

INTELLECTUAL CAPITAL IMPACT ON THE PERFORMANCE OF BANKS IN EGYPT DURING THE PANDEMIC COVID 19

Dr. SAMEH ABDELHAY

College of Business Administration Umm Al Quwain University Umm Al Quwain, 356, UAE.
Email: Drsameh.a@uaqu.ac.ae

Dr. MAGDI EL-BANNANY

College of Business Administration Umm Al Quwain University Umm Al Quwain, 356, UAE.
Faculty of Business, Ain Shams University, Cairo, 11566, Egypt. Email: drmagdi.e@uaqu.ac.ae

Abstract

Purpose - This research aims to understand what factors contributed to the success of Egypt's banking sector in terms of intellectual capital between 2019 and 2022. **Design/methodology/approach** – The effectiveness of intellectual capital as a dependent variable is investigated via multiple regression analysis, which examines the association between intellectual capital performance and a number of potential predictors. **Findings** – The research shows that the intellectual capital performance of Egyptian banks is significantly influenced by the age of the banks, the size of the banks, the structure of the market, and the global financial crisis. Because no comparable empirical study has been undertaken in Egypt before, the findings are crucial. **Research Limitations:** In order to generalise the findings, more research on the factors that affect the performance of intellectual capital is required. Further, the study's empirical tests were undertaken solely on Egyptian banks during 2019–2022, therefore its conclusions cannot be extrapolated to any other set of banks or any other period of study. **Practical implications** – The research could help regulators focus on the elements that affect banks' intellectual capital performance, leading to improved efficiency and productivity in the context of value generation. It's helpful for researchers and policymakers in this area because it lays out some principles to follow. **Originality/value** – This research contributes to the existing body of work on the factors that affect the effectiveness of banks' intellectual capital. Specifically, it investigates the novel ideas that the market structure and worldwide financial crisis affect the productivity of intellectual capital.

Keywords: Egypt, banks, bank age, bank profitability, bank size, market structure, global financial crisis, intellectual capital performance.

Article type: Research paper

1. INTRODUCTION

Companies' chances of succeeding in a cutthroat market are correlated with their capacity to secure a competitive advantage by making better use of the tangible and intangible resources at their disposal, which, in turn, may improve the value they provide for their stakeholders.

Services sectors, such as banking, rely more on intangible resources, such as intellectual capital, than on tangible resources, such as noncurrent assets, to generate income. As a result, banks should prioritise intellectual capital above physical capital if they want to maximise the value they provide for their customers (consider the following as an example, Bharathi, 2010; Young et al., 2009; El-Bannany, 2008; Mavridis, 2004; Tan et al., 2008; Marr et al., 2003 and Canibano et al. 2000).

Intellectual capital (IC) is a phrase that has been debated in the literature to define several traits that can be used to gain an advantage over competitors. Incorporating any or all of the characteristics of IC reflected by i.e. workers' expertise, computer software, knowledge sharing, innovation, corporate culture, intellectual property, goodwill, patent, and management philosophy may place a bank at an advantage over its competitors (consider the following as an example, the World Bank, 1998 & 1999; Usoff et al. 2002). According to Mavridis (2004), the banking industry is an excellent candidate for an intellectual capital study because of the ease with which one can obtain the relevant data required for the study's empirical section.

To sum up, IC is crucial in the banking business for the creation of value and the maximisation of shareholder capital. As a result, consideration must be given to the aspects that may influence intellectual capital's effectiveness. Its worth stems from the possibility that it will aid in enhancing IC's efficiency and, by extension, the bank's worth.

Based on the abovementioned, it is clear that the current study is crucial to gaining insight into the workings of Services-based industries since it seeks to explain the elements that affect the results of IC.

Previous research (consider the following as an example, Joshi et al., 2010; El-Bannany, 2008; Yalama and Coskun, 2019; Goh, 2005) has considered a wide range of potential influences on intellectual capital performance; preliminary empirical investigation suggests that the bank age, bank profitability, market structure, and global financial crisis are among the most important in explaining variations in intellectual capital performance for Egyptian banks.

Unfortunately, not one of them looked to Egypt for actual data on how these variables affect the efficiency of intellectual capital. Because of this, the current study will make a significant empirical contribution to the existing literature on the causes of variations in the performance of intellectual capital.

The sample of financial institutions used for this analysis are listed in Table 1. Since the study period 2019-2022 encompasses both the years leading up to and including the global financial crisis in 2020, as well as the immediate post-crisis years 2021 and 2010, it can be argued that the timeframe covers a variety of situations useful for the study's stated goals (Fariborz, 2011). This will aid in gauging how the global financial crisis has affected the productivity of intellectual capital.

Through an analysis of the elements that have influenced intellectual capital performance from 2019 to 2010 (see Table 1), this research aims to learn what determines Egyptian banks' success throughout this time period.

The remaining portion of this paper will be organised as follows. In Section 2, we examine what is meant by "intellectual capital" and how its performance might be evaluated. The factors that influence the efficiency of intellectual capital are discussed in Section 3. Methodology is discussed in Section 4. This study's empirical findings are presented in Section 5, and its conclusions are presented in Section 6.

Table 1: Banking firms from the years 2019-2022 made up the study's sample

Bank name
Arab African International Bank (AAIB)
Al Watany Bank of Egypt (AWB)
Banque Misr (BM)
Bank of Alexandria (BOA)
Credit Agricole Egypt (CAE)
Commercial International Bank (Egypt) SAE (CIB)
Faisal Islamic Bank of Egypt (FIBOE)
Housing & Development Bank (HDB)
National Societe Generale Bank (NSGB)
Piraeus Bank (PIRAEUS)

2. DEFINITION OF INTELLECTUAL CAPITAL AND ITS EFFICIENCY METRICS

Several studies have highlighted the idea that information is exploited through various techniques in an organisation. These studies have designated a company's existing knowledge as its intellectual capital. According to these research, a company's intellectual capital consists of all of the information it has acquired and can put to use for profit (Nahapiet & Ghoshal, 1998; Youndt, Subramaniam, & Snell, 2004). Moreover, academics now have a tool in the conceptualization of intellectual capital's various elements to more easily synthesise the various methods by which firms amass and apply their knowledge. Human, organisational, and social capital have previously been identified as three major components of intellectual capital. Abilities, skills, and knowledge that are owned by and put to use by people is called human capital (Schultz, 1961),

