INTELLECTUAL CAPITAL AS THE MAIN FACTOR OF COMPANY’S VALUE ADDED

Irena MAČERINSKIENĖ, Simona SURVILAITĖ
Mykolas Romeris University, Faculty of Economics and Finance Management, Ateities st. 20, LT–08303, Vilnius, Lithuania;
e-mail: irena.macerinskiene@mruni.lt; simona.fortress@gmail.com

Abstract. Nowadays managers, employers and employees are trying to cope with problems caused by economic crisis. The damage is so huge that many Lithuanian specialists and good employees migrated to other European countries. Almost all economic indicators and indexes had decreased and it is important to mention the fact that every day the value of intellectual capital and its importance to company’s value added is growing. This paper is designed to investigate the theory of intellectual capital and to reveal the importance of intellectual capital for a normal and stable life of each company. In addition, this paper reveals the situation of value added in Lithuanian companies. There is a huge problem – Lithuania’s value added is very small, compared to other European countries. The purpose of the article is to analyse the relation between intellectual capital and company’s value added.

JEL classification: D24, D92, G32, M21.

Keywords: intellectual capital, value added, human capital, structural capital, customer capital.

Reikšminiai žodžiai: intelektinis kapitalas, pridėtinė vertė, žmogiškasis kapitalas, struktūrinis kapitalas, klientų kapitalas.

Introduction

Nowadays many managers are coping with the problems caused by economic crisis. At all times employers of all companies are trying to find out ways to increase company’s value added. Recently, intellectual capital and its components became very important and even vital for the life of some companies. The spread of informational technologies, new inventions and innovations has a strong impact on every company’s strategy, mission, main objectives and goals. In addition to this, many scientists (Bontis, 1999; Stewart, 1997; Ulrich, 1998; Sanchez, 2007; Edvinsson and Malone, 1997; Zéghal and Maaloul, 2010; Palumickaitė and Matuzevičiūtė, 2007; Mikulėnienė and Jučevičius, 2000) are in-

ISSN 1822-8011 (print)
ISSN 1822-8038 (online)
INTELEKTINĖ EKONOMIKA
INTELLECTUAL ECONOMICS
vestigating intellectual capital as a source of the increase of company's value added. It is difficult to explain intellectual capital because it is not a simple and solid material.

It consists of the three main parts – human capital, structural capital and customer capital. Nevertheless, different scientists explain intellectual capital structure differently; for instance: Van Buren (1999) identifies human capital, innovation capital, process capital and customer capital; O'Donnell and O'Regan (2000) identify human capital, internal structure, external structure; Edvinsson and Malone (1997) identify only human capital and structural capital. In addition to this, it is hard to describe intellectual capital and give it a worldwide known definition. That is why the problem arises – how to explain intellectual capital and identify its influence over the company's value added? The object of this paper is the intellectual capital's influence over a company's value added. The aim is to analyse the influence of intellectual capital over company’s value added in Lithuania. The objectives of the article are as follows:

1) to reveal the main theoretical and practical aspects of the intellectual capital and company’s value added;
2) to discover the relationship between company's value added and intellectual capital;
3) to analyse company’s value added in Lithuania;
4) to evaluate intellectual capital as a factor of the increase of company’s value added;
5) to present the results of the research on intellectual capital influence over company’s value added.

Methods of research: comparative analysis of scientific literature, statistical analysis.

1. Intellectual capital and its influence over company’s value added

These days changing environment has a huge impact on the entire society. The importance of immaterial and intangible resources is indisputable. That is why many scientists are discussing about the new form of company's successful life – intellectual capital. It is indisputable that managers, directors, principals and owners want to have intellectual, well-educated and sophisticated employees. A successful company needs to have proper equipment and installations, be good at information technologies, always follow the latest innovations and have a broad circle of loyal customers, suppliers and partners. Intellectual capital matches all of the aspects listed above.

Many scientists have their own and quite similar opinion about intellectual capital and its definition. One of the most famous intellectual capital researchers Bontis (1999) proposes plenty of intellectual capital definitions. He considers that intellectual capital is everything that is in a company: all intangible resources and processes. Innovations, patents, contacts, tacit and explicit knowledge are also intellectual capital. Bontis (1999) accentuates the difference between tacit and implicit knowledge. Tacit knowledge is knowledge that cannot be transferred to other people and cannot be written or de-
scribed. For example: studying, learning, development, training, improving and so on. Tacit knowledge cannot be transferred due to the fact that it is impossible to explain how a person learns or improves himself, it is hard to explain the process of learning. Explicit knowledge, conversely, is knowledge that can be expressed effortlessly, it can be coded, saved and incorporated in a special media, like computer files, compact discs, USB keys. For instance: documents, procedures, tutorials, routines.

