector.

Jardón and Martos (2012) found out that human capital affected directly performance in SME clusters of the Oberá region of Argentina and affected structural capital that in turn generated relational capital. In our study, most

of the sectors are affected directly by relational capital, the case being thus different from the Argentine one.

Shih et al. (2010) on the banking sector of Taiwan, found out that human capital has a positive and direct influence on structural capital. While the methodology used by them is quite simplified, the results we obtained on the finished products sector of Portugal also show that human capital and relational capital affect performance directly and structural capital has an indirect effect on the value addition.

Tseng and Goo (2005) studied a sample of Taiwanese manufacturing companies and the relationships between innovation capital, organizational capital and relational capital on enhancement of corporate value, while human capital is only being studied for its relationships with the other types of capital. The analysis and findings are different from our study and do not match our findings, but they attempted a new approach that is quite commendable.

7. Managerial implications

This study should be an eye-opener to managers and CEOs of companies in the timber and related industries sector to improve the management of their companies and make better use of relational capital, either directly or through the mediation of human capital, to augment the creation of value.

Studies prove that managers should consider and manage both internal and external knowledge to enhance the firm's intellectual capital. Managers should pay attention not only to employees' experience, ideas, information and knowledge but also to customers' problems, needs, information and ideas (Migdadi, 2021).

They should also pay attention to the importance of establishing a higher entrepreneurial spirit, optimizing the ability of market analysis, networking with various types of stakeholders and empowering employees, to encourage the creation of innovation capabilities that result in increased performance and achievement of competitive advantages (Sulistyo, 2016) and in the creation of alliances (Sarkar et al., 2001).

The vast differences seen in the generation of value between the three sectors and the two regions under study, suggest that actions must be undertaken to improve performance, through relational capital and marketing efforts. This can be divided into sectorial differences and regional differences. While the former implies internal issues in the structure of companies, the latter suggests different political strategies. Another option is to create cooperation strategies between companies in different sectors to improve collective efficiency (Schmitz, 1995). The sooner these issues are addressed, the better will be the expected performance of the companies in the sector.

Another issue that managers' should address is their commitment in the relationship with the customers rather than just trust that leads to satisfaction that results in enhanced performance and lower overall costs (Mungra & Yadav, 2020).

Conclusions

Relational capital is an important dimension in the value creation equation of timber and related industries. However, the regression does not prove the same in the case of the extraction sector of Galicia. Given the fact that the extraction sector mostly operates in the small, unorganized sector, managers should strive to increase their interaction with outside stakeholders, mainly customers, in order to improve business relationships and thus, revenue. Similarly, the conversion and finished products sector, where direct value creation is observed, should strive to improve their relational capital in order to enhance performance. Human capital and relational capital influence marketing capabilities, that in turn, influence performance (Griffith et al., 2010). Another study conducted in Indonesia also confirms the existence of a significant effect of relational capital on marketing performance of SMEs (Febrian et al., 2020).

Limitations of the study

While this is an innovative study, using a new method to analyze the capital value addition of relational component of intellectual capital and its impact on the three main sectors of timber and related industries, it has its own limitations:

The study is limited to a small geographical region (Galicia in Spain and Portugal) and does not cover the same industrial sector in other parts of Europe or the rest of the world. Thus, the results obtained by the study may not be considered as a representation of the entire timber and related industries sector or of other economic sectors.

The research aims fundamentally in deepening and advancing the available knowledge and information about intellectual capital in a given industry (timber and its related products) by studying its three main sectors (extraction, conversion and final products) by proposing a new method of analysis of intellectual capital value addition to the sector.

The results obtained by a similar study in other regions of the world or in other economic sectors may differ from this study, as the typical characteristics of the region can affect the human capital, structural capital and relational capital efficiencies. An example is the study of F-Jardón and Martos (2009) on the wood sector of SMEs of Argentina, in which they found out that structural capital alone affected performance directly, while the other components of intellectual capital exerted an indirect influence through structural capital. In our case of Galicia and Portugal, we observe that human and relational capital seem to be the two main value addition components to intellectual capital.

Some of the SMEs may not disclose all the items of their balance sheet in detail, and this could hamper to some extent, the regression analysis in this study.

While our study covered a vast number of years (2002–2018), the results could be different, if the number

of years is increased or decreased. In addition, the number of variables used was limited to the three components of intellectual capital. If more related variables are added, the results can differ significantly.

Recommendations for further research

In the nineties of the last century, information technology companies had market capitalizations valued much above the traditional manufacturing concerns[9], bringing about the awareness about the importance of the valuation of intangible assets such as intellectual capital, and the value added by its individual components.

It would be interesting to extend the study to other areas of the world, including both SMEs and other types of organizations or even using the same proposed model to study other sectors, making them thus, comparable on an equal basis. The study can also be modified by including more variables, like social capital[10].

