A Study of Value - Added Efficiency in The Indian Banks

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ABSTRACT

Purpose: This paper explores the importance of Intellectual Capital (IC) in the Indian Banking Industry and compares the efficiency between Public Sector Undertaking (PSU) banks and Private Sector banks, by employing Value Added Intellectual Coefficient (VAIC) method.

Methodology/approach: Using Path Analysis, the study verifies the influence of VAIC on the profitability and market value of the Indian banks. Using simple averages and graphs, VAIC of PSU and Private Banks are compared. Quarterly results are used to verify the impact of COVID on the VAIC of banks.

Findings: Human Capital Efficiency (HCE) is the largest element that contributes to the VAIC in the Indian Banks. VAIC and HCE are greater in the private sector banks than in PSU banks. HCE does contribute to the profitability of banks, whereas no evidence is found of VAIC or HCE making any contribution towards the market value. While VA and HCE fell sharply in the PSU banks and not so sharply in the Private Banks during the first wave of COVID, the recovery has been impressive, in both sectors.

Practical implications: The paper clearly brings out the role of Human Capital Efficiency (HCE) in the Indian Banks and the need to improve HCE in the PSU Banks.

Keywords: *Value Added, Banking, Profitability, Market Value, Human capital*

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Originality Value: As the concept of VAIC is recently developed, this paper adds to the existing literature, especially in the context of Indian Banks.

INRODUCTION

Over the past two centuries corporate success has been measured based on the efficiency of physical capital. In the 21st century, researchers have been extensively investigating the influence of Intellectual Capital (henceforth IC) on the profitability and market value of firms. Some researchers perceive that the gap linking market capitalization and book value of capital is largely contributed by the IC. The firm value is contributed not only by the physical assets employed, but also by the intangible assets which include human capital, spend on R&D, acquisition of intangible assets, the policies of the firm, the connection with the customers and vendors, the public standing of the firm, its organization structure- to name a few.

The focus on IC in the corporate world was brought by Stewart (1991) who published an article titled "Brain Power - how intellectual capital is becoming America's most valued asset" According to Stewart, companies that do not pay attention to knowledge, are not paying attention to business.

It has become an accepted fact now that, IC consists of a Company's human capital (talent), Structural capital (software, IP, Process rights, Methodology etc.) and Customer Capital (relationship with clients).
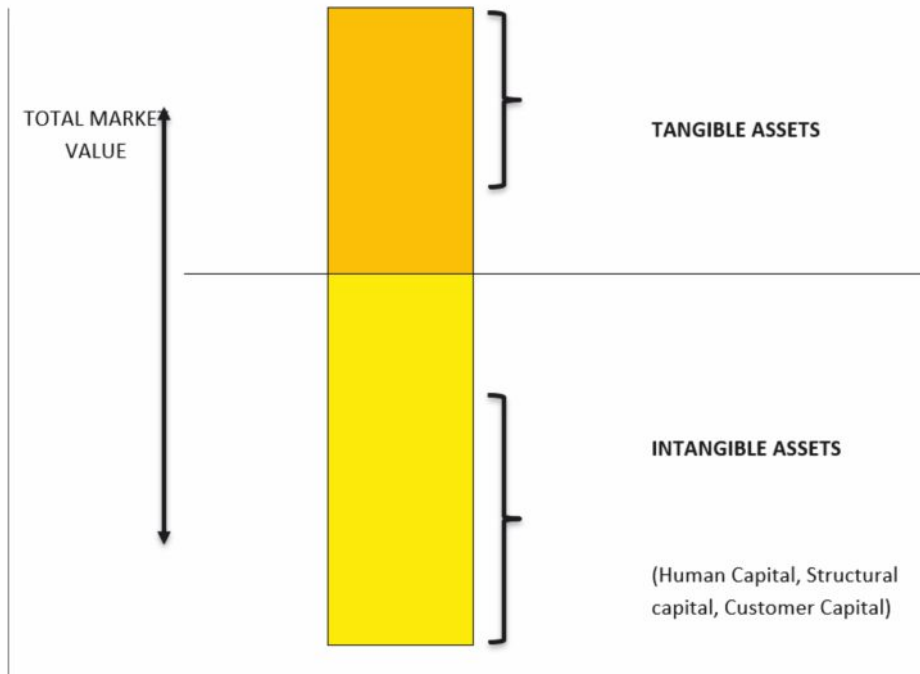

Figure 1: The role of Intangible Assets in Market Value. Source: Stewart (2001). Page 13

One of the popular methods of measuring IC is the "Value Added Intellectual Coefficient" (henceforth VAIC) method that was designed and developed by Ante Pulic (Pulic, 1998 and 2000a and 2000b; and Pulic & Bornemann, 1999). The role of IC is even more pronounced in industries where human knowledge and expertise is of paramount importance. Software industry, Pharmaceuticals, banking, biotechnology industry - are some of the industries that fall in this category. The VAIC method is a reasonable continuation of the method of measuring corporate success. VAIC does not measure IC alone. Rather, it tries to measure the corporate success in a combination of physical as well as intellectual capital. VAIC adopts the method of measuring IC directly, based on published financial statements. Pulic (2000a and 2000b) measured firm's market value as a combination of efficiency of both tangible assets and IC employed - both resources without which any firm cannot survive.

