Using TQM to manage intangible resources: impact on business results of companies that applied for the Uruguayan National Quality Award

ABSTRACT

Purpose

There is ample theoretical and empirical consensus regarding the importance of intangible resources (intellectual capital) on business performance which does not correspond to the explicit attention given to its management. The purpose of this paper is to demonstrate that companies, when successfully implementing TQM, are, at the same time, efficiently managing their intangible resources with a positive impact on business results.

Design/methodology/approach

The data of the evaluations of eighty-four companies that applied for the Uruguayan National Quality Award was used to test a structural model of the relationships among the intangible resources considered in the Continual Improvement Model and how they impact business results. Structural equation modeling based on partial least squares was used for the analysis.

Findings

Significant relationships among the components of intellectual capital and how they relate to business results are similar to those found in specific studies of intellectual capital, suggesting that TQM is an adequate way to manage intangible resources. For the analyzed companies, intellectual capital explains 75% of the variance in financial results and 83% in management results, validating its importance on business performance. The study also validates that financial results are largely the consequence of management results.

Practical Implications

Emphasize the importance of intangible resources management, and TQM as an ideal way to carry out an integrated management of quality and intellectual capital.

Originality/value

Presents an integrated view of intangible resources management and TQM. It uses a very reliable measurement methodology, not used before in similar investigations, that could be applied in other countries for similar works.

Key words: TQM, Quality Award, Intellectual Capital, Business results, Intangible Resources

INTRODUCTION

The Resource Based View states that the competitive capacity and sustained success of a company greatly depend on the way it manages its resources, especially intangible resources (Werneffelt, 1984; Barney, 1991). In recent years, in most companies and industries, intangible resources have surpassed tangible resources, both in value and contribution to growth (Nakamura, 2003; Kaplan and Norton, 2004; OECE, 2010). The percentage of intangible assets in the market value of the 500 companies included in the Standard and Poor's index has increased steadily since 1975. Whereas, in that year, book value represented 83% of the market value of a company. In 2015, it represented only 16%. (Ocean Tomo, 2015).

While the ability of intangible resources to enhance traditional factors of production has been studied since the days of Adam Smith and Alfred Marshall, it often goes unnoticed due to the difficulty of its identification, measurement and valuation (Lev, 2001). In consequence, generally, it does not appear in the financial statements and is not managed properly.

The concern for the development of systematic models for the measurement and management of intangible resources does not appear until the last decades of the 20th century. Since then, many authors have used the term "intellectual capital" (IC) to refer to the set of intangible resources that in combination are able to generate value and produce future benefits for a company (Stewart, 1997, Sullivan, 2000, Edvinsson and Malone, 1997; Bontis, 1998, 2002; Andriessen, 2004; Reed *et al.*, 2006). The Intellectual Capital View seeks to identify, classify and measure valuable intangible resources to improve their management, and through this, business results.

Although some methodologies for measuring and managing intellectual capital have been developed, such as: Intangible Asset Monitor (Sveiby, 1997), Intellectual Capital Index (Roos et al., 1997) or Skandia Navigator (Edvinsson and Malone, 1997), Balanced Scorecard (Kaplan y Norton, 1992, 2004), MERITUM (2002), Intellectus (Bueno et al., 2011), they have not been generalized. Thus, despite its relevance, the systematic management of intangible resources is not an extended practice.

In turn, the Total Quality Management (TQM) supports the Resource Based View and the Intellectual Capital View regarding the fact that competitive competences and sustainable organizational performance are essentially based on the effective management of intangible resources. TQM proclaims that processes are the vehicle used by an organization to harnesses and releases the capabilities of its people to produce results. Hence, for an organization to achieve excellence in key performance results, its leaders should implement policies, strategies and actions focused on its people, partnerships, resources and processes (EFQM, 2016). In other words, suggests the management of intangible resources as a key factor to achieve sustainable results.

In short, there is ample theoretical and empirical consensus regarding the importance of intangible resources on business performance which does not correspond to the explicit attention given to its management. On the other hand, TQM, an extended practice in organizations, is based on the management of intangible resources.

In this paper, we analyze whether companies, when successfully implementing TQM, are, at the same time, efficiently managing their intangible resources with a positive impact on business results, similar to those obtained when specific management systems for intellectual capital are used.

