European Journal of Business and Management
ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online)
Vol.6, No.9, 2014

A Longitudinal Assessment of Intellectual Capital of Companies Listed on Malawi Stock Exchange

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Abstract
The significant of intellectual capital to achieving competitive advantage in today's knowledge-based economy is undeniable. Companies are depending more on intellectual rather than physical capital. Generation and exploitation of knowledge is what is playing a predominant part in the process of wealth creation. The study was aimed at making a longitudinal assessment of the level of intellectual capital in companies listed on the Malawi Stock Exchange for a five year period 2008-2012. Using the market-to-book value method, the results suggested that intellectual capital was a significant part of the total value of the listed companies. However, the results indicated that the value of intellectual capital has been declining significantly over the period, raising concerns over the long run competitiveness of the companies and the economy as a whole. As such the study recommends further studies to empirically determine the factors contributing to the decline and the required remedy.
Keywords: Intellectual capital, Malawi Stock Exchange (MSE), Market Capitalization Methods (MCM)

Introduction

In the current knowledge-based economy which is also called new economy or knowledge era, competitive success depends less on the strategic allocation of physical and financial resources, and more on strategic management of intellectual capital (Tseng and Goo, 2005). This has prompted considerable interest in developing appropriate measurement metrics of intellectual capital, reflecting on the maxim that "what gets measured gets managed" (Mohiuddin et al., 2006). According to Campisi and Costa (2008) measuring the performance of these intangible assets is strategic to foreseeing with great accuracy the future value of an enterprise and as a result, it is a gradient of competitiveness in the current knowledge economy. Besides, Campisi and Costa (2008) pointed out that in order to clearly describe future scenarios of development in planning; a company has to fully understand its own intellectual potential as only those organisations that succeed in this intent will maintain a competitive advantage over their competitors.

Despite the broadness and importance of these assets, the current accounting framework, very narrowly defines intangible assets, by not including assets such as human resources, customer loyalty, company reputation (Brennan and Connell, 2000). This may be partly due to the rigid requirements of the accounting concepts and principles developed since the rules of double entry were set up (Gan and Saleh, 2008). Consequently, traditional accounting measures are inadequate for determining real corporate value in this knowledge-based economy (Tseng and Goo, 2005). Thus, the traditional accounting methods, which have been portraying the condition of the companies for half a millennium, are now losing their way at the advent of dynamic changes taking place in today's business (Mohiuddin et al., 2006). This is the case, due to the lack of standardized accounting guidelines on these vital assets, resulting in resources worth thousands of millions going unreported in the annual reports thwarting the basic motive of true and fair view of financial statements (Singh and Kansal, 2011).

Substantial differences exist between the market and book values of companies (Brennan and Connell, 2000). Many of these differences can be explained by intellectual capital assets not recognised in company's balance-sheets (Brennan and Connell, 2000). Gan and Saleh (2008) pointed out that while some of these differences are attributable to the current value of physical and financial assets exceeding their historical cost, a large proportion is due to the rise in the importance of intangible assets. According to Abeysekera (2007) intellectual capital held by a firm can be thought of as a form of "unaccounted capital" in accordance with the traditional accounting system terminology and can be described as the knowledge-based equity that supports the knowledge-based assets of a firm (Abeysekera, 2007).

However difficult it may be in reporting, the importance of intellectual capital information should not be neglected instead alternative way of reporting should be looked into (Gan and Saleh, 2008). This is the case because, elements of intellectual capital, if managed properly, have huge potential for creating value hence it is felt that they can no longer be ignored (Brennan and Connell, 2000). Valuing intellectual capital is important in enabling the realisation and appreciation of the true value of the companies (Tseng and Goo, 2005; Maditinos et al., 2009). Valuation is not be done for its sake, but to support effective decision-making. According to Bruggen et al. (2009); investors have difficulties in accurately assessing the value of the firm for resource allocation using the financial statements that do not report intellectual capital, similarly managers may find it difficult to determine relevant intangible investments needed for the company's operations. April et al. (2003) asserted that:

> *"Companies that measure, report and manage their intellectual capital effectively have a competitive advantage because they have identified all the assets at their disposal (tangible and intangible), and are thus in a position to operate at their full potential by making maximum use of their asset pool. In addition, understanding the real value of all assets provides a more accurate reflection of the worth of a company, which supports the corporate goals of transparency to shareholders, potential investors and market analysts."*

The objective of the study was to measure the aggregate value of intellectual capital for companies listed on Malawi Stock Exchange and analyse the changes in value over the five year period. The study provides empirical evidence of the significant contribution of intellectual capital to firm's total value. It further informs and elicits appreciation of intellectual capital particularly to preparers of annual reports generally and also in Malawi. This is important because despite the crucial role of intellectual capital, its appreciation is still at the lower end, especially in the eyes of the preparers such as the accountants (Gan and Saleh, 2008). The remainder of the paper is structured as follows, the second section review the existing literature on intellectual capital and its measurement methodologies. The third section describes the research methodology employed, followed by section four that presents the results of analysis and ensuing discussion. Finally section five gives the concluding remarks.

Literature review

Intellectual capital

Production basically requires both physical and intellectual capital (Goh, 2005). Goh (2005) describes physical capital as the traditional inputs of land, labour, and capital; and intellectual capital as the knowledge, creativity, skill and corporate culture. Youndt et al. (2004) further expand the description of intellectual capital not merely as a catalogue of elements but a sum of all knowledge an organization is able to leverage in the process of conducting business to gain competitive advantage.

Goh (2005) recognises a shift from neoclassical economies toward knowledge economy. According to Goh (2005) in neoclassical economies firms emphasize utilisation of physical capital particularly seen in mass production in the agricultural and industrial sectors. On the other hand, in knowledge economy firms depending more on intellectual rather than physical capital. It is recognised that the shift in not yet completed, however, Janosević et al. (2013) suggested that even though corporate success is still achieved through intensive application of financial and physical capital that is not sustainable in long run. This is a case because slowly but surely, the traditional management of financial assets and liabilities can no longer ensure competitive advantage (Tseng et al. 2013), it is the generation and exploitation of knowledge that is playing a predominant part in the process of wealth creation (Goh, 2005).

Attempts have been made to describe intellectual capital; however as of now there is no generally accepted description. According to Gan and Saleh (2008) analysis of literature suggests two aspects of intellectual capital. The first aspect is indicated in the accounting standards which refers intellectual capital to patent, intellectual property, brand and trademarks. On the other aspect, intellectual capital is seen as the soft asset such as knowledge, information, and experience. Gan and Saleh (2008) further state that the second aspect forms much of the intellectual capital today and needs to be further understood and researched.

It must be noted that intellectual capital requires effort to be realised. According to Youndt et al. (2004) intellectual capital does not naturally develop and evolve rather, targeted managerial investments seemed to be much more important in building a strong organizational knowledge-base. In so doing Mavridis (2004) posited that personal and inaccessible liability (intellectual potential) becomes an intangible "intellectual asset" or simply intellectual capital when the tacit or invisible knowledge leads to practical results. Mavridis (2004) indicates that the practical results are far reaching as they can be evidenced not only in the creation of "intangible goods" (such as know-how, licenses, patents, franchises, copyrights, trademarks, software and methods), but also creation of invisible competences or competitive advantages and lastly real common tangible assets.

Intellectual capital measurement methodologies

According to Saenz (2005) economists have noticed a growing gap between the market value of companies' shares and their book value. The gap suggests the inadequacy of the traditional accounting as much of it can be explained by intellectual capital assets not recognised in company's balance-sheets (Brennan and Connell, 2000). In an attempt to overcome the inadequacy of the traditional accounting framework in its failure to reflect the value of intellectual capital, researchers and practitioners have been developing numerous and innovative metrics and models of intellectual capital reporting (Campisi and Costa, 2008; Bruggen et al., 2009).