According to Pulic (2005), if the management of a firm decides to be more productive and profitable with its existing resources, the firm must introduce measures that will indicate how productive each element / segment has been and this will push employees transform their skills into value creation. Today, the firms that are very successful, participate in the competitive environment by utilizing intellectual capital. The question is not what the company has, but what it can.

The objective of this paper is to analyze and evaluate the efficiency of VAIC and its elements in the Indian Banking Industry, by studying the Public Sector (PSU) as well as the Private Sector Banks. The second part of the paper evaluates the impact of COVID-19 on the Value- Added Efficiency of Indian Banks. The objective of this paper may be summed up as follows:

1. Compare the VAIC and its elements in the PSU and Private Sector banks

2. Verify the impact of VAIC and its elements on the profitability of banks

3. Verify the impact of VAIC and its elements on the market valuation of banks

4. Verify the impact of COVID-19 on VAIC

LITERATURE REVIEW

Study of IC, especially after the development of VAIC methodology, has evinced a lot of interest in the research world. In India too, many studies have contributed to the rich archives of the research on IC.

Kamath (2015) picked 30 firms from S&P BSE sensitive index to evaluate the influence of IC on the market valuation and financial results. The firms chosen were across manufacturing and service sectors. The period of sample was 2008-09 to 2012-13. The author used the VAIC methodology and multiple linear regression to establish that profitability of the firms under study is clearly influenced by the productivity of its IC. The research also revealed that among the sections of VAIC, the HCE and SCE have a bigger bearing on profitability than CEE. The impact of SCE was negative on profitability. The study also observed that Leverage and ROE have a bearing on firm's financial performance. The control variable of size did not have any bearing on profitability. The study clearly shows that IC has a bearing on the profitability of firms. Hence, it is important that stake holders take into consideration the influence of intangible assets also, while evaluating the profitability and market value of firms.

Nagaraj & Vinay (2016) studied Indian Companies for the years 2007 to 2009 to empirically test the impact of intangible assets, financial policies, and financial performance on firm value. By using path analysis, the researchers established that financial policies, financial performance and intangible assets have an influence on firm value. The results indicated that, Intellectual capital and debt were negatively correlated, though not significantly. Higher the investment in IC, lower was the debt. Intellectual capital had positive effect on dividend policy, though not significant. Higher IC resulted in higher dividends to give positive signals to the investors. Intellectual capital had a significant positive

correlation with performance. IC had a negative, though not significant correlation with current ratio and Asset Turnover ratio.

Pulic (2000b) did a study of 30 randomly selected UK based companies listed in FTSE 250 and established that VAIC and market value of firms have a high scale of correlation. The study was for the period 1992 to 1998.

By using the VAIC methodology, Firer & Williams (2003) verified the nexus between IC and traditional computations of financial performance i.e., Profitability, Productivity & Market Value in South African companies. The result of the study did not indicate a strong nexus between VAIC, and the measures indicated.

The affiliation between IC, market value & financial performance of Taiwanese firms was studied by Chen et al (2005). The study pointed out that investors valued higher companies with better IC and that such companies performed very well with high profitability in the current and subsequent years.

Kamath (2007) ranked the selected sample of Indian banks according to their IC efficiency to measure their value-based performance. The study was for the period 2002 to 2007. The study points that the difference in performance in distinct sections is due to the distinction in HCE in the factors.

Ghosh & Mondal (2009) selected 80 companies in the IT and pharma sectors in India to study the impact of IC on profitability. The researchers developed the efficiency measures using VAIC. The study could only explain the bearing of IC on profitability but not on market valuation and productivity in the selected industries in India.

Purohit & Tandon (2015) examined the correlation between market valuation, productivity, and profitability (being the traditional methods of measuring financial well-being) and IC. The study was conducted regarding Indian IT and pharmaceutical industries for the period 2008-09 to 2011-12. Prior research indicates that if the sections of VAIC (HCE, SCE, CEE) are considered separately, one would obtain better results / have greater explanatory power, than taking only VAIC as an aggregate. As such, in this study also the researchers consider the components separately. The study employs ROA as an independent variable that reflects the profitability of the given firm. As the study considers the three components of VAIC separately and develops three separate sets of hypotheses. The study investigates 10 companies listed in IT and Pharmaceutical industries and listed in BSE (Bombay Stock Exchange). The overall result, arrived at from correlation and multiple linear regression is that the relationship between the three components and profitability, productivity and market valuation is limited and do not support the proposed hypothesis. Further, the outcome of the study syncs with the previous research that failed to establish the relationship. The study supports the research conducted by Shaban & Kavida (2013), where it was found that CEE has a high level of positive correlation with M/B ratio. In India, firms follow the traditional accounting measures and hence, results based on intangible assets like IC are not very robust.