Several definitions of "intellectual capital" have been provided in the literature, and all agree that its role is to assist enterprises in gaining a competitive edge and, by extension, aid in strengthening the capability of these firms to maximise the procedures of wealth creation. They used the terms "internal capital," "external capital," and "human capital" to denote the three basic types of intellectual capital, each of which has the characteristics listed below (consider the following as an example, Whiting and Woodcock 2011; Campbell and Abdul Rahman, 2010; Yi and Davey, 2010; Branco, et al., 2010; Davey et al., 2009; Bruggen, et al., 2009; Abeysekera, 2008; Striukova et al., 2008; Beattie and Thomson, 2019; Abdolmohammadi, 2005; Mavridis, 2005; Martinez & Garcia-Meca, 2005; Chen et al., 2004; Riahi-Belkaoui , 2003; Brennan, 2001; Bontis et al., 2000; Galunic & Anderson, 2000; Edvinsson & Malone, 1997; Mouritsen, 1998; Brooking, 1996).

Factors including knowledge sharing, philosophies, methodology, innovation, infrastructure, telecommunication, computer software, network, IT, information systems, management process, communication, leadership, and corporate culture are examples of what are considered internal capital. A company's distribution channels, market share, customer service, customer satisfaction, customer loyalty, and brand are all examples of external capital. Career advancement, employee perks, empowerment, employee retention, training, expertise, knowledge, and education are all examples of human capital.

As a result, the extent to which these aspects are included in the definition of intellectual capital will determine the definition's quality.

By taking into account the performance of internal capital, external capital, and human capital, this measure may ensure that the quality of intellectual capital is accurately reflected.

The Value-Added Intellectual Capital technique was employed by Pulic (1997) to measure the performance of intellectual capital and its components in previous studies (consider the following as an example, El-Bannany, 2012; Bharathi, 2010; Young et al., 2009; El-Bannany, 2008; Kamath, 2007; Goh, 2005; Pulic, 2002) of intellectual capital performance in banks. As a result, the present investigation will employ Value Added Intellectual Capital as a proxy for quality.

While using Value-Added Intellectual Capital method, the following calculations can be used to evaluate the bank 'i's intellectual capital performance in the given year 't'

Output = total revenues

Input = operating costs (excluding staff related costs)

Value added (VA_{it}) = output – input

Human Capital (HC_{it}) = staff related costs (considered as investment)

Internal Capital (IC_{it}) = physical capital represented by the book value of net assets

External Capital (EC_{it}) = external capital for bank 'i' in year 't' which is equal to $VA_{it} - HC_{it}$

Value Added Human Capital ($VAHC_{it}$) = VA_{it} / HC_{it}

Value added Internal Capital ($VAIC_{it}$) = VA_{it} / IC_{it}

Value added External Capital ($VAEC_{it}$) = EC_{it} / VA_{it}

Value Added Intellectual Capital ($VAIC_{it}$) = ($VAHC_{it}$) + ($VAIC_{it}$) + ($VAEC_{it}$)

3. DETERMINANTS OF INTELLECTUAL CAPITAL PERFORMANCE

The success of a bank's intellectual capital is said to depend on a number of elements, many of which have been the subject of prior research (consider the following as an example, El-Bannany 2012, 2011, 2008; Saengchan, 2008; Kamath, 2019). Bank age, bank profitability, bank size, market structure, global financial crisis are the ones thought to be significant factors in determining intellectual capital performance in the Egyptian context. This research contributes to the research on bank's intellectual capital performance by re-evaluating El-Bannany (2012)'s hypotheses that the market structure and global financial crisis are influential determinants on intellectual capital performance.

3.1 Global financial crisis (GFC)

Because of the widespread panic caused by the COVID-19 outbreak, many recognisable names in a variety of markets are likely to go bankrupt (Tucker, 2020). There is a lot of financial stress on well-known American businesses like J. Crew, Hertz, Neiman Marcus, JCPenney,

and Sears. It has a significant impact on the tourism sector. Asmelash & Cooper (2020) report that 80 percent of hotel rooms are unoccupied, and that airlines have reduced staff by 90 percent, suggesting that travel destinations will generate zero income this year. Further, cultural institutions like galleries and museums have been forced to cancel large-scale events like conferences and expos. Lockdowns have also halted the operations of businesses providing personal services, such as barbershops, fitness centres, and taxis, and those providing general consulting services. In the end, significant industries including the automobile, tractor, and electronic equipment manufacturing sectors have closed suddenly (although they started to open up two months after their closure). The list of questions we may ask ourselves about this unexpected shutdown is effectively limitless. When this happens, how do we, for example, ensure the safety of our employees? Is there a reason why businesses don't have more contingency plans in place (such setting aside cash or brainstorming new revenue streams)? How are firms and governments taking advantage of the current climate to strengthen their position in the market?

China is purchasing infrastructures and technologies made in Europe, so it seems like they're taking advantage of the situation (Rapoza, 2020)

These findings expand upon the data from earlier research that examined the immediate aftermath of the coronavirus's spread to small enterprises. Business software used by companies, as measured by the United States. Statistics on Business Start-Ups reported each week by the Census dropped by almost 27 percent between the middle of March and the middle of April, as compared to the same period last year (Wilmoth 2020). Statistics from the Small Business Pulse Survey conducted by the United States Census Bureau suggest that around 50% of firms have seen a significant negative impact from the COVID-19 outbreak, and just 15%-20% of enterprises have sufficient funds available to sustain three months of business activities (U.S. Census Bureau 2020; Bohn, Mejia and Lafortune 2020). Nearly 6,000 small firms who are part of the Alignable corporate network were surveyed in late March by Bartik et al. (2020). The majority of enterprises have less than one month's worth of cash on hand, 43% are currently closed, and employment have been drastically reduced. Over eighty-six percent of the 224 high-revenue Latinx-owned enterprises polled by the Stanford Latino Entrepreneurship Initiative (2020) experienced immediate negative repercussions, like postponed projects and closures, due to the pandemic. This is the first article to make use of CPS data to examine how the COVID-19 rules and demand shifts have affected small enterprises. This study is the first of its kind to investigate the varying impacts on immigrant company owners, minorities, and women. Study could be useful for directing government aid toward struggling small businesses, thereby protecting both those enterprises and the employment they sustain.

