



KNOWLEDGE TACITNESS AND RENEWAL CAPITAL

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Abstract

Organizational ability to create and successfully manage knowledge, in its different forms, has become the basis of superior organizational performance and sustainable competitiveness. Nowadays, especially in developed economies, the importance of knowledge and intangible resources, i.e., intellectual capital, is rapidly increasing. The intangibles have a dominant role and gradually are replacing physical resources as the most important production factors of organizational success. Many studies gave significant findings in the field of intellectual capital measurement and its conceptualization, but there still is not a worldwide consensus on the dimensions of intellectual capital. Previous research focused mainly on traditional intellectual capital dimensions—human, relational, and structural capital—neglecting organizational renewal capability as a dimension of intellectual capital. There are no systematic findings on whether there are interrelationships of traditional intellectual capital dimensions in transition economies. This paper addresses and empirically tests the complementary role of traditional intellectual capital dimensions in organizational renewal, in the context of a transition economy. Primary data were collected using previously psychometrically validated questionnaires from 224 organizations in the Republic of Srpska, Bosnia and Herzegovina. Partial least squares structural equation modelling (PLS-SEM) was used to test hypothesized relationships. Research findings suggest that renewal capital has a significant role. Furthermore, it demonstrates the intensity of relational and structural capital connection with knowledge renewal, highlighting the significance of different forms of knowledge in organizational renewal. Managers can find some useful directions to efficiently manage intellectual capital and to be aware of the presence of knowledge resource interrelationships and their importance for organizational renewal.

Keywords: *intellectual capital, renewal capital, PLS-SEM, transition economy*

1. INTRODUCTION

In a modern economy, under the influence of globalization and increasing information-technological changes, organizational success is not determined primarily by traditional, well-known factors such as physical and financial resources. The process of value creation and the competitive advantage of organizations are defined mainly by intangible or invisible resources such as intellectual capital (Bontis, 1998; Sveiby, 1997; Edvinsson & Malone, 1997; Stewart, 1997; Inkinen, 2015) and the capability of organizations to change and renovate their knowledge bases to respond to an unpredictable, dynamic, and turbulent environment (Edvinsson & Malone, 1997). Parallel to the transformation from a production-based

to a knowledge-based economy (Bontis, 1998; Martinez-Torres, 2006; Huang & Wu 2010) and organizational sensitivity to market needs was a shift from managing tangibles toward managing intangibles and intellect-based resources (Bontis et al. 1999). Intellectual capital and how to efficiently and effectively manage intellectual capital as a function of organizational success and lasting competitiveness became a focus of research interest in last few decades.

Intellectual capital represents a bundle of intangibles such as organizational knowledge, experience, skills, and links between organizations and external parties (Bontis, 1998; Sveiby, 1997). Because intellectual capital is composed of various dimensions, intellectual capital composition has been discussed widely in the literature. In addition to its composition, views

on intellectual capital can be classified as static and dynamic. Whereas the static approach to intellectual capital focuses on intellectual capital as stock owned by an organization in the form of patents, trademarks, or brands (Brooking, 1996; Stewart, 1991), the dynamic approach frames intellectual capital as a dynamic organizational capability or flow (Pöyhönen, 2005). The main purpose of the static approach is to identify and evaluate existing intangibles, as opposed to the dynamic approach, the aim of which is to possess the capability to use, develop, and modify intangibles. The most frequently used intellectual capital perspective to conceptualize intellectual capital is the static view (Bontis, 1999). This research uses the static approach to enhance the understanding of specifics of intellectual capital dimensions and their connections in the context of a transition economy. Therefore, intellectual capital is regarded as stock – something that can be easily identified, moved, and traded (Kianto, 2007).

There are various classifications of intellectual capital, but the most widely accepted involves three dimensions: human, relational, and structural capital (Stewart, 1997; Edvinsson & Malone, 1997; Roos et al., 1998; Bontis, 1998; Bontis et al., 2000). A less frequently mentioned intellectual capital dimension, renewal capital, consists of resources linked to organizational growth and long-term research and development (Bontis, 2004); it is used as a fourth intellectual capital dimension in the proposed research model. This intellectual capital dimension shows how well an organization reacts to challenges coming from outside (Edvinsson & Malone, 1997). Renewal capital becomes a crucial part of intellectual capital in a turbulent and unpredictable market.

According to the author's knowledge, there is a lack of research that examines the proposed interrelationships between intellectual capital dimensions, including renewal capital as an important dimension, in context of transition economies, especially in case of the Republic of Srpska, Bosnia and Herzegovina. Organizational renewal is a crucial dimension of intellectual capital because it renovates the existing knowledge of the organization and focuses on the importance of organizational learning. However, organizational renewal is dependent on the previous use and development of human, relational, and structural capital.

This research proposes and empirically tests links between traditional intellectual capital dimensions and renewal capital as a key aspect of intellectual capital in a dynamic and unpredictable organizational environment in the context of a transition economy such as the Republic of Srpska, Bosnia and Herzegovina. Dimensions of intellectual capital are conceptualized based on a literature review and measured using a psychometrically validated questionnaire. Research findings showed significant positive interaction between traditional intellectual capital dimensions and renewal capital and indicated a more pronounced importance of tacit knowledge gained through communication with customers for organizational learning and knowledge renewal.

The paper is organized as follows. The first section consists of a literature review of intellectual capital phenomenon and its different classifications. The role of renewal capital was less frequently mentioned, but the crucial intellectual capital dimension was emphasized. In the next section, the research methodology including a sample structure, statistical power analysis, data collection process, and application of an econometric technique to test the defined hypotheses is presented. A detailed data analysis, discussion of obtained results, and final remarks are presented as a conclusion. A summary of results, research contributions, and guidelines for managing intellectual capital are given for academics and business practitioners. Some limitations of the research are addressed, and future research directions are suggested.

2. THEORETICAL BACKGROUND

2.1 Intellectual capital phenomenon and its classification

The term intellectual capital was first mentioned by Kronfeld & Rock (1958), who used this term to explain differences in net worth appraisals and price/earnings ratios between (Edvinsson, 2009). Galbraith (1969) is regarded as the first economist who used the term intellectual capital as a construct that explains differences between market and book value (Edvinsson, 2009; Khan, 2011). According to Galbraith, intellectual capital is not just knowledge or intellect. It represents all invisible or intangible re-

sources and actions that are able to generate future value (Roos et al., 1997; Bontis, 1998).

Research interest in the intellectual capital field increased in recent years (Bontis, 2001; Serenko & Bontis, 2004). Two different streams of intellectual capital research can be identified. The first is the measurement stream of intellectual capital research (Martin Castro et al., 2011), the purpose of which is to measure and report intangible resources using traditional financial indicators (Roos et al., 1997; Petty & Guthrie, 2000). The second, the strategic-oriented stream (Martin Castro et al., 2011), is focused on analyzing and detecting the role of intellectual capital in the creation of values and organizational success (Roos et al., 1997; Pett & Guthrie, 2000). There are various definitions of intellectual capital, such as “knowledge that can be converted into value” (Edvinsson & Malone, 1997); the sum of intangible resources and their flows (Bontis et al., 1999); and the sum of stocks or knowledge funds, intangible assets, and capabilities, which allow development of the main business processes in organizations, providing a competitive advantage (Martín de Castro et al., 2011). Because there are many different definitions of intellectual capital, consequently there is no clear classification of intellectual capital. The literature review indicated different dimensions of intellectual capital, such as human and structural capital (Edvinsson & Malone, 1997); human, organizational, and social capital (Reed et al., 2006); and structural, consumer, and employee capital (Zerenler et al., 2008). The most widely used is the classification of intellectual capital as human, structural, and relational capital (Bontis, 1999; Zerenler et al., 2008, Cabrita & Bontis, 2008).

