The impacts of intellectual capital, innovation and organizational strategy on firm performance

Adnan Kalkan\textsuperscript{a}, Özlem Çetinkaya Bozkurt\textsuperscript{b}, Mutlu Arman\textsuperscript{c}, a\textsuperscript{*}

\textsuperscript{a,b} Mehmet Akif Ersoy University, Burdur, 15300, Turkey
\textsuperscript{c}Pamukkale University, Denizli, 20070, Turkey

Abstract

The concept of intellectual capital was popularized by Tom Stewart in 1991 when Fortune Magazine published his article “Brainpower: How intellectual capital is becoming Americas’ most valuable asset”. It can be described as the difference between a firm’s market value and the cost of replacing its assets. Today innovation is considered as a necessity for every company due to the terminating competition in market, globalization and rapid development of technology. Innovation is defined as “implementing new ideas that create value”. Strategy is the outcome of decisions made to guide an organization with respect to environment, structure and processes that influence its firm performance. The organizational literature that improved business performance requires an organizational structure, information systems and management style that are related to a specific-firm strategy. Firm performance can be measured in a variety of ways, including financial performance, product performance and market performance. The purpose of this study is to research the relationships between intellectual capital, innovation, organizational strategy and firm performance. The main contribution of this study is to investigate the effects of intellectual capital, innovation and organizational strategy on performance of firms operating in Antalya, Turkey.

Corresponding author: Assoc. Prof. Dr. Adnan Kalkan, Tel. + 90-248-325-6534 fax. +90-248-325-8509
Email address: adnankalkan@mehmetakif.edu.tr

Keywords: Intellectual capital, Innovation, Organizational strategy, Firm performance
1. Introduction

Intellectual capital evaluation seems to be one of the most important and relevant topics in the new strategic management (Roos et al., 2005). It is widely accepted that an organization’s capability to innovate is closely tied to its intellectual capital, or its ability to utilize its knowledge resources. Intellectual capital has been studied by many past researchers (Amir and Lev, 1996; Edvinsson and Malone, 1997; Wen-Ying and Chang, 2005; Rehman et al., 2011; Ahmad and Mushraf, 2011) who investigate the influence of intellectual capital on firm performance. According to Mohan Subramaniam and Youndt (2005) human, organizational and social capital and their interrelationships selectively influenced incremental and radical innovative capabilities. As anticipated, organizational capital positively influenced incremental innovative capability, while human capital interacted with social capital to positively influence radical innovative capability.

With this study the relationships between intellectual capital, organizational strategy, innovation and firm performance have been researched.

2. Literature Review and Hypotheses

2.1. Intellectual capital

The concept of intellectual capital was first used in 1969 by John Kenneth Galbraith in a letter to Michael Kalecki. However, it was Tom Stewart who popularized the concept in 1991, when Fortune Magazine published his article “Brainpower: How intellectual capital is becoming Americas’ most valuable asset” (Bontis, 1998). There are various definitions of intellectual capital in the literature. Intellectual capital has also been defined as the difference between a firm’s market value and the cost of replacing its assets. Stewart (1997) defined intellectual capital as the total stocks of the collective knowledge, information, technologies, intellectual property rights, experience, organization learning and competence, team communication systems, customer relations, and brands that are able to create values for a firm.

Components of intellectual capital consist of human capital, structural capital and external (customer) capital. This classification is admitted in general.

- Human capital
  Human capital is recognized as the largest and the most important intangible asset in an organization. According to Schultz (1993), the term “human capital” has been defined as a key element in improving a firm assets and employees to increase productive as well as sustain competitive advantage. Human capital refers to processes that relate to training, education and other professional initiatives to increase the levels of knowledge, skills, abilities, values, and social assets of an employee which will lead to the employee’s satisfaction and performance, and eventually on a firm performance (Marimuthu, et al., 2009).

- Structural capital
  Structural capital includes all the non-human storehouses of knowledge in organizations which include the databases, organizational charts, process manuals, strategies, routines and anything whose value to the company is higher than its material value. Roos et al. (1997: 42) describe structural capital as “what remains in the company when employees go home for the night”.

