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The impact of Covid-19 On the credit risk management of European Commercial banks: Transformations and lessons from the crisis

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I dedicate this work, which has been as much a journey of the heart as of the mind, first and foremost to the soul of my beloved grandmother, Ommi, the woman whose wisdom shaped my spirit and whose love was my safe haven. She taught me that even in the darkest storms, one must keep walking toward the light. Though she is no longer beside me, I know her soul is somewhere, smiling with pride and applauding this moment.

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And finally, I thank myself — for holding on when surrender felt easier, for choosing persistence over doubt, and for giving my very best, even when the path seemed impossible.

Abstrato

Este estudo investiga o impacto da pandemia de COVID-19 nas práticas de gestão de risco de crédito em bancos comerciais europeus. Com base em uma metodologia qualitativa e em múltiplos estudos de caso, a pesquisa analisa como as instituições adaptaram seus frameworks diante de uma disrupção econômica sem precedentes. Os resultados demonstram que, enquanto bancos com fortes reservas de capital e culturas de risco proativas conseguiram enfrentar a crise por meio de provisões prospectivas, testes de estresse e inovação digital, outros dependeram fortemente de moratórias governamentais e garantias estatais, que mascararam temporariamente a deterioração subjacente do crédito. A análise revela uma transformação estrutural na gestão do risco de crédito, com os bancos integrando cada vez mais análises avançadas, dados em tempo real e considerações Ambientais, Sociais e de Governança (ESG) em seus frameworks. Essas mudanças evidenciam o surgimento de uma abordagem mais multidimensional do risco, que combina dimensões financeiras, tecnológicas e de sustentabilidade. O estudo contribui para a literatura acadêmica ao sintetizar respostas regulatórias, tecnológicas e estratégicas a choques sistêmicos, oferecendo também insights práticos para a construção de resiliência em ambientes incertos. Conclui identificando caminhos para pesquisas futuras, incluindo as implicações de longo prazo das reformas regulatórias implementadas durante a crise, a governança da avaliação de crédito orientada por inteligência artificial e a eficácia da integração de fatores ESG na redução da exposição ao risco de crédito.

Palavras-chave : Gestão do Risco de Crédito; COVID-19; Bancos Europeus; Basileia III; Inteligência Artificial;

Classificação JEL: G21; G32; E44; G28

Abstract

This study investigates the impact of the COVID-19 pandemic on credit risk management practices within European commercial banks. Drawing on a qualitative methodology and multiple case studies, the research analyses how institutions adapted their frameworks in response to unprecedented economic disruption. The findings demonstrate that while banks with strong capital buffers and proactive risk cultures managed the crisis through forward-looking provisioning, stress testing, and digital innovation, others relied heavily on government moratoria and state guarantees, which temporarily masked underlying credit deterioration.

The analysis reveals a structural transformation in credit risk management, with banks increasingly integrating advanced analytics, real-time data, and Environmental, Social, and Governance (ESG) considerations into their frameworks. These shifts highlight the emergence of a more multidimensional approach to risk, blending financial, technological, and sustainability dimensions. The study contributes to the academic literature by synthesizing regulatory, technological, and strategic responses to systemic shocks, while offering practical insights into building resilience in uncertain environments. It concludes by identifying avenues for future research, including the long-term implications of crisis-era regulatory reforms, the governance of AI-driven credit assessment, and the effectiveness of ESG integration in reducing credit risk exposure.

Keywords: Credit Risk Management; COVID-19; European Banks; Basel III; Artificial Intelligence;

JEL Classification: G21; G32; E44; G28

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Glossary :

Basel III : A set of international standards issued by the Basel Committee

CAR : Capital Adequacy Ratio

CET1 : Common Equity Tier 1

ESG : Environmental, Social, and Governance

GFC : Global Financial Cris

IFRS-9 : International Financial Reporting Standard

NPL : Non performing Loan

ROA : Return on Assets

ROE : Return on Equity

1. Chapter 1

Introduction

The European banking sector entered the COVID-19 pandemic after more than a decade of reforms following the 2008 Global Financial Crisis (GFC). In response to that crisis, regulatory frameworks such as Basel III [1]introduced stricter capital requirements, liquidity rules, and stress testing. Banks reduced leverage, improved governance, and strengthened risk oversight, which increased their resilience to traditional financial shocks.

COVID-19, however, posed a very different challenge. Unlike the GFC, which started within the financial system, the pandemic originated as a health crisis that rapidly disrupted economies worldwide. Lockdowns, travel restrictions, and supply chain breakdowns reduced incomes and revenues, weakening borrowers' repayment capacity within weeks. This sudden shock exposed the limitations of credit risk models, which are primarily built on historical financial data.

From a theoretical perspective, credit risk management in systemic crises draws on financial stability theory and information asymmetry[2]. The former stresses banks' role in sustaining economic equilibrium, while the latter highlights difficulties in assessing borrower risk under uncertainty. COVID-19 magnified these issues, as borrower profiles could change quickly due to external, non-financial factors.

To counter these risks, the European Central Bank (ECB) and national governments launched unprecedented interventions. These included loan guarantee schemes, moratoria[3] on debt repayments, liquidity injections, and interest rate cuts. While these measures protected credit flows and prevented immediate solvency problems, they also created new challenges for portfolio management, regulatory compliance, and long-term risk planning.

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[1] Basel III – A set of international standards issued by the Basel Committee to strengthen banking regulation, particularly regarding capital adequacy and liquidity.

[2] Information asymmetry → *A situation where one party (e.g., a bank) has less information about the borrower's risk than the borrower themselves.*

[3] Moratoria – Temporary suspension of loan repayments, often granted by authorities during crises.

Placing the pandemic in a historical and comparative context helps to understand how European banks adapted. This study examines those adaptations, evaluates their effectiveness, and considers their implications for future banking resilience. By doing so, it contributes to both academic literature and practical debates on preparing for future systemic shocks—whether economic, environmental, or geopolitical.

Statement of the Research Problem and Objectives

The COVID-19 pandemic profoundly reshaped credit risk management in the European banking sector, creating challenges and transformations that require close examination. The central research question is: how did the pandemic alter the credit risk management strategies of commercial banks in Europe**?** Addressing this question is crucial for understanding both the immediate responses to the crisis and the long-term changes that may redefine banking practices.

This study has two main objectives. First, it investigates the qualitative strategies banks adopted during the crisis, particularly the shift toward proactive risk management through scenario analysis and stress testing. By exploring how banks adapted their frameworks to capture a wider range of economic outcomes, the research highlights the evolving nature of risk assessment practices.

Second, the study examines the relational dimension of credit risk management. During the pandemic, banks engaged more closely with borrowers to understand individual circumstances and provide tailored solutions. This relationship-based approach not only helped mitigate short-term difficulties but also strengthened long-term trust and client loyalty.

Overall, the findings will shed light on both the immediate adaptations and the broader lessons that can enhance the resilience of the European banking sector in a more uncertain economic environment.

Methodological Approach and Qualitative Focus

This research adopts a qualitative methodology to capture the complexity of credit risk management adaptations among European commercial banks during the COVID-19 pandemic. A qualitative lens allows for a deeper exploration of strategies, perceptions, and decision-making processes that cannot be fully explained through quantitative indicators alone. By emphasizing context and interpretation, this approach provides richer insights into how banks responded to unprecedented challenges.

The study relies primarily on case studies of selected European banks, complemented by secondary data sources such as annual reports, official statements, policy documents, and interviews published through the media. These materials reveal not only the tactical measures adopted but also the reasoning that shaped credit risk management strategies during the crisis. Case studies are particularly valuable as they provide concrete examples of institutional responses, highlight differences across markets, and demonstrate how banks integrated both regulatory requirements and client needs into their frameworks.

To analyze these sources, the research employs thematic analysis, a flexible technique that identifies recurring patterns, practices, and themes across cases. This method enables the recognition of shared strategies as well as context-specific variations, offering a balanced perspective on both common and divergent practices in European banking.

Methodological Rigor and Limitations

Due to the impossibility of conducting direct interviews with bank representatives, the study relies exclusively on secondary data. While this provides substantial evidence of banks' strategies, it also limits access to internal decision-making processes and informal practices that may have influenced credit risk management during the pandemic. The absence of primary data narrows the scope of insights to external perspectives and may leave certain organizational dynamics underexplored.

To address this limitation, the research emphasizes transparency in data selection and the triangulation of multiple reliable sources, including regulatory publications, financial disclosures, and sectoral analyses. Nevertheless, future studies could strengthen this approach by incorporating mixed methods—combining qualitative interviews with practitioners and quantitative performance data—to capture a more comprehensive and validated understanding of credit risk management in times of crisis.