International Federation of Accountants (IAFC) also offers a definition of intellectual capital. According to this financial institution (1998), intellectual capital is a capital property that is based on knowledge. The scientist Ulrich is of the same position (1998), claiming that intellectual capital is knowledge and skills that employees have. In addition, Sanchez (2007) also considers that intellectual capital is just a sum of all the knowledge in a company. Edvinsson and Malone (1997) affirm that intellectual capital is a management of employees’ knowledge, experience, skills, customer relations, technologies and innovations.

Zéghal and Maaloul (2010) are trying to investigate intellectual capital profoundly. They have found that intellectual capital is all amount of knowledge in the enterprise that allows companies creating and increasing value added. Lithuanian scientists are also investigating intellectual capital and Palumickaitė and Matuzevičiūtė (2007) also describe intellectual capital as an amount of knowledge that helps creating company’s value added. They consider that intellectual capital is a driving force behind the modern economy and creates value. According to them, it is necessary to coordinate and combine two types of capital: human capital and structural capital.

Mikulienė and Jucevičius (2000) even classified intellectual capital into four categories:

1) intellectual capital as the equivalent of three components – organisational structure, personnel, processes related with personnel and relationships with internal and external environment;
2) intellectual capital as the equivalent of two components – organisational structure and personnel;
3) intellectual capital as the equivalent of four components – all of the parts referred above including finance;
4) intellectual capital not as just knowledge, but also as intellectual property.

Nevertheless, Mikulienė and Jucevičius (2000) argue that intellectual capital is the knowledge that can be converted into company’s value added.

In order to sum up the scientific literature, it is useful to provide essential characteristics of intellectual capital (Fig. 1).

Figure 1 (Fig. 1) shows intellectual capital’s influence and importance to company’s value added in general. Intellectual capital is a combination of three types of capital: human capital, organisational capital and customer capital. All those types of capital are intangible, untouchable, it is hard to measure it and it is difficult to determine its true value. This is due to the fact that intellectual capital consists of knowledge, skills, capabilities and abilities, motivation, responsibility belonging to different employees of different enterprises. Their improvement increases their competence. The higher the
competence of employees, the greater is the value added that the worker creates for his/her enterprise. Now it is obvious why intellectual capital is intangible and why it is hard to measure. This is due to the fact that it is very difficult to calculate staff competence, motivation and finally – difficult or even impossible to determine employees’ preparation to work and to carry out tasks smoothly.

Fig. 1. Intellectual capital’s influence over company’s value added

In addition, these days most companies are investing in their employees and their knowledge. According to the Organisation for Economic Co-operation and Development (OECD, 1999), many enterprises are investing in staff training, research and development, new and more effective, modern computing and administrative systems. Many scientists (Sullivan, 2000; Pew Tan and Plowman, 2007; Mouritsen, 1998; Palliam, 2006; Biddle et al., 1998; Sharma et al., 2007) accentuate importance of intellectual capital for the company’s value added. It is argued that the number of companies whose value depends on the intellectual capital in recent years has been increasing. According to Sullivan (2000), there are several factors that led to the importance of intellectual capital:

1) *The changing legal environment.* Newly created laws protect intellectual property, patents, licenses, copyrights and other intangible elements that require high intellectual capital.

2) *The spread of Internet and information technologies.* High-speed Internet use is associated with the lightning spread of information. On the production era, the main source of the value was material resources, but on an information era, information is more valuable than tangible assets.
3) **The impact of intellectual capital.** Intellectual capital has the ability to increase company’s profitability. It enables companies to develop new products and services, new business processes and organizational forms. Company converts its resources from tangible to intangible: knowledge and information.

According to the Statistical Yearbook of Lithuania (2009), company’s value added of all companies (except individual companies) is calculated on the basis of the same method:

Income from sales of goods and services + Other operating income + The capitalised production + / – Change in inventories during the year – The purchase of goods and services + Subsidies on products and production – Taxes on production and products.

For individual companies the value added is calculated as total revenue minus the cost of expenditure.

