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ANALYSIS OF THE INFLUENCE OF INTELLECTUAL CAPITAL ON FINANCIAL PERFORMANCE IN THE BANKING INDUSTRY IN INDONESIA BASED ON CORE CAPITAL GROUPS

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Abstract

This study examines influenceintellectual capitalon financial performance in the banking industry in Indonesia based on core capital groups. Intellectual capitalIn this research, Human Capital Efficiency (HCE), Innovation Capital Efficiency (INVCE) and Capital Employed Efficiency (CEE) are used as independent variables. Financial performance in this research uses the NPL, CKPN, CAR, ROA and BOPO ratios as dependent variables. The research sample isdata on intellectual capital, NPL ratio, CKPN, CAR, BOPO and CKPN for 94 (ninety-four) commercial banks in Indonesia as of June 2022 which are divided into 4 (four) groups based on KBMI. There are 62 (sixty-two) KBMI-1 banks, 16 (sixteen) KBMI-2 banks, 12 (twelve) KBMI-3 banks, and 4 (four) KBMI-4 banks. The research period is divided into 2 (two) periods, namely before the Covid-19 pandemic (January 2013 to December 2019) and the Covid-19 pandemic period (January 2020 to June 2022). Data analysis uses regressionmultiple or Multiple Regression Analysiswith the help of Eviews software. The research results showed that in KBMI-1 there were 5 hypotheses accepted and 10 hypotheses rejected in the period before Covid-19, while in the Covid-19 period there were 9 hypotheses accepted and 6 hypotheses rejected. KBMI-2 had 8 accepted hypotheses and 7 rejected hypotheses in the period before Covid-19, while in the Covid-19 period there were 7 accepted hypotheses and 8 rejected hypotheses. KBMI-3 had 10 accepted hypotheses and 5 rejected hypotheses in the pre-Covid-19 period, while in the Covid-19 period there were 9 accepted hypotheses and 6 rejected hypotheses. Finally, in KBMI-4 there were 11 accepted hypotheses and 4 rejected hypotheses in the period before Covid-19, while in the Covid-19 period there were 5 accepted hypotheses and 5 rejected hypotheses.

Keywords: *Intellectual Capital, Financial Performance, Banking Industry in Indonesia*.

INTRODUCTION

The Financial Services Authority (OJK) issued Financial Services Authority Regulation (POJK) No.18/POJK.03/2016 dated 22 March 2016 concerning the Implementation of Risk Management for Commercial Banks, hereinafter referred to as POJK Risk Management, which states that there are eight different forms of risk in commercial banks. namely credit, market, liquidity, operational, legal, reputation, strategic and compliance risks. According to Fairuza (2012) The biggest threat to Indonesian banking is credit risk which is also the most common and real threat. Credit risk has the potential to turn current credit into problem credit or better known as Non-Performing Loan (NPL) credit.

HR education can be carried out by the bank itself, taking part in educational or training activities organized by other banks, collaborating with other banks to organize joint training or education or the next option is taking part in training or education carried out by other third parties. Education funds that need to be provided by banks in accordance with the provisions of BI DIR Decree No.31/310/KEP/DIR dated 31 March 1999 concerning

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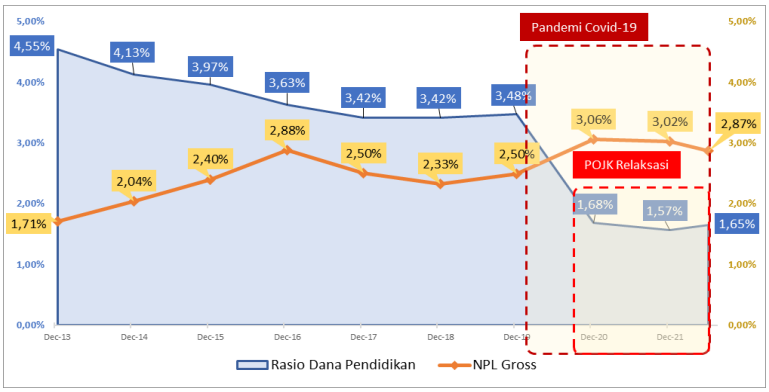
Provision of Funds for Human Resources Development for Commercial Banks is 5% of the HR budget. These provisions were updated through POJK No.24 of 2022 dated 5 December 2022 concerning Development of the Quality of Human Resources for Commercial Banks by changing the provision of funds to 3.5% of the total realization of gross salary expenses for the previous year.

Figure 1 Trend in Gross NPL Ratio and Education Fund Ratio, period 2013 to 2022



Source: OJK Monthly Report, processed.

Figure 1 depicts the trend of the Gross NPL ratio and the ratio of Education Funds compared to HR Costs or the Education Fund Ratio of the banking industry in Indonesia for the period 2013 to June 2022. The period 2013 to 2016 shows a decrease in the Education Fund ratio from 4.55% to 3.63% in On the other hand, an increase in the NPL ratio indicates greater credit risk from 1.99% to 2.88%. For the period 2017 to 2019, the trend in the Education Fund ratio was relatively stable in the range of 3.42% to 3.48, while the NPL ratio moved in the range of 2.33% to 2.50%. For the period 2020 to 2022, the Education Fund ratio is in a low trend compared to previous years, namely in the range of 1.57% to 1.68% and the NPL ratio is in a higher condition compared to previous years in the range of 2.87% to 3.06 %.

In the period 2020 to 2022, the national disaster of the Covid-19 pandemic occurred in Indonesia which resulted in pressure on the Indonesian economy contracting by 2.07%, which is the lowest economic growth when compared to economic growth in the period 2013 to 2019. The Indonesian government and regulators, especially in the financial sector, issued various policies to stimulate the economy to grow again and maintain the resilience of bank capital so that it can encourage banking performance and maintain financial system stability in a sustainable manner. POJK No.11/POJK.03/2020 dated 16 March 2020 concerning National Economic Stimulus as a Countercyclical Policy for the Impact of the Spread of Coronavirus Disease 2019, hereinafter referred to as POJK Covid-19 Stimulus. The POJK was updated and finally changed to POJK No.17/POJK. 03/2021 dated September 10 2021. POJK Covid-19 Stimulus provides stimulus including financing, loans or credit with a maximum ceiling of IDR 10 billion, accuracy of debtors in paying principal and/or interest obligations or principal payments and/or profit sharing margins are permitted used by banks