If this were the case, it would be possible to propose TQM as an ideal way to carry out an integrated management of quality and intangible resources.

INTELLECTUAL CAPITAL AND QUALITY MANAGEMENT SYSTEMS

Intellectual capital is used to designate the set of intangible resources that, in combination, are able to generate value for the organization. It is widely accepted that these resources are grouped in three basic components of IC: human capital, structural capital and relational capital. These three

types of capital represent the accumulated wealth generated by the values, knowledge, skills and talents of people (human intelligence); the values, culture, routines, protocols, procedures, systems, and intellectual property of the organization (organizational intelligence) and the relationships and shared activities with external stakeholders (social intelligence) (CIC, 2003).

Although each of the intellectual capital components can independently impact organizational performance, the components interact and it is the type and quality of these interactions that ultimately determines its influence on the overall business results. These interactions and their impact on business performance have been studied, among other, by Bontis (1998), Bontis and Fitz-enz (2002), Cabrita (2005), Wang *et al.* (2005), Ciavolino and Dahlgaard, (2009) and Miles (2011). Understanding how intellectual capital components relate will help to improve organizational performance by taking actions to further develop and strengthen the highest-impact relations.

On the other hand, during the last decades, quality management systems (TQM) have been implemented all around the world in all types of organizations. Many have adopted the criteria established by the standards ISO 9000 and/or the excellence models, such as the EFQM, the Malcolm Baldrige, or the Continual Improvement Model of Uruguay (MMC). These management models postulate that "sustainable success in an organization is attained through its capacity to satisfy the needs and expectations of its customers and other stakeholders in the long term and in a balanced way" (ISO 9004:2018).

These quality management systems not only contribute to make explicit the organizational knowledge, by providing a framework to structure and to document it, but also have a positive impact on: a) the organizational culture, by encouraging a culture based on continuous improvement, promoting cooperative leadership styles, trust and involvement, b) the personnel; by properly managing their competences and creating a work environment that reinforces improvement, personal development and the achievement of organizational goals, c) the style of relationships; by promoting win-win relationships with suppliers, the satisfaction of the needs and expectations of all the stakeholders in a balanced manner, and encouraging the sharing of knowledge.

Consequently, organizations that implement and maintain management systems according to these models and standards not only document knowledge and improve processes management (generate

structural capital), but also perform several activities that strengthen other intangible resources such as teamwork, sense of belonging and engagement, personal competences, trust, cooperative leadership, etc., thus influencing all components of intellectual capital.

Likewise, Lim *et al*. (1999) point out that the success of the implementation of a TQM strategy depends on the intellectual capital of the organization. Leadership skills and values, staff competencies and involvement, management of organizational culture and processes, relationships with customers, suppliers and society -all elements of intellectual capital- are key factors for a successful TQM implementation. Fernández and Fernández (1996) state that quality management systems provide methods that promote the development and growth of organizational knowledge and intellectual capital. Thus, quality management can be considered as a process where knowledge is the primary input and intellectual capital the primary output (Zaho and Bryar,2001). Martín-Castilla and Rodríguez-Ruiz (2008) relate the different elements of the EFQM excellence model with the intellectual capital components, and Heng (2001) illustrates the existing synergy among ISO 9000 requirements, knowledge management and the management of intellectual capital.

Therefore, TQM implemented with ISO 9000 and/or excellence models, can be considered a good framework for the management of intangible resources.

It is reasonable to expect that companies that successfully implement quality management systems also effectively manage their intangible resources. Thus, they can be used to analyze whether good management of intangible resources has a significant positive impact on business results.

CONTINUAL IMPROVEMENT MODEL OF URUGUAY (MMC)

Over the past 25 years, MMC (INACAL, 2017) is the standard used to assess the organizations that apply the Uruguayan National Quality Award. Based on similar excellence models, such as Malcolm Baldrige, MMC frame a series of principles and elements (or enablers) that companies can use to implement their quality management systems with the objective of achieving excellence through the balanced satisfaction of all stakeholder needs.

These elements, that an organization needs to develop in order to implement its strategy and to attain desired results, are intangible resources. MMC groups them into seven management areas:

senior management leadership, planning, people development, external customer approach, information and analysis, process management and impact on society and environment.

MMC distinguishes two results categories: "financial results" and "management results," comprised of customer satisfaction, the quality of the production process for goods and services, and the development and engagement of people.

