



STRATEGIC MANAGEMENT CONTROL AND CREDIT RISK MANAGEMENT: THE CASE OF CPA BANK IN ALGERIA

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Abstract

This article analyzes the contribution of strategic management control to mastery of credit risk and its impact on financial performance of an Algerian Commercial bank. The study is based on a Principal Component Analysis (PCA) applied of the data of the public People's Credit bank of Algeria (CPA-BANK) over the period 2003 to 2023. The results allow for the identification of the most critical management control tools in the steering of credit risk management.

Keywords: keywords; keywords; keywords; keywords; keywords.

Introduction:

Effective credit risk management is essential for financial institutions, particularly in dynamic economic environments such as the Algerian banking sector (Siam &Khanji, 2015). Defined as the potential loss resulting from a borrower's failure to repay a loan or meet contractual obligations, this type of risk constitutes a major threat to banks' stability and profitability (Baafi et al., 2019). In this context, the intense competition that characterizes the banking industry drives institutions to pursue sustainable financial performance to ensure their long-term viability. This objective is closely linked to the adoption of sound governance, based on key pillars such as ethics, transparency, traceability, accountability, and rigor.

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The implementation of such governance and the fulfillment of managerial expectations, particularly regarding financial performance, require a coherent management control system. This system relies on a high level of commitment and shared moral values among all employees, such as self-confidence and recognition of competence. These elements are essential for coping with cyclical fluctuations, competitive pressure, and the numerous constraints specific to the banking and financial sectors.

In the economy, commercial banks play a fundamental role in contributing to financial stability and growth, primarily through their traditional mission of intermediation. This role is reflected in the granting of loans, which help address capital shortages, support economic development, and promotes wealth creation. In the specific case of Algeria, where institutions such as CPA Bank operate within particular regulatory and economic environments, it is crucial to understand the relationship between strategic control and credit risk management. Strategic control encompasses all processes and systems aimed at aligning the organization's activities with its overall objectives, including the formulation, implementation, and evaluation of strategies (Bouguelmouna, 2021). This also involves establishing appropriate capacities and conditions, utilizing guarantees, rigorously selecting borrowers, and applying risk analyses to mitigate and control credit risks (Mutai, 2020).

By fully integrating these strategic control mechanisms into credit risk management, banks can proactively identify, assess, and mitigate potential losses, thereby strengthening their long-term resilience and competitive advantage.

At the core of the concerns of the Bank of Algeria (BA) and the senior management of primary banks lies the proactive implementation of prudential rules and techniques in the area of credit granting to businesses and households, with the objective of limiting and reducing the impact of credit risk. Indeed, this

crucial operation exposes the bank to multiple sources of credit risk that may adversely affect its financial performance.

The present article specifically aims to highlight the contribution of strategic management control to the management of credit risk, by identifying the tools that influence financial performance and operational profitability. In this context, the issue of financial performance evaluation arises with particular importance for all financial institutions, since only a bank capable of demonstrating strong performance can ensure its long-term sustainability.

1. Literature Review and Research Positioning

To rigorously examine the relationship between strategic management control, credit risk management, and banks' financial performance, it is necessary to situate this study within a conceptual framework supported by existing literature. Several academic works have explored separately the notions of credit risk, management control tools applied in the banking sector, and financial performance indicators, while highlighting the importance of their interconnection to ensure the sustainability of financial institutions.

This section therefore aims to provide a structured review of the literature around four main axes. First, it clarifies the fundamental concepts related to credit risk and banking performance. Next, it examines the main instruments of strategic management control used by financial institutions to manage these challenges. The third subsection synthesizes previous studies that have analyzed the impact of management control on risk management and profitability, thereby situating the present research in relation to the achievements and limitations of existing studies. Finally, the fourth subsection highlights the originality and added value of this study, both in its contextual and methodological dimensions, positioning it within the field of contemporary research in financial and banking management sciences.



1.1 Fundamental Concepts: Credit Risk and Banking Performance

In the banking industry, credit risk holds a predominant position among financial risks due to its direct impact on the profitability and stability of institutions. It is generally defined as the risk of loss incurred by a bank as a result of a borrower's inability to meet contractual obligations (Coussergues et al., 2017). This risk, also referred to as counterparty risk, corresponds to the possibility of total or partial default in repayment or partial repayment of due installments, thereby affecting the principal, expected interest, and ultimately the solvency of the institution.

Despite technical and regulatory advances - notably the Basel II and III Accords - credit risk remains one of the main sources of fragility and even bank failure, often representing more than 80% of balance sheet items related to intermediation activities (Gourieux & Tiomo, 2007). Its management therefore requires the implementation of rigorous policies for loan granting, monitoring, and recovery, combining both quantitative analyses of repayment capacity and qualitative assessments of borrower behavior and moral integrity.