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in determining the quality of credit, financing or other funding. The implementation of this stimulus under normal conditions will reduce the NPL ratio in the same direction. During the Covid-19 pandemic period, the NPL ratio remained increased compared to the pre-pandemic period. On the other hand, POJK Covid-19 Stimulus provides a stimulus to banks to provide a ratio of Education Funds to labor costs contributing less than 5% (five percent) of the HR cost budget set by each bank. POJK Covid-19 Stimulus provides stimulus including financing, loans or credit with a maximum ceiling of IDR 10 billion, the accuracy of debtors paying principal obligations and/or interest or principal payments and/or profit sharing margins are permitted to be used by banks in determining credit quality, financing, or other funding. The implementation of this stimulus under normal conditions will reduce the NPL ratio in the same direction. During the Covid-19 pandemic period, the NPL ratio remained increased compared to the pre-pandemic period. On the other hand, POJK Covid-19 Stimulus provides a stimulus to banks to provide a ratio of Education Funds to labor costs contributing less than 5% (five percent) of the HR cost budget set by each bank. POJK Covid-19 Stimulus provides stimulus including financing, loans or credit with a maximum ceiling of IDR 10 billion, the accuracy of debtors paying principal obligations and/or interest or principal payments and/or profit sharing margins are permitted to be used by banks in determining credit quality, financing, or other funding. The implementation of this stimulus under normal conditions will reduce the NPL ratio in the same direction. During the Covid-19 pandemic period, the NPL ratio remained increased compared to the pre-pandemic period. On the other hand, POJK Covid-19 Stimulus provides a stimulus to banks to provide a ratio of Education Funds to labor costs contributing less than 5% (five percent) of the HR cost budget set by each bank. loans or credit with a maximum ceiling of IDR 10 billion, the debtor's accuracy in paying principal and/or interest obligations or principal payments and/or profit sharing margins is permitted to be used by banks in determining the quality of credit, financing or other funding. The implementation of this stimulus under normal conditions will reduce the NPL ratio in the same direction. During the Covid-19 pandemic period, the NPL ratio remained increased compared to the pre-pandemic period. On the other hand, POJK Covid-19 Stimulus provides a stimulus to banks to provide a ratio of Education Funds to labor costs contributing less than 5% (five percent) of the HR cost budget set by each bank. loans or credit with a maximum ceiling of IDR 10 billion, the debtor's accuracy in paying principal and/or interest obligations or principal payments and/or profit sharing margins is permitted to be used by banks in determining the quality of credit, financing or other funding. The implementation of this stimulus under normal conditions will reduce the NPL ratio in the same direction. During the Covid-19 pandemic period, the NPL ratio remained increased compared to the pre-pandemic period. On the other hand, POJK Covid-19 Stimulus provides a stimulus to banks to provide a ratio of Education Funds to labor costs contributing less than 5% (five percent) of the HR cost budget set by each bank. The debtor's accuracy in paying principal and/or interest obligations or principal payments and/or profit sharing margins is permitted to be used by banks in determining the quality of credit, financing or other funding. The implementation of this stimulus under normal conditions will reduce the NPL ratio in the same direction. During the Covid-19 pandemic period, the

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VAIC measures financial-based intellectual capital which is able to assess the efficiency of intellectual capital in all industries by calculating 3 (three) components, namely Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), and Capital Employed Efficiency (CCE). The VAIC™ model is often used in research, including on the banking industry, conducted byFirer & Mitchell Williams, (2003)informing that the financial industry, especially banking, is one of the 4 (four) intellectual capital-intensive industrial sectors, research on banking company management to measure the efficiency of intellectual capital(Nadeem et al., 2018).

*Research gaps*with several previous studies, an analysis of the impact of intellectual capital has been carried out using several calculation methods including using the VAIC, A-VAIC, and Modified-VAIC (M-VAIC) methods on management capabilities in the banking industry in improving financial performance. However, there has been no research regarding the influence of intellectual capital as represented by the Education Fund ratio, especially using the A-VAIC method with components of Human Capital Efficiency (HCE), Innovation Capital Efficiency (INVCE) and Capital Employed Efficiency (CEE) on financial performance as represented by the Non-Efficiency ratio. Performing Loans (NPL), Allowance for Impairment Losses on Non-Performing Loans (CKPN), Capital Adequacy Ratio (CAR), Return on Assets (ROA), and Operating Expenses compared to Operating Income (BOPO) in the banking industry in Indonesia based on Bank Groups based on Core Capital (KBMI) during the COVID-19 pandemic period. The research used a sample of commercial banks in all KBMI to test the effectiveness of regulatory regulations regarding

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the education funding budget of 5% of the HR budget which applies one size fits all to all commercial banks.

This research was conducted due to the fact that there is still a research gap and based on Figure 1, there is a phenomenon of a decreasing trend in the Education Fund ratio, but on the other hand, there is an increase in the NPL ratio and a scarcity of literature analyzing the impact of intellectual capital on the financial performance of banks in Indonesia, especially based on the KBMI category in the period before the COVID pandemic. -19 (January 2013 to December 2019) and during the Covid-19 pandemic period (January 2020 to June 2022).

Some of the results and research problem formulations above require further and in-depth research related to the topic of intellectual capital with phenomena and research gaps as a reference for researching and finding solutions to the role of intellectual capital in the financial performance of commercial banks. Apart from that, the effectiveness of regulatory regulations regarding the education funding budget of 5% of the HR budget will be tested, applying one size fits all for all commercial banks consisting of several KBMIs. Based on the description of the problem above, intellectual capital research questions and supporting components can be formulated as follows:

1. What is the influence of the HCE, INVCE and CEE components on NPL in banks in the KBMI-1 to KBMI-4 groups before and during the Covid-19 pandemic period?
2. What is the influence of the HCE, INVCE and CEE components on CKPN in banking groups KBMI-1 to KBMI-4 before and during the Covid-19 pandemic period?
3. What is the influence of the HCE, INVCE and CEE components on CAR in banks in the KBMI-1 to KBMI-4 groups before and during the Covid-19 pandemic period?
4. What is the influence of the HCE, INVCE and CEE components on ROA in banks in the KBMI-1 to KBMI-4 groups before and during the Covid-19 pandemic period?
5. What is the influence of the HCE, INVCE and CEE components on BOPO in banking groups KBMI-1 to KBMI-4 before and during the Covid-19 pandemic period?

LITERATURE REVIEW

Intellectual Capital

Intellectual capital refers to a company's set of knowledge, experience, professional skills, goal relationships, and technological capacity so that it can foster competitive advantages and growth opportunities(D'Amato, 2021).Sawarjuwono & Kadir, (2003) concludes the definition of intellectual capital as the sum or output of a company which consists of 3 (three) main components in a company, namely human, structural and customer capital related to knowledge and technology so that it succeeds in growing company value in the form of competitive advantage to be able to compete in the industry. Other researchers widely agree that intellectual capital includes human capital, structural capital and relational capital.(Harrison & Sr, nd; Pulic, 2004; Tovstiga & Tulugurova, 2009).

VAIC

Among these methods, VAIC™ developed by Pulic over the last twenty years has attracted attention and is widely used as a technique in intellectual capital measurement

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models and describing a company's market value.(Raharja & Purwanto, 2021).Pulic, (1998)developed the VAIC™ model, a financial-based intellectual capital measurement model capable of assessing the efficiency of intellectual capital across industries. The VAIC™ model is often used in research and practice by researchers and company management to measure intellectual capital efficiency(Nadeem et al., 2018). The VAICTM model in calculating intellectual capital consists of 3 (three) components, namely Human Capital Efficiency, Structural Capital Efficiency, and Capital Employed Efficiency.

- ***Human Capital Efficiency*** **(HCE)**

  HCE is a comparison between Value Added (VA) and Human Capital (HC) which is represented by labor costs. The relationship between HC and VA can measure an indication of HC's ability to increase company value so that HC can be used as an indicator of the quality of human resources in a company(Riahi-Belkaoui, 2003).

- ***Structural Capital Efficiency*** **(SCE)**

  SCE is the contribution of Structural Capital (SC) to company value creation. In the VAICTM model, SC can be calculated by dividing the VA component by HC, meanwhileCurado et al., (2014)states that SC covers all assets including databases, organizational structures, procedures, policies, manuals, strategies, and everything that creates company value higher than the material value of its assets(Aritonang & Muharam, 2012).

- ***Capital Employed Efficiency*** **(CEE)**

  CEE is a comparison between VA and Capital Employed (CE).Pulic (1998)formulate if CE can generate higher profits than competitors, then the company has been successful in utilizing CE. The higher the CEE level, the more efficient the company is in using its physical capital to increase profits(Aritonang & Muharam, 2012).