Even though solid financial results are required for the long-term success of any organization, financial results alone are not sufficient to ensure it. If the organization is not able to satisfy all stakeholders – customers, suppliers, staff, and society at large – it is not likely to survive in the long run. To a large extent, strong financial results are the consequence, or the reward, of having a balanced management process that achieves good results for all stakeholders (Gonzalez *et al.*, 2009; Algorta *et al.*, 2014, ISO 9004. 2018).

For this study, the elements of MMC (the intangible resources managed by companies that apply this model) are grouped according to the intellectual capital categories (Table I). For this, the following criteria were considered:

- ✓ The elements of "senior management leadership" have been included in **human capital**; even though some could also be related to **structural capital**, through values and culture, or to **relational capital** thorough the way leaders relates with the stakeholders.
- ✓ The elements of "planning" and "information and analysis" are grouped together because there is no planning without information and, in turn, information is necessary to control and monitor the plans.
- ✓ The elements of "people development" are considered **human capital**.
- ✓ The elements related to "promotion and disclosure of the quality culture among the stakeholders" are included in **relational capital**.

Table I: Grouping of elements of MMC in the intellectual capital constructs

Construct		Elements of the MMC	MMC Nº	Indicator
Human Capital (first order)		Leadership by example	1.1	L1
		Organizational Values	1.2	L2
		Education and Training	3.1	E1
		Involvement	3.2	E2
		Employee performance recognition	3.3	E3
		Quality of life at work	3.4	E4
Structural Capital (second order)	Planning and monitoring (first order)	Strategic planning	2.1	P1
		Operational planning	2.2	P2
		information about products, services and processes	5.1	I1
		Analysis and review of the organization's strategic performance	5.2	I2
	Processes (first order)	Design and control of processes	6.1	01
		Supporting processes	6.2	02
		Documentation	6.5	05
		Processes for preservation of ecosystems	7.2	S2
Relational Capital (second order)	Customers (first order)	Knowledge about the market and external customers	4.1	C1
		Indicators employed to measure customer satisfaction	4.2	C2
		Service standards	4.3	C3
	Suppliers (first order)	Suppliers	6.4	04
	Society (first order)	Promotion and disclosure of the quality culture among the stakeholders	7.1	S1
Management Results (first order)		Results from external customer satisfaction	8.1	R1
		Results from production processes, support areas and suppliers	8.2	R2
		Results from workforce development programs	8.3	R3
Financial Results (first order)		Product market performance	8.4	R4
		Financial performance	8.5	R5

Note: second order constructs are the cause of the first order components.
MMC Nº: the number of the element in MMC.
Indicator: evaluation item
The MMC can be consulted and downloaded from www.inacal.ogr.uy

EVALUATION PROCESS OF THE URUGUAYAN NATIONAL QUALITY AWARD

To provide a background on how the data was compiled for statistical analysis, a brief description of the Uruguayan National Quality Award evaluation process is appropriate.

To apply for the Uruguayan National Quality Award, the first step is for a company to submit a self-assessment report describing how each MMC area is managed and what results were achieved. A team of evaluators analyze the report and assigns a score of 0 to 100 to each element according to the degree of progress.

The evaluators consider: whether the processes and systems developed by the organization have the appropriate theoretical approach, if they are appropriately implemented, and if the results achieved are in line with expectations and show positive and satisfactory trends in relation to those of other equivalent organizations.

To minimize the differences in scores due to the subjectivity inherent to the evaluation process, the following steps are taken:

- ✓ discussion-calibration among the evaluators through workshops;
- ✓ the development and use of an evaluation guide during the assessment process, and
- ✓ evaluation teams comprised of at least four experts from different fields, professions, and organizations.

Each evaluator individually analyzes and assigns a score to each element. The team then gets together, reviews the different scores and assigns a consensus-based final score to each element. Afterwards, the team makes an on-site visit to verify the reliability of the information submitted by the organization in the self-assessment report. Final scores are established after the final visit.

The advantages of this assessment method are many:

a. MMC points out, in a precise manner, the aspects of the management system that needs to be evaluated,
b. the evaluation process is done by multidisciplinary teams of 4 to 5 experts duly trained for the task,
c. the evaluation is “objective” and it is based on evidence presented in the self-assessment report which is later verified during the visit to the organization, and
d. the scores are verified by a council of judges, thus removing the risk of biases and homogenizing the evaluations of the different groups.