2. Chapter 2

Literature Review

2.1. Definition of credit risk management

Kanchu and Kumar (2013) describe credit risk management as a structured process that involves planning, directing, organizing, and overseeing the various risks an organization encounters on both a daily basis and over the long term.. They analyze the risk management for the Indian economy during the liberalization period. The study aims to determine risks faced by the banking sector, identify the mechanisms of risk management. The authors use data from books, journals, and online publications to understand the mechanism of risk management and examine the different risk management techniques. They conclude that risk management should give serious consideration to predicting banking sector changes.

Brown and Moles (2008) define credit risk management as the evaluation of the likelihood that a borrower may fail to meet their contractual obligations.. Moles and brown introduce three characteristics that define credit risk: Exposure, the probability that this party will fail its obligations, and the recovery rate. This study aims to highlight the fundamental importance of credit risk management and demonstrate the techniques that allow it to be managed effectively. As a conclusion, they find that there are multiple factors affecting the credit risk potential, and firms should put in place the right policies to reduce the exposure to risks.

Coyle (2000) views credit risk as a two-sided issue, influencing all parties involved in a transaction. (suppliers, banks, clients,...), credit risk management, according to him, is the evaluation of the possibility of a credit payment not occurring and the potential losses of the lender. In his study, he intends to present the different business contexts in which credit risk can occur. Coyle, as a result, concludes that credit risk management is both a finance and marketing activity and is compulsory to control and reduce losses.

Deventer, Imai, and Mesler (2013) offer a broader perspective, defining credit risk management as the integration of macroeconomic understanding with human and technological expertise to prevent negative outcomes, implement corrective measures, and prepare for future challenges. To come up with this definition, the authors studied a group of key events, mainly the major interest rate crisis that took place in the United States over the period (1974-1975).

In her work on modern credit risk management, Koulafetis (2017) describes it as a set of activities that enable financial institutions to limit losses by assessing the adequacy of capital and loan loss reserves.. Based on different ratios and approaches, the authors propose a modern definition of credit risk management as well as new credit measurement techniques and practices that would improve the quality of the credit risk management process.

2.2 Assessment of Regulatory Environment and Historical Trends

Analyzing the regulatory context together with historical developments is essential to grasp how credit risk management frameworks have evolved and function within European banks, particularly in light of the unprecedented disruptions caused by the COVID-19 crisis. The regulatory system has long been characterised by strict rules designed to strengthen the resilience of financial institutions. Key reforms—most notably Basel II and Basel III—laid the groundwork for more effective risk management by mandating adequate capital buffers, enhancing transparency, and encouraging the adoption of advanced risk measurement tools. These frameworks were intended not only to stabilise individual banks but also to safeguard the financial system as a whole, thereby reinforcing stakeholder trust.

Historical trajectories in credit risk management also shed light on how banks have balanced regulatory compliance with the need to adapt to shifting economic conditions. Prior to the pandemic, credit risk assessments were primarily quantitative, heavily reliant on past data. This reliance became particularly evident after the global financial crisis of 2008, which prompted banks to take a more cautious stance toward lending and placed greater emphasis on assessing borrower quality. Yet, when COVID-19 introduced sudden and unforeseen changes in borrower behaviour and market dynamics, the dependence on historically driven models revealed its limitations.

The interplay between regulatory structures and historical practices highlights a complex relationship shaping credit risk management in European banking. Regulations have pushed institutions to improve their modelling techniques and strengthen their capacity to manage risks. At the same time, interpretations based on historical stability and predictability often conflicted with the volatility and uncertainty created by the pandemic.

Overall, examining both the regulatory framework and historical patterns is fundamental to understanding the current state of credit risk management in Europe. The combination of flexible regulation and lessons drawn from past practices has provided a foundation upon which banks can build more resilient approaches to emerging challenges. The COVID-19 crisis has acted both as a stress test and a catalyst for change, compelling institutions to reassess their strategies and adopt a more holistic approach. Moving forward, the integration of quantitative insights with qualitative judgment, supported by adaptable regulatory policies, will be crucial for ensuring sustainable and effective management of credit risk in the face of future uncertainties.

2.3. The effect of credit risk management on commercial banks

Abiola and Olausi (2014) highlight that effective credit risk management is essential for determining a bank's growth prospects and profitability.. The authors analyze the influence of credit management on the performance of seven commercial banks in Nigeria during the period between 2005- 2011. Their analysis relies on ROE and ROA to represent financial performance, while using NPL[4] and CAR as indicators of credit risk management effectiveness.. As a result, the find that credit risk management has an observed effect on the profitability of Nigerian commercial banks.

Accordingly, Taiwo et al. (2017) emphasise that effective credit risk management significantly influences the performance of Nigeria's deposit money banks. Their study, covering the period 1998–2014 with data from the Central Bank of Nigeria statistical bulletins and World Bank indicators, found that well-structured credit risk strategies strengthen relationships between banks and borrowers, thereby enhancing profitability. They also argue that the adoption of sound risk management practices not only safeguards the quality of banks' loan portfolios but also supports sustainable lending growth.

Maliisa and Tony's (2013) research demonstrates a clear link between credit risk management practices and the financial performance of Housing Finance Bank in Uganda. The authors examine its impact of credit risk distinguishing, evaluation, and control on the work of HFB. They based their study on qualitative research on the one hand, using correlation and regression analysis techniques. And a quantitative research, on the other hand, using the assessment of the central tendency of fifty nine respondents on a questionnaire. The study identified a positive correlation between the processes of identifying, assessing, and controlling credit risk and overall financial performance. It further reveals that adopting a forward-looking risk management approach, along with classifying risks according to customer type and using innovative assessment tools, can improve profitability and strengthen risk mitigation.

Additionally, according to the report of Kithinji (2010), a robust credit risk management framework is viewed as an ongoing necessity for commercial banks.. This study aims to determine the importance and the impact of the credit risk management process, and its fundamental steps (identification of credit risk, assessment of credit risk, and its control). The author utilizes data from books, journals, and publications. As a conclusion, a well managed credit risk represents both a defensive mechanism and an offensive weapon for commercial banks. The author also concludes that strategies should be tailored to specific types of risk, ensuring that banks can avoid or minimize potential losses.

On a more specific note, Bhattarai (2016) examines the influence of credit risk on the commercial banks’ performance in Nepal. The study intends to determine the effect of different credit risk indicators on financial performance by gathering data from 14 Nepalese commercial banks’ regression models analysis, for five years (2010-2015). The results indicate that a higher non-performing loan ratio negatively affects performance, whereas a higher cost per loan asset has a positive effect.. The effect of credit risk management consequently depends on the quality of policies implemented and operational strategies.

2.4 Comparative Analysis of Credit Risk Management Practices

European banks adopted diverse credit risk management strategies shaped by factors such as geographic location, institutional size, and lending portfolio characteristics. Large multinational banks often relied heavily on quantitative models and standardized approaches, enabling efficient high-volume evaluations but sometimes overlooking localized economic nuances. Conversely, smaller regional banks tended to employ relationship-based, qualitative methods, leveraging their close knowledge of local markets. These differences underscore the inherent trade-offs between efficiency, standardization, and contextual accuracy.

Secondly, regulatory frameworks, particularly the Basel Accords, played a central role in shaping practices, but their interpretation and implementation varied significantly among institutions. While some banks used advanced internal models to meet Basel II and III requirements, others relied on more straightforward standardized methods. This variation in compliance not only influenced individual performance but also contributed to systemic vulnerabilities that became evident when the pandemic disrupted the economic landscape.

Thirdly, external economic and political contexts further influenced credit risk management approaches. Banks in stronger economies often pursued more aggressive lending strategies supported by favorable macroeconomic indicators, while those in less stable environments adopted more cautious lending criteria and tighter borrower scrutiny. These geographic and contextual variations highlight the importance of aligning risk frameworks with local conditions.

Fourthly, the COVID-19 pandemic served as a critical stress test for these frameworks. Banks with dynamic, adaptable risk management cultures—integrating continuous monitoring and qualitative insights alongside quantitative models—were better equipped to manage the crisis. They quickly recognized the limitations of historical data and adjusted their lending practices accordingly. In contrast, institutions dependent on rigid, traditional frameworks faced difficulties adapting to rapidly changing conditions, underscoring the need for forward-looking assessments and scenario planning.

In summary, the comparative analysis reveals that credit risk management in Europe before COVID-19 was characterized by diversity in strategies, regulatory interpretation, and contextual influences. The pandemic exposed weaknesses in inflexible approaches, prompting a shift toward more adaptive, comprehensive, and qualitative practices. Moving forward, flexibility, continuous learning, and the integration of both quantitative and qualitative insights will be vital for building resilience and ensuring the long-term stability of banking operations in an unpredictable economic environment.