Kay (1995) describes company’s value added as ‘the difference between the value of a firm’s output and the cost of the firm’s inputs.’ According to Kay, firm’s outputs and inputs are comprehensively accounted. He also emphasises the importance of company’s value added and defines it as ‘the key measure of corporate success’. Lepak et al. (2007) emphasise that one of the most important concepts in management and organisation is value added, but the value creation itself is not well understood. Lepak et al. revealed that ‘value creation depends on the relative amount of value that is subjectively realised by a target user (or buyer) who is the focus of value creation.’ In addition, Helfat et al. (2007) describe value and value creation as ‘willingness to pay minus opportunity costs’. Likewise, willingness to pay is from the customer/client side and opportunity costs are from the company’s side.

Bowman and Ambrosini (2009) divide value added into two different parts: use value and exchange value. Use value is ‘all products and services that provide utility’, while exchange value is ‘a monetary amount exchanged between the firm and its customers or suppliers when use values are traded.’ This means that use values are converted into exchange values when they are sold. In addition, use values include both – tangible and intangible – assets. According to Bowman and Ambrosini, use values can be any equipment, machinery, buildings, software, installations and human inputs in the form of accomplished tasks (services or activities).

To conclude, intellectual capital is a new and modern concept that plays a vital role for companies. In addition, it generates and increases company’s value added. Intellectual capital is the sum of the three main components: human capital, structural capital, customer capital. All of these parts are very important factors for any company, its value added and its stability. It is essential to analyse the Lithuanian companies’ value added and to find out the main parts and elements of intellectual capital that mostly affect company’s value added.

2. The analysis of Lithuanian companies’ value added

First of all, it is necessary to identify the number of enterprises now operating in Lithuania and how many of them are small and medium-sized, because small and me-
medium-sized business accounts for the largest part of the Gross Domestic Product (GDP) and Gross Value Added (GVA) in Lithuania. Because of the worldwide economic crisis in 2008 the number of operating entities in Lithuania has decreased sharply (Table 1).

**Table 1. Number of operating entities in Lithuania in 2007–2010**

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>76 516</td>
<td>81 376</td>
<td>84 574</td>
<td>83 201</td>
</tr>
</tbody>
</table>

Source: Department of Statistics under the Government of the Republic of Lithuania

Table 1 shows that the number of enterprises in Lithuania was growing from 2007 to 2009 (from 76516 to 84574 operating entities). Due to the crisis at the beginning of 2010 the number of companies decreased by 1373 – only 83 201 entity was operating in Lithuania.

In addition, Table 2 shows the number of small and medium-sized companies in Lithuania (Table 2).

**Table 2. Number of small and medium-sized companies in Lithuania in 2007–2010**

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>59 712</td>
<td>63 187</td>
<td>65 232</td>
<td>63 447</td>
</tr>
</tbody>
</table>

Source: Department of Statistics to the Government of the Republic of Lithuania

Table 2 shows that the number of small and medium-sized companies was increasing from 2007 to 2009. But at the beginning of 2010 there were only 63447 small and medium-sized companies in Lithuania. They account for as much as 76.3% of all operating entities in Lithuania and create the major part of Lithuania’s Gross Domestic Product and Gross Value Added.

![Gross Value Added in Lithuania at current prices, LTL million](image)

Source: prepared in accordance with the Department of Statistics to the Government of the Republic of Lithuania

**Fig. 2.** Gross Value Added in Lithuania at current prices, LTL million
Figure 2 (Fig. 2) shows Gross Value Added in Lithuania at current prices from 2005 to the first quarter of 2010. From 2005 to 2008 the Gross Value Added was increasing, however, in 2009 it sharply decreased by 17.2% (from LTL 99 639,901 million to LTL 82 512.28 million). That decrease was also caused by the economic crisis, labour force slump and rise of migration. According to the most recent data, in the first quarter of 2010 Gross Value Added was LTL 18 404.883 million. Compared to the first quarter of 2009, the Gross Value Added decreased by 2.4% (from LTL 18 862.236 million to LTL 18 404.883 million).

In addition, Figure 3 (Fig. 3) shows the Gross Value Added per capita in Lithuania.