Thus, the initial working hypothesis (H1) is as follows:

H1: In the wake of the global financial crisis, intellectual capital has proven to be a reliable investment

3.2 Market structure

Through expanding on the concept of SCP hypothesis, we can establish a connection between intellectual capital performance and the underlying structure of markets. This hypothesis arises from the banking literature and proposes that firms' actions taken (conduct) in pursuit of maximization of value creation would be affected by the market structure indicated by the number of organizations dominating the market (degree of market concentration) and the presence of barrier to market entry (consider the following as example, Bain, 1968; Molyneux et al., 1994 and Molyneux & Teppett, 1993). El-Bannany (2012) argues that there are barriers to entry in the market. If a few number of companies control the majority of the market, those companies will have little incentive to boost the efficiency of their intellectual capital because they will be making a steady profit regardless of how well they perform.

The banking literature has studied multiple indicators of market concentration without settling on a single preferred metric. On the other hand, this is consistent with the claim made by Heggstad (1979) that SCP may be tested using any measure of market structure. Since concentration ratio is the standard for assessing market structure, it will serve as a proxy for market structure in this research (consider the following as example, El-Bannany, 2012, 2019, 2002; Holden and El-Bannany, 2004; Chang et al., 1998; Calem and Carlino, 1989).

According to Ferguson (1988), “the degree of market concentration is easily estimated since published data on the number and size distribution of firms are generally available. For other structural variables published information is rare” (pp. 23-24). This provides further evidence in favour of using the concentration ratio as a measure of market structure, and it also helps to overcome the previously mentioned difficulty of insufficient data.

According to The Monopolies and Mergers Commission (1996, p.12), “The complex monopoly is a situation where individuals or companies, account for at least 25 per cent of the supply or acquisition of particular goods or services, followed by a course of conduct, by agreement or not, that prevents, restricts or distorts competition”. To determine how many banks should dominate the market, a ratio of twenty-five percent of overall market share measured in terms of deposits or assets is a good starting point. In other words, if the concentration ratio of the four selected banks is equivalent to or greater than 25 percent, and the concentration ratio of the three selected banks is 22 percent, then the concentration ratio of the four selected banks will be utilised as the market concentration measure.

In the banking literature, the concentration ratio is often calculated as a percentage of either assets or deposits (consider the following as example, El-Bannany, Forthcoming, 2012a, 2012b, 2010, 2019, 2002; Holden and El-Bannany, 2004; Chang et al., 1998; Calem and Carlino, 1989). In the banking literature, the concentration ratio is often calculated as a percentage of either assets or deposits. According to Koch (1980), a more appropriate way to describe the human capital, external capital, and internal capital that make up intellectual capital performance is to use total assets as a comprehensive metric.

In conclusion, comparing to less concentrated markets, highly concentrated markets would inhibit competition, and as a result, the dominant firms will be less motivated to improve the

efficiency with which they use their intellectual capital to maximise the value that their businesses provide.

The second hypothesis (H2) is as follows, given the preceding discussion:

H2: The degree of market concentration has a detrimental impact on the efficiency of intellectual capital.

3.3 Bank size

Evidence suggests that larger companies are more likely to invest in innovation (a form of intellectual capital) than their smaller counterparts (consider the following as example, Alcouffe, 2002; Dahlgren et al., 2001; Malmi, 1999; Krumwiede, 1998; Bjornenak, 1997; Brown, 1981). According to El-Bannany (2012), this could be due to the fact that larger enterprises have access to more resources, such as the money market and public recognition, which could motivate them to embrace new practises in order to maintain their dominant market positions. Therefore, it is reasonable to predict that large companies' intellectual capital performance will be higher than that of minor organizations.

A variety of metrics have been employed to characterise financial institutions in the academic literature (consider the following as example, Joshi, et al., 2010; Zeghal & Maaloul 2010; Al-Twaijry, 2009; Chan, 2009; Shiu, 2006 and Firer & Williams, 2003). Total asset value is the metric that will be used to determine the relative size of the banks in this analysis. According to El-Bannany (2019), relying on a partial measure, such as total deposits, to represent firm size can be problematic because intellectual capital is a compound concept with many sources of powers making a contribution to its performance. To get around this issue, total assets could be viewed as a suitable size measure. According to El-Bannany (2011)'s research on financial institutions in the United Arab Emirates, a larger institution tends to have a higher performing intellectual capital.

This leads us to the fifth hypothesis (H3), which is:

H3: Performance in terms of intellectual capital tends to improve as bank size increases.

3.4 Bank profitability

Profit maximisation is the goal of most businesses, and it can be attained through cutting expenses, maintaining constant revenue, or both. It can also be accomplished by either boosting revenues or decreasing expenditures. Having the potential to maximise the firms' value generation is why intellectual capital is a source of competitive advantage, as stated above. Human Capital, External Capital, and Internal Capital all contribute to intellectual capital, which can be used to accomplish this. In a nutshell, companies with more intellectual capital will succeed more often than those with less (consider the following as example, Rahman and Ahmad, 2012; Ahmadi, et al., 2011; Muhammad and Ismail 2009). That's why it makes sense to assume there's a connection between the efficiency of a company's intellectual capital and its bottom line. Profitability increases as a result of improved utilisation of intellectual capital. This notion is supported by the empirical findings of El-Bannany (2011)'s banking research in the UAE and the UK (2008).

Many different profitability metrics have been utilised in academic banking research (consider the following as example, Tsolas, 2010; Rasiah, 2010 and Bowers & McGrath, 1993). One useful metric for gauging profitability, however, is the ratio of annual net profit before taxation of bank 'i' divided by its total assets in year 't', as this number represents the proportion of assets that turn a profit for every 1 AED invested, with assets standing in for all forms of intellectual capital.

The sixth hypothesis (H4) is as follows, given the above:

H4: Profitability of banks correlates positively with intellectual capital performance.