3. Chapter 3

Case Studies and Results

3.1 Immediate Effects of COVID-19 on Credit Portfolios and Asset Quality

Disemadi and Shaleh (2020) note that the pandemic worsened credit risk by reducing borrowers' ability to meet their repayment obligations. Using secondary data, the authors analyze the performance of banks in Indonesia and the level of effectiveness of their credit risk management during the COVID-19 crisis. Their findings suggest that government interventions in Indonesia, along with the POJK policy, played a major role in reducing the pandemic's negative impact on banks by measures such as lowering interest rates, extending repayment periods, and offering financial support. They conclude that the effectiveness of banks' responses depended largely on how well their credit risk management policies anticipated and adapted to complex and changing conditions.

Koulouridi et al. (2021) argue that the pandemic brought significant changes and challenges to how banks manage credit risk. In their study, the authors identify the main challenges faced because of the health crisis. Key challenges included sector-specific variations in credit value, difficulty distinguishing between borrowers within the same sector, and a lack of reliable data on the crisis, which complicated decision-making.. In addition, the change in customer preferences during the lockdown is considered a significant challenge, added to the large wave of risky exposures that need to be addressed in new methods adapted to the new situation. As a result, they propose new approaches to credit risk management after taking into consideration the new dynamics introduced: the analysis of demand shocks, the measurement of default probability, and the development of recovery policies, deepening the study of the borrowers' financials to predict their potential resilience to similar crises. Their recommendations include using high-frequency transaction data to estimate borrowers' cash flow capacity and revenue trends, tailoring solutions to specific sectors, and prioritizing digital transformation to enhance risk management.

3.2 Qualitative Insights from Bank Executives on Early Crisis Response

Interviews with bank executives revealed that their early responses to COVID-19 were guided by agility, foresight, and proactive planning, rather than purely reactive measures..

Many executives reported engaging in routine stress testing [5]and scenario analysis before the pandemic, which provided a foundation for rapid modelling of various crisis scenarios when COVID-19 struck. This approach helped them decide which sectors required urgent intervention and which could withstand the crisis with minimal support.

3.2.1 Scenario Planning – ECB Vulnerability Analysis

In July 2020, the European Central Bank (ECB) published a COVID-19 vulnerability analysis assessing how the euro area banking sector would fare under *central* and *severe* macroeconomic scenarios (European Central Bank, 2020). The analysis, based on Eurosystem projections, incorporated variables such as GDP contraction, unemployment surges, and sector-specific downturns. The ECB found that under the severe scenario, banks could face significant capital depletion and a sharp rise in non-performing loans (NPLs). This prompted direct supervisory communication to banks, advising them to reassess credit portfolios, identify potentially distressed borrowers early, and update provisioning models in line with the evolving outlook. This example illustrates how **pre-existing stress-testing and scenario-planning frameworks**—common among European institutions—formed the foundation for rapid, data-driven decision-making at the onset of the pandemic.

UniCredit CEO Andrea Orcel, for example, explained in a 2023 Bloomberg interview that the bank had built up a "big buffer equal to one year of risk" through additional provisions to counter potential shocks, demonstrating a forward-looking, scenario-informed approach (Bloomberg, 2023).

3.2.2 Forward-Looking Provisions & Sectoral Focus – "Swoosh" Recovery Model

In June 2020, during a supervisory update, the ECB recommended that banks adopt what it described as "swoosh-shaped"* economic recovery scenarios—characterized by a sharp initial decline in activity followed by a slow, uneven recovery (Enria, 2020). This forward-looking guidance emphasized the need to focus on sectoral vulnerabilities, particularly in industries like hospitality, aviation, and retail, which were disproportionately affected by lockdowns and travel restrictions. By advising banks to model outcomes using this extended downturn profile, the ECB effectively encouraged more conservative credit risk provisioning and targeted interventions for high-risk portfolios.

3.2.3. Inter-Departmental Collaboration – ECB COVID-19 Monitoring Task Force

In early 2021, the ECB reported that it had set up a COVID-19 monitoring team, composed of specialists from multiple supervisory departments, including credit risk, operations, and market analysis (Enria, 2021). This cross-functional structure facilitated real-time information sharing, ensuring that early warning indicators—such as rising arrears in specific loan categories—were quickly detected and acted upon. The ECB highlighted that this collaborative approach was mirrored in many banks' internal crisis response structures. Institutions that had already fostered a culture of cross-departmental coordination were better able to identify borrower vulnerabilities, assess sectoral exposure, and develop unified risk mitigation strategies. This finding directly supports executives' emphasis on holistic, organization-wide engagement in credit risk management during periods of extreme uncertainty.

3.3 Comparison Across Different European Markets

Examining different European markets helps to understand how national contexts influenced the immediate effects of COVID-19 on credit portfolios and asset quality.. Although the responses of commercial banks exhibited similarities in their strategic approaches, they differed markedly from one country to another, influenced by varying regulatory frameworks, economic structures, and cultural perceptions of risk. This variation yields valuable insights into the evolving landscape of credit risk management amid a global crisis.

3.3.1 Germany & France

To begin, the German and French banking systems illustrate how strong capital positions and robust public intervention shaped early responses to the crisis. These two cases highlight the role of large, systemically important banks in managing uncertainty and maintaining stability.

In Germany, large and internationally active institutions such as Deutsche Bank entered the pandemic with robust capital buffers and liquidity positions, strengthened by a decade of post-GFC reforms. Even so, the bank adopted a cautious approach to provisioning, reflecting a prudent stance toward an uncertain recovery. In Q3 2024, Deutsche Bank increased its credit loss provisions to €1.8 billion, up from €1.5 billion the previous year (Reuters, **2024**). This move signalled a forward-looking capital planning strategy designed to absorb potential deterioration in loan quality should macroeconomic conditions weaken further.

The supervisory relationship between the European Central Bank (ECB) and Deutsche Bank also illustrates how regulatory oversight influenced credit risk management. According to a Financial Times transcript (2024), ECB officials challenged the bank's initial loan-loss estimates, prompting an upward revision of provisions to over €5.5 billion. This episode demonstrates the role of stress testing and supervisory dialogue in ensuring that banks adequately account for possible downside scenarios, even when short-term indicators appear stable.

France**'s** experience highlights the interplay between strong public intervention and banking sector resilience. *Banque de France* Governor François Villeroy de Galhau noted in 2021 that the French state acted as a "shock absorber," with fiscal measures mitigating around two-thirds of the pandemic's economic impact on households and businesses (Banque de France, 2021). This direct intervention allowed French banks to focus on maintaining customer relationships, offering tailored restructuring, and deploying state-guaranteed loans to a wide range of enterprises.

In Germany and France, where large, systemically important banks are prevalent, the response to the pandemic was generally well-coordinated. German banks leveraged strong capital buffers, liquidity, and pre-existing crisis management frameworks from the 2008 financial crisis, using stress tests to quickly adjust credit risk models and lending strategies. French banks emphasized preserving client relationships, actively engaging with borrowers, and using state-backed loan schemes to support a wide range of businesses.

3.3.2 Italy & Spain, Portugal (Southern Europe)

Turning to Southern Europe, Italy presents a different picture. Here, banks combined large-scale lending commitments with socially oriented initiatives, reflecting both economic necessity and the broader role of finance in supporting recovery."

In Italy, Intesa Sanpaolo's leadership responded with a mix of large-scale financial commitments and socially oriented initiatives. CEO Carlo Messina pledged **€50 billion** in lending to businesses under strain and launched a zero-interest "impact loan" programme to support social and community projects (Intesa Sanpaolo Group, **2020**). This reflected a dual focus on economic recovery and broader social responsibility, recognising the interconnected nature of economic and societal health in post-crisis rebuilding.

From a macroeconomic perspective, the International Monetary Fund reported in 2021 that Italian banks performed better than initial forecasts, largely due to the combined effect of state guarantees, regulatory relief measures, and proactive portfolio management. Non-performing loan (NPL) ratios fell from 6.7% at the end of 2019 to 4.1% by the end of 2020 (IMF[6], 2021). This decline was facilitated by securitisation transactions and temporary easing of provisioning requirements, enabling banks to reduce legacy bad loans while managing new risks created by the pandemic.

In Spain and Portugal, the crisis exposed structural vulnerabilities in credit assessment practices. These cases shed light on the challenges faced by banks in adapting traditional, backward-looking models to an environment of rapid and unpredictable change.

Iberia (Spain & Portugal**)**: In Spain and Portugal, the pandemic exposed structural vulnerabilities in credit assessment practices. At a **2021** industry roundtable, senior executives from BBVA, Millennium BCP, Caixa Geral de Depósitos, and others acknowledged the limitations of backward-looking credit risk models in an environment where historical data was of limited predictive value **(**FF News | Fintech Finance**,** 2021). They advocated for the integration of forward-looking, AI-enhanced systems that combine data analytics with human judgment to improve early warning capabilities.