Bank Size in Indonesia

Based on Article 3 POJK Business Activities, it is regulated that based on Core Capital it is grouped into 4 (four) BUKU, namely BUKU-1 to BUKU-4 with differences in core capital. The above provisions have been in effect since 27 January 2016 and were revoked on 31 October 2021 through POJK No.12/POJK.03/2021 dated 30 July 2021 concerning Commercial Banks, hereinafter referred to as POJK Commercial Banks. Based on Article 147 POJK for Commercial Banks, it is regulated that the grouping of commercial banks based on their Core Capital into 4 (four) Bank Groups based on Core Capital, hereinafter referred to as KBMI-1 to KBMI-4. KBMI-1 commercial bank which has core capital of s. d IDR 6 trillion rupiah; KBMI-2 commercial banks that have core capital greater than IDR 6 trillion but less than IDR 14 trillion; KBMI-3 commercial banks that have core capital greater than IDR 14 trillion but less than IDR 70 trillion; and KBMI-4 commercial banks which have core capital greater than IDR 70 trillion. This research uses bank business groupings based on the KBMI which is valid in June 2022. Data analysis for the period January 2013 to October 2021 which still uses bank grouping data based on BUKU will have the grouping adjusted based on KBMI provisions.

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***Non Performing Loans*(NPL)**

The NPL ratio is a comparison between the total debit balance for non-bank loans consisting of 3 (three) credit qualities, namely Quality 3, Quality 4 and Quality 5, compared to the total debit balance for non-bank credit. The NPL ratio is often used to measure credit risk which shows the potential for a debtor to fail to pay principal and/or interest obligations. The higher the NPL ratio, the higher the credit risk of a bank will require larger reserves, which can suppress profits and vice versa. The total credit and the amount of non-performing loans as explained above are credits that only include non-bank third party credits.

Reserve for Impairment Losses (CKPN)

CKPN based on POJK Asset Quality is defined as a reserve that must be established regarding the decline in the value of a financial instrument in accordance with applicable financial accounting standards. CKPN is an allowance or reserve that must be made by commercial banks if there is a decrease in productive assets as a result of an adverse event (loss event) and/or has an impact on the bank's cash flow in the future which can be reliably predicted (Dalwai et al. 2021).

***Capital Adequacy Ratio* (CAR)**

Commercial bank capital structure can be measured by the CAR ratio or Minimum Capital Requirement (KPMM). The CAR ratio has taken into account credit risk, operational risk and market risk in accordance with POJK No.34/POJK.03/2016dated 26 September 2016 hereinafter referred to as POJK KPMM. The minimum capital provision for commercial banks is determined based on the risk profile of each bank with a minimum of 8% (eight percent) to 14% (fourteen percent).

Every commercial bank is required to fulfill CAR in accordance with its risk profile. In addition, commercial banks based on the provisions above are required to form buffer capital as additional capital in accordance with the specified criteria for each bank. The higher the CAR or KPMM shows the better the commercial bank's ability to absorb various risks so that it can increase the trust of the public or fund owners. A high CAR also shows that the potential for lending to borrowers is higher.

***Return on Assets* (ROA)**

ROA based on SEOJK Transparency and Publication is a comparison between profit before tax and the current year's average total bank assets. Profit before tax is the bank's profit for the year before tax which is calculated annually. Meanwhile, average total assets are the accumulated total assets for each month in the current year divided by the number of months.

The ROA ratio is used, among other things, to determine financial performance, especially the level of bank effectiveness in managing productive assets to generate profits or income. The higher the ROA ratio value, the better the bank's performance in generating profits or income.

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Operating Expenses compared to Operating Income (BOPO)

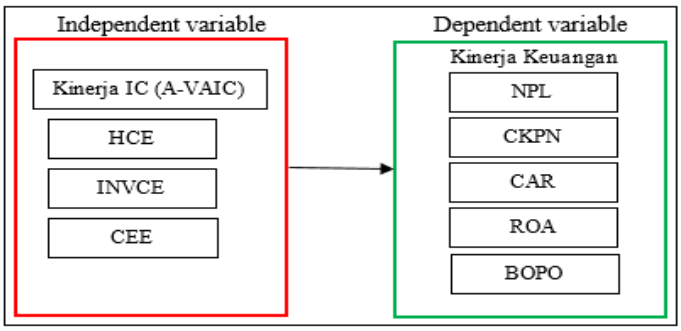
The comparison of total operational costs to total operational income is the BOPO ratio. Operational expenses are all expenses including losses due to the formation of CKPN, labor expenses, as well as education and training expenses. Operational income is all interest income, CKPN corrections, and other business operational income. The total operating income and operating expenses mentioned above are calculated per period and are not annualized.

The BOPO ratio can be used by bank shareholders to see management's ability to efficiently use finance in operational expenses to generate maximum operating income. The lower the BOPO, the more efficient the bank is in increasing operational income and reducing operational costs.

Theoretical Framework

The framework is a conceptual model of interrelated theories from various components that have been identified as important problems in a research theme. The framework as in Figure 2 explains that the independent variables consist of HCE, INVCE and CEE and the dependent variables consist of NPL, CKPN, CAR, ROA and BOPO. The relationship between the independent variable and the dependent variable will be tested on the financial performance of commercial banks in Indonesia for the period January 2013 to June 2022.

Figure 2 Theoretical Framework for Intellectual Capital Variables



Based on the conceptual framework above, the researcher formulated a hypothesis about the influence of intellectual capital on the NPL, CKPN, CAR, ROA, BOPO ratios of commercial banks in Indonesia KBMI 1-4 as follows:

Before the Covid-19 Period	Covid-19 period
H1a: HCE is negatively correlated with NPL	H1a: HCE is negatively correlated with NPL
H1b: INVCE is negatively correlated with NPL	H1b: INVCE is negatively correlated with NPL
H1c: CEE is negatively correlated with NPL	H1c: CEE is negatively correlated with NPL

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H2a: HCE has a negative correlation with CKPN	H2a: HCE has a negative correlation with CKPN
H2b: INVCE has a negative correlation with CKPN	H2b: INVCE has a negative correlation with CKPN
H2c: CEE is negatively correlated with CKPN	H2c: CEE is negatively correlated with CKPN
H3a: HCE is positively correlated with CAR	H3a: HCE is positively correlated with CAR
H3b: INVCE is positively correlated with CAR	H3b: INVCE is positively correlated with CAR
H3c: CEE is positively correlated with CAR	H3c: CEE is positively correlated with CAR
H4a: HCE is positively correlated with ROA	H4a: HCE is positively correlated with ROA
H4b: INVCE is positively correlated with ROA	H4b: INVCE is positively correlated with ROA
H4c: CEE is positively correlated with ROA	H4c: CEE is positively correlated with ROA
H5a: HCE is negatively correlated with BOPO	H5a: HCE is negatively correlated with BOPO
H5b: INVCE has a negative correlation with BOPO	H5b: INVCE has a negative correlation with BOPO
H5c: CEE is negatively correlated with BOPO	H5c: CEE is negatively correlated with BOPO

METHOD

Data Types and Sources

Quantitative research is used in the process of solving problems or drawing hypotheses using financial report data to analyze what you want to know. In this intellectual capital research, the data that will be processed is in the form of secondary data figures from bank published financial reports for 3 (three) monthly periods, the OJK website, Indonesian Banking Statistics, and other information media that are considered relevant in supporting the data collection process.

Population and Sample

Population

Margono, (2004)defines a group of data of interest to researchers over a predetermined range and time period. In this research, the population used is data on intellectual capital, NPL ratio, CKPN, CAR, BOPO and CKPN for all commercial banks in Indonesia as of June 2022, totaling 107 (one hundred and seven) banks.