3.5 Bank age

According to Zheng et al. (2010), a company's ability to innovate has a more favourable effect as it ages. According to Wahab et al. (2010), the longer a Joint Venture has been in operation, the greater the degree of technology transfer, and the greater the favourable impact on company performance. According to Gopalakrishnan et al. (2006), a company's maturity can affect the effectiveness of its knowledge-based approaches. According to El-Bannany (2011), established businesses have a competitive advantage due to factors including longevity, customer loyalty, and brand recognition. It can be turned into an advantage in the marketplace, and this should be reflected in the human, external, and internal capital that make up intellectual capital's performance powers.

The data suggests that established businesses do better than startups (consider the following as example, El-Bannany, 2011; Batra, 1999 and Majumdar, 1997).

Accordingly, this is the fifth working hypothesis (H5):

H5: Banks that are older tend to have higher intellectual capital performance.

4. RESEARCH METHODS

The study's chosen regression model is displayed as follows:

$$VAIC_{it} = \beta_0 + \beta_1 GFC_t + \beta_2 CR1ASS_t + \beta_3 LGASS_{it} + \beta_4 ROE_{it} + \beta_5 LGAGE_{it} + u_{it}$$

Where:

VAIC_{it} = the dependent variable 'Value Added Intellectual Coefficient' for bank 'i' in year 't'; measured as explained in Section 2 above.

β₀ = constant

β_{1,2,3,.....} = coefficients of the independent variables

u_{it} = disturbance term, i.e. the usual error term

Table 2 provides the detailed explanations of the independent variable definitions.

Table 2: Description of independent variables and expected signs

Variable and abbreviation	Measurement	Expected sign	Actual sign
Global Financial Crisis (GFC_{it})	Dummy variable representing the occurrence of the global financial crisis, set to the value of 1 for the year 2019 and 0 for each year from 2008 through 2010.	-	+
Market Structure (CR1ASS_{it})	The ratio of total assets of the largest bank <i>i</i> to total assets of the banking market in year <i>t</i> to represent the level of market structure concentration.	-	-
Bank Size (LGASS_{it})	The logarithm of total assets for bank <i>i</i> in year <i>t</i>	+	+
Bank profitability (ROA_{it})	Individual bank <i>i</i> annual net profit before taxation divided by total assets in year <i>t</i>	+	+
Bank Age (LGAGE_{it})	The logarithm of the age of bank <i>i</i> in year <i>t</i> , measured by the number of years for the bank since started in business until each year of the study period.	+	+

(Source of data: Annual reports)

Banks' publicly available financial reports from 2019–2022 are given in Table 1. These reports will be used for this analysis. The study's goals were optimised by restricting the time frame to this window, thus that's why it was chosen.

5. ANALYSIS OF THE RESULTS

5.1 Descriptive statistics

The descriptive statistical analysis for the independent factors and intellectual capital performance are presented in Table 3. The intellectual capital performance values for the sample banks over the study period range from -1.38 to 5.17, with a mean value of 1.85%. According to Naser and Al-Khatib (2000), the results of the current study can be trusted because the values of the independent variables representing the bank age, bank profitability, bank size, concentration ratio, and global financial crisis are all different.

N= 40 observations

Table 3: Descriptive Statistics for the dependent and independent variables

Variable	Mean	SD	Min	Max
Intellectual Capital Performance (VAIC _{it})	1.85	1.54	-1.38	5.17
Global Financial Crisis (GFC _t)	0.75	0.44	0.00	1.00
Market Structure (CR1ASS _t)	0.39	0.01	0.38	0.41
Bank Size (LGASS _{it})	4.42	0.40	3.89	5.40
Bank Profitability (ROE _{it})	0.17	0.13	-0.22	0.35
Bank Age (LGAGE _{it})	1.36	0.50	0.00	1.95

5.2. Test for multicollinearity and cross-sectional correlation

Multicollinearity is a statistical issue that can impact negatively on the regression model by rendering otherwise useful independent variables useless as predictors of the dependent variable of interest (Grapentine, 1997). Because when value of the correlation coefficient between two or more independent variables in the regression model falls between 0.70 and 0.80, there is a possibility of having misrepresentative outcome, such as - sign for some regression coefficients (suggesting a bad relation between the independent and dependent) when theory predicts + sign (suggesting good relation between the independent and dependent variable) (consider the following as example, Kiers & Smilde, 20007; Kroll et al., 2004 and Mason & Perreault, 1991). Methods for identifying the multicollinearity issue have been proposed (consider the following as example, Jørgen, 2006; Grewal et al., 2004 and Wang, 1996), and one of these is the correlation matrix. Table 4 displays the technique's effectiveness; the largest coefficient value is found between $LGAGE_{it}$ and $LGASS_{it}$, and it is less than .80 (which was 0.43). This indicates that the multicollinearity problem does not present, supporting the preceding thesis.

Table 4: The correlation coefficient matrix for the independent variables

Independent Variables	GFC_t	$CR1ASS_t$	$LGASS_{it}$	ROE_{it}	$LGAGE_{it}$
GFC_t	-	0.171 (0.292)	0.069 (0.673)	-0.082 (0.614)	0.083 (0.612)
$CR1ASS_t$		-	-0.025 (0.877)	0.051 (0.755)	-0.021 (0.898)
$LGASS_{it}$			-	-0.023 (0.889)	0.427** (0.006)
ROE_{it}				-	0.173 (0.286)
$LGAGE_{it}$					-

The 2-tailed significance level is shown in brackets.

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed)

Due to the frequent use of the same bank over time, cross-sectional correlation can arise as a statistical issue if the study sample (the banks in this case) is small, potentially leading to the generation of biased estimated standard error of coefficients. Petersen (2009) proposes a solution to this problem in the form of dummy variables representing the banks in the regression analysis, which is implemented in Table 5 below.

5.3. Regression results and discussion

Table 5 shows that the regression model is statistically significant and adequately describes the link between independent variables and intellectual capital performance (a strong indicator of the model's robustness and well-specification). Age of bank, profitability of bank, size of bank, concentration ratio, global financial crisis, and bank dummy variables all have statistically significant coefficients (p 0.05). In addition, the signs of the coefficients for all of these variables, with the exception of the global financial crisis, are consistent with the direction that was hypothesised.