Consequently, this evaluation methodology can be placed between two approaches: one based on objective indicators, and one based on opinions and individual perceptions. Without achieving the

total objectivity of a "physical" measurement, this methodology provides greater objectivity than just the opinion and perceptions given by a person in an interview or in a survey.

The data used for the statistical analysis are the scores that come from the evaluations carried out by the teams of evaluators of the companies that applied to the Uruguayan National Quality Award between 1996 and 2013. Although these data are confidential, they can be accessed due to an agreement between the Catholic University of Uruguay and the National Quality Institute of Uruguay.

STRUCTURAL MODEL OF INTELLECTUAL CAPITAL AND ORGANIZATIONAL RESULTS

To analyze how the components of the intellectual capital interact and influences organizational results, a structural model was developed. In the model, all of the relationships between the IC components and business results are represented (Figure 1). These relationships are validated in the statistical analysis to verify strength and significance.

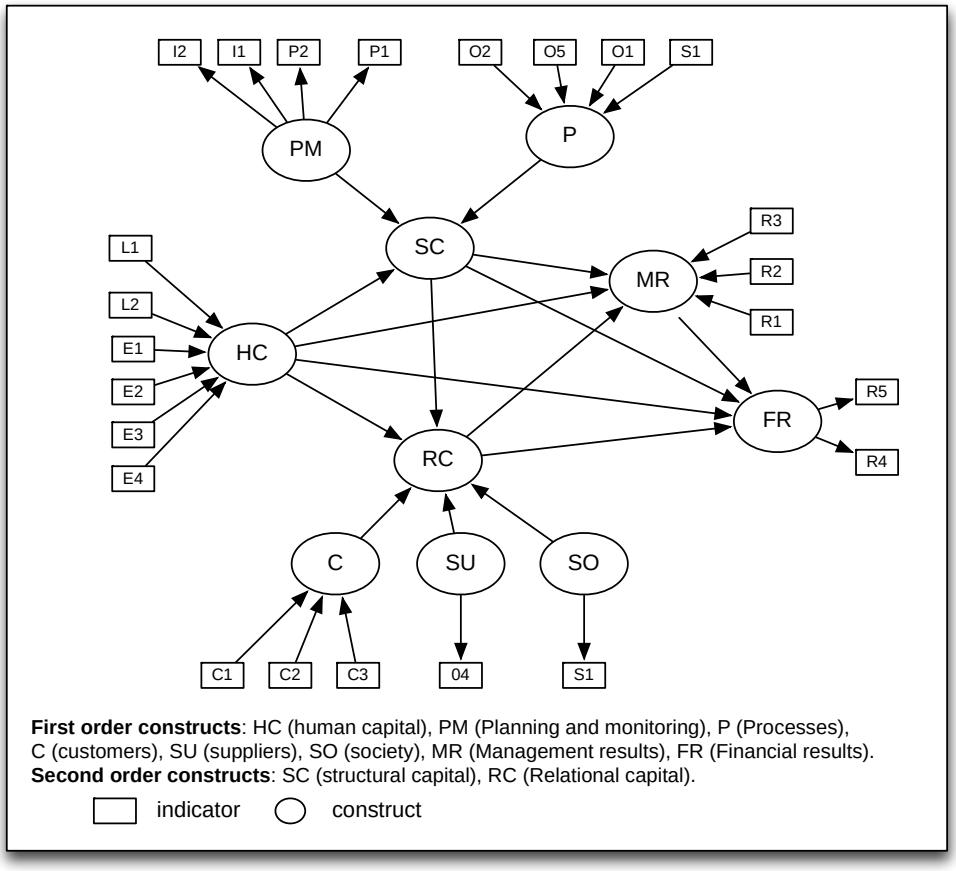
To create a structural model, statistical relations verified in previous studies on intellectual capital management were used (Bontis, 1998; Chen et al., 2004; Wang et al.,2005; Cabrita, 2005 and Miles, 2011) as well as the following considerations:

Human capital is the basic component of intellectual capital and indirectly affects the results of the organization through its impact on the other components. Employees, with the right motivation and skills, are the people who develop processes of high quality and achieve better services and long-lasting relationships with customers. Consequently, improving and increasing human capital will produce a positive impact on the other intellectual capital components, which, in turn, will have a positive effect on organizational performance.