Figure 3 shows that from 2005 to 2008 the Gross Value Added per capita was increasing (from LTL 1590.27 to LTL 2472.06). At the beginning of 2009 it shrunk by 16.7% to LTL 2058.38. In the first quarter of 2010 the Gross Value Added per capita was LTL 1844.10. On the one hand, this number shows great success, but on the other, compared to other European countries, Lithuania’s Gross Value Added is very small. According to the latest data of Eurostat, the highest Gross Value Added is in Germany (EUR 542380 million), France (EUR 436689 million) and United Kingdom (EUR 351291.4 million). By Gross Value Added Lithuania is only the 22 among 26 countries (EUR 5980.5 million). This data is of the fourth quarter of 2009 at current prices.

The analysis of Lithuanian companies’ value added revealed a huge problem – very small Lithuania’s Gross Value Added, compared to other European countries. The growth of value added in the country means improvement of economy and attraction of foreign direct investment. All this leads to a better life for all Lithuanian citizens, quality of Lithuanian products and services and recovery of the total small and medium-sized business. It is necessary to reveal the elements able to increase the compa-
ny’s value added: does intellectual capital increase company’s value added, what types of intellectual capital mostly affect value added, what processes and objects or subjects need to be improved in order to increase company’s value added.

3. Results of the research on intellectual capital influence over company’s value added

From April to July 2010, a survey of Lithuanian small and medium-sized companies was conducted. The subject of the analysis was the way that intellectual capital affects company’s value added and the elements that mostly increase a company’s value added. 500 questionnaires were distributed, 457 of them were completed. 428 questionnaires were answered correctly. Due to these facts the return of questionnaires was 85.6%. Companies were selected randomly. A sample of respondents was measured according to a formula (Eq. 1):

\[
n = \frac{1}{\Delta^2 + \frac{1}{N}}
\]

where: \(n\) – sample, where error probability \(P = 0.95\)
\(N\) – general population
\(\Delta\) – allowable size of sample error (\(\Delta = 0.05\))

According to the formula (Eq. 1), the sum of respondents was nearly 400 (Eq. 2). General population \(N\) was the number of all operating entities in Lithuania \((N = 83201)\).

\[
n = \frac{1}{0.05^2 + \frac{1}{83201}} = \sim 400
\]

In addition, a model of intellectual capital influence over a company’s value added was created in order to investigate the relationship between the main factors of intellectual capital and value added (Fig. 4).

![Fig. 4. Model of intellectual capital influence over a company’s value added](image-url)
The model shows (Fig. 4) that intellectual capital consists of the three main components – human capital, structural (or organisational) capital and customer capital. Also external environment is influencing intellectual capital and its value. The arrows show that external environment, human capital, structural capital and customer capital affect intellectual capital: if one of the capitals increases, intellectual capital also increases. Furthermore, intellectual capital influences company’s value added – if intellectual capital increases, company’s value added increases as well.

First of all, the types of resources most important for Lithuanian businesses were investigated, such as human resources with plenty of information or still material resources. Respondents were asked to assign a score to different resources in the Likert scale from 1 to 7 (1 – less important, 7 – the most important). Figure 5 (Fig. 5) shows that financial resources in Lithuanian companies are the most important resources today (mean – 6). Human resources are in the second place (mean – 5.07). It is quite strange and reveals that Lithuanian companies still do not realise the importance of intellectual capital and of human resources.

![Fig. 5. The importance of different types of resources in Lithuanian companies](image)

As already mentioned above, intellectual capital influences the company’s value added, but it is necessary to analyse the elements of intellectual capital that are most important for the increase of company’s value added. Figure 6 (Fig. 6) shows that human capital is the most important (mean – 3.87). Customer capital and structural capital, however, are very important too (means – 3.7991 and 3.6927). The significance of these numbers in the Likert scale is ‘important’. 
In order to identify the elements of intellectual capital components that are the most important for company’s value added, respondents were given factors and were asked to assign a score in the Likert scale from 1 to 5 (1 – less important, 5 – most important). Figure 7 (Fig. 7) shows that quality of the product is one of the most important for company’s value added (mean – 4.315). Customer relations are in the second place (mean – 4.122) and motivation comes third (mean – 4.105).
It is important to make clear the elements that are the most important for intellectual capital itself. Respondents were given the same factors as in Figure 7, however, they were asked to grade them by importance of intellectual capital itself. Figure 8 (Fig. 8) shows that quality of the product is also one of the most important factors of intellectual capital, however, with a less mean (mean – 4.137). Motivation was in the second place (mean – 4.071) and experience came third (mean – 4.049).