According to the data, we find that:

As predicted by Hypothesis 1, the global financial crisis is positively associated to the performance of intellectual capital, as evaluated by a dummy variable set to 1 for the years 2020, 2021, and 2022 and set to 0 for 2019. The explanation for this is that financial institutions are expected to make more use of their human, external and internal resources to reduce the likelihood of bankruptcy and its repercussions. There were no bank failures in Egypt as a result of this strategy throughout the global financial crisis, proving the strategy to be effective.

The market concentration ratio in year 't', as determined by the proportion of that market's assets held by the largest single bank to the market's total assets held by all banks combined. Consistent with Hypothesis 2, there is a negative relationship between the intellectual capital performance and market concentration ratio. Consistent with the prediction of Hypothesis 3, the logarithm of bank I in year 't's total assets has a positive relationship with the intellectual capital performance. To support Hypothesis 4, we find that the ratio of a bank's pretax profit to its total assets in a given year (hence referred to as "net profit") is positively correlated with that bank's success in terms of its intellectual capital performance. In accordance with the prediction of Hypothesis 5, we find that the logarithm of the age of bank I in year 't' is positively associated to the intellectual capital performance.

Table 5: The regression results: dependent variable VAIC_{it};

Number of observations 40

Regressor	Coefficient	t-ratio	Probability
Intercept	6.311	1.636	0.113
GFC _t	1.078	4.719	0.000
CR1ASS _t	-40.598	-4.678	0.000
LGASS _{it}	1.666	4.328	0.000
ROE _{it}	11.655	6.629	0.000
LGAG _{it}	0.751	2.778	0.009
AWB _{it}	1.499	4.347	0.000
BM _{it}	-1.356	-2.071	0.047
BOA _{it}	-1.140	-3.177	0.004
FIBOE _{it}	1.193	2.587	0.015
PIRAEUS _{it}	2.316	3.117	0.004

R-SQUARED = 0.89 R-BAR-SQUARED = 0.85

F (10, 29) = 23.545 Sig. F. = 0.000

N = 40

6. CONCLUSIONS

Using data from Egyptian financial institutions between 2019 and 2010, this study examines the correlation between intellectual capital performance and five independent variables (couple

of which, the market structure and global financial crisis as analysed by concentration ratio, have recently been considered by El-Bannany, 2012).

In this investigation, we take into account the following factors as independent variables:

According to one concept put forth in response to the global financial crisis (GFC), banks should be inspired to make the most of the intellectual capital represented by their human, external, and internal human capital resources. Any issue that could threaten the banks' capacity to continue as a going concern should be avoided at all costs. Based on the concentration ratio, the market structure theory predicts that a small number of banks may work with each other to increase their profits at the cost of the industry as a whole due to inadequate competitiveness. There could be a negative effect on the efficiency of intellectual capital if this continues. The size of the bank. The intellectual capital performance of larger banks will be higher for factors including economies of sale, brands, and goodwill. Bank profitability. One possible explanation for the superior financial results of some banks over others is the quality of their intellectual capital. The bank age. Older banks outperform their younger counterparts on the basis of intellectual capital performance for a variety of reasons, including their greater experience in maximising the benefits of their intellectual capital's human, external, and internal resources. Based on the data, we can conclude that the market structure and global financial crisis (as assessed by bank age, bank profitability, bank size, and concentration ratio) have substantial influences on intellectual capital performance. The following are some suggestions for follow-up studies: First, the model developed in the current study can be used to expand our understanding of the variables that contribute to the intellectual capital performance. Second, the empirical tests were implemented on Egyptian banks between 2019 and 2022, therefore the findings of the current study can be used as a foundation for comparing the findings of studies for these banks across different study periods, which may help them improve their performance. Finally yet importantly, notions like leadership and culture could be taken into account to explain intellectual capital performance.

References

1. Ahmadi, F.; Habibi, F.; Khodamoradi, A. (2011), 'The role of Intellectual Capital on improvement performance of agricultural bank in Iran', *Interdisciplinary Journal of Contemporary Research In Business*, Vol.3 No. 3 pp. 1116-1124.
2. Alcouffe, S. (2002), *La diffusion de l'ABC en France: une etude empirique utilisant la theorie de la diffusion des innovations*, 23rd Congress of the French Association of Accounting, Toulouse.
3. Al-Bawab, A. (2011), "Impact of Global Financial Crisis on the Auditing Profession in the Republic of Yemen (An Empirical Study)", *Interdisciplinary Journal of Contemporary Research in Business*, Vol. 3 No. 2 pp.): 1790-1807
4. Abdelbaki, H. (2010), "Assessing The Impact Of The Global Financial Crisis On GCC Countries", *Journal of Business & Economics Research*, Vol. 8 No. 2 pp.: 139-151.
5. Abdolmohammadi, M. (2005), "Intellectual capital disclosure and market capitalization", *Journal of Intellectual Capital*, Vol. 6 No. 3, pp. 397-416.
6. Abeysekera, I. (2008), "Motivations behind human capital disclosure in annual reports", *Accounting Forum*, Vol. 32 No. 1, pp. 16-29.