The stakeholders of a firm could be investors, government, customers, employees, shareholders and even creditors. Depending on the traditional methods of measurement of efficiency alone may not show the correct results, thereby resulting in inaccurate decisions and wrong allocation of resources. Depending on traditional methods will only give the accountant's view. Researchers (Bontis, 2001; Syeiby, 2001) therefore opine that long established methods of analyzing the financial results are alone do not suffice to analyze the performance of knowledge firms. These changes are very necessary in certain sectors, specifically service sectors like banking, tourism, hotels IT and Education. In manufacturing sector also, pharmaceutical sector would be in the category where measurement of IC is very necessary.

Many studies show that IC and firm performance are related in some way, though not convincingly. It is also noted that individual components of VAIC have an impact on firm performance, though these findings cannot be generalized.

Maji & Chakrabarty (2019) study the impact of intellectual capital on the financial performance of listed Indian commercial banks for the period 2000 to 2016 by employing quantile regression model in panel data set up. The authors opine that the panel data mean regression model is inadequate to explore the true impact of intellectual capital and a set of quantile regression models is necessary to explain adequately the effect of intellectual capital at different locations of the conditional distribution of bank performance. Results of the study suggest that panel data mean regression model provides a partial view of the relationship between intellectual capital and bank performance after controlling the effect of physical capital, specifically in a situation when some out-performers or non-performers are present in the data set. In this situation, the results of quantile regression indicate that the positive impact of intellectual capital is significant only at upper tails of the distribution of bank performance. The results of quantile regression for panel data also show that the impact of intellectual capital becomes stronger with higher degree of precision when the banks' value goes up.

Some researchers have questioned the very basis of VAIC arguing that it only shows the efficiency of Human capital, Structural capital and Physical Capital employed and that IC is very wide to be expressed in VAIC (Stahle et al, 2011). Researchers have also gone ahead in modifying the VAIC model, arguing that it leaves out the impact of R&D and Advertising / marketing and showing a better result obtained by the modified VAIC model (Xu & Liu, 2020). Overall, the studies show that the results of the impact of VAIC on various parameters is varied. While studies indicate a positive impact of VAIC and its elements on the profitability and productivity, its impact on market valuation is limited. This is because in certain countries like India, investors still depend on the traditional measures profitability indicators and still look at the outcome from physical assets. Further, the accounting disclosures are not developed to include the IC in the financial statements, from where the investors can make their decisions.

With the licensing of more new private sector banks during the last two decades, the banking industry in India is very competitive, with private banks using state of the art technology, growth focused management and trying to take the share from the PSU banks (Tridedi, 2013). As the banking industry is vastly under penetrated in a vast country, Sha N. et al (2018) make an attempt to study the efforts made by the government to reach banking to the remote areas of the country where, the objective is not profitability but social equilibrium and economic development. Further, the demonetization and the resultant spike in the digital transactions and resultant recovery in VAIC also is captured by the work of Chavali et al., (2019).

METHODOLOGY

Construction of VAIC

VAIC is based on two key resources i.e., Physical assets employed and the IC. The intellectual capital consists of Human Capital and Structural Capital.

Human Capital = All employees, their abilities to add value and their organization.

Structural Capital = Information systems, Labs, Market intelligence etc.

The starting point of VAIC is the calculation of VA or Value Added.

VA = Output - Input (in input, human expenditure is not considered, as this element is considered as capital).

Public (2004) proposed a formula of calculating Value Added, which is the most popular method today, which is explained as follows:

$VA = OP + EC + D + A$

Where, VA is Value Added ; OP = Operating Profit ; EC = Employee Cost ; D=Depreciation; A = Amortization

The components of VAIC are three - HCE (Human capital efficiency)- this measures the efficiency of the human capital, SCE (structural capital efficiency) - this measures the efficiency of the structural capital and CEE (Capital employed efficiency) - this measures the efficiency of the physical assets employed by the company. These three aspects together constitute VAIC. Algebraically it can be summed as follows:

$VAIC = HCE + SCE + CEE$

Each element of VAIC is calculated as follows:

$HCE = VA / HC$
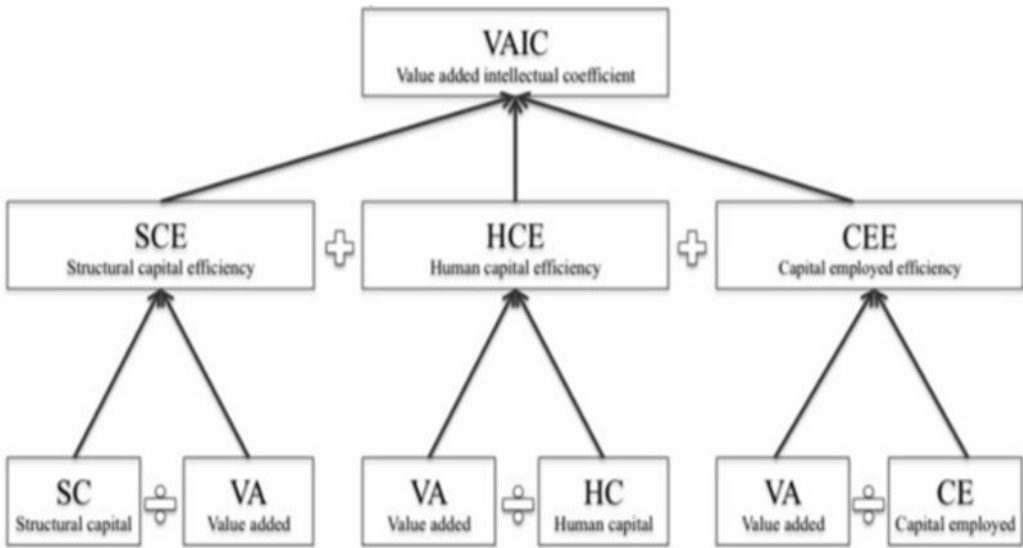
$SCE = (VA\text{-}HC) / VA$

$CEE = VA / CE$

Figure 2: Construction of Value-Added Intellectual Coefficient.
Source: Pulic, 2004

The measure of VAIC has several merits as compared to other gauges. It puts forward a stable basis of measurement. There are many other methods namely, Profit rate, ROI, EVA, SVA (shareholder value added)- whose basis of calculation is tangible capital. As the values for workings of VAIC are derived from audited financial statements, the measures are more authentic and provable (Pulic, 2000a & 2000b).

The use of VAIC is not without limitations. It cannot measure the IC of companies that have negative financial results (Chu et al, 2011). The collaboration between HCE and SCE can be very demanding,

and it is grueling to exactly assess each element (Bontis et al, 2000).

Collection of data: the workings of this paper are based on the data of 12 years (FY ended 31.3.2009 to FY ended 31.3.2020) of public sector as well as private sector banks in India. The data is obtained on www.screener.in, which compiles the financial results of Indian companies. To do a comparison between public sector and private sector banks, 5 leading banks from each sector are selected. The banks are:

Public Sector Banks:

1. State Bank of India

2. Punjab National Bank

3. Canara Bank

4. Bank of Baroda

5. Bank of India

Private Sector Banks:

1. HDFC Bank

2. ICICI Bank

3. Axis Bank

4. Kotak Mahindra Bank

5. IndusInd Bank

The selected banks represented 87.1% of the market capitalization and 73.5% of the revenue of the total number of listed banks, as on 31.3.2020. The banks that were not in operation for continuous 12 years or have suffered losses during the 12 years have not been considered.

Variables in this paper are calculated as follows:

Table 1: Calculation of Variables

Value Added	Calculation: Net Profit + Employee Cost + Depreciation +Taxes Paid VA = NP+EC+D+T
Human Capital Efficiency (HCE)	Calculation: Value Added / Employee Cost HCE = VA / EC
Structural Capital Efficiency (SCE)	Calculation: (Value Added – Employee Cost) / Value Added SCE = (VA-EC) / VA
Intellectual Capital Efficiency (ICE)	Calculation: Human Capital Efficiency (HCE) + Structural Capital Efficiency (SCE) ICE = HCE+SCE

Capital Employed Efficiency (CEE)	Calculation: Value Added (VA) / Capital Employed CEE = VA / CE
Value Added Intellectual Capital (VAIC)	Calculation: Intellectual Capital Efficiency (ICE) + Capital Employed Efficiency (CEE) VAIC = ICE + CEE. or VAIC = HCE + SCE + CEE
Return on Assets (ROA)	Profit after Taxes / Total Assets
Price to Earnings (PE) Ratio	Market price of Shares / Earnings per Share
Market Capitalization	(Market price of share at the end of the year X Number of shares outstanding at the end of the year)
Size	Total Assets of the bank at the end of the year

Value Added and VAIC / its elements are calculated as per the method explained in Table 1. For every bank, 5 variables are calculated from the data taken from the Annual Financial Statements. The variables are VA, HCE, SCE, ICE, CEE and VAIC. Hence, for each bank there is 12-year data of 5 variables. Hence the data points per bank are 72 (12 years x 5 variables). The total number of data points for 10 banks is 720. While studying the impact of COVID, the quarterly data is used. We use quarterly data from June,2018 to December,2020 (totally 11 quarters). Here we have calculated VA, HCE and VAIC quarterly. That gives 3 variables for 11 quarters, making a total of 33 data points per bank. For COVID related impact, we have 330 data points for 10 banks (10 banks x 33 data points per bank).