2.2 Intellectual capital components and their interrelationships

Traditionally, intellectual capital is composed of human, relational, and structural capital, combined in different ways. Recently, renewal capital has been considered as part of intellectual capital (Kianto, 2010) that enables organizational growth and long-term research and development (Bontis, 2004) emphasizing how well organization respond to future challenges and radical changes in the market (Edvinsson & Malone, 1997). A brief description of intellectual capital dimensions follows.

Human capital represents a key dimension of intellectual capital composed of the knowledge, skills, and expertise of employees. Human capital is the sum of the values, attitudes, and capabilities of employees, providing a competitive advantage and value creation (Cohen & Kaimenakis, 2007). It refers to know-how, experience, and talent of employees and managers in organizations (Edvinsson & Sullivan, 1996; Roos et al., 1997; Bontis, 1998). The significance of human capital is enormous because it is considered to be a prime intellectual capital dimension with unquestionable economic value (Stewart, 1997; Cohen & Kaimenakis, 2007; F-Jardón & Martos, 2009). However, significant individual knowledge accumulation does not influence intellectual capital unless it is considered to be complementary to organizational capital. In this paper, human capital refers to the intelligence of organizational members (Bontis, 1998), composed of outstanding, experienced, and skilled employees, who are prone to teamwork, knowledge sharing, continuously improving their capabilities, and doing the best that they are able.

Relational capital refers to relationships between an organization and external parties such as customers, suppliers, business associations, and other stakeholders (Roos et al., 1997; Sveiby, 1997; Bontis, 1999; Marr, 2006). Bontis (1999) emphasized the significance of any knowledge flow from external sources to organizations and vice versa. The literature often mentions external parties' perceptions of the organization and its products, brands, reputation, and image as parts of relational capital. It is assumed that these relationships are specific to organizations and are tacit and nontransferable, which disables their imitation and substitution. Therefore, relational capital is considered to be as strategic relevant source of sustainable competitive advantage and above-average organizational performance. In this paper, relational capital refers to knowledge of marketing channels and customer relationships (Bontis, 1998).

Structural capital is a relevant strategic resource encompassing intangible assets such as organizational structures, business process (manuals), organizational routines, administrative systems, distributional networks, communications, databases, and information-communication technologies (Edvinsson & Sullivan, 1996; Roos et al., 1997; Stewart,

1997; Sveiby, 1997; Bontis, 1998; Marr, 2006; Cabrita & Bontis, 2008). It represents developed organizational knowledge inseparable from the organization. Although structural capital improves the capabilities of employees, it must be considered apart from employees. Structural capital refers to knowledge remaining in an organization after employees leave the organization at the end of the workday or even when they permanently leave the organization. In this paper, structural capital consists of elements of efficiency, transaction times, procedural innovativeness, and access to information for codification into knowledge (Bontis, 1998). Without structural capital, intellectual capital would just be human capital. Structural capital has a critical role because it enables measurement of intellectual capital at organizational level (Bontis, 1998).

Renewal capital represents organizational resources to renovate an existing knowledge base and advance learning capabilities. Organizations with more-developed renewal capital are capable of building and enhancing based on previous knowledge and creating new knowledge (Madininos et al., 2010). Because organizations need to survive in an unpredictable and turbulent environment, renewal capital is an important dimension of intellectual capital (Kianto et al., 2010). In this dynamic environment, organizations need to continuously develop and renovate to be ahead of the competition (Eisenhardt & Martin, 2000). Many studies investigated organizational renewal using different terms, such as organizational learning (Huber, 1991), knowledge creation (Nonaka & Takeuchi, 1995), organizational change and development (Weick & Quinn, 1999), dynamic capabilities (Eisenhardt & Martin, 2000), organizational agility (Bessant et al., 2001), continuously innovating (Boer & Gertsen, 2003), and organizational renewal (Kianto, 2008). The capability to learn and to renovate knowledge in organizations determines renewal capital (Kianto et al., 2010), which is a critical aspect of intellectual capital especially in organizations facing a competitive environment (Zollo & Winter, 2002). In this paper, renewal capital consists of organizational learning and knowledge base renewal (Kianto et al., 2010). Renewal capital indicates an organizational ability to learn and to renovate its knowledge which depends on the use of human, relational, and structural capital (Kianto et al., 2010).

The interaction of intellectual capital dimensions combined with tangible resources improves competitive advantage and provides above-average performance (Madininos et al., 2010; F-Jardon & Martos, 2012). Human capital is crucial for building structural capital. It is needed to store knowledge in organizations. On the other hand, structural capital is important for establishing relational capital (F-Jardon & Martos, 2009, 2012). Creative, skilled, and experienced employees with well-developed relationships with customers lead to a large number of product innovations (Martin de Castro et al., 2013). Bontis (1998) indicated that human and structural capital cannot be considered isolated from each other in order to obtain organizational success. Bontis et al. (2000) determined that structural capital is complementary to human and relational capital. Welbourne and Pardo-del-Val (2009) suggested an intrinsic connection between human and relational capital due to humans in organization who create, maintain, and nurture relationships that contribute to organizational performance. Employees, organizational infrastructure, and established networks, individually, are insignificant; their importance becomes crucial because of their interrelationships.

Structural capital has an obvious influence on renewal capital. Explicit knowledge codified and stored in databases of organizations, information systems, and written procedures is a standard basis for creation of new knowledge (Nonaka & Takeuchi, 1995). It is impossible for an organization to learn if there is no accumulated knowledge in databases with open access for employees (Argote & Miron-Spektor, 2011). Because learning is crucial for knowledge renewal, more developed structural capital is a necessary condition for updating knowledge funds. Structural capital, as a consequence of implementing a codification strategy of knowledge management, provides easy access to stored knowledge that can be used to enhance renewal capital. Relational capital refers to knowledge as a product of tacit knowledge sharing in and out of the organization. Relationships between an organization and customers, business partners, and research centres are a source of new knowledge which nurtures and improves organizational capability to learn (Hsu, Fang, 2009). Thus, renewal capital depends on existing knowledge (Kianto et al.,

2010), especially in the form of tacit cognitive and technical knowledge (Bueno et al., 2010). Access to tacit knowledge is possible only through individuals' interaction, which represents an element of personalization strategy of knowledge management focused on communication among individuals instead of knowledge objects located in databases (Hansen et al., 1999).

The following hypotheses are proposed:

- H1. Human capital positively effects relational capital.
- H2. Human capital positively effects structural capital.
- H3. Relational capital positively effects structural capital.
- H4. Relational capital positively effects renewal capital.
- H5. Structural capital positively effects renewal capital.