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Sample

The sample is a representative portion of the population that will carry out further research(Arikunto, 2006). The sample in the research was determined to consist of intellectual capital, NPL ratio, CKPN, CAR, BOPO and CKPN of all commercial banks in Indonesia. Based on SPI data for June 2022, the number of commercial banks is 94 (ninety four) commercial banks with details for each KBMI as follows:

Table 1 Number of Commercial Banks based on KBMI

KBMI	KBMI 1 Capital 1-6 trillion	KBMI 2 Capital >6-16 trillion	KBMI 3 Capital >14-70 trillion	KBMI 4 Capital > 70 trillion
Bank population	73	17	13	4
Bank sample	62	16	12	4

Source: Indonesian Banking Statistics June 2022, processed.

This research classifies commercial banks into 4 (four) based on KBMI. Based on Table 1 above, as of June 2022, there are 62 (sixty two) KBMI-1 banks, 16 (sixteen) KBMI-2 banks, 12 (twelve) KBMI-3 banks, and 4 (four) KBMI-4 banks . The research period is divided into 2 (two) periods, namely before the Covid-19 pandemic (January 2013 to December 2019) and the Covid-19 pandemic period (January 2020 to June 2022). This is with the following considerations:

1. The availability of all financial performance data for each bank for the period 2013 to 2022 required for this research is available from the data source above.
2. The total assets of the sample of commercial banks reached the position in December 2013 of IDR 4,774 trillion (96.36% of the total assets of all commercial banks in Indonesia) and the position in June 2022 of IDR 9,850 trillion (95.55% of the total assets of all commercial banks in Indonesia).

Thus, the sample of commercial banks in this research is represented by 94 commercial banks which are divided into 4 (four) KBMI.

RESULTS AND DISCUSSION

Commercial Bank Descriptive Data

Details of descriptive data for each variable from 94 samples of commercial banks in Indonesia before the Covid-19 period and during the Covid-19 period are as follows:

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Table 2 Descriptive Data for Commercial Banks

KBMI	Period	Variable	Data	Minimal	Maximum	Mean	Standard Deviation
All KBMI	Before period Covid-19	NPLs	2632	0.00	26,24	2.71	2.35
		CKPN	2632	0.00	18.71	1.49	1.70
		CAR	2632	4.93	201.04	25.02	16.88
		ROA	2632	(29.19)	8.38	1.82	1.89
		BOPO	2632	0.96	432.73	83.78	18.91
		HCE	2632	(40.66)	54.61	5.03	4.57
		INVCE	2632	(3,964.32)	19,545.47	188.30	625.60
		CEE	2632	(7.78)	54.74	0.47	1.33
All KBMI	During period Covid-19	NPLs	940	0.00	22.27	3.21	2.41
		CKPN	940	0.00	45.39	2.66	3.89
		CAR	940	0.41	1,107.97	38.82	75.63
		ROA	940	(14.75)	7.96	1.15	2.29
		BOPO	940	1.00	287.86	88.16	28.50
		HCE	940	(11.99)	58.34	5.18	5.87
		INVCE	940	(223.18)	77,028.08	708.42	3,289.87
		CEE	940	(0.40)	9.53	0.33	0.67

Results of Research Data Analysis

Panel data processing using eViews will produce 3 (three) models, namely the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). Researchers determined the best model by testing the Chow Test, Hausman Test, and Breusch Pagan-Lagrange Multiplier Test. The Chow test aims to test the best model between CEM compared to FEM, while the Hausman test aims to test the best model between FEM and REM and the BPLM test aims to test the best model between REM compared to CEM.

1. KBMI-1 Before the Covid-19 Period and the Covid-19 Period

Researchers conducted tests on 64 (sixty-four) KBMI-1 commercial banks for the period 2013 to 2022 with the periodThe research was divided into 2 (two) periods, namely before the Covid-19 pandemic (January 2013 to December 2019) and the Covid-19 pandemic period (January 2020 to June 2022).

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 5.19%, reflected in the R2 value recorded at 0.0519. The independent variables INVCE and CEE are positively correlated, the independent variables HCE and CEE have a significant effect on NPL as stated in table 3.

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Table 3 Regression Model REM KBMI-1 Before the Covid-19 Period Dependent Variable NPL

Variable	Coefficient	Probability
Constant	3.0052	0.0000
HCE	-0.0706	0.0000
INVCE	0.0001	0.4376
CEE	0.3076	0.0000

Then, using the CEM model, it was discovered that the ability of the independent variable to explain the dependent variable was 0.64%, reflected in the R2 value recorded at 0.0064. All independent variables are negatively correlated and have no significant effect on NPL as stated in table 4.

Table 4 Regression Model of CEM KBMI-1 Covid-19 Period Dependent Variable NPL

Variable	Coefficient	Probability
Constant	3.5097	0.0000
HCE	-0.0129	0.4828
INVCE	-0.0001	0.2234
CEE	-0.1414	0.4032

Intellectual Capital Against CKPN

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 2.22%, reflected in the R2 value recorded at 0.0222. All independent variables have a positive correlation, the independent variable CEE has a significant effect on CKPN as stated in table 5.

Table 5 Regression Model REM KBMI-1 Before the Covid-19 Period Dependent Variable CKPN

Variable	Coefficient	Probability
Constant	1.3778	0.0000
HCE	0.0004	0.9651
INVCE	0.0002	0.0768
CEE	0.1729	0.0000

Then, using the CEM model, it was discovered that the ability of the independent variable to explain the dependent variable was 19.38%, reflected in the R2 value recorded at 0.1938. The independent variables INVCE and CEE are positively correlated, all independent variables have a significant effect on CKPN as stated in the table6.

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Table 6 Regression Model of CEM KBMI-1 Covid-19 Period Dependent Variable CKPN

Variable	Coefficient	Probability
Constant	2.6888	0.0000
HCE	-0.1517	0.0000
INVCE	0.0005	0.0000
CEE	0.6325	0.0155

Intellectual Capital Against CAR

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 0.76%, reflected in the R2 value recorded at 0.0076. The independent variable INVCE has a positive correlation, the independent variable CEE has a significant effect on CAR as stated in table 7.

Table 7 Regression Model REM KBMI-1 Before the Covid-19 Period Dependent Variable CAR

Variable	Coefficient	Probability
Constant	27.3287	0.0000
HCE	-0.0504	0.6253
INVCE	0.0006	0.4710
CEE	-1.0187	0.0005

Then, using the REM model, it was discovered that the ability of the independent variable to explain the dependent variable was 3.92%, reflected in the R2 value recorded at 0.0392. Independent variables HCE and INVCEcorrelatepositive, the independent variables HCE and CEE have a significant effect on ROA as stated in table 8.

Table 8 Regression Model REM KBMI-1 Covid-19 Period Dependent Variable ROA

Variable	Coefficient	Probability
Constant	0.6953	0.0000
HCE	0.0746	0.0000
INVCE	0.0001	0.9582
CEE	-0.4793	0.0015

Intellectual Capital Against ROA

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 20.01%, reflected in the R2 value recorded at 0.2001. The independent variables HCE and INVCE are positively correlated, the independent variables HCE and CEE have a significant effect on ROA as stated in table 9.

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Table 9 Regression Model REM KBMI-1 Before the Covid-19 Period Dependent Variable ROA

Variable	Coefficient	Probability
Constant	1.2822	0.0000
HCE	0.1109	0.0000
INVCE	0.0001	0.6222
CEE	-0.2693	0.0000

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 3.92%, reflected in the R2 value recorded at 0.0392. The independent variables HCE and INVCE are positively correlated, the independent variables HCE and CEE have a significant effect on ROA as stated in table 10.