At the same time, the financial performance of banks, which reflects their ability to sustainably generate profits after covering risks, constitutes a key indicator of their long-term viability. It is traditionally measured through ratios such as Return on Equity (ROE), Return on Assets (ROA), and Net Interest Margin (NIM) (Dietrich & Wanzenried, 2009). These indicators reflect how efficiently a bank uses its own and mobilized resources to create value while maintaining an acceptable level of risk.

Thus, in a context where banks must reconcile growth with prudential requirements, the link between credit risk control and financial performance becomes a major strategic issue. This justifies the attention devoted to the analysis of strategic management control systems, which aim precisely to align risk management with the achievement of financial objectives.

1.2 Strategic Management Control Tools Applied to Banks

In the banking sector, strategic management control is defined as a cross-functional system designed to ensure coherence between strategic orientations and operational actions, with the aim of optimizing both financial performance and risk management (Bouquin, 2005; Helluy& Durand, 2009). This role is particularly crucial as banks operate in an uncertain environment characterized by strict prudential constraints and intense competition.

- To effectively manage credit risk and ensure profitability, banks rely on a set of specific management control tools. Among the most significant are: The cost-to-income ratio, which measures the relationship between operating expenses and net banking income. It serves as a key indicator of operational efficiency and helps anticipate the margins generated by the bank's core intermediation activities (Mor& Touré, 2018).
- Reporting and dashboards, which ensure the periodic flow of financial and operational information to decision-making centers. These tools facilitate variance monitoring, support corrective decision-making, and strengthen cross-functional communication within the bank (Ramond, 2004; Malo, 2000).
- The solvency ratio, in compliance with international standards such as Basel II and III, aims to protect the bank from excessive default risks by maintaining a minimum level of regulatory capital. This ratio acts as a genuine safety cushion against potential losses related to non-performing loans (Walter, 2011).
- Collateral and real guarantees, such as mortgages or pledges, which are required when granting loans. These constitute a traditional yet fundamental risk mitigation tool, reinforcing recovery capacity in case of borrower default (Besanko &Thakor, 1987).



- The loan portfolio quality ratio, such as the Portfolio at Risk (PAR), which assesses the proportion of non-performing loans relative to total credits granted. This ratio is crucial for diagnosing portfolio health and anticipating preventive measures to be implemented (Dannon & Lobeze, 2014).

The effectiveness of strategic management control thus relies on the simultaneous mobilization of these instruments, which work synergistically to balance profitability and security. This articulation between financial, prudential, and decision-making tools gives management control a central role in banking governance and in strengthening the competitive position of institutions.

1.3 Summary of Previous Studies on Risk Management and Performance

Several studies have examined the relationships between bank management control systems, credit risk management, and financial performance, highlighting results that are sometimes convergent but also nuanced, depending on the institutional and economic contexts studied.

Thus, Ducrocq (2000) emphasizes the decisive contribution of information technologies to bank management control, enabling the systematic production of financial data that facilitates risk monitoring, particularly credit risk, and the measurement of the associated performance.

In the same vein, Miloud and Belhouche (2013), based on a case study of BNP Paribas El Djazaïr, demonstrate that management control significantly contributes to the regularity of operations and the establishment of a mapping of operational and credit risks, thereby strengthening overall bank risk management. From a broader perspective, Schier (2007) highlights the complementarity between social responsibility and financial performance, suggesting that rigorous risk management (including credit risk) forms part of a sustainable value creation process. At the level of budgetary practices, S. and Lambert

(2010) note that innovations in budget control—such as the use of evolving dashboards—enhance communication among stakeholders and strengthen performance management.

However, some studies warn about the limitations of bank management control. Assienin (2020), in research on Ivorian banks, indicates that management control can paradoxically have a negative impact on economic profitability when its operational effectiveness is insufficient or poorly adapted to local specificities.

Finally, studies focused on prudential ratios, such as those by Walter (2011) and Grourieux&Tiomo (2007), emphasize the protective role of the solvency ratio against credit risks but also point out its capital cost for banks, which can affect margins and profit dynamics.

These contributions show that the relationship between management control, credit risk management, and financial performance is neither uniform nor universal. It depends on a set of contextual factors-such as regulatory frameworks, portfolio structure, and internal practices-and thus justifies the relevance of a targeted empirical investigation, such as that conducted in this study on CPA Bank, to clarify the mechanisms and correlations at work in the Algerian banking context.

1.4 Contribution and Originality of the Research

In light of the existing literature, it appears that although numerous studies have explored the impact of management control on the performance of financial institutions, few have specifically focused on the interactions between strategic management control tools and credit risk management. This research contributes by integrating and simultaneously analyzing several performance indicators such as ROE, ROA, and Net Interest Margin (NIM). Moreover, most previous studies have focused on European, Asian, or Sub-Saharan contexts, leaving limited room for empirical investigation within North African economies, and particularly Algeria. Yet, the structural



specificities of the Algerian banking sector characterized by the dominance of public banks, an evolving prudential regulatory framework, and an economy largely composed of public and semi-public enterprises make the analysis of these mechanisms especially relevant.