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References

Abhaywansa, S., & Guthrie, J. (2014). Importance of intellectual capital information: A study of Australian analysts' reports. *Australian Accounting Review*, *24*(1), 66–83. https://doi.org/10.1111/auar.12012

Ahmed, M., Kristal, M., & Pagell, M. (2014). Impact of operational and marketing capabilities on firm performance: Evidence from economic growth and downturns. *International Journal of Production Economics*, *154*, 59–71. https://doi.org/10.1016/j.ijpe.2014.03.025

Albertini, E. (2016). An inductive typology of the interrelations between different components of intellectual capital. *Management Decision*, *54*(4), 887–901. https://doi.org/10.1108/MD-09-2015-0425

Allen, D., & Wilburn, M. (2002). *Linking customer and employee satisfaction to the bottom line*. American Society for Quality.

Andreeva, T., & Garanina, T. (2016). Do all elements of intellectual capital matter for organizational performance? Evidence from Russian context. *Journal of Intellectual Capital*, *17*(2), 397–412. https://doi.org/10.1108/JIC-07-2015-0062

Badaracco, J. (1991). *The knowledge link: How firms compete through strategy alliance*. Harvard Business School Press.

Badawi, N., & Battor, M. (2020). Do social capital and relationship quality matter to the key account management effectiveness? *Journal of Business & Industrial Marketing*, *35*(1), 134–149. https://doi.org/10.1108/JBIM-01-2019-0003

Barzotto, M., Corò, G., & Volpe, M. (2016). Territorial capital as a company intangible: Exploratory evidence from ten Italian multinational corporations. *Journal of Intellectual Capital*, *17*(1), 148–167. https://doi.org/10.1108/JIC-09-2015-0077

Bontis, N. (1998). Intellectual capital: An exploratory study that develops measures and models, *Management Decision, 36*(2), 63–76. https://doi.org/10.1108/00251749810204142

Bontis, N. (1999). Managing organizational knowledge by diagnosing intellectual capital. *International Journal of Technology Management*, *18*(5–8), 433–462. https://doi.org/10.1504/IJTM.1999.002781

Bontis, N. (2002). *World Congress on intellectual capital reading*. Butterworth-Heinemann, MA.

Bontis, N., & Fitz-Enz, J. (2002). Intellectual capital ROI: A casual map of human capital antecedents and consequents. *Journal of Intellectual Capital*, *3*(3), 223–247. https://doi.org/10.1108/14691930210435589

Bozbura, F. (2004). Measurement and application of intellectual capital in Turkey. *The Learning Organization*, *11*(4/5), 357–367. https://doi.org/10.1108/09696470410538251

Byun, H., Frake, J., & Agarwal, R. (2018). Leveraging who you know by what you know: Specialization and returns to relational capital. *Strategic Management Journal*, *39*(7), 1803–1833. https://doi.org/10.1002/smj.2790

Caballero, G. (2015). Community-based forest institutions in the Galician communal forests: A new institutional approach. *Forest Policy and Economics*, *50*, 347–356. https://doi.org/10.1016/j.forpol.2014.07.013

Dzisi, S., & Ofosu, D. (2014). Marketing strategies and the performance of SMEs in Ghana. *European Journal of Business and Management*, *6*(5), 102–111.

Edvinsson, L., & Malone, N. (1996). *Intellectual capital: Realizing your company's true value by finding its hidden brainpower*. Harper Business.

Febrian, A., Sukresna, I., & Ghozali, I. (2020). Relational capital and marketing performance: The mediating role of SMEs networking in Indonesia. *Management Science Letters*, *10*, 3405–3412. https://doi.org/10.5267/j.msl.2020.5.038

F-Jardón, C., & Martos, M. (2009). Intellectual capital and performance in wood industries of Argentina. *Journal of Intellectual Capital*, *10*(4), 600–616. https://doi.org/10.1108/14691930910996670

Gogan, M., Duran, D., & Draghici, A. (2014). The impact of relational capital on competitiveness of the organization. *Network Intelligence Studies*, *II*(4), 233–237.

Griffith, D., Yalcinkaya, G., & Calantone, R. (2010). Do marketing capabilities consistently mediate effects of firm intangible capital on performance across institutional environments? *Journal of World Business*, *45*(3), 217–227. https://doi.org/10.1016/j.jwb.2009.09.008

Hu, L., & Randel, A. (2014). Knowledge sharing in teams: Social capital, extrinsic incentives, and team innovation. *Group & Organization Management*, *39*(2), 213–243. https://doi.org/10.1177/1059601114520969

Investopedia. (n.d.). https://www.investopedia.com/

Jardón, C., & Martos, M. (2012). Intellectual capital as a competitive advantage in emerging clusters in Latin America. *Journal of Intellectual Capital*, *13*(4), 462–481. https://doi.org/10.1108/14691931211276098

Jardón, C., & Silva, A. (2017). Intellectual capital and environmental concern in subsistence small business. *Management of Environmental Quality*, *28*(2), 214–230. https://doi.org/10.1108/MEQ-05-2015-0085

[9] In 1997, the market value of Microsoft Corp. was $119 billion, and the market value of General Motors Corp. was $49 billion, even though the fixed assets of General Motors Corp. had much higher value than those of Microsoft Corp. (Roos & Roos, 1997).