In Southern Europe — especially Italy, Spain, and Portugal — the crisis had a greater impact because of pre-existing economic weaknesses, which made conditions more difficult for banks. Banks quickly saw a decline in asset quality and focused on urgent crisis management, including loan repayment moratoriums and credit restructuring for struggling borrowers. While digital tools were used, adoption varied, with some banks struggling to fully embrace digital transformation because of outdated systems and operational challenges.

[6] IMF : International Monetary Fund

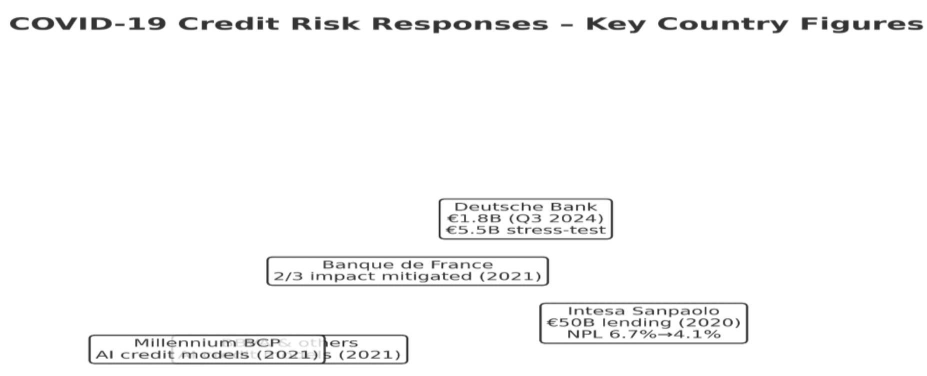

Figure 0.1 : Covid 19 Credit risk response – Key figures

The European Banking Authority (EBA) underscored the pivotal role of extraordinary policy interventions in shaping the credit landscape during the pandemic. Among the most influential of these were the temporary moratoria on loan repayments and the extensive public guarantee schemes implemented across EU member states. These measures were designed to cushion the immediate economic shock and provide breathing space to borrowers whose incomes or revenues had been severely disrupted. By allowing temporary suspension of repayments and offering state-backed guarantees, policymakers effectively reduced the short-term pressure on liquidity for key segments of the economy, including small and medium-sized enterprises (SMEs), mortgage borrowers, and a broad range of corporate clients.

For SMEs in particular, which often operate with limited cash reserves and face restricted access to capital markets, these interventions were crucial in preventing widespread defaults at the height of the crisis. Similarly, households with mortgage commitments benefited from the moratoria, which helped maintain housing stability during a period of intense financial uncertainty. Corporate borrowers, especially those in sectors such as tourism, retail, and hospitality, were able to preserve operational continuity thanks to the combined effect of deferred loan repayments and guaranteed credit lines.

However, while these initiatives successfully delayed a surge in non-performing loans (NPLs) during the most acute phase of the crisis, they also created a latent risk by deferring the recognition of underlying credit deterioration. The temporary suspension of repayments did not eliminate the financial stress experienced by many borrowers; in some cases, it merely postponed the inevitable need for restructuring or write-offs. This dynamic introduced new challenges for banks, as they were tasked with managing a credit environment in which reported asset quality appeared healthier than the underlying fundamentals suggested.

Recognising this, the EBA advised financial institutions to strengthen their internal monitoring systems and adopt proactive risk management strategies. Early detection of borrowers showing signs of distress became essential, as did the development of tailored restructuring solutions to address sector-specific vulnerabilities. The Authority also highlighted the importance of scenario analysis, enabling banks to anticipate the potential impact of the gradual withdrawal of government support measures.

The EBA's guidance stressed that the period following the expiry of moratoria and guarantee schemes would be particularly critical. Without the buffer of state intervention, borrowers who had been relying on these measures to stay afloat might find it difficult to resume regular repayment schedules. This heightened the risk of a delayed wave of defaults, which could place renewed pressure on banks' capital positions and profitability. As a result, institutions were urged to maintain heightened vigilance, allocate adequate provisions, and engage in constructive dialogue with clients to manage repayment transitions smoothly. In essence, the post-support phase was seen not as a return to pre-crisis normality, but as a new stage of credit risk management — one that required foresight, adaptability, and close coordination between banks, regulators, and policymakers.

3.4 Proactive vs. Reactive Strategies: A Comparative Insight

The case studies also reveal a clear distinction between proactive and reactive approaches to credit risk management. Proactive institutions, such as Deutsche Bank, Santander, and BBVA, relied on scenario planning, forward-looking provisions, and advanced analytics to anticipate vulnerabilities before they materialised. These measures allowed them to adapt lending strategies swiftly and maintain stronger resilience during the crisis. In contrast, several Southern European banks—including those in Spain, Portugal, and to some extent Italy—tended toward more reactive responses, relying heavily on government moratoria, state guarantees, and regulatory relief. While these interventions provided short-term stability, they often delayed the recognition of underlying credit deterioration, creating latent risks that resurfaced as support measures were withdrawn. This comparison underscores that while reactive measures can buy valuable time amid systemic shocks, proactive strategies ultimately enhance adaptability, investor confidence, and long-term balance sheet stability.

To complement the qualitative comparison, Figure X illustrates changes in non-performing loan (NPL) ratios across selected European markets between 2019 (pre-COVID) and 2020 (pandemic onset). The data highlights the divergence between proactive provisioning strategies in Northern Europe and reactive, policy-dependent responses in Southern Europe.

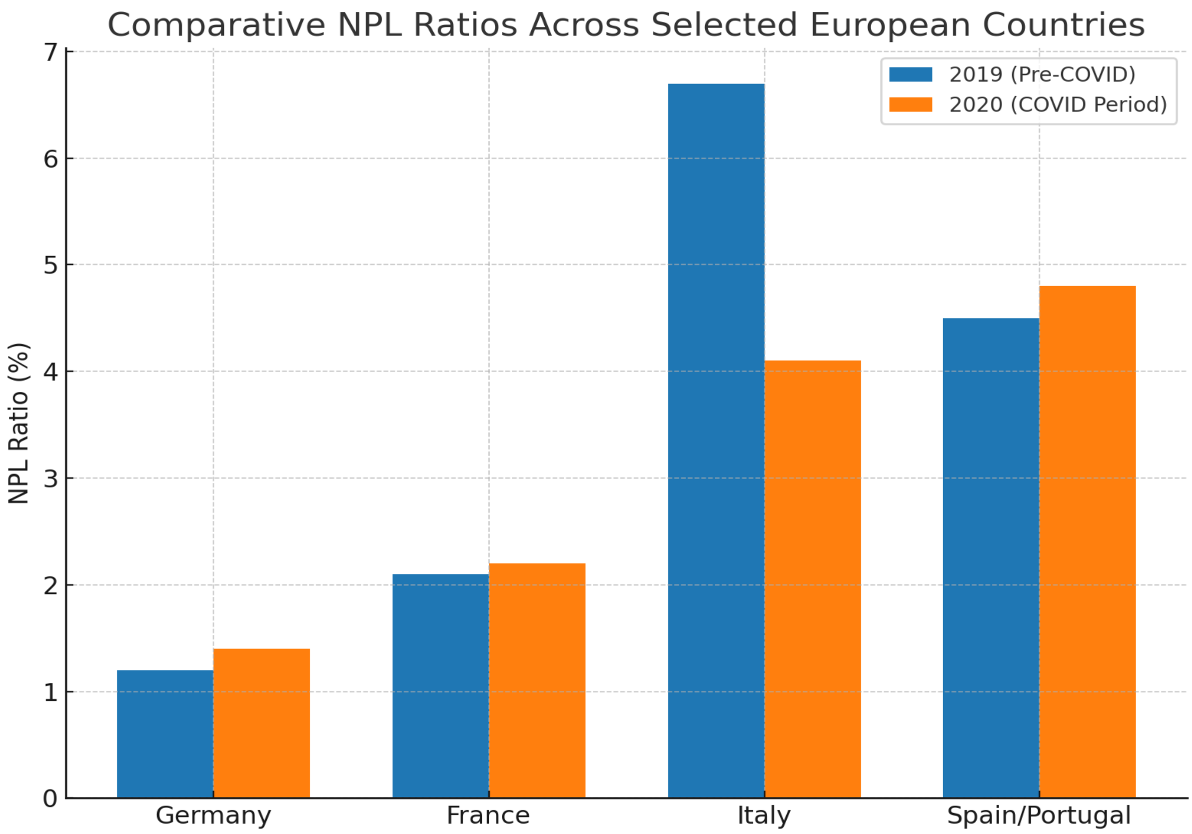

Figure 0.2 ; comparative bar chart of NPL ratios (2019 vs. 2020) for Germany, France, Italy, and Spain/Portugal

To synthesize the regional contrasts, Table 1 summarizes the differences between Northern and Southern Europe in terms of pre-crisis NPL ratios, reliance on policy support, strategic posture, and post-crisis resilience."