This research therefore stands out for its dual originality. On one hand, it provides a detailed empirical investigation of CPA Bank, the leading Algerian public bank, covering an extended observation period (2003–2023) that captures both structural and cyclical dynamics. On the other hand, it employs a Principal Component Analysis (PCA) to examine, in a multidimensional way, the correlations between strategic management control tools related to credit risk and financial performance indicators offering an integrated perspective rarely found in the existing literature.

In this regard, the article provides new insights for both academic research and banking practitioners by identifying practical levers of action to strengthen financial performance through improved credit risk management.

2. Conceptual Framework and Hypotheses

In a banking context driven by the simultaneous pursuit of profitability and financial soundness, the issue of credit risk management is of central importance. This risk, as the main exposure factor for banking institutions, determines their ability to generate sustainable performance while complying with prudential requirements.

Accordingly, the main research question of this study can be formulated as follows:

To what extent do strategic management control tools contribute to managing credit risk and improving the financial performance of banks, particularly in the case of a public Algerian bank such as CPA Bank?

To answer this question, we use a conceptual framework that combines three main dimensions. First, strategic

management control, analyzed through its key instruments (cost-to-income ratio, reporting, solvency ratio, collateral, and loan portfolio quality), constitutes the internal lever upon which bank management can act.

Next, credit risk management, measured notably by the quality of loan commitments and coverage mechanisms, represents the intermediate variable that ensures the security of banking assets. Finally, financial performance, evaluated through indicators such as ROE, ROA, and Net Interest Margin (NIM), reflects the ultimate outcome of these strategic trade-offs.

This conceptual framework highlights a dual relationship: a direct link between management control and performance, and an indirect link through the impact of credit risk management. It serves as the basis for constructing the hypotheses tested empirically in this research.

Based on this analytical framework and previous literature, we formulate the following hypotheses:

H1: Strategic management control, through its main tools, has a positive effect on the control of credit risk.

H2: Better credit risk management, made possible by these control mechanisms, significantly contributes to improving financial performance.

More specifically, the following sub-hypotheses detail the mechanisms involved:

H2.1: Reducing the operating ratio promotes bank profitability (ROE and ROA).

H2.2: A higher-quality loan portfolio (lower ratio of non-performing loans) is positively correlated with financial performance.

H2.3: Compliance with a high solvency ratio, even though it involves a higher capital cost, helps to sustain long-term performance.

These hypotheses will be empirically tested through the analysis of financial and accounting data from CPA Bank over



the period 2003–2023, in order to validate the relevance of the proposed model and identify the levers for optimizing bank management.

3. The Impact of Credit Risk Management through Strategic Control on Financial Performance: An Empirical Study

After defining the concepts, the tools of strategic management control, and insights from the literature, it is now necessary to confront the theoretical model with the reality of a concrete case. This section therefore presents the empirical study conducted to test the formulated hypotheses and analyze the interactions between credit risk management, through strategic management performance in a specific banking context.

The investigation is based on an in-depth study of the CPA Bank, the leading public Algerian bank in terms of market share. It combines the analysis of financial and accounting data collected over a period from 2003 to 2023, and the use of an exploratory statistical method Principal Component Analysis (PCA). This approach makes it possible to identify the main correlations between variables representing management control and performance indicators, while highlighting the evolving dynamics specific to this institution. The remainder of this section successively details the context and data collection process, the definition of the variable used, and the analytical methodology. It then presents the main results obtained, before discussing their implications for risk management and the creation of banking value.

3.1 Context and Data Collection

As an extension of the conceptual framework and formulated hypotheses, this empirical study aims to analyze the influence of strategic management control tools on credit risk management and financial performance.

To this end, the study focuses on the case of the CPA Bank “People’s Creditbank of Algeria”, a major Algerian public banking institution. Established in 1962, shortly after

independence, this bank has played a historic role in financing and supporting the development of key sectors of the national economy, including public works, industry agribusiness, and real estate.

CPA Bank stands out with a network of 164 branches spread across the entire national territory, making it a key player in the Algerian banking Landscape. This wide geographical and sectoral coverage, combined with a significant credit portfolio, makes it a particularly relevant instruction for studying credit risk management mechanisms. Through this case study, we seek to illustrate how strategic management control tools can help regulate risks related to loan granting and, consequently, optimize the bank's financial performance.

The data used were collected over a recent five-year period, from 2019 to 2023, in order to capture the contemporary evolution of risk management practices and their impact on financial performance.

This data collection required several visits to the headquarters of CPA Bank in Algiers, particularly within departments involved in risk management and performance supervision. The main sources of information include the Management control and Planning Department (DPCG), which provided activity reports, management reports submitted to the Board of Directors and the General Assembly, as well as the instruction's consolidated balance sheets and income statements.