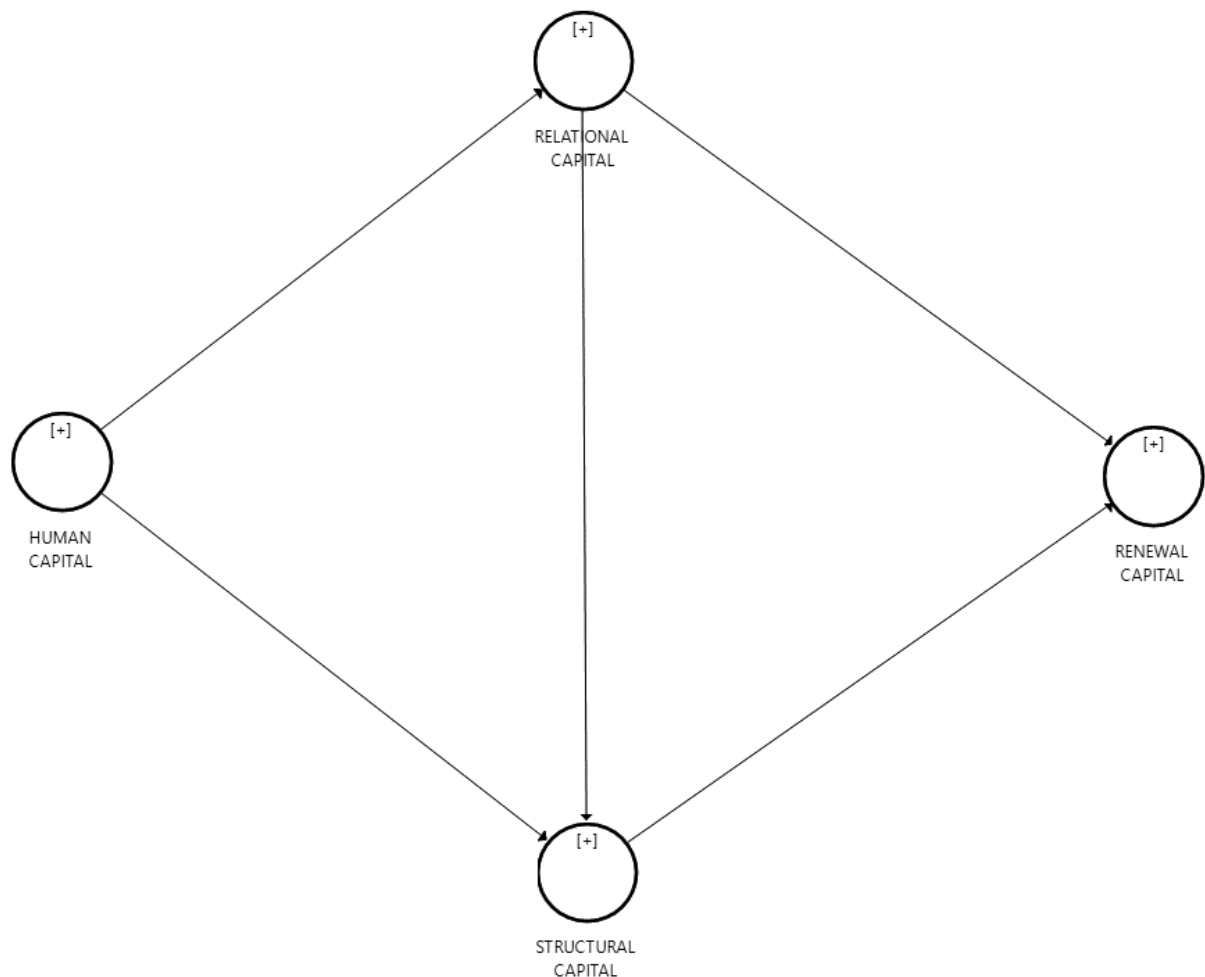
The aim was to test the proposed conceptual research model in Figure 1.

3. METHODOLOGY

3.1 Sample and collection of data

The population used to collect necessary data consisted of registered 3838 organizations as members of Chamber of Commerce and Industry of the Republic of Srpska. To obtain representativeness of the results, 349 organizations were contacted by phone, email, or face-to-face with a request that questionnaire be fulfilled by executives as representatives of each organization. The data collection period was from February to July 2018. Many organizations were contacted several times to obtain representativeness of the sample. At the end of the collection period, questionnaires were returned by 243 organizations. The response rate was 69.62%. Returned questionnaires were thoroughly exam-

Figure 1: Proposed conceptual research model



ined to detect missing data, inconsistency, and outliers that can lead to distortion of results. Through a data-cleansing procedure, 18 questionnaires were detected and excluded from the sample. A final sample of 224 correctly filled questionnaires was used to test the complex relationships between latent variables. The structure of the sample by industry branch is presented in Figure 2.

3.2 Measures

The questionnaire used to measure the intellectual capital dimensions of human capital, structural capital, and relational capital, contained 53 items, developed and validated by Bontis and applied in

many empirical studies on intellectual capital (Bontis, 1998, 1999, 2000). Measures for renewal capital, a less empirically observed intellectual capital dimension, were developed and tested to provide their content validity and psychometric robustness and validated by (Kianto et al., 2010). The questionnaire used in this research is presented in Table 1.

A seven-point Likert scale, where 1 indicated completely disagree and 7 indicated completely agree, was applied to measure intellectual capital dimensions. Perceptual measures were applied to evaluate intellectual capital which are regarded as acceptable indicators of intangibles (Kannan & Aulbur, 2004).

Figure 2: Sample structure: industry branches

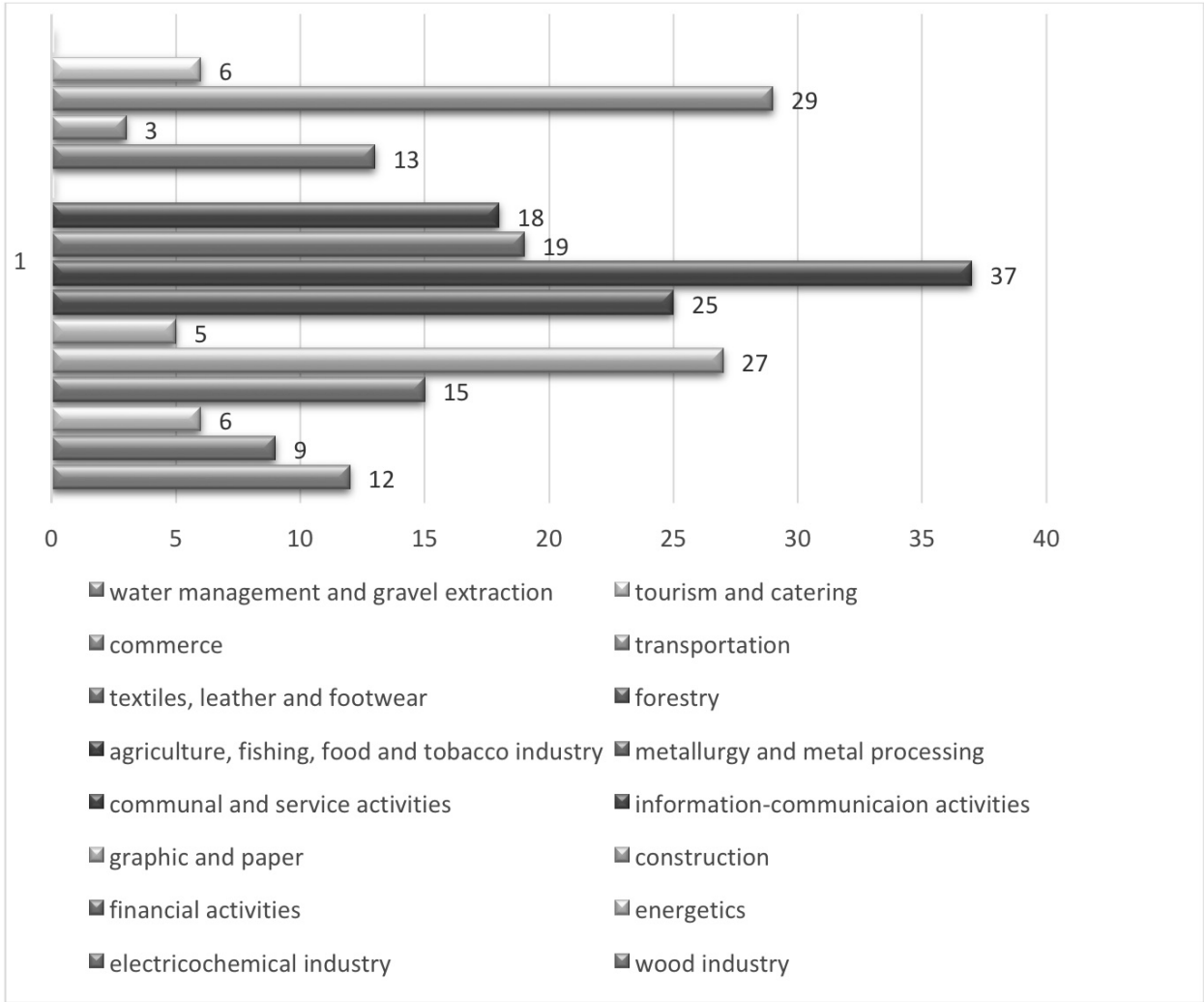


Table 1: Summary of survey items (excerpts from questionnaire)