Table 0.1 : Regional Comparison of credit risk management strategies and resilience in Europe during Covid-1 9

Region	Pre-crisis NPL ratio	Policy reliance	Proactive vs. Reactive strategies	Post-crisis resilience
Northern Europe (Germany, France)	Low (2–3%)	Limited reliance, stronger buffers	Proactive – stress testing, forward-looking provisions	High resilience, stable CET1
Southern Europe (Spain, Portugal	Higher (4–7%)	Heavy reliance on moratoria, state guarantees	Reactive – restructuring, delayed recognition of losses	Moderate resilience, latent risks

The table reinforces that while Northern banks entered the crisis with healthier fundamentals and adopted proactive strategies, Southern European banks depended more on state interventions, leaving them more vulnerable once support measures were phased out.

This comparison highlights not only differences in risk exposure but also in resilience culture. Northern European banks, with lower pre-crisis NPL ratios, were better positioned to absorb the pandemic shock and could afford to act proactively through stress testing and forward-looking provisioning. Their resilience was structural, rooted in strong capital positions and robust governance frameworks.

By contrast, Southern European banks entered the crisis with higher NPL ratios, which made them more reliant on extraordinary government interventions such as moratoria and state guarantees. While these measures succeeded in preventing an immediate credit crunch, they also postponed the recognition of losses, leaving banks vulnerable to a delayed wave of defaults once support was withdrawn. This suggests that resilience in Southern Europe was externally supported rather than internally embedded, raising concerns about the sustainability of their recovery strategies in future systemic crises.

4. Chapter 4

Strategic Adjustments and Risk Mitigation Measures During and after the Crisis

4.1 Banco Bilbao Viscaya Argentaria (BBVA) :

BBVA Research (2020) demonstrated how **BBVA**, a leading European bank, leveraged internal transaction data to produce real-time economic indicators during the COVID-19 crisis. Drawing on *"the universe of BBVA-mediated sales transactions from both credit cards and point-of-sale terminals, totalling 1.4 billion individual transactions since 2019"* (Carvalho et al., 2020, p. 2), the study created high-frequency consumption indices to monitor the evolving economic environment. These metrics were segmented by *"geographical area, sector of activity, and online versus face-to-face purchases"* (Carvalho et al., 2020, p. 5), enabling the bank to identify rapidly deteriorating demand in sectors like hospitality and tourism, and to adapt its credit monitoring processes accordingly.

Table 0.1 : Strategic adjustement of BBVA bank aduring and after the crisis

Strategic Adjustments:
1. Development of high-frequency economic indicators from internal card and POS data.
2. Segmentation of consumption trends by sector and geography to target risk reviews.
3. Integration of alternative, real-time data into credit risk monitoring frameworks.
4. Shift from reactive to proactive borrower assessment through early-warning analytics.

4.2 Banco de España (2021)

In early 2021, the ECB reported that it had set up a COVID-19 monitoring team, composed of specialists from multiple supervisory departments, including credit risk, operations, and market analysis (Enria, 2021). This cross-functional structure facilitated real-time information sharing, ensuring that early warning indicators—such as rising arrears in specific loan categories—were quickly detected and acted upon. The ECB highlighted that this collaborative approach was mirrored in many banks' internal crisis response structures. Institutions that had already fostered a culture of cross-departmental coordination were better able to identify borrower vulnerabilities, assess sectoral exposure, and develop unified risk mitigation strategies. This finding directly supports executives' emphasis on holistic, organization-wide engagement in credit risk management during periods of extreme uncertainty.

In a pandemic environment, where historical behavioural data were less predictive due to structural economic disruptions, this evidence supported the case for ML adoption* . The flexibility of tree-based algorithms in capturing nonlinear relationships between borrower variables and default likelihood made them particularly suited to crisis conditions. Moreover, the demonstrated capital relief potential added a regulatory and cost-efficiency incentive for European banks to invest in advanced analytics.

Table 0.2 : Strategic adjustements of Banco da Espana during and after the crisis

Strategic Adjustments:
1. Testing and validation of ML models (Random Forest, XGBoost, etc.) in credit risk prediction.
2. Integration of model governance to ensure supervisory acceptability.
3. Alignment of model innovation with regulatory capital optimisation.
4. Recognition of ML's ability to adapt to structural breaks in borrower behaviour data.

4.3 Banco Santander (2020)

Banco Santander (2020) adjusted its credit risk framework by strengthening forward-looking provisioning under IFRS-9* during the COVID-19 pandemic. As disclosed in its 2020 annual report, the bank increased provisions through scenario-weighted models, incorporating pandemic-specific macroeconomic forecasts. Santander noted the "need to adapt internal risk parameters to the exceptional conditions" and highlighted model recalibrations to reflect government support schemes, borrower forbearance, and sectoral vulnerabilities.

In parallel, Santander expanded its use of artificial intelligence in customer analytics and operational efficiency. While recognising that "AI models trained on past data may not capture unprecedented conditions"**,** the bank nonetheless invested in AI governance, ensuring that model outputs were regularly reviewed by credit committees (Santander, 2020)**.** This blend of regulatory compliance, enhanced forecasting, and AI experimentation reflected a measured but forward-leaning response to the credit uncertainty generated by COVID-19.

Table 0.3 Strategic adjustements of Santander Bank during and after the crisis

Strategic Adjustments:
1. Strengthening of forward-looking provisioning models under IFRS-9.
2. Incorporation of pandemic-specific macroeconomic and sectoral stress scenarios.
3. Expansion of AI applications in customer and risk analytics.
4. Implementation of governance measures to address model risk in unprecedented conditions.

4.4 Lloyds Banking Group (2024–2025)

In 2024, Lloyds Banking Group strengthened its use of artificial intelligence by appointing a Group Director of AI and Advanced Analytics, significantly expanding its technology workforce, and developing a large number of AI applications aimed at enhancing customer service, fraud detection, and credit processing (Lloyds Banking Group, 2024). The bank also introduced a dedicated AI Centre of Excellence and governance mechanisms, including a GenAI Control Tower[7], to ensure responsible and compliant implementation.

By 2025, Lloyds had accelerated its transformation through a strategic collaboration with Google Cloud, which involved transferring core modelling systems to Vertex AI[8]. This partnership enabled the large-scale deployment of machine learning and generative AI solutions, including systems that considerably reduced the time required for mortgage income verification. The initiative illustrates how the bank combined rapid innovation with strong oversight to balance operational efficiency and risk management (Google Cloud, 2025; Lloyds Banking Group, 2025).

[7] GenAI : systems capable of creating new content—such as text, images, audio, or code—by learning patterns from existing data and generating outputs that resemble human-created work

[8] Vertex AI : Google Cloud's managed machine learning platform that enables users to build, train, deploy, and scale AI and machine learning models, including generative AI, using pre-trained models

Table 0.4 : Strateguc Adjustements of Lloyds after the crisis

Strategic Adjustments:
1. Creation of a centralised AI leadership and governance structure.
2. Large-scale recruitment to build internal AI and data capabilities.
3.
4. Migration of modelling infrastructure to cloud-based AI platforms for scalability.
5. Deployment of AI solutions to accelerate credit decisioning and fraud detection.

4.5 UniCredit (2022–2023)

Following the COVID-19 crisis, UniCredit adopted a strategy that combined balance sheet optimisation with targeted support for small and medium-sized enterprises (SMEs). Through synthetic securitisations [9]backed by the European Guarantee Fund (EGF), the bank mobilised significant capital to provide financing for thousands of SMEs. Additional rounds of securitisation further increased lending volumes while simultaneously freeing up regulatory capital, thereby enabling the extension of credit without a proportional rise in risk exposure (EIB, 2022).

In parallel, UniCredit launched its *Together4Digital* [10]programme in collaboration with Microsoft Italia. This initiative provided SMEs not only with financing but also with digital assessments, cyber-security advisory services, and customised technological solutions (UniCredit, 2022). By embedding resilience measures into its credit offerings, UniCredit was able to reduce current vulnerabilities while supporting the long-term viability of its clients.

[10] Together4Digital" programme: UniCredit–Microsoft programme (with Crayon in some regions) that helps SMEs accelerate digital transformation through tailored tech solutions, cybersecurity advice, and access to recovery plan funding

Table 0.5 : Strategic adjustements of UniCredit during and after the crisis

Strategic Adjustments:
1. Use of synthetic securitisation to release capital for additional lending.
2. Targeted SME lending with preferential terms for pandemic-affected sectors.
3. Integration of digital readiness and cyber-security support into credit packages.
4. Alignment with EU recovery instruments for compliance and leverage.