The way to increase customer satisfaction is by increasing the quality perceived by customers (Zeithaml *et al.*, 1988; Fornell *et al*., 1996). The perceived quality can be increased by effectively managing the relationships with customers (relational capital) and the processes that build the value proposition (structural capital). Besides, relationships with customers is greatly determined by the way the processes are managed (Algorta *el al.*, 2014)

Financial results are determined by management results (Miles, 2011; Algorta *el al*., 2014, Miles et al. 2018); customer satisfaction leads to improved financial performance (Ittner and Larcker, 1998; Banker *et a*l., 2000) and higher quality processes lead to superior financial results (Powell, 1995; Hardie, 1998).

Figure 1: Structural model: intellectual capital components and organizational results



As seen in Figure 1, human capital is conceptualized as a first-order construct. Structural capital as a second-order construct, with "planning" and "processes" as its dimensions. Relational capital as second-order constructs formed by the first-order constructs: relationships with customers, suppliers, and society.

The constructs can be modeled as reflective or formative, depending on how is the relationship between the latent variable and its indicators.

To determine if a construct is reflective or not, the following question can be asked: "If all indicators have the same direction, does the increase in one indicator imply that the rest of

indicators will change in a similar manner? If the answer is yes, then the construct is reflective (Chin, 1998).

Based on this criterion, the constructs "financial results" and "planning and monitoring" were modeled as reflective constructs. The others where modeled as formative.

RESEARCH DESIGN

The objective of this paper is to analyze if companies that successfully implement TQM also effectively manage their intangible resources. At the same time, this paper will detect how intellectual capital components relate to each other and can have a positive impact on business results.

With the intangible resources considered in MMC (Table I), a structural model was developed to show the relationships among elements and with business results. The constructs and paths of the model are defined based on previous empirical studies of intellectual capital.

The model is tested employing structural equation modeling (SEM) based on partial least squares (PLS).

When applying SEM, two approaches can be used: covariance-based or partial least squares (PLS). In this study, PLS was used because it is a technique designed to reflect the theoretical and empirical conditions of social sciences where less conclusive theories and scarce information are common (Wold, 1979). PLS' aim is to obtain values for the latent variables for predictive purposes (Chin, 1998). In addition, PLS is a powerful analysis method due to its minimum requirements regarding measurement scales, sample sizes and residual distributions (Chin et al., 2003).

This methodology has been used in similar studies which analyze the structure of intellectual capital (Bontis, 1998; Bontis *et al.* ,2000; Fitz.enz and Bontis, 2002; Wang *et al.* ,2005; Cabrita , 2005; Miles, 2011) and the structure of excellence models (González *et al.* 2009; Algorta *et al.*, 2014)

Sample

This study considered 84 companies that applied for the Uruguayan National Quality Award (PNC) in the large firm's category between 1996 and 2014. The sample was 31% private industrial

or agricultural, 41% private service o commercial, and 27% state-owned. To be admitted to the PNC, the company first must demonstrate that it has a relatively successful TQM program and implementation.

This is not a representative sample of all the companies that apply TQM principles or implement the MMC. It is only representative of those firms that apply TQM and apply to the PNC. There may be companies that effectively implement MMC but do not apply for the award. There may also be companies that, despite applying MMC, do not obtain good results and consequently, do not apply to the PNC. Therefore, generalization of the findings of this research should be handled with care.

The sample size required when using PLS is that which would support the most complex multiple regression of the model. For this regression to be identified, the following should be observed: (a) the formative construct with the largest number of indicators (i.e. the largest measurement equation) or (b) the dependent latent variable with the largest number of independent latent variables influencing it (i.e. the largest structural equation). Using a regression heuristic of 10 cases per predictor, the sample size requirement would be 10 times either (a) or (b), whichever the greater (Barclay *et al.*, 1995; Chin, 1998; Hair *et al.* 1999).

In this research, the formative construct with the largest number of indicators is "human capital" with 6. The dependent variable with the largest number of independent variables influencing it is "financial results" with 4 (see Figure 1). Therefore, the minimum sample size required is 60.

Results of the statistical analysis

With PLS, the model is analyzed and interpreted in two stages: first, the assessment of the reliability and validity of the measurement model, and second, the assessment of the structural model. This sequence ensures that the constructs measures are valid and reliable before drawing conclusions about the relationships among constructs (Barclay *et al.*, 1995).