Human capital				
hc1	competence ideal level		hc11	employees perform their best
hc2	succession training program		hc12	recruitment program comprehensive
hc3	planners on schedule		hc13r*	big trouble if individuals left
hc4	employees cooperate in teams		hc14r*	rarely think actions through
hc5r*	no internal relationships		hc15r*	do without thinking
hc6	come up with new ideas		hc16	individuals learn from others
hc7	upgrade employees' skills		hc17	employees voice opinions
hc8	employees are bright		hc18	get the most out of employees
hc9	employees are best in industry		hc19r*	bring down to others' level
hc10	employees are satisfied		hc20	employees give it their all
Relational capital				
rc1	customers generally satisfied		rc10	meet with customers
rc2	reduce time to resolve problem		rc11	customer info disseminated
rc3	market share improving		rc12	understand target markets
rc4	market share is highest		rc13r*	do not care what customer wants
rc5	longevity of relationships		rc14	capitalize on customers' wants
rc6	value added service		rc15r*	launch what customers don't want
rc7	customers are loyal		rc16	confident of future with customer
rc8	customers increasingly select us		rc17	feedback with customer
rc9	firm is market-oriented			
Structural capital				
sc1	lowest cost per transaction		sc9	develops most ideas in industry
sc2	improving cost per revenue		sc10	firm is efficient
sc3	increase revenue per employee		sc11	systems allow easy info access
sc4	revenue per employee is best		sc12	procedures support innovation
sc5	transaction time decreasing		sc13r*	firm is bureaucratic nightmare
sc6	transaction time is best		sc14	not too far removed from each other
sc7	implement new ideas		sc15	atmosphere is supportive
sc8	supports development of ideas		sc16r*	do not share knowledge
Renewal capital				
rnw1	Our company has acquired a great deal of new and important knowledge			
rnw2	Our employees have acquired many important skills and abilities			
rnw3	Our company can be described as a learning organisation			
rnw4	The operations of our company can be described as creative and inventive			

* r denotes reverse-coded item.

Adapted from Bontis, 1998; Kianto et. al., 2010

3.3 Econometric analysis

Descriptive analysis was carried out using IBM SPSS software in order to indicate the level of development of each item and each latent construct – the intellectual capital dimension. The *t*-values, *p*-values, and bootstrapping 95% confidence interval of the bootstrapping procedure indicated the statistical significance of each item.

Structural equation modelling based on partial least squares was used to test the proposed research hypotheses. Structural model evaluation was performed using SmartPLS 3.2.8 software. The conceptual research model proposes relationships between intellectual capital dimensions which are not direct observable, called latent constructs (Chin, 1998; Ringle et al., 2006). These constructs are operationalized with indicators called manifest variables (Chin, 2010; Hair et al., 2010) which in this study are items in the questionnaire (Chin, 2010). There are two parts to the structural equations. First, a measurement model known as an outer model indicates the relationships between items and their appropriate latent construct. Second, a structural model known as an inner model contains relationships between latent constructs indicating research hypotheses (Chin, 1998).

4. RESULTS

4.1 Power analysis

The partial least squares structural equation modelling (PLS-SEM) technique is appropriate for smaller sample sizes. However, the general rule of thumb indicates that the sample size should be at least 10 times greater than the maximum number of arrows pointing to a certain latent construct (Hair et al., 2014). In this case, there were a maximum of two arrows pointing to the endogenous construct, so the minimal sample size should be 20. The final sample size was 224 observations, which suggests that this sample size is appropriate for PLS estimation. Apart from the rule of thumb, statistical power analysis for multiple regression was performed using G*Power 3.1.9.2, which indicated that the minimal sample size was 55 observations in order to achieve 80% statistical power of the model, a coefficient of determination of 25% of endogenous

construct, or f^2 effect size of 0.15. The final sample size was 224 observations, which exceeds the minimal required sample size for PLS analysis (Chin et al., 2003, 2010).

4.2 Some additional assumptions

Application of the PLS algorithm requires some preconditions to be met. In addition to sample size, SEM based on variance needs to be used in studies in which the research aim is to predict constructs of interest. All latent constructs in the structural model are connected with one-way arrows in a nonrecursive model, so this assumption was met. PLS-SEM belongs to a family of nonparametric techniques that handles nonnormal data in analysis. Kolmogorov–Smirnov’s and Shapiro–Wilk’s normality tests are used for items of intellectual capital dimensions. Tests showed that the normality assumption of the data was not met, which cannot be considered as barrier to use structural equation modelling. PLS-SEM is regarded as robust enough not to require normality distributions of data (Barclay et al., 1995).

4.3 Outer model assessment

According to the literature, there are many guidelines for the evaluation of PLS-SEM results (Chin 1998, 2010; Henseler et al., 2009; Hair et al., 2017). Assessment of PLS-SEM involves two stages: the outer model or measurement model is assessed in the first stage, followed by the second phase in which the structural model or inner model is evaluated. The measurement and structural models are assessed according to some guidelines which offer rules of thumb as a basis to determine whether the obtained results are adequate or not.

In the proposed research model, all latent constructs – human, relational, structural, and renewal capital, as intellectual capital dimensions – are measured by reflective indicators. To assess the fulfilment of reflective measurement model criteria, the following criteria must be examined: indicator reliability, internal consistency analysis to determine construct reliability, convergent validity, and discriminant validity (Hair et al., 2017). In the case of the reflective measurement model, indicator loadings are examined. Indicators with loadings above

the threshold value of 0.7 are retained in the model because loadings above 0.7 indicate that the latent construct explains more than 50% of the variance of indicator, which means that the indicator has a satisfactory level of reliability. Next, internal consistency reliability is assessed using several indicators. Values of these indicators between 0.7 and 0.95 indicate satisfactory to good levels of reliability (Hair et al., 2017). Composite reliability, ρ_c , generally used to assess a construct's reliability (Jöreskog, 1971), has values for intellectual capital dimensions between 0.836 and 0.921, demonstrating high level of construct reliability. The values of other construct reliability coefficients, such as Cronbach's α and ρ_A (Dijkstra & Henseler, 2015), exhibit satisfactory internal consistency of constructs. Convergent validity shows the extent to which a construct converges in its constructs by explaining the variances of items. In other words, convergent validity exhibits whether each intellectual capital dimension is linked with its items. It is assessed by the average variance extracted (AVE) across all items linked with a certain latent construct. All AVE values are above the threshold of 0.5, which means that all intellectual capital dimensions, on average, explain more than 50% of the items' variance. When indicators' and constructs' reliability and convergent validity are successfully established, the next step is to assess discriminant validity. Discriminant validity determines to what extent a latent construct is empirically unique and different from other constructs in the structural model. In this study, discriminant validity is assessed by the heterotrait-monotrait criterion (HTMT) (Henseler et al., 2015). All obtained HTMT values are above the conservative threshold of 0.85. Results are derived from a bootstrapping procedure at the 5% significance level with 5.000 samples and use no sign change option, and two-tailed testing. The BCa bootstrapping confidence interval showed that none of the HTMT BCa confidence intervals include a zero value, which means that all HTMT values are significantly different from 1 and the discriminant validity for all intellectual capital dimensions in the structural model is established.