This fieldwork is further justified by recent reforms undertaken by the bank to strengthen its prudential and risk management framework. Among these initiatives is the creation of the Financing Decision Department (DDF), established in October 2024, the computerization of data entry and validation processes for guarantees since September 2022, as well as the integration of new prudential components into the organization and the operation of credit committees since July 2024.

These developments reflect a stronger commitment to risk analysis and alignment with international best practices. In



summary, the study adopts a specific empirical approach to examine, in a concrete and applied manner, the relevance of the credit risk management framework and its contribution to enhancing financial control and performance tools within CPA Bank. The application results also help to validate and refine the advanced assumptions regarding the role of risk prevention systems and the creation of sustainable value within the Algerian banking sector, which is currently undergoing major structural transformations.

3.1 Presentation of Variables

To assess the effect of strategic management control tools on credit risk management and their impact on financial performance, we selected a set of representative variables grouped into two main categories:

On the one hand, explanatory variables related to management control:

- Operating ratio, an indicator of cost control, expressed as the ratio of operating expenses to net banking income.
- Volume of reporting: expressed by the number of activity reports produced and transmitted from branches to central departments, reflecting the level of coordination and operational monitoring.
- Actual collateral (real guarantees) established, serving as a measure of the coverage of granted loans.
- Solvency ratio: indicating compliance with national and international prudential requirements.
- Portfolio at risk ratio (PAR), calculated as the proportion of loans with arrears or contentious cases to the total amount of outstanding loans.

On the other hand, the dependent variables related to financial performance were selected among the most commonly used indicators in the banking literature (Dietrich & Wanzenried, 2009; Ongore & Kusa, 2013):

- Return on Equity (ROE)

- Return on Assets (ROA)
- Net Interest Margin (NIM).

A summary table (Table 1) below presents all the variables, their definitions, and the sources of the collected data.

Table 1: Variables Selected for the Study

Category	Variable	Definition	Source
Management Control of Risk	Operating Ratio	Charges / PNB	Reports DPCG
Management Control of Risk	Reporting	Number of branch activity reports	Internal Reports
Management Control of Risk	Collateral (Real Guarantees)	Collected guarantees / Outstanding loans	DSRC
Management Control of Risk	Solvency Ratio	Shareholders' Equity / Risk-Weighted Assets	Balance sheet
Management Control of Risk	Portfolio at risk ratio (PAR),	Non-performing Loans / Total Loans	DSRC
Performance	Return on Equity (ROE)	Net Income / Shareholders' Equity	Income Statement
Performance	Return on Assets (ROA)	Net Income / Total Assets	Income Statement
Performance	Net Interest Margin (NIM).	PNB / Total Assets	Income Statement

Source: Prepared by the author based on the activity reports and balance sheets of CPA Bank.

Table (Table 2) below summarizes all the quantitative variables concerning credit risk management through management control, together with the dependent variables related to financial performance. The data were collected and computed over the period (2003–2023).



Table 2: Quantitative Variables retained for the study.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Contrôle de Gestion "CG"										
C1-CG=Coefficient d'Exploitation % (MAX 50%)=le	39%	35%	32,70%	28,80%	33,20%	27,20%	30,40%	32,40%	31,60%	32,90%
C2-CG= le nombre des rapports d'activité	3	4	3	3	3	3	3	4	3	3
Pilotage Risque Crédit										
P1-PRC =Ratio de solvabilité % (norme min 8%)=F	16,00	16,10	19,78	23,26	26,05	16,86	19,66	25,48	22,48	21,82
Fonds Propres nets réglementaire FPR	29 100 000,00	29 271 000,00	35 968 000,00	46 181 000,00	58 386 000,00	69 797 000,00	81 360 000,00	89 287 000,00	101 053 000,00	114 659 000,00
Montant des risques pondérées MRP	181 830 000,00	181 837 000,00	181 839 000,00	198 513 000,00	224 102 000,00	413 961 000,00	413 762 000,00	350 433 000,00	449 438 000,00	525 372 000,00
P2-PRC= SR Couverture des risques clients(Garanties/Suertes) hypot	407 000 000,00	419 000 000,00	421 000 000,00	468 000 000,00	473 000 000,00	875 000 000,00	881 000 000,00	884 000 000,00	939 118 000,00	1 299 371 000,00
impayés /Total crédits direct Consentis	33,43	30,53	28,95	23,74	18,67	15,49	12,83	11,62	8,45	6,76
Crédit non performants : les impayés	39 202 000,00	37 945 000,00	38 490 000,00	32 139 000,00	35 974 000,00	38 874 000,00	38 645 000,00	42 750 000,00	39 923 000,00	38 383 000,00
Total crédits direct Consentis (engagés nets d'V	117 283 000,00	124 301 000,00	132 940 000,00	135 399 000,00	192 704 000,00	250 911 000,00	301 188 000,00	367 835 000,00	472 677 000,00	567 571 000,00