[10] In this study, social capital was considered as a part of relational capital.

Kavida, V., & Sivakoumar, N. (2009). Intellectual capital: A strategic management perspective. *The IUP Journal of Knowledge Management*, *7*, 55–69.

Kaya, F., Sahin, G., & Gurson, P. (2010). Intellectual capital in organizations. *Problems and Perspectives in Management*, *8*(1), 153–160.

Lee, C., & Ha, B. (2018). The impact of buyer-supplier relationships' social capital on bi-directional information sharing in the supply chain. *Journal of Business & Industrial Marketing*, *33*(3), 325–336. https://doi.org/10.1108/JBIM-01-2017-0021

Lopes, I., & Martins, M. (2006). The new business models in the knowledge economy: The strategic way to value creation. *The Electronic Journal of Knowledge Management, 4*(2), 159–168.

Luo, X., Griffith, D., Liu, S., & Shi, Y. (2004). The effects of customers relationships and social capital on firm performance: A Chinese business illustration. *Journal of International Marketing*, *12*(4), 25–45. https://doi.org/10.1509/jimk.12.4.25.53216

Marey-Perez, M., Diaz-Varela, E., & Calvo-Gonzalez, A. (2015). Does higher owner participation increase conflicts over common land? An analysis of communal forests in Galicia (Spain). *iForest – Biogeosciences and Forestry*, *8*(4), 533–543. https://doi.org/10.3832/ifor1060-008

Martín-de-Castro, G., Navas-López, J., López-Sáez, P., & Alama-Salazar, E. (2006). Organizational capital as competitive advantage of the firm. *Journal of Intellectual Capital*, *7*(3), 324–337. https://doi.org/10.1108/14691930610681438

Martinez, X., F-Jardón, C., & Cobas, X. (2021). Capital relacional y cultura en los negócios de subsistência: El caso de la Maná. *Estudios de Economía Aplicada*, *39*(2). https://doi.org/10.25115/eea.v39i2.3288

Martins, M., Xavier, A., & Fragoso, R. (2014). A bioeconomic forestry management model for the Mediterranean forests: A multicriteria approach. *Journal of Multi-Criteria Decision Analysis*, *21*(1–2), 101–111. https://doi.org/10.1002/mcda.1495

Mertins, K., Alwert, K., & Will, M. (2006). Measuring intellectual capital in European SME. In *Proceedings of I-KNOW ´06, 6th International Conference on Knowledge Management* (pp. 21–25). https://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=363EE25ABEF47D9E524623651F4931A3?doi=10.1.1.161.9580&rep=rep1&type=pdf

Migdadi, M. (2021). Knowledge management, customer relationship management and innovation capabilities. *Journal of Business & Industrial Marketing*, *36*(1), 111–124. https://doi.org/10.1108/JBIM-12-2019-0504

Mourão, P., & Martinho, V. (2016). Discussing structural breaks in the Portuguese regulation on forest fires – An economic approach. *Land Use Policy*, *54*, 460–478. https://doi.org/10.1016/j.landusepol.2016.03.003

Mungra, Y., & Yadav, P. (2020). The mediating effect of satisfaction on trust-commitment and relational outcomes in manufacturer-supplier relationship. *Journal of Business & Industrial Marketing*, *35*(2), 219–230. https://doi.org/10.1108/JBIM-09-2018-0268

Nunes, L., Moreno, M., Alberdi, I., González, J., Ferreira, P., Mazzoleni, S., & Rego, F. (2020). Harmonized classification of forest types in the Iberian Peninsula based on national forest inventories. *Forests*, *11*(11), 1–21. https://doi.org/10.3390/f11111170

Nuryakin, & Ardyan, E. (2018). SMEs' marketing performance: The mediating role of market entry capability. *Journal of Research in Marketing and Entrepreneurship*, *20*(2), 122–146. https://doi.org/10.1108/JRME-03-2016-0005

Peng, M., & Luo, Y. (2000). Managerial ties and firm performance in a transition economy: The nature of a micro-macro link. *Academy of Management Journal*, *43*(3), 486–501. https://doi.org/10.2307/1556406

Purohit, H., & Tandon, K. (2017). Intellectual capital efficiency of Indian firms: An empirical analysis. *The IUP Journal of Knowledge Management*, *XV*(3), 44–65.