The statistical analysis was done using the PLS-Graph Version 3.00 build 1130 software, developed by Wynne W. Chin.

First stage: Measurement Model evaluation

The capacity of the indicators to correctly measure the corresponding constructs was evaluated. Reflective and formative constructs were analyzed separately.

Reflective constructs analysis

The characteristics that should be evaluated for reflective construct are: individual item reliability, construct reliability, convergent validity, and discriminant validity.

The individual item reliability refers to the extent to which an indicator validly measures the latent variable to which it has been connected. It is assessed by examining the loadings (λ) or simple correlations of the measures with their respective constructs. As shown in Table II, all the values observed were over 0.707 which implies more of a shared variance between the construct and its measures than an error variance (Carmines and Zeller, 1979; Barclay *et al.*, 1995). This means that more than 50% of the variance in the observed variable is shared with the construct.

Construct reliability, or internal consistency, refers to the extent to which all the indicators are measuring the same latent variable. If this is true, all the indicators making up the construct should be highly correlated. For this assessment two indexes can be used: a) Cronbach's alpha and b) composite reliability (Werts *et al*, 1974). Nunnally (1978) suggests a value of 0.7 as a modest level of reliability in early stages of research. In our case, all values exceed this minimum suggested value (Table II).

Convergent validity refers to the degree to which the measures that theoretically should be related are in fact related. Convergent validity is assessed using the average variance extracted (AVE), developed by Fornell and Larcker (1981). AVE provides the amount of variance that a latent variable captures from its indicators relative to the amount due to the measurement error. The authors suggest an average variance extracted over 0.5, meaning that over 50% of variance of the construct, is due to its own indicators. Results are shown in Table II.

Discriminant validity refers to the extent to which a given construct differentiates from others. That is, the extent to which the constructs of the model validly measure different things. For this to be true, a construct should share more variance with its measures than it shares with other constructs of the model. The discriminant validity was assessed using the average variance extracted (AVE) and following Fornell and Larcker (1981) methodology of comparing the AVE

of each construct with the variance shared between the construct and the other constructs of the model. For adequate discriminant validity, the AVE for each construct should be greater than its shared variance with any other construct (the squared correlations between two constructs). Results are shown in Table III.

Table II: Reflective constructs evaluation – Part I

Construct and Indicator	Loading	α - Cronbach	Composite reliability	AVE
Planning and monitoring		0.921	0.945	0.812
P1	0.887			
P2	0.873			
I1	0.908			
I2	0.935			
Financial results		0.818	0.918	0.849
R4	0.921			
R5	0.922			

Table III. Reflective constructs evaluation – Part II discriminant validity

Reflective Construct	AVE	Square correlations among constructs							
		Human	Process	Customer	Supplier	Society	Management Results	Financial Results	Planning - Monitoring
Planning - Monitoring	0.812	0.806	0.746	0.634	0.466	0.510	0.771	0.557	--
Financial Results	0.849	0.482	0.511	0.581	0.226	0.376	0.743	--	0.557
Notes: For discriminant validity, the square correlations among constructs should be smaller than the AVE of the corresponding reflective construct									

Formative Construct Analysis

It is necessary to analyze the collinearity of the indicators for formative constructs. This is because the solutions to formative models are based on multivariate regressions, contrary to reflective constructs which are based on simple regressions. High multicollinearity between formative indicators of a construct would produce unstable estimates and makes it difficult to isolate the individual effects of the indicators on a specific construct. The results from the multicollinearity test are displayed in Table IV. In all the cases, the VIF (variance inflation factor) and the CI (condition index) are inside the established values to rule out a significant multicollinearity. (VIF<5, CI<30) (Hair et al. 1999).

Table IV. Analysis of formative construct multicollinearity

Formative construct	Maximum VIF	Maximum Condition Index
Human	4,577	21,580
Process	3,284	12,179
Customer	3,027	12,644
Management Results	3,712	12,482

Weights of indicators of formative constructs

In Table V, we can observe the weights and standard errors for the indicators of the formative constructs and the first order constructs.