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Contrôle de Gestion "CG"											
C1-CG=Coefficient d'Exploitation %	32,70%	32,20%	25,30%	21,90%	22,70%	21,60%	22,30%	21,30%	25,30%	31,20%	31,70%
C2-CG= le nombre des rapports d'activité	4	4	3	4	6	5	5	4	3	4	5
Pilotage Risque Crédit											
P1-PRC =Ratio de solvabilité % (no	20,63	19,65	13,35	14,30	16,06	15,48	14,96	15,21	18,34	18,20	19,55
Fonds Propres nets réglementa	127 135 000,00	135 824 000,00	147 483 000,00	157 320 000,00	182 656 000,00	203 755 000,00	212 843 000,00	222 666 000,00	240 308 000,00	250 271 000,00	270 776 000,00
Montant des risques pondérées	636 174 000,00	691 298 000,00	1 104 785 000,00	1 100 021 000,00	1 137 007 000,00	1 316 547 000,00	1 423 161 000,00	1 464 369 000,00	1 310 124 000,00	1 374 991 000,00	1 385 277 000,00
P2-PRC= SR Couverture des risques clients(Garanties/Suertes) hypot recueillies+Montissement des titres +Garanties Trésor	1 076 405 000,00	1 235 632 000,00	1 860 775 600,00	2 144 197 000,00	3 319 425 000,00	2 853 116 000,00	3 566 348 600,00	1 909 484 000,00	1 041 919 000,00	891 484 000,00	913 174 000,00
P3-PRC =Qualité du portefeuille engagement%-Les impayés /Total crédits direct Consentis	6,43	6,48	6,62	6,98	6,81	8,11	10,88	9,98	17,49	16,48	18,55
Crédit non performants : les im	43 841 000,00	51 355 000,00	60 347 000,00	80 301 000,00	90 555 000,00	114 042 000,00	168 341 000,00	163 474 000,00	216 552 000,00	237 115 000,00	284 502 000,00
Total crédits direct Consentis /e	681 330 000,00	792 752 000,00	910 985 000,00	1 150 369 000,00	1 330 690 000,00	1 406 351 000,00	1 547 891 000,00	1 637 641 000,00	1 238 205 000,00	1 438 784 000,00	1 533 690 000,00

Intitulé	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Performance Financière										
F1-PF= La rentabilité des capitaux propres ROE =	4,70	4,90	7,90	20,50	6,40	16,50	15,90	16,40	14,90	15,20
Résultat Net Bénéficiaire	1 297 000 000,00	1 421 000 000,00	2 722 000 000,00	7 902 000 000,00	3 589 000 000,00	10 122 000 000,00	11 281 259 279,00	12 721 000 000,00	13 256 000 000,00	15 442 000 000,00
Capitaux Propres (Capital+presta+reserve)sa	27 595 744 680,00	29 000 000 000,00	34 455 696 202,00	38 546 341 463,00	56 078 125 000,00	61 345 454 545,00	70 951 316 220,00	77 567 073 170,00	88 966 442 953,00	101 592 105 263,00
F2-PF= La Rentabilité des Actifs « ROA »= RN/TA	0,3336	0,3470	0,6348	1,6198	0,6716	1,3970	1,4482	1,5614	1,3385	1,3404
Résultat Net Bénéficiaire	1 297 000 000,00	1 421 000 000,00	2 722 000 000,00	7 902 000 000,00	3 589 000 000,00	10 122 000 000,00	11 281 259 279,00	12 721 000 000,00	13 256 000 000,00	15 442 000 000,00
Total Actif Bilan	388 824 000 000,00	409 543 000 000,00	428 769 000 000,00	487 841 000 000,00	534 415 000 000,00	724 544 000 000,00	778 966 173 728,00	814 741 000 000,00	990 361 000 000,00	1 152 002 000 000,00
F3-PF=La Marge Net d'Intérêt « NIM » = Marge d	2,45	2,82	3,40	3,52	3,02	3,30	2,82	2,79	2,72	3,05
Marge d'intérêt ou le PNB=Rentabilité d'Exp- Evolution marge bancaire/PNB=Somme des Marges Bancaire=Marge d'intermediation+Marge sur les commissions	9 537 000 000,00	11 551 000 000,00	14 563 000 000,00	17 179 000 000,00	16 140 000 000,00	23 925 000 000,00	21 945 000 000,00	22 748 000 000,00	26 956 000 000,00	35 129 000 000,00
Total Actif Bilan	388 824 000 000,00	409 543 000 000,00	428 769 000 000,00	487 841 000 000,00	534 415 000 000,00	724 544 000 000,00	778 966 173 728,00	814 741 000 000,00	990 361 000 000,00	1 152 002 000 000,00