Comparison between Public sector and Private sector banks is done through analysis of graphs. The analysis of impact of COVID is done by analyzing the quarterly results. Here again, the comparison is done using graphs.

The impact of VAIC and HCE on the profitability and market value is done using path analysis. We use path analysis rather than multiple linear regression, in order to analyze the impact each variable has on the profitability and the market valuation. In the process, we analyze the influence of mediating variables on the independent variables and also the direct impact if any, the independent variables would have on the dependent variables.

EMPIRICAL RESULTS AND DISCUSSION

The VA of each bank is calculated for every year from 2009 to 2020. We then take the average of PSU banks and Private banks for each year. This average is compared in figure 4 below.
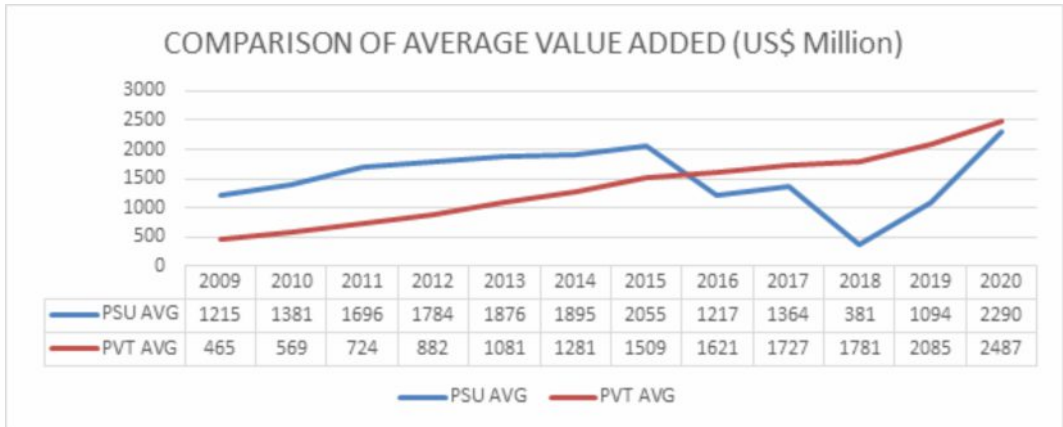
Figure 4: Comparison of Average Value Added between PSU and Private Banks

The graph clearly demonstrates that while the VA in private sector is steadily growing, the VA in public sector banks has an uneven growth path. It is also observed that the growth in VA in 2020 as compared to 2009 was 88.4% in public sector banks whereas it was 434.3% in the private sector banks.

After obtaining the VA for all years for all banks, we calculate the HCE, SCE, CEE and VAIC of all banks. It is observed that HCE is the largest among the three elements of VAIC. The average of each of the elements and VAIC is taken and compared between private and public sector banks. The comparison of HCE is shown in Figure 5 below.
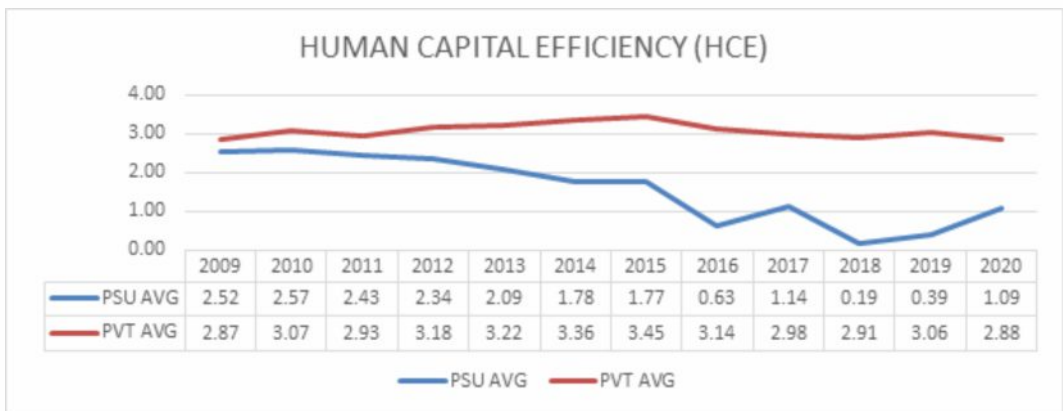