7. Al-Twajry, A. (2009), "Intangible assets and future growth: evidence from Japan", *Asian Review of Accounting*, Vol. 17 No. 1, pp. 23-39.
8. Asmelash, L., & Cooper, A. (2020). Nearly 80% of hotel rooms in the US are empty, according to new data. CNN <https://edition.cnn.com/2020/04/08/us/hotel-rooms-industry-coronavirus-trnd/index.htm>.
9. Anonymous (2009). Chapter 1: The global financial crisis and its impact on developing countries. Washington, Washington: <http://search.proquest.com/docview/89141158?accountid=42604>, Global Monitoring Report.
10. Bain, J. (1968), "Industrial Organization" 2nd ed., John Wiley & Sons, New York.
11. Batra, G. (1999), 'Job Reallocation, the Export Market, and Firm Performance: Microeconomic Evidence'; World Bank Policy and Research; Business Environment Unit.
12. Beattie, V. and Thomson, S. (2019), "Lifting the lid on the use of content analysis to investigate intellectual capital disclosures", *Accounting Forum*, Vol. 31 No. 2, pp. 129–163.
13. Bharathi, K. (2010), "The Intellectual Capital Performance of Banking Sector in Pakistan", *Pak. J. Commer. Soc. Sei.*, Vol. 4 No. 1, pp. 84-99.
14. Bjornenak, T. (1997), Diffusion and accounting: the case of ABC in Norway, *Management Accounting Research*, 8 (1): 3-17.
15. Bohn, Sarah, Marisol Cuellar Mejia, and Julien Lafortune. 2020. "The Economic Toll of COVID-19 on Small Business," Public Policy Institute of California.
16. Bontis, N., Keow, W. and Richardson, S. (2000), "Intellectual capital and business performance in Malaysian industries", *Journal of Intellectual Capital*, Vol. 1 No. 1, pp. 85-100.
17. Bowers, D., & McGrath, T. (1993), 'Measuring branch profitability in banking: A case study of a large Midwestern bank', *The Journal of Bank Cost & Management Accounting*, Vol. 6 No.2, pp. 21-21.
18. Branco, M., Delgado, C., Sa, M. and Sousa, M. (2010), "An analysis of intellectual capital disclosure by Portuguese companies" *EuroMed Journal of Business*, Vol. 5 No. 3, pp. 258-278.
19. Brooking, A. (1996), *Intellectual Capital: Core Assets for the Third Millennium Enterprise*, Thomson Business Press, and London.
20. **Brown, L. A. (1981), *Innovation diffusion: A new perspective*, New York: Methuen.**
21. Brennan, N. (2001), "Reporting intellectual capital in annual reports: evidence from Ireland", *Accounting, Auditing & Accountability Journal*, Vol. 14 No. 4, pp. 423-36.
22. **Bruggen, A., Vergauwen, P. and Dao, M. (2009), "Determinants of Intellectual capital Disclosure: evidence from Australia", *Management Decisions*, Vol. 47 No. 2, pp. 233-246.**
23. Canibano, L., Garcia-Ayuso, M., Sanchez, P. (2000), "Accounting for intangible: a literature review", *Journal of Accounting Literature*, Vol. 19 pp.102-30.
24. Calem, P. and Carlino, G. (1989), "The Concentration/Conduct Relationship in Bank Deposit Markets", working Paper no. 89-26, Federal Reserve Bank of Philadelphia.
25. Campbell, D. and Abdul Rahman, M. (2010), "A longitudinal examination of intellectual capital reporting in Marks & Spencer annual reports, 1978–2008", *The British Accounting Review*, Vol. 42 No. 1, pp. 56-70.
26. Chang, E., Hasan, I. and Hunter, C. (1998), "Efficiency of Multinational Banks: An Empirical Investigation" *Applied Financial Economics*, Vol. 8 No. 6, pp. 689- 696.
27. Chan, K.H. (2009), "Impact of intellectual capital on organisational performance. An empirical study of companies in the Hang Seng Index (Part 2)", *The Learning Organization*, Vol. 16 No. 1, pp. 22-39.

28. Chen, J., Zhu, Z. and Xie, H. (2004), "Measuring intellectual capital: a new model and empirical study", *Journal of Intellectual Capital*, Vol. 5 No. 1, pp. 195-212.
29. Chubrik, A., Dabrowski, M., Mogilevsky, R., & Sinitsina, I. (2011). The impact of the global financial crisis on public expenditures on education and health in the economies of the former Soviet Union. *CASE Network Reports*, (100), 1-2, 7-91.
30. Dabrowski, M. (2010). The global financial crisis and its impact on emerging market economies in Europe and the CIS: Evidence from mid-2010. *CASE Network Studies and Analyses*, (411), 0_1-35.
31. Dahlgren, J., Holmstrom, M. and Nehler, H. (2001), *Activity Based Costing diffusion and adoption*, congress EAA, Athens.
32. Davey, J., Schneider, L. and Davey, H. (2009), "Intellectual capital disclosure and the fashion industry", *Journal of Intellectual Capital*, Vol. 10 No. 3, pp. 401- 424.
33. Edvinsson, L. and Malone, M. (1997), *Intellectual Capital: Realizing Your Company's True Value by Finding its Hidden Brain Power*, Harper Collins Publisher Inc., New York, NY.
34. El-Bannany, M. (Forthcoming), 'A Model to Explain Intellectual Capital Disclosure in UAE. *International Journal of Learning and Intellectual Capital*.
35. El-Bannany, M. (2012a), 'Corporate Governance, Financial Leverage and other Determinants of Intellectual Capital Performance in UAE Banks'. *Global Business & International Management Conference*, Orlando, USA, Jan 15-17, 2012.
36. El-Bannany, M. (2012b), "Global Financial Crisis and the Intellectual Capital Performance of UAE Bank", *Journal of Human Resource Costing and Accounting* Volume 16, issue 1 (Forthcoming).
37. El-Bannany, M. (2011), "Earnings Quality and other Factors Affecting Intellectual Capital Performance: The Case of UAE Banks" in *Proceedings of 3rd European Conference on Intellectual Capital in University of Nicosia, Cyprus*, Academic Conferences International, UK, pp. 136-146.
38. El-Bannany, M. (2010), *Modelling Intellectual Capital Disclosure: The Case of UAE Banks*. *International Conference on Business, Economics and Tourism Management (CBETM 2010)*, Singapore, Feb. 26-28, 2010.
40. El-Bannany, M. (2008), "A Study of Determinants of Intellectual Capital Performance in Banks: the UK Case", *Journal of Intellectual capital*, Vol.9 No. 3, pp. 487-498.
41. El-Bannany, M. (2019), "A Study of the Determinants of Social Disclosure Level in UK Banks" *Corporate Ownership & Control*, Vol. 5 No. 1, pp. 120-130.
42. El-Bannany, M. (2002), "Investment in Information Technology Systems and Other Determinants of Bank Performance in the UK and Egypt", Unpublished Ph.D. thesis, Liverpool John Moores University, UK.
43. Ellaboudy, S. (2010), "The Global Financial Crisis: Economic Impact on GCC Countries and Policy Implications" *International Research Journal of Finance and Economics*, Issue 41, pp. 177-190.
44. Fariborz, M. (2011), "The global financial crisis and the evolution of markets, institutions and regulation", *Journal of Banking & Finance*, Vol. 35 No. 3, pp. 502-511.
45. Ferguson, P. (1988), "Industrial Economics: Issues and Perspectives", Macmillan, London.
46. Firer, S. and Williams, S.M. (2003), "Intellectual capital and traditional measures of corporate performance", *Journal of Intellectual Capital*, Vol. 4 No. 3, pp. 348-60.
47. Galunic, C. and Anderson, E. (2000), "From security to mobility: generalized investments in human capital and agent commitment", *Organization Science*, Vol. 11, pp. 1-20.