Results in Table 2 indicate that all parameters have acceptable values above the thresholds, indicating finalization of the assessment of the reflective measurement model.

Table 2: Internal consistency analysis, convergent and discriminant validity

Internal consistency reliability and convergent validity			
Intellectual capital			
Human capital (HC)	Relational capital (RC)	Structural capital (SC)	Renewal capital (RNWC)
Cronbach's α			
0.836	0.740	0.700	0.886
ρ_A			
0.849	0.743	0.711	0.891
ρ_c			
0.883	0.836	0.834	0.921
AVE			
0.602	0.561	0.626	0.745
Retained indicators with loadings above 0.7			
hc6 0.794	rc1 0.784	sc7 0.854	rnwc1 0.868
hc8 0.834	rc2 0.748	sc10 0.765	rnwc2 0.893
hc9 0.771	rc8 0.714	sc12 0.750	rnwc3 0.875
hc10 0.767	rc10 0.749		rnwc4 0.815
hc18 0.706			
Discriminant validity – HTMT values and bootstrapping bias-corrected intervals			
	HC	RC	RNWC
RC	0.637 *[0.502; 0.744]		
SC	0.598 *[0.449; 0.726]	0.567 *[0.385; 0.721]	0.678 *[0.533; 0.794]
RNWC	0.526 *[0.389; 0.647]	0.753 *[0.632; 0.851]	
* The values in brackets represent the lower and the upper bounds of the 95% confidence interval			

4.4 Inner model assessment

After proving the satisfactory quality of the reflective measurement models, next step in the PLS algorithm is the evaluation of the structural model according to several criteria: collinearity issues, coefficient of determination R^2 , f^2 effect size, predictive relevance Q^2 , significance and relevance of the path coefficients, and holdout sample validation.

After checking for collinearity issues among latent constructs and establishing that the variance inflation factor (VIF) has values below the conservative threshold of 3 (VIF values from 1 to 1.35), the evaluation procedure focuses on identification of the predictive relevance of the structural model using the following criteria: coefficient of determination (R^2), cross-validated redundancy (Q^2), and the path coefficients (Table 3).

The coefficient of determination indicates endogenous variance explained by other constructs pointing at them. Relational, structural, and renewal capital have R^2 values of 0.259, 0.27 and 0.472, respectively (Table 3). As a rule of thumb, R^2 values of 0.25, 0.5, and 0.75 are regarded as substantial, moderate, and weak (Henseler et al., 2009; Hair et al., 2011). Interpretation of the obtained R^2 value needs to consider the research context and to compare the R^2 value to R^2 values obtained in related studies. Effect size f^2 indicates the intensity of the impact of certain omitted constructs on the endogenous construct, where f^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and large effects of exogenous constructs (Cohen, 1988). Omitting relational capital has a large effect, whereas omitting structural capital has a moderate effect on renewal capital (Table 3). Omitting human capital has a large effect on relational capital. Predictive relevance of the model can be assessed using the Q^2 value (Geisser, 1974; Stone, 1974) obtained by a blindfolding procedure. Using a blindfolding procedure with omission distance 6, the obtained Q^2 values are larger than zero (Q^2 values from 0.135 to 0.32 were obtained from cross-validation redundancy analysis) for certain en-

dogenous constructs, which indicates that the predictive relevance and accuracy of the path model is acceptable for certain constructs. To test the significance at the 5% level of the direct effect, a bootstrapping procedure with 5,000 samples and no sign change option, two-tailed test is performed. The BCa bootstrapping confidence intervals showed that none of the direct effects of BCa confidence intervals include zero values, which means that all direct effects are significant at the 5% level (Table 3). In terms of relevance, the path coefficients have values ranging from -1 to +1. All direct effects in the research structural model have values from 0.224 to 0.509, indicating positive relationships between particular constructs significant at the 5% level, indicating that all hypotheses are confirmed. Results of the structural model estimation are shown in Figure 3.

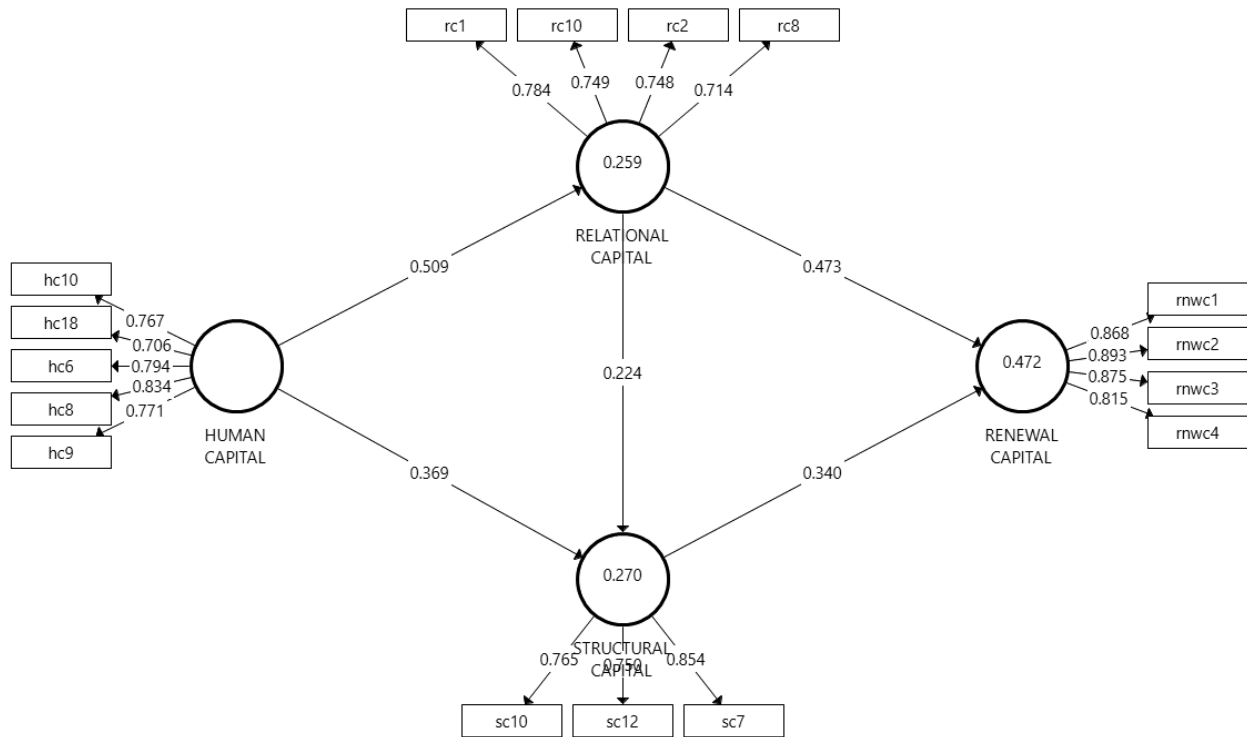
The strongest effect in the structural model is the direct effect of human capital on relational capital (0.509). Human capital has a stronger effect on structural capital (0.369) than does relational capital (0.224). Relational capital has a stronger effect (0.473) on renewal capital than does structural capital (0.34). Details of the relevance and significance of the path coefficients and the predictive relevance of the model are given in Table 3 and Figure 3. When examining the structural model results, researchers should interpret the total effects that represent the sum of direct and indirect effects in the structural model. Interpretation of the total effects provides more comprehensive understanding of the links between latent constructs in the path model. Human capital has only indirect effects on renewal capital via relational and structural capital in the path

Table 3: Direct effects and predictive relevance of structural model

	Direct effects	t-value	p-value	95%BCa confidence interval		Expected result*	Obtained result*	R^2	f^2 effect size
				2.5%	97.5%				
HC -> RC	0.509	9.812	0.000	0.399	0.602	+	√	0.259	0.350
HC -> SC	0.369	5.473	0.000	0.234	0.497	+	√	0.270	0.138
RC -> RNWC	0.473	8.459	0.000	0.352	0.575	+	√	0.472	0.352
RC -> SC	0.224	3.039	0.002	0.076	0.367	+	√	0.270	0.051
SC -> RNWC	0.340	5.564	0.000	0.220	0.458	+	√	0.472	0.181

* + denotes positive relationship; √ denotes confirmed relationship.