- Customer capital
  Customer capital is also named relational capital and external capital. This capital refers to the organization’s relationships or network of associates and their satisfaction with and loyalty to the company (Akpunar and Akdemir, 1999). Customer capital puts forward the value of the relationship of an enterprise with customers, suppliers and the rest of the society for consideration and states the loyalty of mentioned ones to the enterprise (Chwalowski, 1997:89).

2.2. Innovation

Due to fierce competition in the marketplace, globalization and an explosion of technology in recent years, innovation and differentiation are considered as a necessity for every company. At the same time, to achieve market success and sustain a competitive advantage, businesses need to exploit new opportunities, develop new products...
Innovation is defined as “implementing new ideas that create value”. This generic description refers to the various types of innovation such as product development, the deployment of new process technologies, and also management practices. This means the adoption of new products and/or processes to increase competitiveness and overall profitability, based on customer needs and requirements (Leskovar, 2007: 535). The Oslo guide (2005: 51) has given a large extent place to the definitions about innovation and the types of innovation. In these definitions, four types of innovation are discussed. These are product innovation, process innovation, marketing innovation and organizational innovation.

Product innovations include both presentation of new products and services to market, and major improvements in the functional or user characteristics of existing goods and services (Oslo guide, 2005: 52). Process innovation includes major changes in methods, equipments and/or software. A new type of production method can be an example for process innovation. Marketing innovations, to increase the company’s sales, aim to respond the customers’ needs more successful way, open new markets or locate a company’s product in market in a new way. The new sales techniques, new financial methods (venture capital) can be seen as marketing innovations. Organizational innovation can be defined as implementing a new organizational method in commercial practices, workplace organization or external relations for a company (Antonioli, et al., 2004: 19). Organizational innovations in commercial practices, involve the realization of new methods of organizing routines and procedures for conducting the work.

2.3. Organizational strategy

Strategy is the outcome of decisions made to guide an organization with respect to environment, structure and processes that influence its organizational performance. There are several typologies. According to Zahra and Pearce (1990) and Smith et al. (1989), the most popular typology is Miles and Snow’s. Miles and Snow’s typology consists of four types of business strategy defined as prospector, defender, analyzer and reactor (Croteau and Bergeron, 2001: 78-79). If management does not select one of these strategies, then the organization will be slow to respond to opportunities and probably show an ineffective performance in its sector (Hambrick, 1983: 8).

Organizations supporting the prospector strategy wish to have access to the largest possible market. They are characterized by their repeated efforts to innovate and bring changes in their industry. Organizations favoring the defender strategy have a restricted market and stress production efficiency. They emphasize the excellence of their products, the quality of their services and their lower prices. Organizations implementing the analyzer strategy share both prospector and defender characteristics, but in moderation. They seek to be first to introduce some new products, but are satisfied to remain in second place with certain products that offer a good quality/price ratio. Finally, organizations supporting the reactor strategy ignore new opportunities, and cannot maintain markets already acquired or take true risks (Croteau and Bergeron, 2001: 78-79).

2.4. Firm performance

Firm performance can be measured in a variety of ways, including financial performance (e.g., profitability, return on investment), product performance (e.g., product reliability, number of unique product features), and market performance (e.g., market share, customer satisfaction) (Jones, Lanctot and Teegen, 2000: 263).

For business firms, two groups of measures may serve as a basis for performance assessment. They are growth measures such as sales growth, and profit measures such as return on assets (ROA) and return on sales (ROS). The former is indicative of how effectively a firm can open up new markets or expand in existing markets. The latter shows the efficiency of its operation (Li and Ye, 1999: 45).

Some empirical evidence suggests that in certain cases both internal and external technology acquisition should lead to improved firm performance, along several performance measures. Zahra (1996) studied the relationship between firm financial performance and technology strategy and found that while external technology sourcing is often beneficial, its effect on firm financial performance was moderated by the firm’s operating environment and was negatively associated with financial performance in stable and homogeneous environments (Jones, Lanctot and Teegen, 2000: 263).
The organizational literature (e.g. Miles and Snow) suggests that improved business performance requires an organizational structure, information systems and management style that are related to a specific-firm strategy (Miles and Snow, 1994).