Raza, A. (2013). Impact of relational capital management on firm performance. *Abasyn Journal of Social Sciences*, *6*(1), 65–78.

Roos, G., & Roos, J. (1997). Measuring your company's intellectual performance. *Long Range Planning*, *30*(3), 413–426. https://doi.org/10.1016/S0024-6301(97)00022-8

Ryals, L. (2005). Making customer relationship management work: The measurement and profitable management of customer relationships. *Journal of Marketing*, *69*(4), 252–261. https://doi.org/10.1509/jmkg.2005.69.4.252

Sabi. (n.d.). https://login.bvdinfo.com/R0/SabiNeo

Saint-Onge, H. (1996). Tacit knowledge the key to the strategic alignment of intellectual capital. *Strategy & Leadership*, *24*(2), 10–16. https://doi.org/10.1108/eb054547

Sarkar, M., Echambadi, R., Cavusgil, S., & Aulakh, P. (2001). The influence of complementarity, compatibility, and relationship capital on alliance performance. *Journal of the Academy of Marketing Science*, *29*(4), 358–373. https://doi.org/10.1177/03079450094216

Sarmento, E., & Dores, V. (2013). A fileira florestal no contexto da economia nacional: A produtividade e a especialização regional. *Silva Lusitana* (Especial), 21–37.

Sayer, J., & Maginnis, S. (2005). New challenges for forest management. In B. B. J. Sayer, S. Maginnis, & M. Laurie (Ed.), *Forests in landscapes: Ecosystem approaches to sustainability* (pp. 1–16). The Earthscan Forestry Library.

Schmitz, H. (1995). Collective efficiency: Growth path for small-scale industry. *Journal of Development Studies*, *31*(4), 529–566. https://doi.org/10.1080/00220389508422377

Shih, K., Chang, C., & Lin, B. (2010). Assessing knowledge creation and intellectual capital in banking industry. *Journal of Intellectual Capital*, *11*(1), 74–89. https://doi.org/10.1108/14691931011013343

Siddiqui, M., & Asad, A. (2014). Relational capital and performance: A case of brand developing firms. *Middle East Journal of Scientific Research*, *21*(11), 2115–2122.

Slee, B. (2006). The socio-economic evaluation of the impact of forestry on rural development: A regional level analysis. *Forest Policy and Economics*, *8*(5), 542–554. https://doi.org/10.1016/j.forpol.2005.07.006

Starovic, D., & Marr, B. (2004*). Understanding corporate value: Managing and reporting intellectual capital*. Chartered Institute of Management Accountants.

Stewart, T. (1991). Brainpower. *Fortune, 3*, 44–56.

Stewart, T. (1994). Your company's most valuable asset: Intellectual capital. *Fortune*, 68–74.

Sulistyo, S. (2016). Innovation capability of SMEs through entrepreneurship, marketing capability, relational capital and empowerment. *Asia Pacific Management Review*, *21*(4), 196–203. https://doi.org/10.1016/j.apmrv.2016.02.002

Sveiby, K. (1998). *Invisible balance sheet: Key indicators for accounting, control and valuation of know-how companies*. Stockholm, The Konrad Group.

Tseng, C., & Goo, Y. (2005). Intellectual capital and corporate value in an emerging economy: Empirical study of Taiwanese manufacturers. *R&D Management*, *35*(2), 187–201. https://doi.org/10.1111/j.1467-9310.2005.00382.x

Xu, J., Quaddus, M., & Gao, X. (2014). Towards a knowledge sharing model for small businesses. *The International Technology Management Review*, *4*(1), 12–26. https://doi.org/10.2991/itmr.2014.4.1.2

Yang, J., Brashear Alejandro, T. G., & Boles, J. S. (2011). The role of social capital and knowledge transfer in selling center performance. *Journal of Business & Industrial Marketing*, *26*(3), 152–161. https://doi.org/10.1108/08858621111115877

Youndt, M., & Snell, S. (2004). Human resource configurations, intellectual capital, and organizational performance. *Journal of Management Issues*, *15*(3), 337–360. https://doi.org/10.1037/t68746-000

Zaheer, A., & Ventakraman, N. (1995). Relational governance as an interorganizational strategy: An empirical test of the role of trust in economic exchange. *Strategic Management Journal*, *16*(5), 373–392. https://doi.org/10.1002/smj.4250160504

Zambrano, L., Castellanos, A., & Merino, J. (2018). Impact of investments in training and advertising on the market value relevance of a company's intangibles: The effect of the economic crisis in Spain. *European Research on Management and Business Economics*, *24*(1), 27–32. https://doi.org/10.1016/j.iedeen.2017.06.001