Figure 3: Structural model assessment



model, so it can be concluded that human capital has a significantly larger impact on organizational renewal through relational capital. In addition to direct effects, relational capital has an indirect effect on renewal capital via structural capital. The total effect of relational capital on renewal capital is stronger than its direct effect, with the help of structural capital as mediator.

5. DISCUSSION AND CONCLUSION

This research examined the complementary role of traditional intellectual capital dimensions, such as relational and structural capital, as representatives of tacit and explicit knowledge in renovating knowledge bases and organizational renewal. Extant previous research in the field of intellectual capital rarely mentions renewal capital as part of intellectual capital or focuses on its relevance. The findings of this study reveal the important role of renewal capital as a potential dimension of intellectual capital, especially in the dynamic and unpredictable business environment of organizations in transition economies.

In terms of the intercorrelation of intellectual capital dimensions, human capital has the strongest direct effect on relational capital. More-developed human capital, which means a more-qualified and better-trained work force, leads to more-developed capabilities and skills to satisfy customers demands and needs (Bontis et al. 2000). Workers possessing advanced knowledge and skills are more capable of developing better and higher-quality relationships with customers based on their formal education, expertise, and capabilities, which enables accumulation of relational capital resources. Hypothesis 1 is confirmed. Results of previous research confirm a positive relationship between human capital and relational capital with following direct effects: 0.315 (Tseng & Goo, 2005), 0.391 (Cabrita & Bontis, 2008), 0.463 (F-Jardon & Martos, 2009), 0.465 and 0.568 (Shih et al., 2010), 0.701 and 0.771 (Madininos et al., 2010), and 0.798 (Bontis et al., 2000).

The weakest direct effect in the proposed research model is that of human on structural capital, which indicates a lack of or underdeveloped organizational capabilities to transform individual tacit knowledge into explicit knowledge. Obviously, orga-

nizations in the Republic of Srpska are aware of the importance of the externalization of knowledge owned by employees. However, organizations still are facing challenges how to manage tacit knowledge, through adequate knowledge codification systems and innovation procedures, and retain knowledge inside the organizations. Hypothesis 2 is confirmed. Previous research detected similar direct effects of human capital on structural capital, such as 0.264 and 0.280 (Madinios et al., 2010), 0.304 and 0.525 (Bontis et al., 2000), 0.397 (F-Jardon & Martos, 2009), 0.546 (Martínez-Torres, 2006), 0.550 (Tseng & Goo, 2005), 0.755 (Cabrita & Bontis, 2008), and 0.886 (Shih et al., 2010).

Relational capital has a weaker positive direct effect on structural capital than renewal capital. External communication with stakeholders and the market leads to the development of adequate systems and procedures as providers of relevant information to employees. However, incorporating external information into internal organizational structures is undeveloped. Neglecting the importance of explicit knowledge adoption and integration implies omission of potentially significant information about clients, which can result in missing interesting business and market opportunities. Redirecting organizations toward the market and customers can lead to the creation of efficient organizational routines and processes as determinants of customer satisfaction (Bontis et al., 2000). Hypothesis 3 is confirmed. Results of previous studies indicate a positive stronger direct effect of relational capital on structural capital, such as 0.359 (Shih et al., 2010), 0.399 (Cabrita & Bontis, 2008), 0.441 and 0.496 (Bontis et al., 2000), and 0.489 (F-Jardon & Martos, 2009). Relational capital has a nearly two times stronger direct effect on renewal capital than does structural capital in organizations in the Republic of Srpska, Bosnia and Herzegovina. Clients and business relationships represent a channel for gaining new knowledge that enhances organizational capability to learn (Hsu & Fang, 2009). Organizations in the Republic of Srpska are focused on the development of connections with the external environment that improve organizational knowledge. Hypothesis 4 is confirmed. Results of similar studies showed the direct effect of relational on renewal capital, such as 0.179, 0.208, 0.278, and 0.324 (Buenechea-Elberdin et al., 2018).

Structural capital has a weaker positive direct effect on renewal capital than does relational capital. Explicit knowledge codified and stored in organizational systems and procedures represents one of the main sources of knowledge creation (Nonaka & Takeuchi, 1995). Without organizational systems and procedures that deliver relevant information to employees (Argote & Miron-Spektor, 2011), organizations cannot learn. Structural capital development enables easy access to knowledge that enhances organizational renewal capability. Hypothesis 5 is confirmed. Relational and structural capital play an important role in renewal capital creation and development. Knowledge base renovation depends on previously developed knowledge resources and tacit knowledge created through employee–environment interaction. The synergetic effect of relational and structural capital improves organizational capability to learn (Hansen et al., 1999; Storey & Kahn, 2010; Kuma & Ganesh, 2011). Relational capital has a dominant role in acquiring new knowledge and learning, which implies the dominance of personalization strategy as a knowledge management strategy in which knowledge is created through individuals' interaction, whereas codification knowledge has a secondary role.

In terms of the prediction relevance of the structural model, it can be concluded that the proposed interrelationships between intellectual capital dimensions explain 47.2% of renewal capital's variance, which is relatively high considering that the model has only relational and structural capitals as predictors. Results of previous studies indicated similar values of renewal capital's coefficient of determination, such as 0.393 and 0.433 (Buenechea-Elberdin et al., 2017). Structural capital's coefficient of determination of 27% is a relatively weak result, but similar to results were obtained in other studies with human and relational capital as predictors, with values of R^2 such as 0.565 (F-Jardon & Martos, 2009), 0.680 (St-Pierre & Audet, 2011) and some weaker results such as 0.039 (Wang & Chang, 2005) and 0.249 (Bontis, 1998). With values of 25.9%, the R^2 of relational capital is quite high considering that it has only human capital as its predictor. Results of previous studies indicated similar values of relational capital's R^2 , such as 0.170 (St-Pierre & Audet, 2011) and 0.214 (F-Jardon & Martos, 2009).

The aim of this research was to test and emphasize the relevance of intellectual capital management in the context of a transition economy such as the Republic of Srpska, Bosnia and Herzegovina. To the author's knowledge, there are no studies examining the relationship between intellectual capital dimensions of human, relational, structural, and renewal capital in the case of organizations in the Republic of Srpska, Bosnia and Herzegovina.

It can be concluded that renewal capital to a large extent is dependent on previously developed knowledge resources in organizations in the form of relational and structural capital. Organizations with a developed base of tacit and explicit knowledge have better preconditions to create and enhance organizational renewal. Relational and structural capital as a result of pursuing personalization and codification knowledge management strategies have a significant role in creating renewal capital. These knowledge management strategies are combined in organizations in the Republic of Srpska, which is in accordance with previous empirical results (Hansen et al., 1999; Storey & Kahn, 2010). Results show that it is important to promote personal interaction and codification of tacit knowledge in an organization to enhance the knowledge base and to improve the organizational ability to learn.