Despite the difficulties in explaining the contribution of information technology to firm performance, a few studies have concluded on the importance of the alignment among business strategy, information technology, and firm performance. In a study on firm performance, Bergeron and Raymond (1995) used both an objective (return on assets) and a subjective measurement (instrument of Venkatraman, 1989b); in each case, the results obtained were comparable and significant (Croteau and Bergeron, 2001: 81).

A strategic plan must specify goals, strategic objectives and actions and the final performance measures by which management and the stockholders will gauge success. Top management’s performance can usually be measured in terms of sales volume, market share, cash flow, profit, ROI, dividends and market value (Donovan, 2009: 1).

3. Methodology

3.1. Research Goal

In this survey, we aim to identify the effects of intellectual capital, innovation and organizational strategy on firm performance. For this study a field survey using questionnaires were conducted. Insurance companies operating in Antalya were chosen as the research population. Data obtained from these questionnaires were analyzed and three hypotheses were tested by correlation and regression analyses.

**Hypothesis 1:** Intellectual capital has a positive effect on firm performance.

**Hypothesis 2:** Innovation has a positive effect on firm performance.

**Hypothesis 3:** Organizational strategy has a positive effect on firm performance.

3.2. Sample and Data Collection

In this study, a field survey using questionnaires were conducted for analysis. Firms operating in insurance companies sectors in Antalya were chosen as the research population. Randomly selected 186 insurance companies were taken as the sample of the research. The number of insurance companies registered to Antalya Chamber of Commerce and Industry is 435 (population) in Antalya 2013. Analysis has been carried out using data which were obtained from the insurance firms in Antalya by using a questionnaire form. The respondents were chosen from the middle and senior managers of firms. Questionnaires were subjected to respondents by interviewing face to face. Data obtained from those 186 questionnaires were analyzed through the SPSS 20.0 statistical program.

The question items were developed after a thorough review of literature related on intellectual capital and performance such as Atieno (2009), Man and Wafa (2008), Boudreau and Ramstad, (1997), Marr and Neely (2001). In this study the scales for business strategies (Croteau ve Bergeron, 2001) were used. As creating a set of questions used in the form of the questionnaires, the scales for innovation (Akman and Yildiz, 2008) were used.

3.3. Analyses and Results

First the Descriptive Statistics test was applied in order to obtain descriptive information about insurance companies. The values obtained from the test are given in Table 1.
Cronbach’s alpha is .812 and Cronbach’s alpha based on standardized items is .836 for reliability statistics. The reliability coefficients for variables are given in Table 2.

| Variables               | # of Items | Cronbach’s Alpha |
|-------------------------|------------|------------------|
| Intellectual capital    | 6          | 0.852            |
| Innovation              | 5          | 0.865            |
| Organizational Strategy | 4          | 0.822            |
| Firm performance        | 5          | 0.823            |

Alpha coefficients obtained were accepted because they were higher than 0.50, as defined by Bagozzi and Yi (1988), and 0.70 as defined by Nunnally (1978), respectively.

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is 0.715 and Sig. is 0.000. KMO value is greater than 0.50. Therefore data set is suitable for factor analysis. The cumulative percent in rotation sums of squared loadings is 61.051. This result shows that four factors resulted in factor analysis explained 61.051 % of the total variance.

The Pearson correlation was used to examine the relations between the variables. The results show that all the variables correlate with the firm performance (Table 4).

| Variables               | IC     | IN     | ST     | FP     |
|-------------------------|--------|--------|--------|--------|
| Intellectual capital (IC)| Pearson Correlation | 1      | 0.292** | 0.273** | 0.222** |
|                         | Sig. (2- tailed)    | 0.000  | 0.000  | 0.002  |
|                         | N           | 186    | 186    | 186    | 186    |
| Innovation (IN)         | Pearson Correlation | 0.292** | 1      | 0.561** | 0.221** |
|                         | Sig. (2- tailed)    | 0.000  | 0.000  | 0.002  |
|                         | N           | 186    | 186    | 186    | 186    |
| Organizational Strategy (OS)| Pearson Correlation | 0.273** | 0.561** | 1      | 0.101** |
|                         | Sig. (2- tailed)    | 0.000  | 0.000  | 0.002  |
|                         | N           | 186    | 186    | 186    | 186    |
| Firm performance (FP)   | Pearson Correlation | 0.222** | 0.221** | 0.101** | 1      |
|                         | Sig. (2- tailed)    | 0.002  | 0.002  | 0.002  |
|                         | N           | 186    | 186    | 186    | 186    |