In the attempt to understand these measurement methods, authors have endeavored to categorise them. According to Mavridis (2004) there are two orientations under which measurement methods can be grouped. The first is the "process orientation" which derives the value of intellectual capital from costs or expenses particularly by the difference between market and book values. The second being the "value orientation" that derives the value of intellectual capital from profit or investment returns and their respective drivers. Brennan

(2001) recognises three measurement approaches. The first approach derives the value from the difference between market value of the firm and its book value. The second approach uses the Skandia Navigator to identify and quantify critical success factors in four dimensions of the business. And the final approach merely measures the efficiency of intellectual assets. On the other hand, Tan et al. (2007) posited that intellectual capital measuring methods can be grouped broadly under two categories: those that do not use a monetary valuation; and those that put a monetary value. Tan et al. (2007) further clarifies that the former includes not only methods that attempt to estimate the dollar values of intellectual capital, but also those that derive the monetary values through the use of financial ratios.

Campisi and Costa (2008) however consolidated the positions of Brennan (2001), Mavridis (2004) and Tan et al. (2007). **TABLE 1** presents the consolidated profile of the methods proposed by various scholars and institutions that can be used in measuring intellectual capital presented by Campisi and Costa (2008). **TABLE 1** exhibits twenty-eight measurement methods, indicating that measuring intellectual capital is a very difficult proposition (Jurczak, 2008). However, Gan and Saleh (2008) posited that despite the reporting difficulties, the importance of intellectual capital information should not be neglected instead alternative ways of reporting should be looked into. Thus efforts should still be made that will ultimately lead to clear methodology. Tan et al. (2007) recognised that the measuring techniques are still evolving. Thus, in evolution stage, questioning the validity of the method should be made with the purpose of improving measurement and rather than discouraging it.

Due to the wide variety of the measurement methods, process of method selection becomes challenging. However, Jurczak (2008) opined that selection should be dependent on its purpose, situation and audience. thus of interest to this current study in line with the research objectives is the market capitalization methods (MCM) which falls under the cost orientation and involves monetary evaluation of intellectual capital at an aggregate level. According to Campisi and Costa (2008) MCM tend to compute the difference between a company's market capitalization and its stockholders' equity as the value of its intellectual capital or intangible assets.

As can be observed on **TABLE 1**, there are four methods under MCM namely: investor assigned market value, Market-to-book value, Tobin's q and the invisible balance sheet. Consistent with the objectives, the study employs market-to-book value method, which is recognised as an effective "yardstick" for measuring intangibles (Mavridis, 2004). The method measures the value of intellectual capital as the excess of the market value of the company or stock-market capitalization over its stockholders' equity (Saenz, 2005). Arguably this "excess" is the market valuation of the intellectual capital stocks and organizational learning flows of the company (Sharabati et al., 2010). According to Campisi and Costa (2008) MCM and return on assets methods are the two broad methods that produce indexes at an aggregate level, useful in making comparisons between enterprises regarding the efficient management of their intangible assets and monitoring the trends. Furthermore, the method is recognised to be more useful to external users of accounts (Brennan, 2001).

The method has however some limitations which include the fact that the evaluation of intellectual capital is totally subject to the financial market (Campisi and Costa, 2008). Furthermore it does not take into account numerous exogenous factors (macroeconomic conditions, current industrial policies, etc.) indirectly influencing the company market value and consequently calculated intangible assets value (Campisi and Costa, 2008).

Research methodology

Data collection

The population of the study comprised all the fifteen companies that are listed on the Malawi Stock Exchange (MSE) over the five year period 2008 to 2012. **Table 2** shows the names of all the companies and their respective sectors. Selection process however excluded Packaging Industries (Malawi) as it was delisted in 2011. Furthermore Old Mutual Limited was excluded as its primary operating environment is not Malawi. The study targeted the listed companies operating primarily in Malawi during the entire period. The study therefore sampled thirteen companies. Data was collected from the reports produced by Malawi Stock Exchange (MSE) for each of the year under study. The reports were downloaded from the website of MSE.

Intellectual capital measurement method

In order to measure the aggregate value of intellectual capital for each company over the study period, the market-to-book value method was used consistent with other related studies (Singh and Kansal, 2011; Bayatiani and Khodamipour, 2013). The study employed the model that was used by Bayatiani and Khodamipour (2013) given below:

$$IC_t = \frac{MV_t - BV_t}{1 + I_{nfn}}$$

Where:

IC_t= Intellectual Capital

MV_t= Market value of company

BV_t= Book value of company

I_{nfn}= The average inflation rate during the (t) period.