Table 10 Regression Model REM KBMI-1 Covid-19 Period Dependent Variable ROA

Variable	Coefficient	Probability
Constant	0.6953	0.0000
HCE	0.0746	0.0000
INVCE	0.0001	0.9582
CEE	-0.4793	0.0015

Intellectual Capital Against BOPO

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 18.30%, reflected in the R2 value recorded at 0.1830. The independent variables INVCE and CEE are positively correlated, the independent variables HCE and CEE have a significant effect on BOPO as stated in table 11.

Table 11 Regression Model REM KBMI-1 Before the Covid-19 Period Dependent Variable BOPO

Variable	Coefficient	Probability
Constant	90.9104	0.0000
HCE	-1.4501	0.0000
INVCE	0.0001	0.9616
CEE	3.0896	0.0000

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 4.68%, reflected in the R2 value recorded at 0.0468. The independent variables INVCE and CEE are positively correlated, the independent variables HCE and CEE have a significant effect on BOPO as stated in table 12.

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Table 12 Regression Model REM KBMI-1 Covid-19 Period Dependent Variable BOPO

Variable	Coefficient	Probability
Constant	94.3092	0.0000
HCE	-1.0033	0.0000
INVCE	0.0001	0.9748
CEE	6.8193	0.0003

2. KBMI-2 Before the Covid-19 Period and the Covid-19 Period

Researchers conducted tests on 16 (sixteen) KBMI-2 commercial banks for the period 2013 to 2022 with the periodThe research was divided into 2 (two) periods, namely before the Covid-19 pandemic (January 2013 to December 2019) and the Covid-19 pandemic period (January 2020 to June 2022).

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 3.53%, reflected in the R2 value recorded at 0.0353. The independent variable INVCE has a positive correlation, the independent variables HCE and CEE have a significant effect on NPL as stated in table 13.

Table 13 Regression Model REM KBMI-2 Before the Covid-19 Period Dependent Variable NPL

Variable	Coefficient	Probability
Constant	3.1850	0.0000
HCE	-0.0688	0.0456
INVCE	0.0001	0.8525
CEE	-0.4718	0.0019

Using the FEM model, it is known that the ability of the independent variable to explain the dependent variable is 62.45%, reflected in the R2 value recorded at 0.6245. The independent variable INVCE has a positive correlation and the HCE variable has a significant effect on NPL as stated in table 14.

Table 14 FEM KBMI-2 Regression Model for Covid-19 Period Dependent Variable NPL

Variable	Coefficient	Probability
Constant	4,2900	0.0000
HCE	-0.2012	0.0012
INVCE	0.0002	0.4371
CEE	-0.1947	0.7703

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Intellectual Capital Against CKPN

Using the FEM model, it is known that the ability of the independent variable to explain the dependent variable is 53.85%, reflected in the R2 value recorded at 0.5385. The independent variables HCE and CEE are negatively and significantly correlated as stated in table 15.

Table 15 Regression of the KBMI-2 FEM Model Before the Covid-19 Period Dependent Variable CKPN

Variable	Coefficient	Probability
Constant	1.6351	0.0000
HCE	-0.0358	0.0705
INVCE	0.0001	0.9954
CEE	-0.4811	0.0000

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 10.07%, reflected in the R2 value recorded at 0.1007. The independent variable INVCE has a positive correlation, the independent variable HCE has a significant effect on CKPN as stated in table 16.

Table 16 Regression Model REM KBMI-2 Covid-19 Period Dependent Variable CKPN

Variable	Coefficient	Probability
Constant	3.0484	0.0000
HCE	-0.1079	0.0017
INVCE	0.0003	0.1681
CEE	-0.3520	0.3900

Intellectual Capital Against CAR

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 0.85%, reflected in the R2 value recorded at 0.0085. The independent variable INVCE is positively correlated, and all independent variables have no significant effect on CAR as stated in table 17.

Table 17 Regression Model REM KBMI-2 Before the Covid-19 Period Dependent Variable CAR

Variable	Coefficient	Probability
Constant	26.4543	0.0000
HCE	-0.3018	0.1359
INVCE	0.0001	0.8231
CEE	-0.8462	0.3128

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Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 0.88%, reflected in the R2 value recorded at 0.0088. All independent variables are negatively correlated and have no significant effect on CAR as stated in table 18.

Table 18 Regression Model REM KBMI-2 Covid-19 Period Dependent Variable CAR

Variable	Coefficient	Probability
Constant	49.5892	0.0010
HCE	-0.5622	0.6969
INVCE	-0.0067	0.4174
CEE	-7.9487	0.6509

Intellectual Capital Against ROA

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 12.92%, reflected in the R2 value recorded at 0.1292. The independent variables HCE and INVCE are positively correlated, the independent variables HCE and INVCE have a significant effect on ROA as stated in table 19.

Table 19 Regression Model REM KBMI-2 Before the Covid-19 Period Dependent Variable ROA

Variable	Coefficient	Probability
Constant	0.7278	0.0857
HCE	0.2126	0.0000
INVCE	0.0002	0.0016
CEE	-0.0938	0.4673

Using the FEM model, it is known that the ability of the independent variable to explain the dependent variable is 71.98%, reflected in the R2 value recorded at 0.7198. The independent variables HCE and INVCE are positively correlated and the independent variables HCE and INVCE have a significant effect on CAR as stated in table 20.

Table 20 Regression Model of FEM KBMI-2 Covid-19 Period Dependent Variable ROA

Variable	Coefficient	Probability
Constant	-1.5614	0.0000
HCE	0.5414	0.0000
INVCE	0.0005	0.0939
CEE	-0.1271	0.8351

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Intellectual Capital Against BOPO

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 5.49%, reflected in the R2 value recorded at 0.0549. The independent variables INVCE and CEE are positively correlated, the independent variable HCE has a significant effect on BOPO as stated in table 21.

Table 21 Regression Model REM KBMI-2 Before the Covid-19 Period Dependent Variable BOPO

Variable	Coefficient	Probability
Constant	91.2089	0.0000
HCE	-1.6116	0.0000
INVCE	0.0006	0.2814
CEE	0.9804	0.4702

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 4.83%, reflected in the R2 value recorded at 0.0483. The independent variables INVCE and CEE are positively correlated, the independent variable HCE has a significant effect on BOPO as stated in table 22.

Table 22 Regression Model REM KBMI-2 Covid-19 Period Dependent Variable BOPO

Variable	Coefficient	Probability
Constant	95.6465	0.0000
HCE	-2.0058	0.0067
INVCE	0.0043	0.2936
CEE	0.2995	0.9728

3. KBMI-3 Before the Covid-19 Period and the Covid-19 Period

Researchers conducted tests on 12 (twelve) KBMI-3 commercial banks for the period 2013 to 2022 with the periodThe research was divided into 2 (two) periods, namely before the Covid-19 pandemic (January 2013 to December 2019) and the Covid-19 pandemic period (January 2020 to June 2022).

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 0.34%, reflected in the R2 value recorded at 0.0034. The independent variable INVCE is positively correlated, and all independent variables have no significant effect on NPL as stated in table 23.

Table 23 Regression Model REM KBMI-3 Before the Covid-19 Period Dependent Variable NPL

Variable	Coefficient	Probability
Constant	2.6276	0.0000

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Variable	Coefficient	Probability
HCE	-0.0088	0.7117
INVCE	0.0001	0.7089
CEE	-0.0524	0.4509

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 7.35%, reflected in the R2 value recorded at 0.0735. The independent variable CEE has a negative correlation, the HCEE variable has a significant effect as stated in table 24.