Fig. 8. The importance of intellectual capital factors for a company’s intellectual capital

While analysing the importance of intellectual capital factors for a company’s value added and for a company’s intellectual capital itself, it was noticed that quality of the product was the most important factor for a company’s value added and for a company’s intellectual capital (Table 3). In addition, customer capital (customer relations, relations with shareholders, relations with financial institutions) was more important for a company’s value added and human capital (motivation, experience, education, innovativeness of employees) was more important for a company’s intellectual capital. It was surprising that research and development were graded as the least important. This shows that Lithuanian managers still do not understand the importance of research and market research. Despite this fact, we consider that research and development always costs much and this might be the reason why managers are not interested in it.
Table 3. Comparison of factors

<table>
<thead>
<tr>
<th>The most important factors for a company’s value added</th>
<th>The most important factors for a company’s intellectual capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of the product</td>
<td>Quality of the product</td>
</tr>
<tr>
<td>Customer relations</td>
<td>Motivation</td>
</tr>
<tr>
<td>Motivation</td>
<td>Experience</td>
</tr>
<tr>
<td>Experience</td>
<td>Customer relations</td>
</tr>
<tr>
<td>Education</td>
<td>Education</td>
</tr>
<tr>
<td>Relations with shareholders</td>
<td>Innovativeness of employees</td>
</tr>
<tr>
<td>Innovativeness of employees</td>
<td>Relations with shareholders</td>
</tr>
<tr>
<td>Relations with financial institutions</td>
<td>Organisation culture</td>
</tr>
<tr>
<td>Databases</td>
<td>Social activity</td>
</tr>
<tr>
<td>Organisation culture</td>
<td>Relations with financial institutions</td>
</tr>
<tr>
<td>Social activity</td>
<td>Databases</td>
</tr>
<tr>
<td>Research and development</td>
<td>Research and development</td>
</tr>
</tbody>
</table>

To conclude, this research reveals that Lithuanian companies do not understand the importance of intellectual capital as a factor of a company’s value added. Despite this, managers realise that human capital, structural capital and customer capital increase a company’s value added. Moreover, managers do not understand the meaning of research and development in their companies. Yet this can be attributed to the lack of money.

Conclusions

Many scientists accentuate intellectual capital as the main factor for the creation of a company’s value added. While analysing Lithuania’s value added, it was noticed that recently it decreased and was very small, compared to other European countries. This might be due to the fact that the number of operating entities in Lithuania decreased in 2010 from 84,574 to 83,201. In addition, it was found that in 2009 Lithuania’s Gross Value Added sharply decreased by 17.2% (from LTL 99639.901 million to LTL 82512.28 million). In order to identify the factors that can influence a company’s value added, a survey was carried out. The results show that Lithuanian managers understand the importance of intellectual capital, however, they are still concerned about material resources, as today financial resources are considered as the most important resources in Lithuanian companies with the mean of 6. Human resources were on the second place with the mean of 5.07. In addition, the results of the survey revealed that quality of the product was the most important factor for a company’s value added and for a company’s intellectual capital with the means of 4.315 and 4.137. Despite this, research and development was the last factor influencing value added and intellectual capital.
References

INTELEKTINIS KAPITALAS KAI PAGRINDINIS ĮMONĖS PRIDĖTINĖS VERTĖS DIDINIMO VEIKSNYS

Irena MAČERINSKIENĖ, Simona SURVILAITĖ


Irena Mačerinskienė is a Professor, dr., Head of Banking and Investments Department, Faculty of Economics and Finance Management, Mykolas Romeris University. Research interests: intellectual capital, human capital, social capital, finance, financial markets, financial institutions, investments, small and medium sized business, educational economics.

Irena Mačerinskienė – Mykolo Romerio universiteto Ekonomikos ir finansų valdymo fakulteto Bankininkystės ir investicijų katedros vedėja, profesorė. Tyrimų sritys: intelektinis kapitalas, žmogiškasis kapitalas, socialinis kapitalas, finansai, finansų rinkos, finansų institucijos, investicijos, smulkus ir vidutinis verslas, švietimo ekonomika.
Simona Survilaitė is a Master Student in Financial Markets Programme, Faculty of Economics and Finance Management, Mykolas Romeris University. Research interests: intellectual capital, value added, finance, financial markets, investments.

Simona Survilaitė – Mykolo Romerio universiteto Ekonomikos ir finansų valdymo fakulteto Finansų rinkų studijų programos magistrantė. Tyrimų sritys: intelektinis kapitalas, pridedamoji vertė, finansai, finansų rinkos, investicijos.