*Pearson Correlation and Significance
** Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)
Regresyon analysis was used to determine the direction and strength of the relationships between intellectual capital, innovation, strategy and firm performance (Table 5).

| Model                          | Unstandardized Coefficients | Standardized Coefficients | Sig. |
|-------------------------------|-----------------------------|---------------------------|------|
|                               | B                           | Std. Error                | Beta | t     |  |
| Contant                       | 6.807                       | 2.098                     | 3.244| 0.001 |
| Intellectual capital (IC)     | 0.226                       | 0.052                     | 0.218| 4.354| 0.000|
| Innovation (IN)               | 0.192                       | 0.048                     | 0.196| 2.923| 0.025|
| Organizational Strategy (OS)  | 0.465                       | 0.074                     | 0.283| 6.275| 0.000|

$R^2 = 0.419$

$F = 53.506$

Dependent Variable is “Firm Performance”

Hypothesis proposed in the model were tested by using multiple linear regression analysis. As a result of findings, the equation considered as a mathematical model is given numerically.

$$FP = 6.807 + 0.226*IC + 0.192*IN + 0.465*OS$$

The results of multiple linear regression analyses belonging to performance, human capital, social capital and financial capital were shown schematically in a collective manner in Figure 1 below. The relationships accepted were shown by arrows with thick lines.

Figure 1. Conceptual Model Linking Intellectual Capital, Innovation, Organization Strategy and Performance

4. Conclusion

This study explored the literature on intellectual capital, innovation, organizational strategy and their effect on firm performance. According to Veltri (2010), the main aim of the paper is to supply a state-of-the-art of the empirical evidence of relationships between intellectual capital (IC) and firm performance by systematizing the existing researches on such relationship. The main existing research on the relationship between intellectual capital (IC) and firm performance will be shown, in order to highlight the main results achieved by researchers.

Chen et al (2005) according to the results of their research support the hypothesis that firms’ intellectual capital has a positive impact on market value and financial performance, and may be an indicator for future financial performance. In addition, the authors found investors may place different value on the three components of value creation efficiency (physical capital, human capital, and structural capital). Finally, evidence is presented that R&D expenditure may capture additional information on structural capital and has a positive effect on firm value and profitability.

Wang and Chang (2005) according to the results show that intellectual capital elements directly affect business performance, with the exception of human capital. Human capital indirectly affects performance through the other three elements: innovation capital, process capital, and customer capital. There also exists a cause-effect relationship
among four elements of intellectual capital. Human capital affects innovation capital and process capital. Innovation capital affects process capital, which in turn influences customer capital. Finally, customer capital contributes to performance. The cause-effect relationship between leading elements and lagged elements provides implications for the management of firms in the IT industry.

Bontis and friends (2000) of the study is to investigate the three elements of intellectual capital, i.e. human capital, structural capital, and customer capital, and their inter-relationships within two industry sectors in Malaysia. In addition, the results of the research Ahmad and Mushraf (2011) revealed that value added intellectual capital and its components have a significant positive relationship with companies’ profitability.

Table 1 demonstrates the descriptive and statistical information of the respondents. Most of the respondents are in the graduated level (54.8 %). Males dominate (60.2 %) and size of the firms has 1-5 employees (64 %).

Within the literature review it was determined that intellectual capital, innovation and organizational strategy have a positive effect on firm performance.

The results regarding the hypotheses are shown in Table 6. Totally 3 hypotheses are ranked in this Table. With regard to the results; Beta coefficients (β), Significance (ρ) and Accepted/Rejected (A/R) status are also given in Table 6. According to these results; 3 hypotheses was accepted at significance level of 0.01 and 0.05 level.