48. **Goh, P. (2005), "Intellectual Capital Performance of Commercial Banks in Malaysia", *Journal of Intellectual Capital*, Vol. 6 No.3, pp. 385-396.**
49. Gopalakrishnan, S.; Bierly, III; Paul E. (2006), 'the Impact of Firm Size and Age on Knowledge Strategies During Product Development: A Study of the Drug Delivery Industry', *IEEE Transactions on Engineering Management*. Vol. 53 No. 1, pp.3-16.p.
50. Grapentine, T. (1997), 'Managing multicollinearity', *Marketing Research*; Vol. 9 No. 3, pp. 10-22.
51. Grewal, R., Cote, J. A., & Baumgartner, H. (2004). Multicollinearity and measurement error in structural equation models: Implications for theory testing. *Marketing Science*, Vo. 23 No.4, pp.519-529.
52. Habibi, N. (2009), "The Impact of the Global Economic Crisis on Arab Countries: A Year-End Assessment", working paper no. 40, Crown Centre for Middle East Studies, Brandeis University, Massachusetts.
53. Hasan, M. and Dridi, J. (2010), "The Effects of the Global Crisis on Islamic and Conventional Banks: A Comparative Study", working paper no. 10/201, IMF, September. Heggstad, A. (1979).
54. A Survey of Studies on Banking Competition and Performance, Chapter Nine in F. R. Edwards (editors), *Issues in Financial Regulations*. New York: McGraw-Hill Book Company, pp. 449-490.
55. **Holden, K. and El-Bannany, M. (2004), "Investment in Information Technology Systems and Other Determinants of Bank Profitability in the UK", *Applied Financial Economics*, Vol.14 No. 5, pp. 361-65.**
56. Jørgen, M. (2006), 'Multicollinearity in cross-sectional regressions', *Journal of Geographical Systems*, Vol.8 No.4, pp.317-333.
57. Joshi, M., Cahill, D. and Sidhu, J. (2010), "Intellectual capital performance in the banking sector: An assessment of Australian owned banks", *Journal of Human Resource Costing & Accounting*, Vol.14 No. 2, pp. 151-70.
58. Kamath, B. (2019), "The intellectual capital performance of Indian banking **Sector**", ***Journal of Intellectual Capital*, Vol. 8 No. 1, pp. 96-123.**
59. Kiers, H., and Smilde, A. (2019), "A Comparison of various Methods for Multivariate Regression with Highly Collinear Variables." *Statistical Methods & Applications*, Vol.16 No.2, pp. 193-228.
60. Koch, J. (1980). *Industrial Organization and Prices*. 2nd edition. New Jersey: Prentice-Hall, Inc., Englewood Cliffs.
61. Kroll, C., Luz, J., Allen, B., Vogel, M. (2004), "Developing a Watershed Characteristics Database to Improve Low Streamflow Prediction." *J. Hydrologic Engrg.*, Vol.9 No.2, pp.116-125.
62. Krumwiede, P. (1998), the implementation stages of Activity-Based Costing and the impact of contextual and organizational factors, *Journal of Management Accounting Research* 10: 239-277.
63. Majumdar S.K. (1997), "The Impact of Size and Age on FinnLevel Performance: Some Evidence from India", *Review of Industrial Organization*, Vol. 12, pp. 231-241.
64. Malmi, T. (1999), Activity-based costing diffusion across organizations: an exploratory empirical analysis of Finnish firms, *Accounting, Organizations and Society*, 24: 649-672.
65. Mason, H., and Perreault, J. (1991), "Collinearity, Power, and Interpretation of Multiple Regression Analysis." *J. Market. Res.*, Vol.28 No.3, pp. 268-280.
66. Marr, B., Gray, D., Neely, A. (2003), "Why do firms measure their intellectual **capital**", ***Journal of Intellectual Capital*, Vol. 4 No.4, pp.441-64.**