According to Tseng et al. (2013) the market value represents the evaluation of capital market on the future developing potential of the corporation while the book value depicts the present book value of the past investment as calculated by accounting method.

Paired t-test

Furthermore, in order to test the significance of the differences of the calculated values of intellectual capital over the period, a paired t-test was perf+ormed using the Statistical Package for Social Studies (SPSS).

Findings and discussion

This section presents the results of analysis and the ensuing discussion. The analysis was made based on the gap between the market values of the sampled companies and their book values. The gap is recognised as an explanation of the intellectual capital of the firm (Brennan and Connell, 2000). According to Sharabati et al. (2010) "excess" is the market valuation of the intellectual capital stocks and organizational learning flows of the company.

Summary statistics

TABLE 3 presents the summary statistics. The **TABLE** indicates that in each of the years under the study period, there was at least one company operating with the market value below its book value. In 2008 there was only one such company, however the number rose to four in 2009 and stayed the same over the following years. The **TABLE** further shows that the minimum values of intellectual capital has always been in negatives and has declining from negative K435.07 million in 2008 to negative K6,927.45 million in 2012. Similarly the maximum value of intellectual capital has also has been declining from K71, 397.41 million in 2008 to K66, 589.59 million in 2012. The decline is also exhibited by the declining average value of intellectual capital over the period from K13, 487.92 million in 2008 to K6, 490.29 million in 2012. This suggest that although the number of companies operating with an excess of the market value over the book value has remained constant between 2009 to 2012 period, the excess has been constantly declining.

Proportion of intellectual capital to total value of the companies

FIGURE 1 indicates the proportion of accounted capital i.e. shareholder's equity and unaccounted capital i.e. intellectual capital, over the five year period. It can be noted that the intellectual capital was a significant proportion to the total market value of the listed companies on MSE consistent with Brennan (2001). The **FIGURE** reveals the huge value of intellectual capital that has remained unreported in the balance sheet (Singh and Kansal, 2011), further highlighting the need for the accounting field to develop new quantitative categories and metrics that reflect precisely organizations' total capital bases on the balance sheets (Youndt et al., 2004).

Changes of the proportion of intellectual capital

FIGURE 2 shows the percentage changes in the average value of intellectual capital to average book value over the period. The **FIGURE** confirms that the proportion of the average value of intellectual capital to average book value has been declining over the period. It exhibits that the proportion was 311% in 2008 and has declined to 61% in 2012. Indicating that in 2008, intellectual capital was three times the size of the book value of the firm, however in 2012 that has declined to less than one. The largest decline was of 49.5% between 2008 and 2009, followed by a decline of 31% between 2011 and 2012. 2009 and 2010 period registered a fall in value 28% and the least was of a fall was of 21% between 2010 and 2011.

FIGURE 3 presents the results of the trend analysis of the average market values, average book values and average intellectual capital values over the period. It shows an upward trend in the average value of book value. As can be seen on **FIGURE 4** book value has been growing between 17% and 41% over the period. On the other hand, **FIGURE 3** indicates declining of the average market value from 2008 to 2010; however 2011 and 2012 it registered an upward trend. Besides, **FIGURE 3** reveals a wide gap between the average market values and average book values, suggesting the significant quantity of intellectual capital.

However, in relation to trend of average value of intellectual capital, the **FIGURE 3** exhibits a perpetual decline throughout the period. As can also be seen on **FIGURE 4** its growth rates have been in negatives. The worse decline was of 29% in 2009. Improvements can be noted in 2010 (16%) and 2011 (4%) however in 2012 the rate of decline increased to 17%.