Table 6. The Results Belonging to Hypotheses

| Hypotheses                                      | β      | Sig. (ρ) | A/R |
|------------------------------------------------|--------|----------|-----|
| Intellectual capital has a positive effect on firm performance. | 0.226   | 0.000    | A   |
| Innovation has a positive effect on firm performance. | 0.192   | 0.025    | A   |
| Organizational Strategy has a positive effect on firm performance. | 0.465   | 0.000    | A   |

The empirical findings of this research show that there are positive relationships between intellectual capital, innovation and organizational strategy and firm performance.

References

Akman, G., & Yilmaz, C. (2008). Innovative capability, innovation strategy and market orientation: an empirical analysis in Turkish software industry. International Journal of Innovation Management, 12(01), pp. 69-111.

Ahmad, S. and Mushraf, A. M. (2011), The Relationship between Intellectual capital and Business Performance: An empirical study in Iraqi industry. International Proceedings of Economics Development & Research, 6, pp. 104-109.

Akpinar, A. T. and Akdemir, A. (1999), Intellectual capital, in third European Conference, pp. 332-340. http://joines.opf.slu.cz/vvr/akce/turecko/pdf/Akpinar.pdf (05.02.2014)

Amir, E. and Lev, B. (1996), Value-relevance of non-financial information the wireless communications industry, Journal of Accounting and Economics, August-December Vol. 22, pp.3-30.

Antonioli, D., Mazzanti, M., Pini, P. and Tortia, E. C. (2004), Adoption of Techno-Organizational Innovations, and Industrial Relations in Manufacturing Firms: An Analysis for Local Industrial System. Economia politica, 21(1), pp.11-52.

Atieno, R. (2009), Linkages, access to finance and the performance of small-scale enterprises in Kenya. Journal of Accounting and Business Research, 3(1), pp.33-48.

Bontis, N. (1998), Intellectual capital: and Exploratory Study that Develops Measures and Models. Management Decision, 36(2), pp.63-76.

Bontis, N., Keow, W. C. C. ve Richardson, S. (2000). Intellectual capital and business performance in Malaysian industries. Journal of intellectual capital, 1(1), pp. 85-100.

Boudreau, J.W. and Ramstad, P.M. (1997), “Measuring intellectual capital: learning form financial history”, Human Resource Management, Vol. 36 No. 3, pp. 343-56.

Caulkton, R.J., Çavuşgil, T. ve Zhao, Y., (2002). Learning orientation, firm innovation capability, and firm performance. Industrial Marketing Management, 31, pp. 515-524.

Chen, M. C., Cheng, S. J. and Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms’ market value and financial performance. Journal of Intellectual capital, 6(2), pp. 159-176.

Chwalowski, M. (1997), Intellectual Capital Matters, The Electricity Journal, 10 (10), pp.88-93.

Croteau, A. M. and Bergeron, F. (2001), An information technology trilogy: business strategy, technological deployment and organizational performance, The Journal of Strategic Information Systems, 10(2), pp.77-99.

Donovan, R. M. (2001), Performance Measurement: Connecting Strategy, Operations and Actions, Performance Improvement, pp. 1.
Dunne, T., Roberts, M. J. and Samuelson, L. (1988). Patterns of firm entry and exit in US manufacturing industries. RAND Journal of economics, 19(4), pp.495-515.

Dunne, T., Roberts, M. J. and Samuelson, L. (1989). The growth and failure of US manufacturing plants. The Quarterly Journal of Economics, 104(4), pp.671-698.

Edvinsson, L. and Malone, M. S. (1997), Intellectual capital – Realizing your company’s true value by finding its hidden roots, Harper Business, New York.

Hambrick, D. C. (1983), Some tests of the effectiveness and functional attributes of Miles and Snow's strategic types, Academy of Management Journal, 26(1), pp. 5–26.

Jiménez-Jiménez, D. and Sanz-Valle, R. (2011). Innovation, organizational learning, and performance. Journal of Business Research, 64(4), 408-417.