67. Martinez, I. and Garcia-Meca, E. (2005), "Assessing the quality of disclosure on intangibles in the Spanish capital market", *European Business Review*, Vol. 17 No. 4, pp. 305-13.
68. **Mavridis, D. (2004), "Intellectual Capital Performance of the Japanese Banking Sector", *Journal of Intellectual Capital*, Vol. 5 No.1, pp. 92-115.**
69. Mavridis, D. (2005), "Intellectual capital performance drivers in the Greek banking sector", *Management Research News*, Vol. 28 No. 5, pp. 43-62.
70. Molyneux, P.; Lloyd-Williams, D. and Thornton, J. (1994). *Competitive Conditions in European Banking*. *J Bank Finance*, 18: 445-459.
71. Molyneux, P. and Teppett, J. (1993). *Structure- Conduct -Performance in EFTA Banking Markets*. *Bank-en-Financiewezen*, 3: 133-137.
72. Mouritsen, J. (1998), "Driving growth: economic value added versus intellectual capital", *Management Accounting Research*, Vol. 9, pp. 461-82.
73. Muhammad, N., & Ismail, M. (2009). Intellectual capital efficiency and firm's performance: Study on Malaysian financial sectors. *International Journal of Economics and Finance*, Vol. 1 No.2 pp. 206-212.
74. Nahapiet, J., & Ghoshal, S. 1998. Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23: 242–266.
75. Naser, K. and Al-Khatib, K. (2000), "The Extent of Voluntary Disclosure in the Board of Directors' Statement: The Case of Jordan", *Advances in International Accounting*, Vol.13, pp. 99-118.
76. Otobe, N. (2011), "Global economic crisis, gender and employment: **The impact and policy response**", **available at: <http://www.ilo.org> (accessed 16 October 2011).**
77. Petersen, M. (2009) 'estimating standard errors in finance panel data sets: comparing approaches', *Review of Financial Studies*, Vol. 22, No. 1, pp.435–480.
78. Pulic, A. (2002), "Value Creation Efficiency of Croatian Banks 1996 – 2000", available at: www.vaic-on.net (accessed 16 October 2011).
79. Pulic, A. (1997), "The Physical and Intellectual Capital of Austrian Banks", available at: www.vaic-on.net (accessed 16 October 2011).
80. Rahman, S.; Ahmed, J. (2012). Intellectual Capital Efficiency: Evidence from Bangladesh. *Advances in Management and Applied Economics*, Vol. 2 No. 2 pp. 109-146.
81. Rapoza, K. (2020). Watch out for china buying spree, NATO warns. *Forbes*<https://www.forbes.com/sites/kenrapoza/2020/04/18/watch-out-for-china-buying-spreenato/# 23eada31758>.
82. Riahi-Belkaoui, A. (2003), "Intellectual capital and firm performance of US multinational firms", *Journal of Intellectual Capital*, Vol. 4 No. 2, pp. 215-26.
83. Rasiah, D. (2010), 'Review of Literature and Theories on Determinants of Commercial Bank Profitability', *Journal of Performance Management* , Vol. 23 No. 1, pp. 23-49.
84. **Saengchan, S. (2008), "The Role of Intellectual Capital in Creating Value in the Banking Industry", available at: <http://www.bus.tu.ac.th> (accessed 16 October 2011).**
85. Schultz, T. W. 1961. Investment in human capital. *American Economic Review*, 51: 1–17.
86. Shaikh, F. M., Gopang, N. A., & Shafiq, K. (2011). Global financial crisis and its impact on textile industry in pakistan. *Journal of Business Case Studies*, 7(3), 17-21.

87. Shiu, H.-J. (2006b), "The application of the value added intellectual coefficient to measure corporate performance: evidence from technological firms", *International Journal of Management*, Vol. 23 No. 2, pp. 356-65.
88. **Striukova, L., Unerman, J. and Guthrie, J. (2008), "Corporate reporting of intellectual capital: Evidence from UK companies", *The British Accounting Review*, Vol. 40 No. 4, pp. 297-313.**
89. Tan, H.P., Plowman, D., Hancock, P. (2008), "The evolving research on intellectual capital", *Journal of Intellectual Capital*, Vol. 9 No.4, pp.585-608.
90. The Monopolies and Mergers Commission (1996), *The Role of the MMC (1996)*, 5th edition. Monopolies and Mergers Commission, UK.
91. Tsolas, I. (2010), ' Modeling bank branch profitability and effectiveness by means of DEA', *International Journal of Productivity and Performance Management* 59. 5 (2010): 432-451.
92. Tucker, H. (2020). Coronavirus bankruptcy tracker: These major companies are failing amid the shutdown. [Forbeshttps://www.forbes.com/sites/hanktucker/2020/05/03/coronavirus-bankruptcy-tracker-these-major-companies-are-failing-amid-theshutdown/# 5649f95d3425](https://www.forbes.com/sites/hanktucker/2020/05/03/coronavirus-bankruptcy-tracker-these-major-companies-are-failing-amid-theshutdown/# 5649f95d3425).
93. **Usoff, C., Thibodeau, J. and Burnaby, P. (2002), "The Importance of Intellectual Capital and its effect on Performance Measurement Systems", *Managerial Auditing Journal*, Vol. 17 No. 1/2, pp. 9-15.**
94. **Wahab, A.; Abdullah, H.; Uli, Jegak; R., Raduan. (2010), 'Age of Joint Venture, Inter-Firm Technology and Local Firms' Performance', *International Journal of Business and Management*, Vol. 5 No. 3, pp. 89-100.**
95. Wang, S. (1996), 'How to handle multicollinearity in regression modelling', *The Journal of Business Forecasting Methods & Systems*; Vol. 15 No.1, pp. 23-27.
96. **Whiting, R. and Woodcock, J. (2011), "Firm characteristics and intellectual capital disclosure by Australian companies" *Journal of Human Resource Costing & Accounting*, Vol. 15 No. 2, pp.102-126.**
97. **Wilmoth, David. 2020. "Small Business Facts: Early Data Show Severe Disruptions," U.S. Small Business Administration. U.S. Census Bureau. 2020. "Small Business Pulse Survey." World Bank (1999), Knowledge for Development, Oxford University Press, New York.**
98. **World Bank (1998),"Knowledge for Development "World Development Report", available at: www.worldbank.org. (Accessed 16 October 2011).**
99. Yalama, A. and Coskun, M. (2019), "Intellectual capital performance of quoted banks on the Istanbul stock exchange market", *Journal of Intellectual Capital*, Vol. 8 No. 2, pp. 256-271.
100. Yi, A. and Davey, H. (2010), "Intellectual capital disclosure in Chinese (mainland) Companies", *Journal of Intellectual Capital*, Vol. 11 No. 3, pp. 326-347.
101. Young, C., Su, H., Fang, S-C. And Fang, S-R. (2009), "Cross-country comparison of intellectual capital performance of commercial banks in Asian economies", *The Service Industries Journal*, Vol. 29 No. 11, pp. 1565–1579.
102. Youndt, M. A., Subramaniam, M., & Snell, S. A. 2004. Intellectual capital profiles: An examination of investments and returns. *Journal of Management Studies*, 41: 335–362.
103. Zeghal, D. and Maaloul, A. (2010), "Analysing value added as an indicator of intellectual capital and its consequences on company performance", *Journal of Intellectual Capital*, Vol. 11 No. 1, pp. 39-60.
104. Zheng, Y.; Liu, J.; George, G. (2010), 'the dynamic impact of innovative capability and inter-firm network on firm valuation: A longitudinal study of biotechnology start-ups', *Journal of Business Venturing*, Vol. 25 No. 6, pp.593-609.