Paired T-Test

To evaluate the significance of the changes in the average value of intellectual capital over the five year period, a paired T-Test was performed. The results of the test are presented in **TABLE 4**. The results indicate that changes in average values of intellectual capital were statistically significant at 5% level (p-values < 0.05) in the following consecutive years; 2008-2009, 2009-2010 and 2011-2012. However the differences in average values for 2010-2011 were found not to be statistically significant (p-value > 0.05). This period also exhibited relatively the lowest decline of the percentage of average intellectual capital to average book value and lowest negative growth rate (see **FIGURE 4**).

In summary, the above results suggest significant declining trend in the values of intellectual capital. The decline

is worrisome considering importance of intellectual capital to the competitiveness of the companies and consequently of the economy as a whole. More studies are therefore needed to establish whether the decline is limited to listed companies only or to all other companies in Malawi; hence the study proposes further studies sampling unlisted companies. On the other hand, the possible explanation for the deteriorating level of intellectual capital may be the economic hardship that Malawi has been passing through during the period. The economic hardship originated from a sour relationship between Malawi and the donor community which resulted in the suspension of donor aid. Severe shortage foreign currencies followed and the other consequential effects such as severe fuel shortage, lack of imported raw materials resulting in scaling down by manufacturing companies, downsizing etc. As has been already mentioned, intellectual capital does not naturally develop and evolve rather, targeted managerial investments are much more important to its growth (Youndt et al., 2004). These targeted investments can be conscious i.e. where right and well planned actions are made intended to build the value of intellectual capital. On the other hand, may be unconscious, in the sense that investments may be planned however the managers are not be aware that they are building intellectual capital, for instance they may regard them as merely corporate social responsibility. Thus, during this period of economic hardship, managers of the listed companies may have been forced consciously or unconsciously to neglect or reduce investing in intellectual assets. The study therefore further proposes studies to empirically determine the factors contributing to the fall in value of intellectual capital of the listed companies.

Conclusion

Intellectual capital is indisputably essential to achieving competitive advantage for companies in today's knowledge-based economy hence; efforts should be made to effectively manage it. Knowledge of the value of intellectual capital is vital to its management. According to Jurczak (2008) measurements assist in benchmarking, estimation of their real value, controlling their improvement year by year and improving ways of managing them. Hence the study has endeavoured to measure intellectual capital in companies listed on Malawi Stock Exchange using market-to-book value methodology. The results indicate the need for further studies in order to fully understand intellectual capital in Malawi and ways of enhancing it in order to promote the competitiveness of the companies and consequently the economy as a whole.

The study had two major limitations. Firstly, the values of intellectual capital were measured using only one method; market-to-book value which is prone to financial speculations on the capital market (Campisi and Costa, 2008). It is also opined that there is no one method that is credible enough (Jurczak, 2008) as they are all evolving. Furthermore according to Brennan (2001) the difference between market and book value cannot be wholly ascribed to intellectual assets as part may relate to unrealistic tangible asset values in firm balance sheets. Secondly, the sample was small relative the number of companies in Malawi, as there were only fifteen listed companies on MSE, during the period, hence the results cannot be generalised. Future studies should consider measuring and comparing values of intellectual capital combining a number of methods. Furthermore, as already stated future studies should consider a larger sample incorporating companies that are not listed.

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Table 1: Methods for measuring intangible assets

Category	Approach	Methods
Scorecard methods	Non-monetary evaluation Evaluation of single components of the Intellectual Capital	Topplinjen & business IQ Danish guidelines IC rating Value chain scoreboard Meritum guideline Knowledge audit cycle IC-index Skandia navigator Intangible asset monitor Balance score card
Direct Intellectual Capital methods	Monetary evaluation Evaluation of single components of the Intellectual Capital	The value explorer Intellectual asset valuation Total value creation Inclusive valuation methodology Accounting for the future Technology broker Citation-weighted patents HR statement Human resource costing & accounting (Johansson) Human resource costing & accounting (Flamholtz)
Return On Assets methods	Monetary evaluation Evaluation of single components of the Intellectual Capital	Knowledge capital earnings Economic value added Calculated intangible value Value added intellectual coefficient
Market Capitalization Methods	Monetary evaluation Evaluation of single components of the Intellectual Capital	Investor assigned market value Market-to-book value Tobin's q The invisible balance sheet

Source: Campisi and Costa (2008)