Figure 5: Comparison of Average HCE between PSU and Private Banks

It is observed that the HCE in private sector banks is much superior to that in the public sector banks. Figure 5 Clearly indicates that the average HCE in public sector is declining, whereas it is maintaining a steady path in the private sector. Looking at the growth in HCE in 2020 over 2009, in public sector we find a negative growth of (56.9)% whereas in the private sector, HCE has been steady at a growth of 0.21%
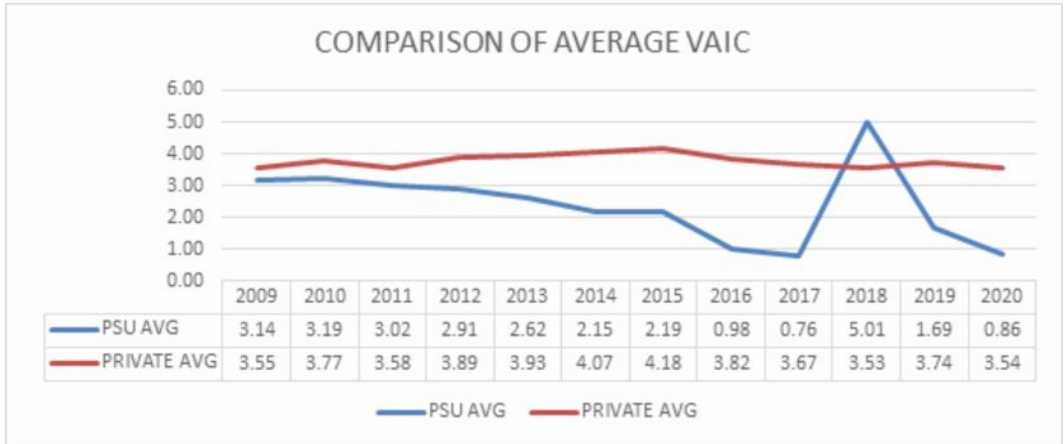
Figure 6: Comparison of Average VAIC between PSU and Private Sector Banks

Similar comparison is made for VAIC also and we find a steady VAIC in private sector and an uneven one in public sector. Comparing 2020 with 2009, we find in the public sector the VAIC has declined substantially by (72.5)% whereas in the private sector the VAIC has been steady. This trend is explained by figure 6 above.

We use path analysis (Figure 7) to understand the impact of VAIC and its elements on the profitability of banks. We use HCE, SCE, CEE, ICE and VAIC as independent variables and use market capitalization and Size as mediating variables. ROA represents profitability and is the dependent variable. It is observed from the regression results in Figure 2 that all elements of VAIC have some impact on the ROA through mediating variables. The p value in every case is less than 0.05. However, it is to be noted that HCE has a direct bearing on ROA and its impact on ROA is the highest.
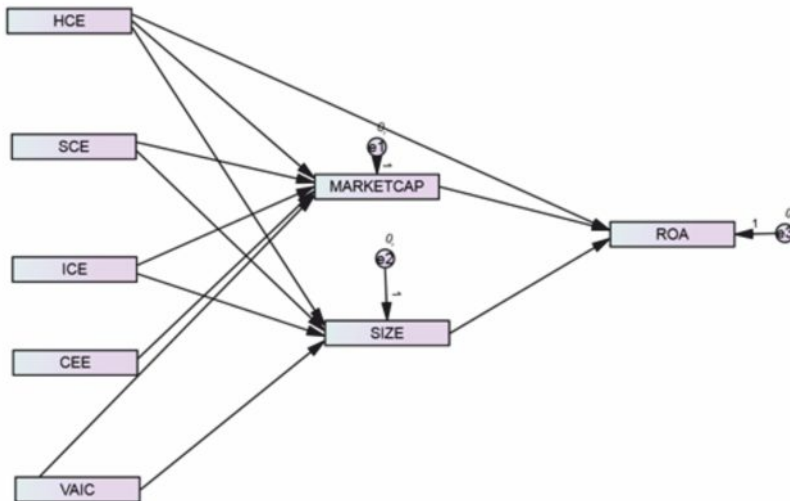

Figure 7: Path analysis showing the impact of VAIC on profitability

Table 2: Regression results

			Estimate	**S.E.**	**C.R.**	**P**
MARKETCAP	<---	HCE	-.94	.09	-9.84	***
MARKETCAP	<---	SCE	-1.17	.04	-24.38	***
MARKETCAP	<---	ICE	30.69	.04	664.17	***
MARKETCAP	<---	CEE	19.15	7.44	2.57	.010
MARKETCAP	<---	VAIC	-29.50	.04	-639.23	***
SIZE	<---	HCE	28.85	.06	464.38	***
SIZE	<---	SCE	28.77	.03	917.24	***
SIZE	<---	ICE	5.70	.03	189.87	***
SIZE	<---	VAIC	-34.51	.03	-1150.27	***
ROA	<---	MARKETCAP	.04	.00	125.33	***
ROA	<---	SIZE	-.16	.00	-519.88	***
ROA	<---	HCE	.52	.02	21.40	***