Table V: Formative constructs values: indicators and first order construct scores.

construct	Indicator	weight	standard error	Statistic t
Human capital	L1 (Leadership by example)	-0.1505	0.1377	1.0943
	E1 (Education and Training)	0.2072	0.1392	1.687*
	E2 (Involvement)	0.2536	0.1485	1.708*
	L2 (Organizational values)	0.7032	0.1608	4.2268 ***
	E3 (employee performance recognition)	0.4313	0.1304	3.3077***
	E4 (Quality of life in the work place)	0.1251	0.067	0.9061
Structural capital	Planning and monitoring	0.9056	0.0922	10.0467 ***
	Process	0.1145	0.1045	1.0955
Relational Capital	Customers	0.7214	0.1162	6.1868***
	Suppliers	0.1409	0.0988	1.4115
	Society	0.2691	0.1075	2.5028**
Management Results	R1 (customer satisfaction)	0.5374	0.1145	4.6944***
	R2 (process)	0.3553	0.1066	3.3320***
	R3 (people)	0.1709	0.0851	2.0090*
*** p<0.001; ** p<0.01; * p<0.05 (based on $t_{499,}$ one-tailed test)				

Second stage: Structural Model Assessment

Once the measurement model quality has been validated, the structural model should be assessed. This refers to the strength of the relations between the latent variables and to the predictive power achieved by the model.

To assess the stability of the model and the statistical significance of the indicators and path coefficients, a nonparametric technique was used. With a bootstrap resampling method, "t" values for each relationship represented in the model were generated. A Student´s t distribution with n-1

degrees of freedom ("n" being the number of subsamples analyzed: 500 in this research) was used for assessing the "t" values and standard errors obtained (Chin, 1998). Given that the relationships signs were specified in the model, a one-tailed Student t distribution was employed, with the following values: $p<0.001$, $t=3.107$; $p<0.01$, $t=2.335$; $p<0.05$, $t=1.648$.

Estimation of path coefficient

To assess the strength of the relations between constructs, path coefficients were examined.

Path coefficients indicate to what extent the predictor variables contribute to the explained variance (R^2) of the endogenous variables; they should be interpreted in a similar fashion to the coefficients obtained on linear regressions analyses. Chin (1998) recommends: to be considered significant, the standardized path coefficients should reach values at least of 0.2, and ideally over 0.3. In our case, all the significant path coefficients satisfy this condition. (Table VI shows the path coefficients with their degree of significance.)

Table VI. Path coefficients, explained variance R^2 and Stone-Geisser predictive relevance Q^2

Endogenous constructs	R^2	Q2	Predictor construct			
			Human	Structural	Relational	Management Results
Structural	0.74	0.61	0.861***			
Relational	0.81	0.55	0.624***	0.303**		
Management Results	0.83	0.66	0.245	0.390***	0.32*	
Financial Results	0.75	0.61	-0.150	0.081	0.195	0.754***
*** p<0.001; ** p<0.01; * p<0.05 (based on $t_{499,}$ one-tailed test)						

It can be observed in Table V that the relationships between the intellectual capital components and the financial results are not significant. Also, the relationships between human capital and management results are not significant. This means that the influence of intellectual capital components on–financial results is not direct; intellectual capital influences financial results through management results.

Model predictive power

A measure of the predictive power achieved by a PLS model is provided by the R^2 value of endogenous constructs (Barclay et al., 1995). These values should be interpreted in the same

manner as the R^2 obtained from a multiple regression analysis. Consequently, R^2 values indicate the amount of variance in the dependent constructs which is explained by the model.

Falk and Miller (1992) state that the amount of variance explained (R^2) of an endogenous construct should be equal or superior to 0.10. Although lower values of R^2 could be statistically significant, they provide very little information and therefore, the predictive power of the relation analyzed is very low. Table VI shows the R^2 values for the dependent constructs. The average explained variance of this model is 62%. Thus, the model has an appropriate predictive power as all explained variances exceed 0.1.

Another measurement employed to evaluate the predictive power of a model is the Stone-Geisser's Q^2 value (Geisser, 1974; Stone, 1974). The predictive relevance Q^2 is used to assess how well the model reproduces the observed values. As suggested by Chin (1998), Q^2 values greater than zero indicates that the model has predictive relevance. If it is less than zero, this indicates that the model lacks predictive relevance. As shown in Table VI, this model has Q^2 values greater than zero for all the endogenous constructs, thus asserting the predictive relevance of the model.