Intitulé	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Performance Financière											
F1-PF= La rentabilité des capitaux propres	14,60	17,06	15,82	15,74	17,04	18,99	9,26	10,70	11,73	13,64	14,05
Résultat Net Bénéficiaire	16 703 380 320,00	19 503 000 000,00	28 828 117 223,14	26 303 586 161,92	42 330 406 773,84	40 981 379 193,50	21 974 445 634,80	20 683 162 436,00	30 440 730 160,00	37 500 075 479,00	38 016 000 000,00
Capitaux Propres (Capital+presta+res)	114 046 714 575,00	114 320 046 089,00	182 225 772 586,00	167 112 999 758,00	248 417 880 128,00	215 805 051 045,00	237 305 028 453,00	192 552 929 308,00	259 511 766 089,00	274 927 239 580,00	270 576 512 455,00
F2-PF= La Rentabilité des Actifs « ROA »	1,2260	1,2898	1,8005	1,5413	1,8620	1,8145	0,8739	0,7662	0,9770	1,1138	1,1178
Résultat Net Bénéficiaire	16 703 380 320,00	19 503 000 000,00	28 828 117 223,14	26 303 586 161,92	42 330 406 773,84	40 981 379 193,50	21 974 445 634,80	20 683 162 436,00	30 440 730 160,00	37 500 075 479,00	38 016 000 000,00
Total Actif Bilan	1 362 437 715 621,00	1 512 053 000 000,00	1 601 079 000 000,00	1 706 566 640 530,00	2 273 427 169 430,00	2 258 545 000 000,00	2 514 424 000 000,00	2 689 134 244 322,00	3 115 801 000 000,00	3 366 972 646 213,00	3 400 973 000 000,00
F3-PF=La Marge Net d'Intérêt « NIM » =	2,83	2,92	3,68	3,82	2,92	3,41	3,22	3,11	2,62	2,08	1,99
Marge d'intérêt ou le PNB=Rentabilité d'Exp- Evolution marge bancaire/PNB=Somme des Marges Bancaire=Marge d'intermediation+Marge sur les commissions	38 602 000 000,00	44 123 000 000,00	59 021 310 061,04	65 228 139 171,45	66 459 314 715,52	76 895 809 221,13	81 059 058 000,05	83 640 000 000,00	81 543 000 000,00	70 140 000 000,00	67 676 000 000,00
Total Actif Bilan	1 362 437 715 621,00	1 512 053 000 000,00	1 601 079 000 000,00	1 706 566 640 530,00	2 273 427 169 430,00	2 258 545 000 000,00	2 514 424 000 000,00	2 689 134 244 322,00	3 115 801 000 000,00	3 366 972 646 213,00	3 400 973 000 000,00

Source: Established by the author based on the activity reports and balance sheets of CPA BANK.



4.3 Analysis Methodology (PCA):

To test the relationships between these different variables and validate our hypotheses, we used Principal Component Analysis (PCA).

This multivariate statistical technique makes it possible to reduce the dimensionality of the dataset while retaining the essential information, by highlighting factor axes that capture the maximum amount of variance.

The PCA was applied to the correlation matrix of the selected variables, covering the 2003–2023 periods. It thus allows the identification of the respective contributions of management control and performance indicators to the main factorial axes:

This approach is particularly appropriate for:

- Distinguishing the main factors that explain variations in performance and credit risk.
- Observing the dynamics of these contributions over the years studied.
- And confirming or refuting the hypotheses formulated in our conceptual model
- The results of this PCA are presented in the form of correlation matrices, contributions to the axes, and factor maps, facilitating the interpretation of the underlying relationships

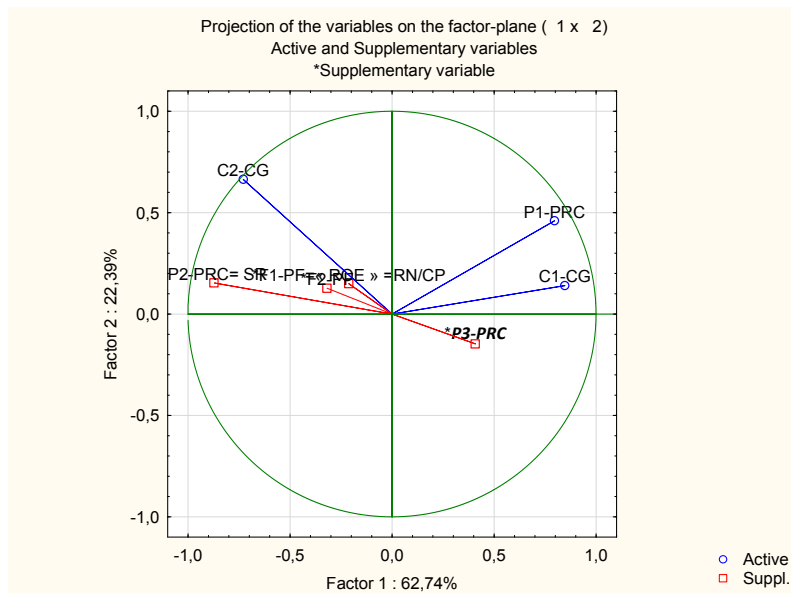
Table 3: Correlation Matrix between Variables