We also try to see if the elements of VAIC in any way influence the market value of the stocks (Figure 8). Here, we use the PE (Price to Earnings) ratio as the proxy to market value. The result is that VAIC and its elements do not have any bearing on the market value of the firm (Table 3).
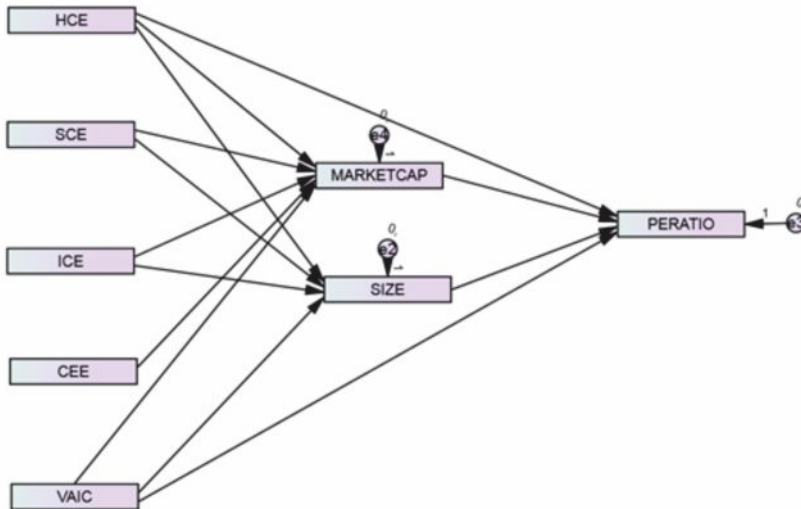

Figure 8: Path analysis showing impact of VAIC & its elements on PE ratio

Table 3: Regression analysis:

			Estimate	**S.E.**	**C.R.**	**P**
LOGMARKETCAP	<---	HCE	-.94	.09	-9.84	***
LOGMARKETCAP	<---	SCE	-1.17	.04	-24.38	***
LOGMARKETCAP	<---	ICE	30.69	.04	664.17	***
LOGMARKETCAP	<---	CEE	19.15	7.44	2.57	.01
LOGMARKETCAP	<---	VAIC	-29.50	.04	-639.23	***
LOGSIZE	<---	HCE	28.85	.06	464.38	***
LOGSIZE	<---	SCE	28.77	.03	917.23	***
LOGSIZE	<---	ICE	5.70	.03	189.87	***
LOGSIZE	<---	VAIC	-34.51	.03	-1150.27	***
PERATIO	<---	MARKETCAP	17.07	.10	162.75	***
PERATIO	<---	SIZE	3.47	.11	30.30	***
PERATIO	<---	HCE	-4.55	7.36	-.61	.53
PERATIO	<---	VAIC	-2.63	5.58	-.47	.63

The paper also tries to find the impact if any, of COVID-19 on the VA and HCE of the banks under study. To achieve this, we study the quarterly results of the bank to ascertain the impact on a particular quarter/s. it is observed that the VA in public sector banks dropped sharply in the March,2020 quarter but has quickly recovered thereafter. We also notice a decline (though not as sharp as in the public banks) in the VA of private banks in March 2020 quarter and the recovery thereafter has been quick. The behavior of VA over the quarters is shown in Figure 9 below.
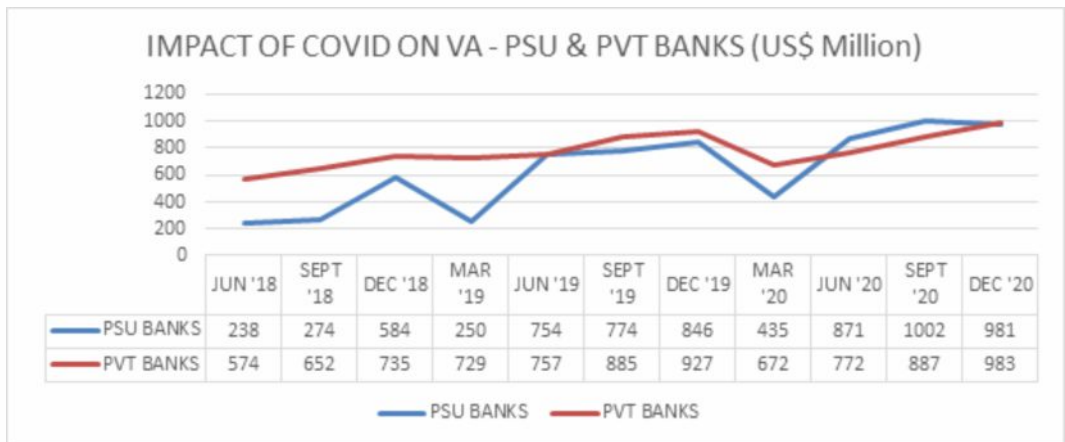

IMPACT OF COVID ON VA - PSU & PVT BANKS (US$ Million)

	JUN '18	SEPT '18	DEC '18	MAR '19	JUN '19	SEPT '19	DEC '19	MAR '20	JUN '20	SEPT '20	DEC '20
PSU BANKS	238	274	584	250	754	774	846	435	871	1002	981
PVT BANKS	574	652	735	729	757	885	927	672	772	887	983