TABLE 2
List of companies listed on MSE and their sectors 2008 - 2012

No	**Name of the companies**	**Industry/ Sector**
1	Blantyre Hotels Limited	Tourism
2	First Merchant Bank	Banking
3	Illovo Sugar	Agro-processing
4	Malawi Property Investment Co. Limited	Property Development
5	National Bank of Malawi	Banking
6	NBS Bank	Banking
7	NICO Holdings Limited	Financial
8	National Investment Trust Limited	Investment Trust
9	Packaging Industries (Malawi) Limited*	Industrial
10	Press Corporation Limited	Conglomerate
11	Real Insurance Limited	Insurance
12	Standard Bank	Banking
13	Sunbird Tourism Limited	Tourism
14	Telekom Networks Limited	Telecoms
15	Old Mutual Limited**	Financial

** delisted in 2011*
***its primary listing is on the London Stock Exchange*
(Source: Malawi Stock Exchange)

TABLE 3: Analysis of aggregate value of intellectual capital (IC)

Year	**Minimum IC value** ***K'million***	**Maximum IC value** ***K'million***	**Average IC value** ***K'million***	**Standard deviation**	**Number of Companies reporting excess of market value over book value (N = 13)**
2008	-435.07	71,397.41	13,487.92	19,633.39	12
2009	-3,482.89	60,672.31	9,619.99	16,905.62	8
2010	-3,219.82	61,128.49	8,090.41	17,116.86	8
2011	-5,937.28	69,396.01	7,803.19	19,470.72	8
2012	-6,927.45	66,589.59	6,490.29	18,809.84	8

TABLE 4: Results of Paired Samples Test

		Mean	**Standard Deviation**	**Standard Error Mean**	**t**	**Sig. (2-tailed)**
Pair 1	2008 - 2009	3,867.92	5,334.92	1,479.64	2.61	0.023
Pair 2	2009 - 2010	1,529.58	2,474.18	686.21	2.23	0.046
Pair 3	2010 - 2011	287.21	3,029.10	840.12	0.34	0.738
Pair 4	2011 - 2012	1,312.90	2,072.33	574.76	2.28	0.041