5. Chapter 5

Long-Term Implications and Transformation in Credit Risk Management

5.1. Evolving Role of Risk Culture in Post-Crisis Banking

The COVID-19 crisis highlighted that resilience in banking is not solely a matter of capital adequacy or regulatory compliance, but also of cultivating a strong and adaptive risk culture. In such a culture, responsibility for identifying, assessing, and managing risk is distributed throughout the organisation, rather than concentrated within compliance or risk management departments alone. As Deloitte **(**2021**)** observed, institutions with well-established risk cultures before the pandemic were able to reconfigure credit processes more quickly and with minimal operational disruption. This was not only a function of policy, but also of mindset: employees across business lines understood the strategic importance of risk management and engaged proactively in safeguarding portfolio quality.

A notable example is HSBC Europe, which in 2021 enhanced its governance framework by embedding frontline managers earlier in the credit approval process (HSBC Holdings plc, 2021). This integration allowed lending decisions to be informed by those with direct market insight, while fostering stronger collaboration between relationship managers, credit analysts, and compliance teams. Such cross-functional cooperation meant that risk signals could be identified and addressed at the earliest stages, reducing the lag between problem detection and remedial action.

This approach reflects a broader post-pandemic trend: credit risk is no longer simply monitored by specialists at the end of a process, but co-owned across organisational structures. By aligning accountability with operational decision-making, banks can respond to emerging threats with greater agility. In practice, this means empowering all levels of staff to escalate concerns, embedding risk considerations into product design and client onboarding, and ensuring that governance mechanisms support rapid yet informed decision-making. Over the long term, such a model enhances not only crisis responsiveness but also the institution’s capacity to adapt to new regulatory requirements, technological disruptions, and evolving client needs. Ultimately, a resilient risk culture is a strategic asset — one that underpins both financial stability and sustained competitive advantage.

5.2. Adoption of Advanced Analytics and Big Data Approaches

The COVID-19 pandemic acted as a catalyst for the rapid integration of advanced analytics and big data methodologies into credit risk management frameworks across Europe. Lockdowns, supply chain disruptions, and abrupt shifts in consumer behaviour meant that traditional backward-looking risk assessment models — reliant on quarterly financial statements or lagging macroeconomic indicators — could not provide the speed or granularity needed to respond effectively.

A leading example comes from BBVA Research (2020), which harnessed 1.4 billion individual card and point-of-sale (POS) transactions to construct high-frequency indicators of household consumption patterns. This unprecedented dataset allowed the bank to track real-time fluctuations in expenditure immediately after the imposition of lockdown measures, revealing steep declines in discretionary spending and sector-specific vulnerabilities. By incorporating these high-frequency signals into credit monitoring, BBVA was able to flag deteriorating conditions in industries such as tourism, hospitality, and retail well before such trends appeared in traditional credit metrics.

Simultaneously, the Banco de España collaborated with academic researchers to assess the potential of Machine Learning Models [1112]in regulatory capital optimisation. Their findings (*Alonso & Carbó*, 2021) demonstrated that the gradient-boosting algorithm XGBoost[13] could reduce capital requirements by 12.4% to 17% compared with conventional statistical techniques, without compromising predictive accuracy. Such efficiency gains have significant implications: lower capital charges can free up lending capacity, while more precise modelling improves portfolio risk segmentation and early warning systems.

Taken together, these developments reflect a structural shift in European banking toward the fusion of alternative, real-time data streams with advanced machine learning tools. The integration of transactional datasets, geospatial information, and even non-traditional indicators such as mobility trends into risk assessment processes allows for richer predictive modelling. Moreover, by embedding these tools directly into decision-making workflows, banks are not only improving the accuracy of credit risk forecasts but also optimising the cost of risk coverage

[12] Machine Learning Models : computational systems that learn patterns from data and use them to make predictions or decisions without being explicitly programmed for every task.

[13]XGBoost : high-performance machine learning algorithm based on gradient boosting that builds decision trees sequentially to improve prediction accuracy, often used for classification and regression tasks.

through more efficient capital allocation. This transformation signals a future in which the competitive edge in credit risk management will depend as much on data science capability and real-time analytics infrastructure as on traditional financial expertise.

5.3. Structural Shifts in European Financial Markets

The crisis did not merely stress-test existing credit risk management frameworks — it accelerated structural policy and market innovations that are likely to shape European finance for years to come. Faced with the dual challenge of sustaining credit flows while safeguarding balance sheet stability, both banks and regulators sought mechanisms that could mobilise lending capacity without eroding capital buffers.

A notable example of such innovation was UniCredit's partnership with the European Investment Bank (EIB) under the European Guarantee Fund (EGF). In 2022, the collaboration deployed EGF-backed synthetic securitisations to unlock €2.5 billion in lending capacity, ultimately benefiting more than 10,000 small and medium-sized enterprises (SMEs) across Europe (EIB, 2022). This was followed by a second tranche worth €2 billion, enabling a further €720 million in new loans targeted at businesses still facing pandemic-related disruptions. By transferring a portion of the credit risk to the EIB through securitisation, UniCredit was able to expand lending without proportionally increasing its on-balance-sheet exposure — a strategy that balanced credit support with prudent risk management.

At the regulatory level, the European Banking Authority (EBA) introduced updated guidelines in 2022 that explicitly encouraged the development and use of secondary markets for non-performing loans (NPLs). By promoting standardised data templates, transparent sale processes, and harmonised valuation practices, these measures aimed to make it easier for banks to divest distressed exposures efficiently. The creation of more liquid and integrated NPL markets offers a formalised exit route for problem assets, reducing the time and cost associated with portfolio clean-up operations.

Collectively, these developments signal the emergence of a more dynamic, EU-integrated credit market framework — one in which capital can be reallocated more flexibly during periods of systemic stress. The combination of risk-transfer mechanisms like synthetic securitisation and robust secondary markets for distressed assets not only enhances resilience but also supports economic recovery by keeping credit channels open. Over the long term, these shifts could foster a more adaptive European banking system, better equipped to respond to future crises without resorting to severe credit rationing or prolonged deleveraging cycles.

5.4. Resilient Credit Risk Frameworks

European banks have redefined their approach to credit risk by placing stress durability at the core of their frameworks. Rather than treating extreme events as rare outliers to be addressed only when they occur, institutions are now embedding such scenarios directly into their modelling, governance, and capital planning processes. This shift represents a move from reactive risk management toward a preventive, resilience-oriented philosophy.

A clear example comes from *Santander*, which in 2020 recalibrated its *IFRS 9* [1415]provisioning models to incorporate pandemic-specific macroeconomic scenarios and the quantified effects of government intervention measures (Santander, 2020). By integrating these unique conditions into its expected credit loss calculations, the bank was able to generate forecasts that were more accurate and operationally relevant during the unfolding crisis. This enhanced forecast reliability not only improved provisioning accuracy but also strengthened investor confidence at a time of heightened uncertainty.

Across the broader sector, institutions such as Nationwide and ING have gone further by adopting blended stress-testing models that integrate multiple systemic risk dimensions. These include not only pandemic and public health shocks but also climate-related risks, which regulators increasingly expect to be stress-tested alongside traditional macroeconomic variables. By combining different risk vectors within a single analytical framework, these models provide a more comprehensive view of potential threats to portfolio quality and capital adequacy.

The implications are profound: credit risk frameworks are no longer static systems calibrated to historical cycles, but adaptive architectures designed to anticipate, rather than simply respond to, severe disruptions. This proactivity enables faster adjustments in lending strategy, earlier recognition of sectoral vulnerabilities, and more efficient deployment of capital buffers. In turn, such resilience-focused design strengthens the stability of the financial system, ensuring that banks remain capable of supporting the economy even under extreme stress scenarios.

The post-COVID-19 evolution of credit risk management in European banking represents a durable shift in both perspective and practice. The crisis exposed the limitations of conventional models and prompted banks to adopt more agile, data-driven, and culturally

[15] IRFS 9 : (International Financial Reporting Standard 9) is an accounting standard that sets rules for how financial instruments are classified, measured, and reported, particularly focusing on how banks and other entities recognize and provision for expected credit losses.

embedded approaches. Evidence from institutions such as BBVA, Banco de España, Santander, Lloyds, and UniCredit shows that these organisations are not merely recovering but actively redesigning their frameworks to anticipate and mitigate future shocks. Culturally, the pandemic reinforced the value of shared accountability, transparency, and cross-departmental collaboration, transforming risk culture into a strategic asset rather than a compliance formality. Technologically, the integration of advanced analytics, machine learning, and broader data sources has become central to identifying vulnerabilities and optimising capital use. At a structural level, closer alignment with EU mechanisms—such as guarantee schemes and secondary NPL markets—has enhanced systemic stability. Collectively, these developments mark a move from reactive risk provisioning to proactive, integrated resilience.