Table 24 Regression Model REM KBMI-3 Covid-19 Period Dependent Variable NPL

Variable	Coefficient	Probability
Constant	3.3348	0.0000
HCE	-0.1029	0.0069
INVCE	-0.0001	0.8067
CEE	0.1082	0.2439

Intellectual Capital Against CKPN

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 21.81%, reflected in the R2 value recorded at 0.2181. The independent variables INVCE HCE and CEE are negatively correlated, the independent variables HCE and CEE have a significant effect on CKPN as stated in table 25.

Table 25 Regression Model REM KBMI-3 Before the Covid-19 Period Dependent Variable CKPN

Variable	Coefficient	Probability
Constant	2.6418	0.0000
HCE	-0.1537	0.0000
INVCE	0.0002	0.1357
CEE	-0.0988	0.0860

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 7.92%, reflected in the R2 value recorded at 0.0792. The independent variables INVCE and CEE are negatively correlated, the independent variable HCE has a significant effect on CKPN as stated in table 26.

Table 26 Regression Model REM KBMI-3 Covid-19 Period Dependent Variable CKPN

Variable	Coefficient	Probability
Constant	3.4087	0.0000
HCE	-0.1061	0.0019

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Variable	Coefficient	Probability
INVCE	0.0001	0.5729
CEE	0.0260	0.7542

Intellectual Capital Against CAR

Using the FEM model, it is known that the ability of the independent variable to explain the dependent variable is 30.13%, reflected in the R2 value recorded at 0.3013. The independent variables HCE and CEE are positively correlated, the independent variables HCE and CEE are significant to CAR as stated in table 27.

Table 27 Regression of the KBMI-3 FEM Model Before the Covid-19 Period Dependent Variable CAR

Variable	Coefficient	Probability
Constant	17.6555	0.0000
HCE	0.1703	0.0029
INVCE	-0.0001	0.7710
CEE	0.4173	0.0119

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 1.98%, reflected in the R2 value recorded at 0.0198. The independent variables INVCE and CEE are positively correlated and all independent variables have no significant effect on CAR as stated in table 28.

Table 28 Regression Model REM KBMI-3 Covid-19 Period Dependent Variable CAR

Variable	Coefficient	Probability
Constant	25.4937	0.0000
HCE	-0.2533	0.2322
INVCE	0.0008	0.2147
CEE	0.2660	0.6225

Intellectual Capital Against ROA

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 8.50%, reflected in the R2 value recorded at 0.0850. All independent variables have a positive correlation, the independent variables HCE and CEE have a significant effect on ROA as stated in table 29.

Table 29 Regression Model REM KBMI-3 Before the Covid-19 Period Dependent Variable ROA

Variable	Coefficient	Probability
Constant	1.3037	0.0000
HCE	0.0562	0.0023

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Variable	Coefficient	Probability
INVCE	0.0001	0.4965
CEE	0.1303	0.0152

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 21.24%, reflected in the R2 value recorded at 0.2124. The independent variables HCE and INVCE are positively correlated, the independent variables HCE and CEE have a significant effect on ROA as stated in table 30.

Table 30 Regression Model REM KBMI-3 Covid-19 Period Dependent Variable ROA

Variable	Coefficient	Probability
Constant	1.0368	0.0000
HCE	0.1297	0.0000
INVCE	0.0001	0.5414
CEE	-0.2900	0.0001

Intellectual Capital Against BOPO

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 13.42%, reflected in the R2 value recorded at 0.1342. The independent variables INVCE and CEE are positively correlated, all independent variables have a significant effect on BOPO as stated in table 31.

Table 31 Regression Model REM KBMI-3 Before the Covid-19 Period Dependent Variable BOPO

Variable	Coefficient	Probability
Constant	88.5840	0.0000
HCE	-1.5093	0.0000
INVCE	0.0029	0.0930
CEE	2.6752	0.0000

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 13.42%, reflected in the R2 value recorded at 0.1342. The independent variable CEE has a positive correlation and the independent variable CEE has a significant effect on BOPO as stated in table 32.

Table 32 Regression Model REM KBMI-3 Covid-19 Period Dependent Variable BOPO

Variable	Coefficient	Probability
Constant	79.6984	0.0000
HCE	-0.1787	0.6885
INVCE	-0.0008	0.5872

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Variable	Coefficient	Probability
CEE	2.6807	0.0207

KBMI-4

Researchers conducted tests on 4 (four) KBMI-4 commercial banks for the period 2013 to 2022 with the periodThe research was divided into 2 (two) periods, namely before the Covid-19 pandemic (January 2013 to December 2019) and the Covid-19 pandemic period (January 2020 to June 2022).

Intellectual Capital Against NPL

Using the FEM model, it is known that the ability of the independent variable to explain the dependent variable is 38.58%, reflected in the R2 value recorded at 0.3858. All independent variables have a negative and significant correlation with NPL as stated in table 33.

Table 33 Regression of the KBMI-4 FEM Model Before the Covid-19 Period Dependent Variable NPL

Variable	Coefficient	Probability
Constant	4.1714	0.0000
HCE	-0.2783	0.0048
INVCE	-0.0020	0.0008
CEE	-3.1028	0.0000

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 48.68%, reflected in the R2 value recorded at 0.4867. The independent variable CCE is positively correlated and all independent variables have a significant effect on NPL as stated in table 34.

Table 34 Regression Model REM KBMI-4 Covid-19 Period Dependent Variable NPL

Variable	Coefficient	Probability
Constant	4,372	0.0000
HCE	-0.3729	0.0000
CEE	0.3729	0.0000

Intellectual Capital Against CKPN

Using the FEM model, it is known that the ability of the independent variable to explain the dependent variable is 43.45%, reflected in the R2 value recorded at 0.4345. All independent variables have a negative and significant correlation with CKPN as stated in table 35.

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Table 35 Regression of the KBMI-4 FEM Model Before the Covid-19 Period Dependent Variable CKPN

Variable	Coefficient	Probability
Constant	4.3546	0.0000
HCE	-0.1665	0.0380
INVCE	-0.0033	0.0000
CEE	-2.4091	0.0001

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 62.24%, reflected in the R2 value recorded at 0.6224. The independent variable CCE is positively correlated and all independent variables have a significant effect on CKPN as stated in table 36.

Table 36 Regression Model REM KBMI-4 Covid-19 Period Dependent Variable CKPN

Variable	Coefficient	Probability
Constant	8.2918	0.0000
HCE	-0.8773	0.0000
CEE	0.8776	0.0000

Intellectual Capital Against CAR

Using the FEM model, it is known that the ability of the independent variable to explain the dependent variable is 70.11%, reflected in the R2 value recorded at 0.7011. The independent variable HCE is positively correlated, the independent variables INVCE and CEE have a significant effect on CAR as stated in table 37.

Table 37 Regression of the KBMI-4 FEM Model Before the Covid-19 Period Dependent Variable CAR

Variable	Coefficient	Probability
Constant	20.8397	0.0000
HCE	0.1981	0.3433
INVCE	-0.0072	0.0000
CEE	-3.5639	0.0256

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 20.72%, reflected in the R2 value recorded at 0.2072. The independent variable CCE is positively correlated and all independent variables have a significant effect on CAR as stated in table 38.

Table 38 Regression Model REM KBMI-4 Covid-19 Period Dependent Variable CAR

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Variable	Coefficient	Probability
Constant	17.0374	0.0000
HCE	-1.2554	0.0038
CEE	1.2591	0.0038

Intellectual Capital Against ROA

Using the FEM model, it is known that the ability of the independent variable to explain the dependent variable is 32.66%, reflected in the R2 value recorded at 0.3266. The independent variables HCE and CEE are positively correlated, the variables INVCE and CEE have a significant effect on ROA as stated in table 39.