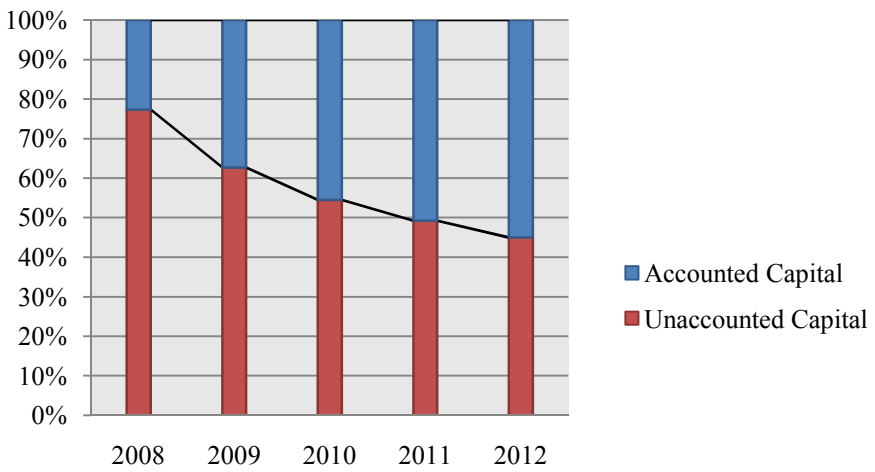


FIGURE 1: Proportion of accounted and unaccounted capital

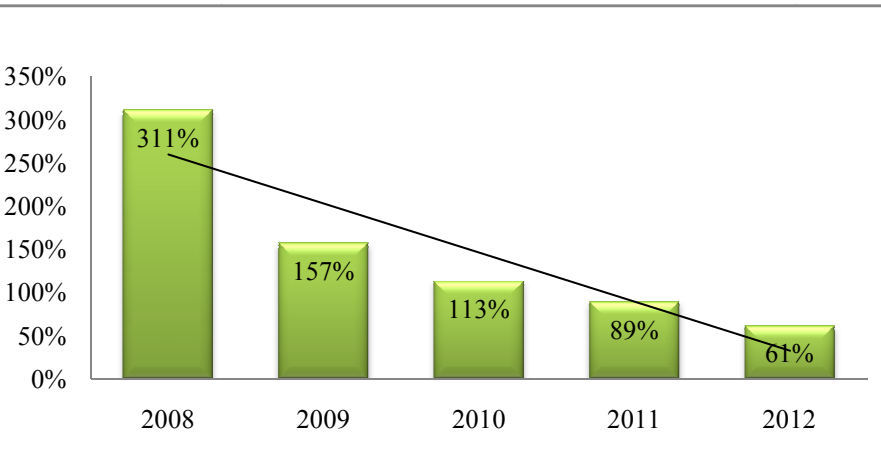


FIGURE 2: Percentage of average IC to average Book value

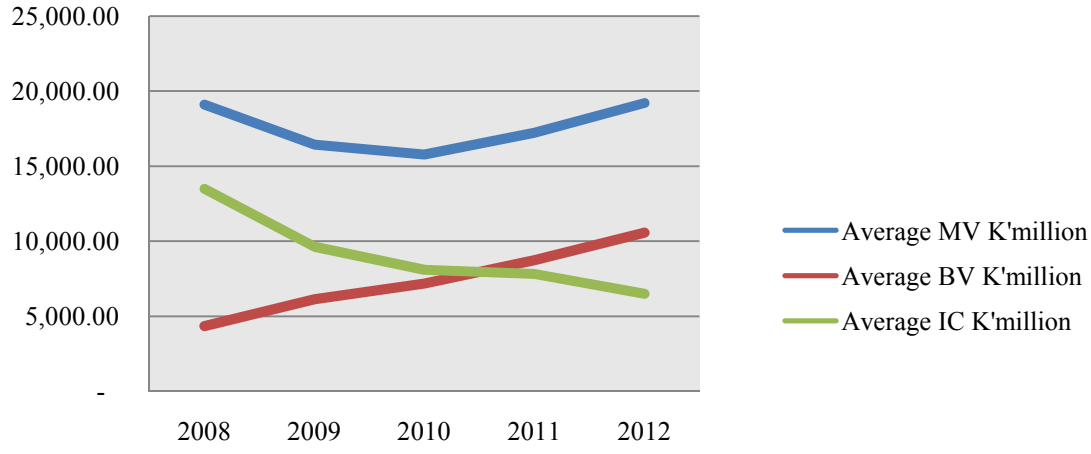
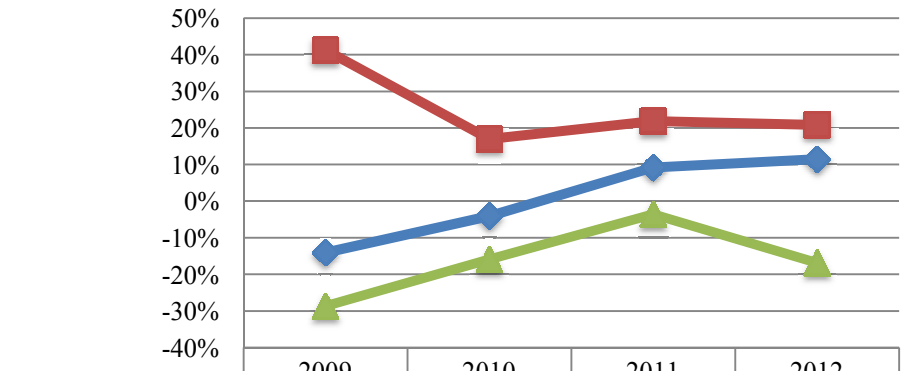


FIGURE 3: Trends over the five year period



	2009	2010	2011	2012
GR of MV	-14%	-4%	9%	11%
GR of BV	41%	17%	22%	21%
GR of IC	-29%	-16%	-4%	-17%

FIGURE 4: Growth rate (GR) in the average value of intellectual capital (IC), market value (MV) and book value (BV)