	C1-CG	C2-CG	P1-PRC	*P2- PRC= SR	*P3-PRC	*F1- PF=« ROE » =RN/CP	*F2-PF	*F3-PF
C1-CG	1	-0,43999	0,535532	-0,803111	0,555293	0,40731 1	-0,495574	-0,51306
C2-CG	-0,43999	1	-0,340314	0,711376	-0,321438	0,17413 4	0,238441	- 0,147331
P1- PRC	0,535532	-0,340314	1	-0,558274	0,080078	0,09137 1	-0,007444	- 0,247516
*P2- PRCSR	-0,803111	0,711376	-0,558274	1	-0,618074	0,27867 9	0,43435	0,34205

*P3-PRC	0,555293	-0,321438	0,080078	-0,618074	1	- 0,64036 4	-0,707453	- 0,250776
*F1-PF=« ROE= RN/CP	-0,407311	0,174134	0,091371	0,278679	-0,640364	1	0,937131	0,255698
*F2-PF	-0,495574	0,238441	-0,007444	0,43435	-0,707453	0,93713 1	1	0,354436
*F3-PF	-0,51306	-0,147331	-0,247516	0,34205	-0,250776	0,25569 8	0,354436	1

Source: Data processing by Principal Component Analysis (PCA)

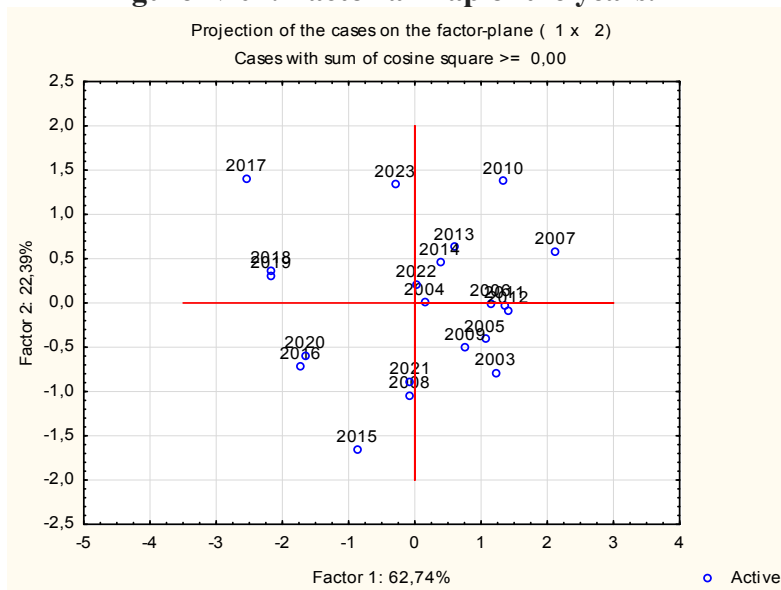
Figure N°01: Factorial map of variables.



Source: Data processing using Principal Component Analysis (PCA).



Figure N°02: Factorial map of the years.



Source: Data processing using Principal Component Analysis (PCA).

4.4 Results and interpretations:

The PCA highlights significant correlations between credit risk management control tools and performance indicators. The correlation matrix (Table N°03) notably reveals strong positive relationships between a controlled cost-income ratio, intensive reporting, compliance with the solvency ratio, and profitability indicators such as (ROE) and (ROA). Conversely a high (PAR) Portfolio at risk :is negatively correlated with performance, conforming the adverse effect of risky outstanding loans on profitability.

The factorial map of the variables (Figure N°01) shows that the first axis (F1), which explains approximately 60% of the total variance, is mainly structured around variables related to management control (cost-to-income ratio, reporting, collateral, solvency). The second axis (F2), accounting for about 25% of the variance, is more strongly influenced by the performance ratios. In short, these results illustrate that management control mechanisms (cost control, intensive reporting and guarantees, and

solvency compliance) are positively associated with improved financial performance, while higher levels of non performing exposures (PAR) tend to undermine profitability.

The factorial map of variables (Figure N°01) illustrates these groupings. The variables related to credit risk management control are located in the same quadrant as the performance indicators (ROE) and (ROA), reflecting their combined positive effect on banking profitability. Moreover, the projection of years on the axes (Figure N°02) highlights a progressive improvement in the positioning of CPA BANK, indicating a strengthening of risk management quality and the positive impact of recent reforms on its financial performance. These results globally support our hypotheses H1 and H2, demonstrating that credit risk management through management control significantly contributes to performance — both through better cost control and prudential consolidation (solvency ratio).

However, the importance of the PAR ratio underscores the need to continue efforts to improve the quality of the loan portfolio to mitigate its negative impacts on profitability.