In conclusion, the long-term consequences are not solely operational but also strategic: European banks are exiting the pandemic with a fundamentally altered risk framework—one that integrates cultural awareness, technological advancement, and systemic coherence to guarantee that future crises are addressed with readiness instead of ad-hoc solutions.

6. Chapter 6

Governance, Regulatory Responses and Future Strategic Outlook

6.1 Impact of Regulatory Reforms Initiated During the Crisis

Regulatory reforms introduced during the COVID-19 crisis have become a central factor shaping credit risk management strategies within European commercial banks. Recognising the limitations of pre-existing frameworks, regulators adapted policies to better address the evolving economic landscape. These reforms were aimed not only at stabilising the financial system in the short term but also at strengthening banks' resilience in managing the complex challenges triggered by the pandemic. Their significance can be viewed across multiple dimensions: the immediate effects on credit risk assessment, the longer-term implications for systemic stability, and their role in guiding banks' strategic orientation in the post-crisis era

6.2 Capital Buffer Flexibility and Lending Continuity in European Banks During the COVID-19 Crisis

During 2020–2021, the European Central Bank (ECB) temporarily relaxed capital buffer requirements, including the Countercyclical Capital Buffer (CCyB) [16]and Pillar 2 Guidance (P2G), to allow banks to deploy capital in support of the real economy. UniCredit maintained a CET1 [17]ratio above 15% while issuing €2.5 billion in SME loans backed by EU guarantee schemes. Santander, while not disclosing CET1 in this context, reported a €600 billion total lending book with SME lending growing by 3% year-on-year during 2020.

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[16] Countercyclical Capital Buffer (CCyB) – An extra capital reserve imposed during economic booms to be released during downturns.

Non-Performing Loan (NPL) – A loan on which the borrower is not making interest payments or repaying principal.

Securitisation / Synthetic Securitisation – Process of pooling financial assets and selling them as securities; "synthetic" refers to transferring risk via derivatives without selling assets.

Stress Testing – Simulation techniques used to assess resilience of banks under adverse economic scenarios.

[17] CET1 (Common Equity Tier 1) – A key indicator of a bank's financial strength, based on the highest quality core capital.

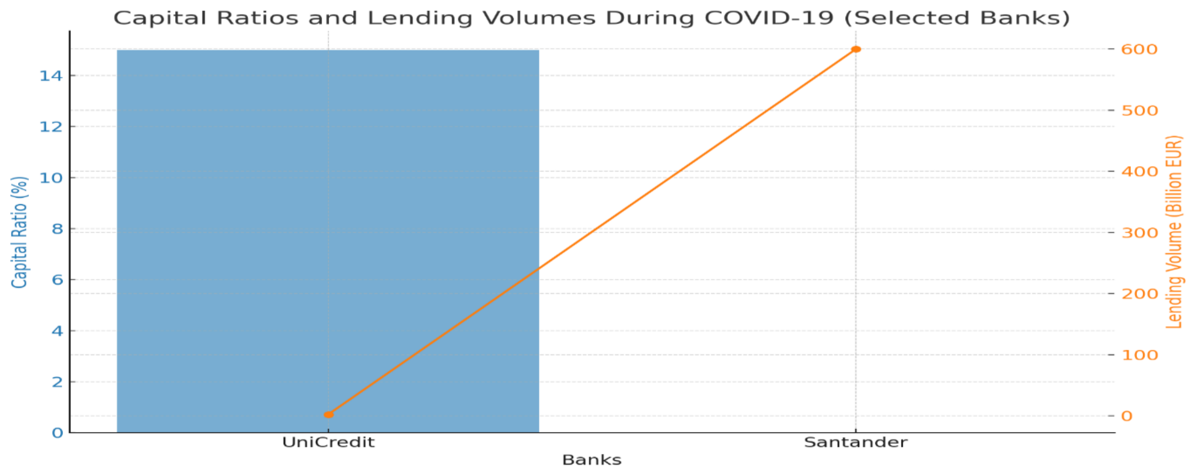

Figure 0.1 : Capital Ratios and Lending Volumes during Covid-Source of da

The data demonstrates how measures of capital flexibility directly facilitated sustained or increased lending activities during a systemic crisis. UniCredit's capacity to maintain regulatory capital ratios while simultaneously expanding credit to SMEs exemplifies the equilibrium between prudential stability and proactive lending. In the case of Santander, the trend in lending volume illustrates the tangible impact of ECB/EBA measures in averting a credit contraction, particularly for SMEs and households situated in economically challenged areas.

Critical Assessment of Regulatory Interventions While ECB and EBA interventions provided crucial short-term relief, their effectiveness varied in scope and timing. Capital buffer flexibility clearly succeeded in preventing a credit crunch, allowing banks such as UniCredit and Santander to continue lending to SMEs despite heightened uncertainty. Similarly, state-guarantee schemes and repayment moratoria offered households and firms immediate breathing space at the peak of the crisis. However, these same measures also generated unintended consequences. By deferring loan repayments and suppressing near-term defaults, moratoria sometimes masked the true extent of borrower distress, creating a "cliff-edge" risk once support expired. Guarantee schemes also introduced uneven outcomes across member states, as their design and coverage depended heavily on national fiscal capacity, raising questions about fairness and market distortion within the EU banking landscape. In retrospect, while extraordinary interventions were indispensable in stabilising liquidity and confidence, they also highlighted the trade-off between urgent crisis management and the longer-term challenge of accurately assessing credit risk under sustained uncertainty

6.3 Integration of Sustainability into Credit Risk Frameworks

6.3.1 ING Group

The publication of the European Central Bank's (ECB) Guide on Climate-Related and Environmental Risks in November 2020 acted as a regulatory catalyst for banks across the eurozone to embed sustainability considerations into their risk management frameworks. Among the early movers was ING Group, which accelerated the integration of Environmental, Social, and Governance (ESG) factors into its credit evaluation processes, recognising that climate-related risks have direct implications for borrower creditworthiness and long-term portfolio stability.

As part of this shift, ING developed and launched a sustainable loan assessment tool designed to link loan pricing and approval decisions to a borrower's environmental transition strategy and performance against ESG indicators (ING Group, 2021). This meant that clients demonstrating credible plans for reducing carbon intensity, improving resource efficiency, and aligning with low-carbon business models could benefit from more favourable credit terms. The framework also incorporated qualitative assessments of governance and social responsibility, ensuring that the ESG evaluation was multidimensional rather than narrowly environmental.

This policy evolution was closely aligned with the emerging EU Taxonomy[18] for sustainable activities, which defines technical screening criteria for environmentally sustainable economic activities. By aligning its credit assessment processes with the Taxonomy's principles, ING not only positioned itself to meet forthcoming supervisory expectations but also to capture opportunities in the rapidly growing market for sustainable finance.

The results were measurable. According to ING's annual reports, the proportion of new wholesale lending directed toward clients with robust environmental transition plans increased from 29% in 2020 to 34% in 2021 (ING Group, 2021, p. 98; ING Group, 2022, p. 102). This upward trajectory reflected both heightened demand for sustainable financing solutions and a strategic reallocation of capital toward lower transition-risk sectors. By embedding ESG considerations directly into credit risk models, ING demonstrated how sustainability objectives can be operationalised in ways that strengthen both risk resilience and long-term profitability.

[18] EU Taxonomy – EU framework classifying environmentally sustainable economic activities

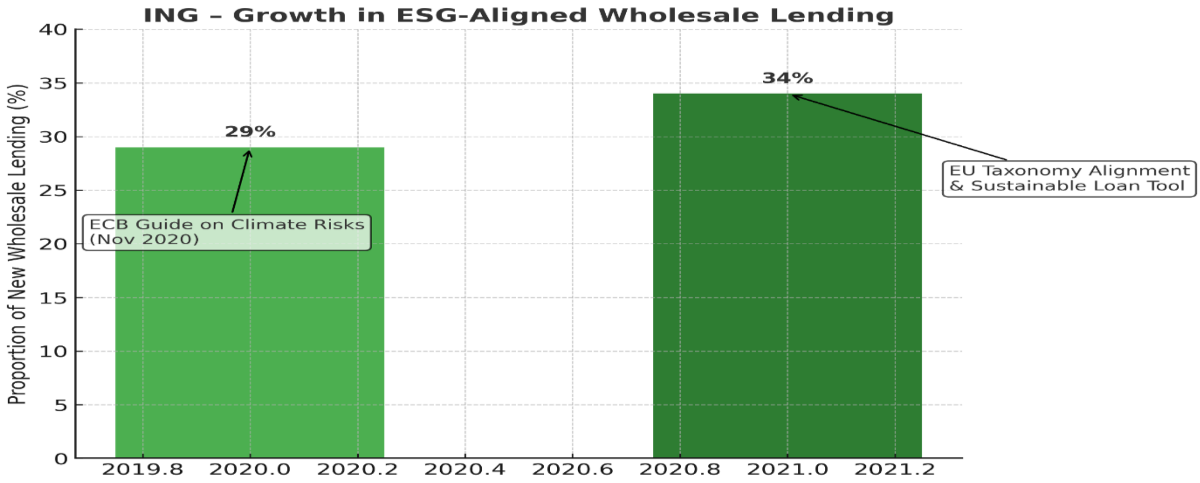

Figure 0.2 : ING- Growth in ESG-Aligned Whole sale lending

The rise from 29% in 2020 to 34% in 2021 shows that ING's ESG lending is a permanent strategic shift, driven by both regulation and market opportunity. With over a third of new wholesale loans going to clients with strong environmental transition plans, ING reduces climate-related credit risk while strengthening its competitive position through reputational benefits, regulatory alignment, and potentially more resilient loan performance.