Table 39 Regression of the KBMI-4 FEM Model Before the Covid-19 Period Dependent Variable ROA

Variable	Coefficient	Probability
Constant	2.9587	0.0000
HCE	0.0452	0.5790
INVCE	-0.0010	0.0431
CEE	2.0240	0.0013

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 39.40%, reflected in the R2 value recorded at 0.3940. The independent variable HCE is correlated and all independent variables have a significant effect on ROA as stated in the table 40.

Table 40 Regression Model REM KBMI-4 Covid-19 Period Dependent Variable ROA

Variable	Coefficient	Probability
Constant	0.9768	0.0077
HCE	0.3958	0.0002
CEE	-0.3957	0.0002

Intellectual Capital Against BOPO

Using the FEM model, it is known that the ability of the independent variable to explain the dependent variable is 50.50%, reflected in the R2 value recorded at 0.5050. The independent variable INVCE is positively correlated, the independent variables HCE and CEE have a significant effect on BOPO as stated in the table 41.

Table 41 Regression of the KBMI-4 FEM Model Before the Covid-19 Period Dependent Variable BOPO

Variable	Coefficient	Probability
Constant	84.6493	0.0000
HCE	-3.8151	0.0000

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Variable	Coefficient	Probability
INVCE	0.0002	0.9472
CEE	-10.4303	0.0141

Using the REM model, it is known that the ability of the independent variable to explain the dependent variable is 78.35%, reflected in the R2 value recorded at 0.7835. The independent variable CCE is positively correlated and all independent variables have a significant effect on BOPO as stated in the table 42.

Table 42 Regression Model REM KBMI-4 Covid-19 Period Dependent Variable BOPO

Variable	Coefficient	Probability
Constant	96.0745	0.0000
HCE	-6.2605	0.0000
CEE	6.2587	0.0000

Conclusion of Research Hypothesis

The following is the conclusion of the research hypothesis on KBMI 1-4 periods before Covid-19 and during the Covid-19 period.

Table 43 Conclusion of KBMI Hypothesis 1-4
KBMI-1 Before the Covid-19 Period

Hypothesis	Research Hypothesis	Regression Coef	Probability	Hypothetical Conclusion
H1a	HCE has a negative correlation with NPL	-0.0706	0.0000	Accepted
H1b	INVCE has a negative correlation with NPL	0.0001	0.4376	Rejected
H1c	CEE has a negative correlation with NPL	0.3076	0.0000	Rejected
H2a	HCE has a negative correlation with CKPN	0.0004	0.9651	Rejected
H2b	INVCE has a negative correlation with CKPN	0.0002	0.0768	Rejected
H2c	CEE has a negative correlation with CKPN	0.1729	0.0000	Rejected
H3a	HCE has a positive correlation with CAR	-0.0504	0.6253	Rejected
H3b	INVCE has a positive correlation with CAR	0.0006	0.4710	Accepted
H3c	CEE is positively correlated with CAR	-1.0187	0.0005	Rejected

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H4a	HCE has a positive correlation with ROA	0.1109	0.0000	Accepted
H4b	INVCE has a positive correlation with ROA	0.0001	0.6222	Accepted
H4c	CEE has a positive correlation with ROA	-0.2693	0.0000	Rejected
H5a	HCE has a negative correlation with BOPO	-1.4501	0.0000	Accepted
H5b	INVCE has a negative correlation with BOPO	0.0001	0.9616	Rejected
H5c	CEE has a negative correlation with BOPO	3.0896	0.0000	Rejected

KBMI-1 Covid-19 Period

Hypothesis	Research Hypothesis	Regression Coef	Probability	Hypothetical Conclusion
H1a	HCE has a negative correlation with NPL	-0.0129	0.4828	Accepted
H1b	INVCE has a negative correlation with NPL	-0.0001	0.2234	Accepted
H1c	CEE has a negative correlation with NPL	-0.1414	0.4032	Accepted
H2a	HCE has a negative correlation with CKPN	-0.1517	0.0000	Accepted
H2b	INVCE has a negative correlation with CKPN	0.0005	0.0000	Rejected
H2c	CEE has a negative correlation with CKPN	0.6325	0.0155	Rejected
H3a	HCE has a positive correlation with CAR	0.4351	0.4640	Accepted
H3b	INVCE has a positive correlation with CAR	0.0008	0.3583	Accepted
H3c	CEE is positively correlated with CAR	-12,824	0.0195	Rejected
H4a	HCE has a positive correlation with ROA	0.0746	0.0000	Accepted
H4b	INVCE has a positive correlation with ROA	0.0001	0.9582	Accepted
H4c	CEE has a positive correlation with ROA	-0.4793	0.0015	Rejected
H5a	HCE has a negative correlation with BOPO	-1.0033	0.0000	Accepted
H5b	INVCE has a negative correlation with BOPO	0.0001	0.9748	Rejected

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H5c	CEE has a negative correlation with BOPO	6.8193	0.0003	Rejected

KBMI-2 Before the Covid-19 Period

Hypothesis	Research Hypothesis	Regression Coef	Probability	Hypothetical Conclusion
H1a	HCE has a negative correlation with NPL	-0.0688	0.0456	Accepted
H1b	INVCE has a negative correlation with NPL	0.0001	0.8525	Rejected
H1c	CEE has a negative correlation with NPL	-0.4718	0.0019	Accepted
H2a	HCE has a negative correlation with CKPN	-0.0358	0.0705	Accepted
H2b	INVCE has a negative correlation with CKPN	0.0001	0.9954	Rejected
H2c	CEE has a negative correlation with CKPN	-0.4811	0.0000	Accepted
H3a	HCE has a positive correlation with CAR	-0.3018	0.1359	Rejected
H3b	INVCE has a positive correlation with CAR	0.0001	0.8231	Accepted
H3c	CEE is positively correlated with CAR	-0.8462	0.3128	Rejected
H4a	HCE has a positive correlation with ROA	0.2126	0.0000	Accepted
H4b	INVCE has a positive correlation with ROA	0.0002	0.0016	Accepted
H4c	CEE has a positive correlation with ROA	-0.0938	0.4673	Rejected
H5a	HCE has a negative correlation with BOPO	-1.6116	0.0000	Accepted
H5b	INVCE has a negative correlation with BOPO	0.0006	0.2814	Rejected
H5c	CEE has a negative correlation with BOPO	0.9804	0.4702	Rejected

KBMI-2 Covid-19 Period

Hypothesis	Research Hypothesis	Regression Coef	Probability	Hypothetical Conclusion
H1a	HCE has a negative correlation with NPL	-0.2012	0.0012	Accepted
H1b	INVCE has a negative correlation with NPL	0.0002	0.4371	Rejected

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H1c	CEE has a negative correlation with NPL	-0.1947	0.7703	Accepted
H2a	HCE has a negative correlation with CKPN	-0.1079	0.0017	Accepted
H2b	INVCE has a negative correlation with CKPN	0.0003	0.1681	Rejected
H2c	CEE has a negative correlation with CKPN	-0.3520	0.3900	Accepted
H3a	HCE has a positive correlation with CAR	-0.5622	0.6969	Rejected
H3b	INVCE has a positive correlation with CAR	-0.0067	0.4174	Rejected
H3c	CEE is positively correlated with CAR	-7.9487	0.6509	Rejected
H4a	HCE has a positive correlation with ROA	0.5414	0.0000	Accepted
H4b	INVCE has a positive correlation with ROA	0.0005	0.0939	Accepted
H4c	CEE has a positive correlation with ROA	-0.1271	0.8351	Rejected
H5a	HCE has a negative correlation with BOPO	-2.0058	0.0067	Accepted
H5b	INVCE has a negative correlation with BOPO	0.0043	0.2936	Rejected
H5c	CEE has a negative correlation with BOPO	0.2995	0.9728	Rejected