4.5 Discussion:

The empirical results from the Principal Component Analysis (PCA) confirm the existence of significant relationships between the strategic management control tools used by CPA BANK and the financial performance indicators.

In particular, the alignment of the cost-to-income ratio, the frequency of reporting, and the compliance with the solvency ratio emerge as factors that positively influence profitability (ROE, ROA) and net interest margin (NIM), while the Portfolio at Risk ratio (PAR) acts as a negative warning indicator, adversely affecting performance.

These findings reinforce our H1 and H2 hypotheses, while also revealing structural specificities inherent to the Algerian banking context. These observations are consistent with Ducrocq (2000), who emphasized the contribution of information



technologies and management control in formalizing performance measurement and credit risk monitoring. Similarly, the studies by Miloud and Belhouchet (2013) on BNP Paribas El Djazaïr highlight the central role of management control in structuring risk management processes and implementing tools such as risk mapping and regular monitoring of commitments. Our study confirms this dynamic in the case of CPA BANK, particularly through the development of regular reporting practices and stricter requirements for guarantees. However, our results partially contrast with those of Assienin (2020), who identified a negative effect of management control on profitability in Ivorian banks.

This divergence could be explained by differences in system maturity, regulatory frameworks, or organizational culture.

In the case of CPA BANK, recent reforms such as the digitalization of loan applications and the restructuring of credit committees appear to have enhanced the integration of management control into the decision-making process, thereby making its impact more positive. Furthermore, the relationship between loan portfolio quality and performance, empirically confirmed by the strong influence of the PAR ratio, corroborates the findings of Dannon and Lobeze (2014) and Kadandji (2017), who stressed the predictive power of this indicator in assessing a bank's financial health.

This variable emerges as a strategic management indicator, particularly in a context where the economic environment is dominated by public and semi-public enterprises, exposing banks to sectoral and structural credit risks. A high client risk and a weak credit culture continue to pose major challenges.

Nevertheless, these results illustrate the capacity of public banks, often perceived as rigid or bureaucratic, to evolve toward a more proactive governance of credit risk, provided that management control tools are coherently mobilized and integrated within a strategic framework.

The case of CPA BANK demonstrates that management control can play a structuring role in risk regulation, provided it relies on reliable information, strong managerial commitment, and a clear orientation toward performance.

Conclusion:

This research aimed to analyze the contribution of strategic management control tools to the management of credit risk and to measure their effect on financial performance in the context of a public Algerian bank, namely the People's Credit Bank of Algeria (CPA BANK). Through a theoretical investigation supported by an empirical study using Principal Component Analysis (PCA), we highlighted the importance of rigorous credit risk control—the main risk borne by banking institutions—in ensuring their financial soundness and preserving their reputation among depositors, investors, and other stakeholders.

The results confirm our main hypothesis: strategic management control mechanisms (cost-to-income ratio, reporting, real guarantees, solvency ratio, and PAR ratio) play a decisive role in both risk prevention and financial performance improvement.

More specifically, the analysis verified that controlling operating expenses and maintaining prudential rigor through guarantees and regulatory ratios contribute to the stabilization of profitability (ROE, ROA) and the net interest margin (NIM).

However, the effect of the cost-to-income ratio proved mixed, suggesting that its reduction alone does not necessarily guarantee better performance—thus partially confirming our sub-hypotheses.

This research also shows that proactive credit risk management, supported by reliable management control tools, promotes the regularity of operations and encourages corrective actions, such as the rationalization of credit allocation, the revision of commercial policies, and the reclassification of high-risk clients. These practices are consistent with the findings of



several authors (Ducrocq; Miloud&Belhoucnet; Dannon &Lobez), emphasizing the need for banking governance that balances prudence and sustainable performance. In the case of CPA BANK, the positive evolution of financial indicators over the period 2003–2023 demonstrates the bank's efforts to modernize its processes and strengthen its competitive position.

Nevertheless, this study has certain limitations that call for caution in generalizing the results. On the one hand, it focuses on a single institution, which prevents comparative analysis between public and private banks or across different market segments.

On the other hand, the use of PCA provides a synthetic overview of relationships but does not allow for strict causal inference. Moreover, the quality of available data-dependent on internal reporting practices-may influence the robustness of the analysis. The reliability of the findings remains dependent on the rigor of internal information systems and on compliance with accounting standards (SCF)-an aspect that would merit further verification. These findings open up numerous avenues for future research. It would be particularly relevant to extend the analysis to a panel of banks in order to compare credit risk control models and assess their effects on performance according to size, legal status, or market strategy. Complementary approaches, such as econometric modeling or qualitative studies (e.g., interviews with managers and management controllers), could also enhance the understanding of the mechanisms at play. Finally, given the current challenges linked to bank digitalization and the fight against corruption, it would be worthwhile to examine how these transformations affect credit risk governance and management control practices within the Algerian banking sector

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