Future studies should examine the impact of interrelationships of intellectual capital dimensions on organizational performance. It would be especially interesting to determine the role of renewal capital as a mediator in intellectual capital–innovation performance in transition economies. In addition, innovation performance could be classified into process and product innovations to gain detailed insight into the nature and intensity of relationships between tested conceptualized intellectual capital and certain types of innovations in transition economies. As control variables in future studies, the size of the organization, the industry branch, product- or service-oriented organizations, and the level of technological sophistication could be used to gain a comprehensive understanding of the nature of links between intellectual capital dimensions.

There are several limitations of this study. The sample structure is a limitation because there was a dominance of service-oriented organizations, which prevents generalization of the results for the population. The assumption of the application of PLS-SEM implies the possibility of using the PLS algorithm to test only nonrecursive models. This represents one of the methodological limitations of the study. In the proposed research model, certain types of one-way relationships were tested. Studies showing other types of intellectual capital dimensions' interaction could be tested in the context of a transition economy such as the Republic of Srpska, Bosnia and Herzegovina. Using only perceptual measures to measure intellectual capital dimension represents the next research limitation. Future studies should reconsider using objective measures to measure intellectual capital dimensions.

From an academic perspective, the results of this research contribute to the existing literature in the intellectual capital field by examining intellectual capital in a transition economy and by identifying the importance of analyzing renewal capital as an intellectual capital dimension and its links with other intellectual capital dimensions. According to the obtained results, renewal capital represents an important knowledge resource, especially in organizations in transition economies.

From a managers' perspective, this research suggests the importance of using an intellectual capital frame to assess the presence of different forms of knowledge resources in organizations in a transition economy such as the Republic of Srpska, Bosnia and Herzegovina, and their inter-relationships. Managers are able to better understand the significance of each intellectual capital dimension and intensity of their mutual links in order to make better decisions to allocate their limited resources to those activities which yield direct and indirect effects on intellectual capital development.

EXTENDED SUMMARY/IZVLEČEK

Organizacijska sposobnost ustvarjanja in uspešnega ravnanja z znanjem v različnih oblikah je postala osnova za vrhunsko organizacijsko uspešnost in trajnostno konkurenčnost. Dandanes se pomen znanja in neopredmetenih sredstev, tj. intelektualni kapital hitro povečuje. Slednje je moč opaziti predvsem v razvitih gospodarstvih. Neopredmetena sredstva imajo prevladujočo vlogo in postopoma nadomeščajo fizične vire kot najpomembnejši proizvodni faktor za organizacijski uspeh. Kljub temu da so številne študije pokazale pomembne ugotovitve na področju merjenja intelektualnega kapitala in njegove konceptualizacije, še vedno ni enoznačnega soglasja glede razsežnosti intelektualnega kapitala. Pretekle raziskave so se osredotočile predvsem na tradicionalno razsežnost intelektualnega kapitala – človeški, relacijski in strukturni kapital – zanemarjajo pa zmogljivost obnavljanja v organizaciji kot razsežnost intelektualnega kapitala. O tem, ali obstajajo medsebojne povezave tradicionalnih razsežnosti intelektualnega kapitala v tranzicijskih gospodarstvih, ni sistematičnih ugotovitev. Ta prispevek, pripravljen v okviru tranzicijskega gospodarstva, obravnava in empirično preverja dopolnilno vlogo tradicionalnih razsežnosti intelektualnega kapitala v organizacijskem obnavljanju. Primarni podatki so bili zbrani z uporabo predhodno psihometrično validiranih vprašalnikov iz 224 organizacij iz Republike Srbske znotraj Bosne in Hercegovine. Hipoteze so bile preizkušene z modeliranjem strukturnih enačb po metodi delnih najmanjših kvadratov (PLS-SEM). Izsledki raziskave kažejo, da ima obnovitveni kapital pomembno vlogo. Prav tako dokazuje intenzivnost povezovalnega relacijskega in strukturnega kapitala z obnovo znanja, pri čemer je poudarek na pomenu različnih oblik znanja v organizacijski obnovi. Managerji lahko najdejo nekaj koristnih navodil za učinkovito upravljanje intelektualnega kapitala in se zavejo prisotnosti medsebojne povezanosti virov znanja ter njihovega pomena za organizacijsko obnovo.

REFERENCES

- Argote, L., & Miron-Spektor, E. (2011). Organizational learning: From experience to knowledge. *Organization Science*, 22(5), 1123-1137.
- Barclay, D., Higgins, C., & Thompson, R. (1995). *The partial least squares (PLS) approach to casual modeling: personal computer adoption and use as an illustration*.
- Bessant, J., Knowles, D., Francis, D., & Meredith, S. (2001). Developing the agile enterprise. *Agile Manufacturing: The 21st Century Competitive Strategy*, 113-130.
- Boer, H., & Gertsen, F. (2003). From continuous improvement to continuous innovation: a (retro)(per)spective. *International Journal of Technology Management*, 26(8), 805-827.
- Bontis, N. (1998). Intellectual capital – An exploratory study that develops measures and models. *Management Decision*, 36(2), 63-76.
- Bontis, N. (1999). Managing organizational knowledge by diagnosing intellectual capital: Framing and advancing the state of the field. *International Journal of Technology Management*, 18(5/6/7/8), 433-462.
- Bontis, N., Keow, W. C., & Richardson, S. (2000). Intellectual capital and business performance in Malaysian industries. *Journal of Intellectual Capital*, 1(1), 85-100.
- Bontis, N. (2001). Assessing knowledge assets: a review of the models used to measure intellectual capital. *International journal of management reviews*, 3(1), 41-60.
- Bontis, N. (2004). National Intellectual Capital Index: A United Nations initiative for the Arab region. *Journal of Intellectual Capital*, 5(1), 13 – 39.
- Brooking, A. (1996). *Intellectual capital*. Boston: International Thomson Business Press.
- Buenechea-Elberdin, M., Sáenz, J., & Kianto, A. (2017). Exploring the role of human capital, renewal capital and entrepreneurial capital in innovation performance in high-tech and low-tech firms. *Knowledge Management Research & Practice*, 15(3), 369-379.
- Buenechea-Elberdin, M., Kianto, A., & Sáenz, J. (2018). Intellectual capital drivers of product and managerial innovation in high tech and low-tech firms. *R&D Management*, 48(3), 290-307.