KBMI-3 Before the Covid-19 Period

Hypothesis	Research Hypothesis	Regression Coef	Probability	Hypothetical Conclusion
H1a	HCE has a negative correlation with NPL	-0.0088	0.7117	Accepted
H1b	INVCE has a negative correlation with NPL	0.0001	0.7089	Rejected
H1c	CEE has a negative correlation with NPL	-0.0524	0.4509	Accepted
H2a	HCE has a negative correlation with CKPN	-0.1537	0.0000	Accepted
H2b	INVCE has a negative correlation with CKPN	0.0002	0.1357	Rejected
H2c	CEE has a negative correlation with CKPN	-0.0988	0.0860	Accepted
H3a	HCE has a positive correlation with CAR	0.1703	0.0029	Accepted

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H3b	INVCE has a positive correlation with CAR	-0.0001	0.7710	Rejected
H3c	CEE is positively correlated with CAR	0.4173	0.0119	Accepted
H4a	HCE has a positive correlation with ROA	0.0562	0.0023	Accepted
H4b	INVCE has a positive correlation with ROA	0.0001	0.4965	Accepted
H4c	CEE has a positive correlation with ROA	0.1303	0.0152	Accepted
H5a	HCE has a negative correlation with BOPO	-1.5093	0.0000	Accepted
H5b	INVCE has a negative correlation with BOPO	0.0029	0.0930	Rejected
H5c	CEE has a negative correlation with BOPO	2.6752	0.0000	Rejected

KBMI-3 Covid-19 Period

Hypothesis	Research Hypothesis	Regression Coef	Probability	Hypothetical Conclusion
H1a	HCE has a negative correlation with NPL	-0.1029	0.0069	Accepted
H1b	INVCE has a negative correlation with NPL	-0.0001	0.8067	Accepted
H1c	CEE has a negative correlation with NPL	0.1082	0.2439	Rejected
H2a	HCE has a negative correlation with CKPN	-0.1061	0.0019	Accepted
H2b	INVCE has a negative correlation with CKPN	0.0001	0.5729	Rejected
H2c	CEE has a negative correlation with CKPN	0.0260	0.7542	Rejected
H3a	HCE has a positive correlation with CAR	-0.2533	0.2322	Rejected
H3b	INVCE has a positive correlation with CAR	0.0008	0.2147	Accepted
H3c	CEE is positively correlated with CAR	0.2660	0.6225	Accepted
H4a	HCE has a positive correlation with ROA	0.1297	0.0000	Accepted
H4b	INVCE has a positive correlation with ROA	0.0001	0.5414	Accepted
H4c	CEE has a positive correlation with ROA	-0.2900	0.0001	Rejected

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H5a	HCE has a negative correlation with BOPO	-0.1787	0.6885	Accepted
H5b	INVCE has a negative correlation with BOPO	-0.0008	0.5872	Accepted
H5c	CEE has a negative correlation with BOPO	2.6807	0.0207	Rejected

KBMI-4 Before the Covid-19 Period

Hypothesis	Research Hypothesis	Regression Coef	Probability	Hypothetical Conclusion
H1a	HCE has a negative correlation with NPL	-0.2783	0.0048	Accepted
H1b	INVCE has a negative correlation with NPL	-0.0020	0.0008	Accepted
H1c	CEE has a negative correlation with NPL	-3.1028	0.0000	Accepted
H2a	HCE has a negative correlation with CKPN	-0.1665	0.0380	Accepted
H2b	INVCE has a negative correlation with CKPN	-0.0033	0.0000	Accepted
H2c	CEE has a negative correlation with CKPN	-2.4091	0.0001	Accepted
H3a	HCE has a positive correlation with CAR	0.1981	0.3433	Accepted
H3b	INVCE has a positive correlation with CAR	-0.0072	0.0000	Rejected
H3c	CEE is positively correlated with CAR	-3.5639	0.0256	Rejected
H4a	HCE has a positive correlation with ROA	0.0452	0.5790	Accepted
H4b	INVCE has a positive correlation with ROA	-0.0010	0.0431	Rejected
H4c	CEE has a positive correlation with ROA	2.0240	0.0013	Accepted
H5a	HCE has a negative correlation with BOPO	-3.8151	0.0000	Accepted
H5b	INVCE has a negative correlation with BOPO	0.0002	0.9472	Rejected
H5c	CEE has a negative correlation with BOPO	-10,430	0.0141	Accepted

KBMI-4 Covid-19 Period

Hypothesis	Research Hypothesis	Regression Coef	Probability	Hypothetical Conclusion

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KBMI-4 Before the Covid-19 Period

Hypothesis	Research Hypothesis	Regression Coef	Probability	Hypothetical Conclusion
H1a	HCE has a negative correlation with NPL	-0.3729	0.0000	Accepted
H1b	INVCE has a negative correlation with NPL	-	-	-
H1c	CEE has a negative correlation with NPL	0.3729	0.0000	Rejected
H2a	HCE has a negative correlation with CKPN	-0.8773	0.0000	Accepted
H2b	INVCE has a negative correlation with CKPN	-	-	-
H2c	CEE has a negative correlation with CKPN	0.8776	0.0000	Rejected
H3a	HCE has a positive correlation with CAR	-1.2554	0.0038	Rejected
H3b	INVCE has a positive correlation with CAR	-	-	-
H3c	CEE is positively correlated with CAR	1.2591	0.0038	Accepted
H4a	HCE has a positive correlation with ROA	0.3958	0.0002	Accepted
H4b	INVCE has a positive correlation with ROA	-	-	-
H4c	CEE has a positive correlation with ROA	-0.3957	0.0002	Rejected
H5a	HCE has a negative correlation with BOPO	-6.2605	0.0000	Accepted
H5b	INVCE has a negative correlation with BOPO	-	-	-
H5c	CEE has a negative correlation with BOPO	6.2587	0.0000	Rejected

CLOSING

Conclusion

The research conducted has limitations, including:

1. The new Commercial Bank HR POJK provisions will come into effect in 2022cause the data obtained is not long enough. A longer reporting time span is needed to obtain more accurate modeling.
2. *Time series*The research can be extended from BI DIR Decree No.31/310/KEP/DIR which came into effect in 1999 until the current position. A longer time series in which there were several abnormal events in the banking industry during the 2008 economic crisis and the stimulus related to the Covid-19 pandemic was withdrawn in 2023.

3. The reporting system does not yet contain more specific records regarding the categories of educational or development material attended by bank employees and the amount of gross salary paid by the bank. Educational or development material categories can be grouped based on POJK Risk Management. It states that there are eight different forms of risk in commercial banks, namely legal, compliance, credit, liquidity, operational, market, reputation and strategic risks.
4. Efforts need to be made to ensure that employees involved in the precredit activity process have received education or development in accordance with the scope of authority to anticipate the emergence of higher credit risks.
5. The research conducted only considered internal bank factors in the form of performance on credit risk or did not consider other risk factors, including operational risk and market risk.

Future Research Agenda

For the future research agenda, it would be very interesting to conduct research on:

1. The effectiveness of determining the provision of funds for developing the quality of human resources which must be provided by banks for each financial year is at least 3.5% (three point five percent) of the total realization of the previous year's gross salary expenses for the eight inherent risks of commercial banks.
2. The analysis of the provision of funds for developing human resource quality does not include non-soft skills costs, including travel costs, accommodation costs, consumption costs, room renovation costs and other costs.

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