Contribution to explained variance in endogenous constructs

Falk and Miller (1992) point out that a reasonable index of variance explained in an endogenous construct by another latent variable is given by the absolute value of the result of multiplying the path coefficient by the corresponding correlation coefficient between the two variables. The total variance explained for "management results" is 83%, composed by structural capital, explaining 46%, and by relational capital explaining 38%. In turn, the variance of relational capital (0.81) is explained by human capital (0.54) and by structural capital (0.27).

DISCUSSION, IMPLICATIONS AND LIMITATIONS

In this paper, we analyzed if companies that successfully implement TQM also effectively manage their intangible resources with a positive impact on business results. For this, a structural model of the relation among the different components of intellectual capital and how they impact business results was tested. Eighty-four companies that applied for the Uruguayan National Quality Award, between 1996 and 2014, were analyzed.

First, it is observed that the significant relationships among the components of intellectual capital and how they relate to business results are similar to those found in specific studies of intellectual capital (Bontis, 1998; Cabrita, 2005; Wang *et al*., 2005; Miles, 2011). This suggests that TQM is an adequate way to manage intangible resources.

This study shows that intellectual capital has an important effect on business results, explaining 75% of the variance in financial results and 83% in management results (human development, process management and customer relationship management). The study also validates that financial results are largely the consequence of management results. This further confirms that satisfied customers, better prepared staff, and properly managed processes lead to better financial results (Kaplan & Norton, 2004). It also confirms the importance of structured management practices (Bloom et al. 2012; Bloom et al. 2017; McKenzie & Woodruff, 2017, Miles et al. 2018).

Not all Intellectual Capital components have a direct impact on business results. Human capital is part of organizational performance; however, it needs quality processes, adequate planning and suitable relationships to have an effective impact on management results and financial results. Human capital had no significant direct impact on either. Human capital directly and significantly influences structural capital and relational capital. As Yaseen *et a*l. (2016) states: "it is valid to suggest that human capital indirectly and significantly influences competitive advantage as it is embedded in the relational capital."

Relational capital is influenced by structural capital, even though to a smaller degree than human capital. The explained variance of relational capital (81%) is mostly due to human capital (54%) and to a lesser extent to structural capital (27%). This confirms that in relationships with customers and other stakeholders, the skills and attitudes of the employees are important, but they should be accompanied by good planning and processes to be effective (Zeithaml *et al*., 1988).

Both, relational and structural capital have a direct influence on management results and an indirect influence on financial results. Their individual impact on management results has a similar dimension, confirming that a balanced management of these elements is needed to ensure superior business results (Adrienssen, 2004; Algorta et al. 2014)

Considering specific intangible resources, it was found that planning and monitoring, customer relations, organizational values and employee performance recognition had the greatest positive impact on business results.

Management implications

This study shows that companies successfully implementing TQM are also effectively managing their intangible resources. These resources explain about 80% of the market value of a company.

On the other hand, the study indicates that managers must pay additional attention to intangible resources in order to improve organizational results. For example, this study indicates that, while the development of human capital is important, it will not have the desired impact on business results if structural capital is not strengthened, especially in the area of planning and monitoring, or if relational capital is not enhanced by improving customer relationships. In addition, this study demonstrates the importance of organizational values and employee recognition for the development of human capital, an area often neglected to address more "practical" things.

Finally, it is obvious and widely demonstrated that good financial results depend on the achievement of good management results (that is: satisfied clients, involved personnel and efficient processes), many managers "forget" this and, with a short-term mentality, focus directly on financial results without giving due importance to other factors. This work is yet another demonstration more that management results predict financial results and it is a further contribution to help convince managers that, to improve financial results, they should focus on improving management results.

Limitations

This study has some limitations that should be kept in mind when interpreting the results.

The data used comes from evaluations of companies over seventeen years (1996-2014). The analytical technique used does not consider the influence of macroeconomic and social context that could have had an impact on each company´s management and results.

The choice of a multi-sectorial sample, while facilitating broader conclusions, could adversely affect the quality of the results obtained, especially given the heterogeneity of the sectors considered.

Another limitation to consider is related to causality. PLS is a method for estimating the probability of an event based on the information available on other events. This technique is oriented to prediction rather than the determination of causality. Therefore, we can say that the relationships this study found predict business results, but they do not cause them.

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