- Bueno, E., Aragon, J. A., Paz Salmador, M., & García, V. J. (2010). Tangible slack versus intangible resources: the influence of technology slack and tacit knowledge on the capability of organizational learning to generate innovation and performance. *International Journal of Technology Management*, 49(4), 314-337.
- Cabrita, M. D. R., & Bontis, N. (2008). Intellectual capital and business performance in the Portuguese banking industry. *International Journal of Technology Management*, 43(1-3), 212-237.
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern Methods for Business Research*, 295(2), 295-336.
- Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information Systems Research*, 14(2), 189-217.
- Chin, W. W. (2010). How to write up and report PLS analyses. In *Handbook of partial least squares* (pp. 655-690). Springer, Berlin, Heidelberg.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Mahwah: Lawrence Erlbaum Associates.
- Cohen, S., & Kaimenakis, N. (2007). Intellectual capital and corporate performance in knowledge-intensive SMEs. *The Learning Organization*, 14(3), 241-262.
- Dijkstra, T. K., & Henseler, J. (2015). Consistent and asymptotically normal PLS estimators for linear structural equations. *Computational Statistics & Data Analysis*, 81(1), 10-23.
- Edvinsson, R. (2009). Swedish harvests, 1665-1820: Early modern growth in the periphery of European economy. *Scandinavian Economic History Review*, 57(1), 2-25.
- Edvinsson, L., & Sullivan, P. (1996). Developing a model for managing intellectual capital. *European management journal*, 14(4), 356-364.
- Edvinsson, L., & Malone, M. S. (1997). *Intellectual capital: The proven way to establish your company's real value by finding its hidden brainpower*. Piatkus.
- Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: what are they? *Strategic management journal*, 21(10-11), 1105-1121.
- F-Jardon, C. M., & Martos, M. S. (2009). Intellectual capital and performance in wood industries of Argentina. *Journal of Intellectual Capital*, 10(4), 600-616.
- Jardon, C. M., & Susana Martos, M. (2012). Intellectual capital as competitive advantage in emerging clusters in Latin America. *Journal of Intellectual Capital*, 13(4), 462-481.
- Geisser, S. (1974). A predictive approach to the random effects model. *Biometrika*, 61(1), 101-107.
- Hair, J.F., Black, W.C., Babin, B.J., & Anderson, R.E. (2010). *Multivariate data analysis*, 7th ed., Prentice Hall, Upper Saddle River, NJ.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139-151.
- Hair Jr, J., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research. *European Business Review*, 26(2), 106-121.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2nd ed.). Thousand Oaks: Sage Publications.
- Hansen, M. T., Nohria, N., & Tierney, T. (1999). What's your strategy for managing knowledge. *The Knowledge Management Yearbook, 2000-2001*, 77(2), 106-116.
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. In R. R. Sinkovics & P. N. Ghauri (Eds.), *Advances in international marketing* (Vol. 20), 277-320. Bingley: Emerald.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115-135.
- Hsu, Y. A., & Fang, W. (2009). Intellectual capital and new product development performance: The mediating role of organizational learning capability. *Technological Forecasting & Social Change*, 76, 664-677.
- Huang, Y. C. & Wu, Y. C. J. 2010. Intellectual capital and knowledge productivity: the Taiwan biotech industry. *Management Decision*, 48(4), 580 - 599.
- Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. *Organization science*, 2(1), 88-115.
- Inkinen, H. (2015). Review of empirical research on intellectual capital and firm performance. *Journal of Intellectual Capital*, 16(3), 518-565.
- Jöreskog, K. G. (1971). Statistical analysis of sets of congeneric tests. *Psychometrika*, 36(2), 109-133.
- Kannan, G., & Aulbur, W. G. (2004). Intellectual capital: measurement effectiveness. *Journal of Intellectual Capital*, 5(3), 389-413.
- Khan, S. (2011). The interactive effects of intellectual capital components on the relevance of the balance sheet as an indicator of corporate value. *Journal of American Academy of Business*, 130-136.
- Kianto, A. (2007). What do we really mean by the dynamic dimension of intellectual capital? *International Journal of Learning and Intellectual Capital*, 4(4), 342-356.

- Kianto, A. (2008). Assessing organizational renewal capability. *International Journal of Innovation and Regional Development*, 1(2), 115-129.
- Kianto, A., Hurmelinna-Laukkanen, P., & Ritala, P. (2010). Intellectual capital in service-and product-oriented companies. *Journal of Intellectual Capital*, 11(3), 305-325.
- Kronfeld, M., & Rock, A. (1958). Some considerations of the infinite. *Financial Analysts Journal*, 14(5), 87-90.
- Maditinos, D., Sevic, Z., & Tsairidis, C. (2010). Intellectual capital and business performance: An empirical study for the Greek listed companies. *European Research Studies*, 13(3), 145-167.
- Marr, B. (2004). Measuring and benchmarking intellectual capital. *Benchmarking: An International Journal*, 11(6), 559-570.
- Martínez-Torres, M. R. (2006). A procedure to design a structural and measurement model of intellectual capital: an exploratory study. *Information & Management*, 43(5), 617-626.
- Martín-de-Castro, G., Delgado-Verde, M., López-Sáez, P., & Navas-López, J. E. (2011). Towards 'an intellectual capital-based view of the firm': origins and nature. *Journal of Business Ethics*, 98(4), 649-662.
- Martín-de Castro, G., Delgado-Verde, M., Navas-López, J. E., & Cruz-González, J. (2013). The moderating role of innovation culture in the relationship between knowledge assets and product innovation. *Technological Forecasting and Social Change*, 80(2), 351-363.
- Mention, A. L., & Bontis, N. (2013). Intellectual capital and performance within the banking sector of Luxembourg and Belgium. *Journal of Intellectual Capital*, 14(2), 286-309.
- Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford University Press.
- Petty, R., & Guthrie, J. (2000). Intellectual capital literature review: measurement, reporting and management. *Journal of intellectual capital*, 1(2), 155-176.
- Pöyhönen, A. (2005, December). Exploring the dynamic dimension of intellectual capital: renewal capability, knowledge assets and production of sustained competitive advantage. In *PMA IC Symposium: Management and Measurement of Intangible Assets and Intellectual Capital: Multidisciplinary Insights*. New York, 15-16.
- Reed, K. K., Lubatkin, M., & Srinivasan, N. (2006). Proposing and testing an intellectual capital-based view of the firm. *Journal of Management studies*, 43(4), 867-893.
- Ringle, C. M., Boysen, N., Wende, S., & Will, A. (2006). Messung von kausalmodellen mit dem partial – least – squares - verfahren. *Das Wirtschaftsstudium*, 35(1), 81-88.
- Roos, J., Roos, G., Edvinsson, L. & Dragonetti, N.C. (1997). *Intellectual Capital*. Macmillan, London.
- Serenko, A., & Bontis, N. (2004). Meta-review of knowledge management and intellectual capital literature: Citation impact and research productivity rankings. *Knowledge and process management*, 11(3), 185-198.
- Shih, K. H., Chang, C. J., & Lin, B. (2010). Assessing knowledge creation and intellectual capital in banking industry. *Journal of Intellectual Capital*, 11(1), 74-89.
- Stewart, T. A. (1991). Brainpower. *Fortune*, 123(11), 44.
- Stewart, T. A. (1997). *Intellectual Capital: The New Wealth of Organizations*. Bantam Doubleday Dell Publishing group, New York, NY.
- Stone, M. (1974). Cross-validatory choice and assessment of statistical predictions. *Journal of the Royal Statistical Society: Series B (Methodological)*, 36(2), 111-133.
- Storey, C., & Kahn, K. B. (2010). The role of knowledge management strategies and task knowledge in stimulating service innovation. *Journal of Service Research*, 13(4), 397-410.
- St-Pierre, J., & Audet, J. (2011). Intangible assets and performance: Analysis on manufacturing SMEs. *Journal of Intellectual Capital*, 12(2), 202-223.
- Sveiby, K.E. (1997). *The New Organizational Wealth: Managing and Measuring Knowledge based Assets*. Barrett-Kohler, San Francisco, CA.
- Tseng, C. Y., & James Goo, Y. J. (2005). Intellectual capital and corporate value in an emerging economy: empirical study of Taiwanese manufacturers. *R&D Management*, 35(2), 187-201.
- Wang, W. Y., & Chang, C. (2005). Intellectual capital and performance in causal models: evidence from the information technology industry in Taiwan. *Journal of Intellectual Capital*, 6(2), 222-236.
- Wang, Q., & von Tunzelmann, N. (2000). Complexity and the functions of the firm: breadth and depth. *Research policy*, 29(7-8), 805-818.
- Weick, K. E., & Quinn, R. E. (1999). Organizational change and development. *Annual review of psychology*, 50(1), 361-386.
- Welbourne, T. M., & Pardo-del-Val, M. (2009). Relational capital: strategic advantage for small and medium-size enterprises (SMEs) through negotiation and collaboration. *Group Decision and Negotiation*, 18(5), 483-497.
- Zerenler, M., Hasiloglu, S. B., & Sezgin, M. (2008). Intellectual capital and innovation performance: empirical evidence in the Turkish automotive supplier. *Journal of technology management & innovation*, 3(4), 31-40.
- Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization science*, 13(3), 339-351.