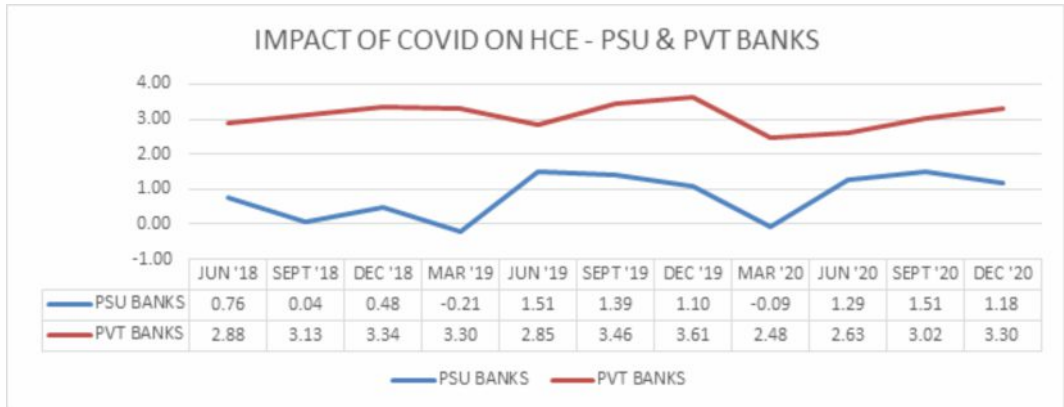**Figure 9:** Impact of COVID on the VA of PSU and Private Banks

Figure 10: Impact of COVID on the HCE of PSU and Private Banks

CONCLUSION

The study used the VAIC method developed by Prof. Ante Public to evaluate the Intellectual capital in the banking industry in India. Ten banks were selected (5 each from PSU and Private sector) among the banks listed in the Bombay Stock Exchange as on 31.3.2020. These banks together represent 87.1% of the market capitalization and 73.5% of the revenue of the total banks listed on the BSE. The VAIC and its elements are calculated for PSU and Private banks and compared. It is observed that HCE is the most important element in the VAIC of the banking industry in India. Value Added, VAIC and HCE indicators in private sector banks are much superior as compared to the PSU Banks. By using path analysis, the impact of VAIC and its components on profitability and market value is studied. It is observed that the elements of VAIC have a bearing on the profitability of the banks through market capitalization and size, the two being mediating variables. HCE also has a direct influence on the profitability. The study however notes that VAIC or HCE do not directly influence the stock price of the banks. As human capital is of vital importance in the banking industry, especially in India, where a large part of banking specially in the rural areas is still carried out by interaction, HCE would play a prominent role. To analyze the impact of COVID-19 on the efficiency of the banks, an analysis is made of the quarterly results. A sharp decline in the HCE of PSU banks and not so sharp decline in the HCE of Private banks is visible in the March,2020 quarter. Both PSU and private banks have been quick to recover from the COVID slump in the HCE.

The paper clearly brings out the importance of HCE in the Indian Banking Industry and the wide gap in efficiencies between PSU and Private banks. While private banks are driven by technology, modern techniques and by the profit motive, PSU banks are more spread out even in the rural areas and are instrumental in driving government programs. Further, a large amount of Non-Performing Assets (NPAs) and interference by the government have a direct bearing on their efficiency and profitability. It is important for the Public Sector banks in India to improve their Value Added and thereby improve the VAIC and HCE. This is a must for their survival and growth. VAIC is one of the methods to evaluate the importance Intellectual Capital, especially the Human Capital in the Banking Industry in India. As the concept of VAIC is recently developed, this paper adds to the existing literature, especially in the Indian context. There have been papers in the Indian context that have dealt with VAIC in various sectors, including the banking Industry. However, this paper clearly brings out the gap in VAIC between Public and Private sector banks. Further, the paper clearly brings out the impact of COVID on

the VAIC of banks and the V shaped recovery the banks have shown post COVID period. This again reiterates the importance of Banking in the Indian Economy and the importance of VAIC in the industry. Thereby, this paper makes a significant contribution to the existing literature.

Limitations & Future Research

The Public Sector Banks in India have a wide network of branches in the rural areas, where the banking facilities are lax and private sector banks are reluctant to operate. Further, Public sector banks in India also extend credit to the Agriculture and SME sectors, which are under-served by the Private Sector Bank. Hence, profit is not the only motive for these banks. Measuring their efficiency only with VAIC would not give a fair view. This aspect is a limitation of this paper.

It would be interesting to match the Quality of Management with the elements of VAIC in the banking industry to see how the quality of Board of Directors and the Top Operations Management team would influence the VAIC. With digitization fast catching up in the banking industry and the banks are quick to deploy advanced platforms, there is also a need to study the growth of Structural Capital Efficiency (SCE) in the banking Industry and how banks with better SCE have an edge over others. This is left to future research.

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