Jones, G. K., Lancot Jr, A. and Teegen, H. J. (2001), Determinants and performance impacts of external technology acquisition. Journal of Business venturing, 16(3), pp.255-283.

Kostopoulos, K., Papalexandris, A., Papachroni, M., and Ioannou, G. (2011). Absorptive capacity, innovation, and financial performance. Journal of Business Research, 64(12), 1335-1343.

Leskovar-Spacapan, G. and Bastic, M. (2007). Differences in organizations’ innovation capability in transition economy: Internal aspect of the organizations’ strategic orientation. Technovation, 27(9), pp.533-546.

Li, M. and Richard Yu, L. (1999). Information technology and firm performance: linking with environmental, strategic and managerial contexts. Information & Management, 35(1), pp. 43-51.

Man MK, Wafa S.A. (2008), Distinctive capabilities and the performance of small and medium-sized enterprises in Malaysia. International Business and Economic Research Journal, 7(6): 45-60, pp. 11-19.

Marimuthu, M., Arokiasamy, L. and Ismail, M (2009). Human capital development and its impact on firm performance: Evidence from developmental economics', The Journal of International Social Research, 2 (8), pp. 265-272.

Marr, B. and Neely, A. (2001), Organisational performance measurement in the emerging digital age. International Journal of Business Performance Management, 3(2), pp. 191-215.

Miles, R. E. and Snow, C. C. (1994), Fit, Failure and the Hall of Fame, Free Press, New York, USA.

Miles, R. E. and Snow, C. C. (2003), Organizational strategy, structure, and process. Stanford University Press, Stanford, California.

Oslo Guide. (2005), Yenilik verilerinin toplanması ve yorumlanması için ilkeler. OECD ve Eurostat ortak yayımı. 3. Baskı.

Rehman, W. U., Rehman, C. A. and Sahid, A. (2011), Intellectual Capital Performance and Its Impact on Corporate Performance: an Empirical Evidence from Modaraba Sector of Pakistan, Australian Journal of Business and Management Research, 1(5), pp. 08-16.

Roos, G., Pike, S. and Fernstrom, L. (2005), Managing Intellectual Capital in Practice, Elsevier Butterworth-Heinemann, Burlington, MA.

Roos, J., Roos, G., Dragonetti, N.C. and Edvinsson, L. (1997), Intellectual Capital, Navigating the New Business Landscape, Macmillan Press Ltd., Basingstoke and London.

Schultz, T.W. (1993), The economic importance of human capital in modernization, Education Economics, 1(1), pp.13-19.

Smith, K. G., Guthrie, J. P. and Chen, M. J. (1989), Strategy size and performance, Organizational Studies, 10 (1), pp. 65-81.

Stewart, A. T. (1997), Intellectual Capital The New Wealth of Organizations, Bantam Doubleday Publishing, New York.

Subramaniam, M. and Youndt, M. A. (2005), The influence of intellectual capital on the types of innovative capabilities, Academy of Management Journal, 48(3), pp. 450-463.

Tajeddini, K. (2010), Effect of customer orientation and entrepreneurial orientation on innovativeness: Evidence from the hotel industry in Switzerland, Tourism Management, 31(2), pp.221-231.

Vaccaro, A., Parente, R. and Veloso, F. M. (2010). Knowledge management tools, inter-organizational relationships, innovation and firm performance. Technological Forecasting and Social Change, 77(7), 1076-1089.

Veltri, S. (2010). Empirical evidence of relationships between Intellectual Capital performance and firm value. Economia Aziendale Online, 1(2-3), pp. 101-118.

Wang, W. Y. and Chang, C. (2005), Intellectual capital and performance in causal models: evidence from the information technology industry in Taiwan, Journal of Intellectual Capital, 6(2), pp. 222-236.

Zahra, S. A. (1996), Technology strategy and financial performance: examining the moderating role of the firm's competitive environment, Journal of Business Venturing, 11(3), pp.189-219.

Zahra, S. A. and Pearce II, J. A. (1990), Research evidence on the Miles and Snow typology, Journal of Management, 16 (4), pp. 751-768.