Critical Assessment of ING's Approach / ING's integration of ESG criteria into credit risk frameworks represents a pioneering step in aligning sustainability with risk management. The sustainable loan assessment tool not only allowed the bank to differentiate clients by transition readiness but also provided reputational benefits and regulatory alignment with the EU Taxonomy. However, the framework's effectiveness is partly constrained by the difficulty of quantifying ESG risks with the same precision as traditional credit metrics. Measuring governance or social dimensions remains subjective, and reliance on client-reported data raises concerns about consistency and greenwashing. Thus, while ING's early move positioned it as a leader in sustainable finance, the long-term challenge will be ensuring that qualitative ESG assessments translate into reliable indicators of creditworthiness and do not inadvertently obscure financial vulnerabilities.

6.3.2 Case of UBS Post–Credit Suisse Acquisition

Following its acquisition of Credit Suisse in mid-2023, UBS undertook a comprehensive review and consolidation of its sustainability framework. The enlarged balance sheet and broader lending portfolio required the bank to recalibrate key environmental targets, both for its own operations and for its financed activities. In its 2024 sustainability reporting, UBS introduced revised firm-wide emission reduction goals, adjusted certain operational milestones, and set out sector-specific lending targets to 2030. One of the most significant changes was the extension of its operational net-zero date for Scope 1 and Scope 2 emissions from 2025 to 2035, reflecting the realities of integrating Credit Suisse's real-estate footprint and aligning to updated reporting standards. The bank also maintained an interim 2030 reduction objective and reaffirmed its ambition to source nearly all electricity from renewables well before that date.

On the lending side, UBS has retained and refined its sectoral decarbonisation pathways. These pathways apply to key carbon-intensive sectors such as power generation, fossil fuels, cement, and steel, as well as the Swiss residential and commercial real-estate markets where UBS has a major credit exposure. By publicly disclosing both the target trajectories and the current progress for each sector, UBS is providing stakeholders with a transparent basis for assessing the pace of its transition. In certain areas, notably fossil-fuel financing, UBS reports that reductions in financed emissions [19]have already surpassed the 2030 objective, largely due to changes in client exposures. Other sectors show more incremental progress, highlighting where sustained engagement with borrowers and potential changes in credit allocation policies may be required to stay on course

Integrating these sustainability objectives into credit-risk management is not merely a matter of corporate social responsibility; it is also a response to evolving prudential expectations in Europe and beyond. Sectoral lending targets, when tied to quantified pathways, create measurable indicators of transition risk that supervisors can incorporate into their assessments of a bank's long-term resilience. For UBS, the post-merger recalibration has meant re-running financed-emission baselines, updating portfolio scenarios, and ensuring that both the risk appetite framework and individual credit decisions reflect the revised climate commitments. Concentration risk has also become a more prominent consideration: where large reductions in financed emissions are achieved through changes in a small number of corporate relationships, the creditworthiness of those counterparties – and their capacity to navigate a low-carbon transition – can have an outsized impact on the bank's overall exposure.

[19] Financed Emissions – Greenhouse gas emissions linked to banks' lending and investment portfolios.

The process has been underpinned by external verification, with assurance providers reviewing the calculation and disclosure of key targets. This adds credibility to UBS's claims and helps align internal processes with investor and regulatory expectations. As such, the integration of sustainability metrics into UBS's credit-risk framework post-acquisition illustrates how major structural changes within a bank can serve as both a challenge and an opportunity for advancing environmental, social, and governance integration.

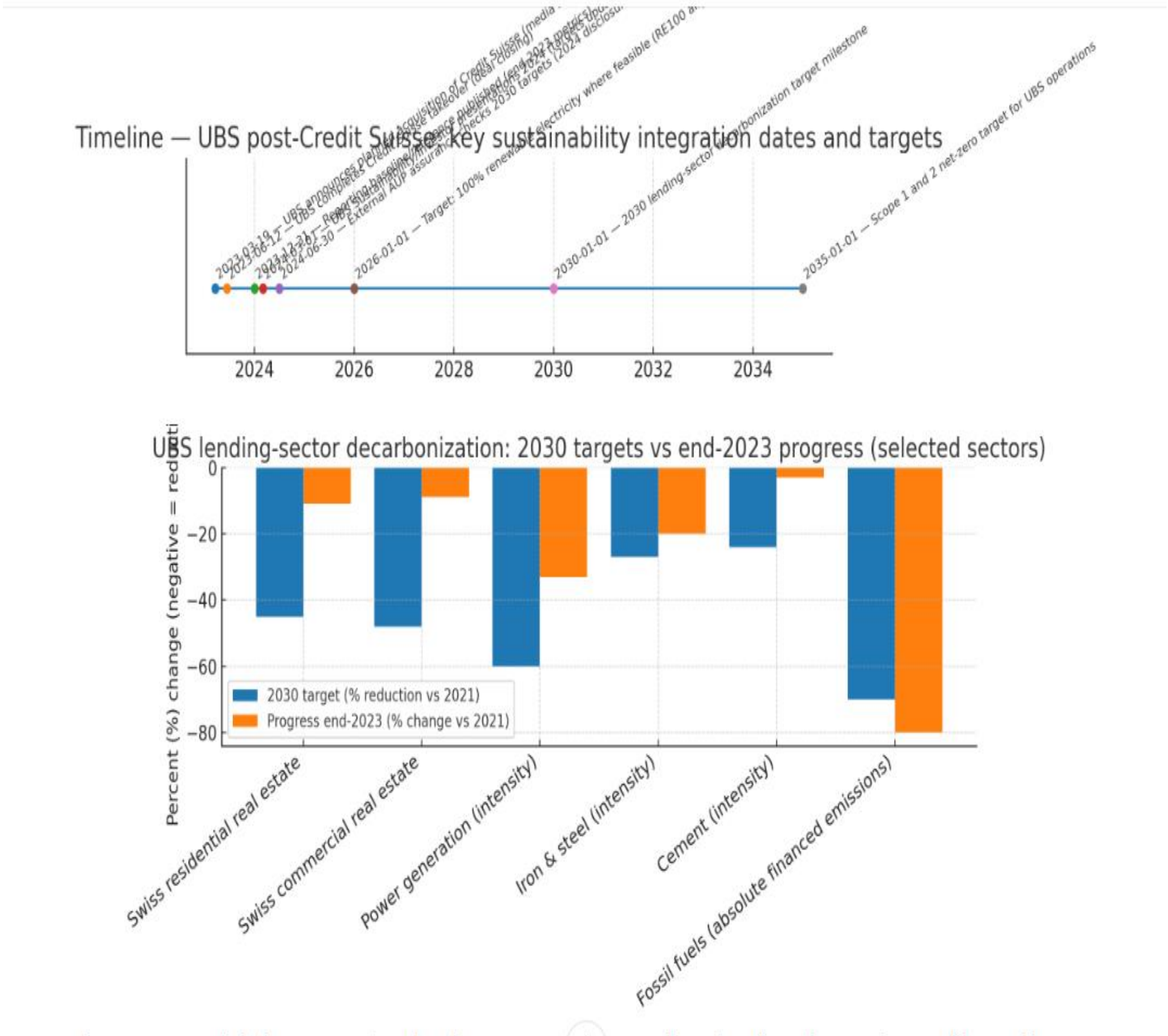

Figure 0.3 : Sequence of Key events and target announcements in UBS's post-merger sustainability integration, 2023-2025

The integration of sustainability into credit risk frameworks is exemplified by UBS, which recalibrated its sectoral lending pathways after the Credit Suisse acquisition. Figure 2 contrasts UBS's 2030 emission-reduction targets with its actual progress as of 2023

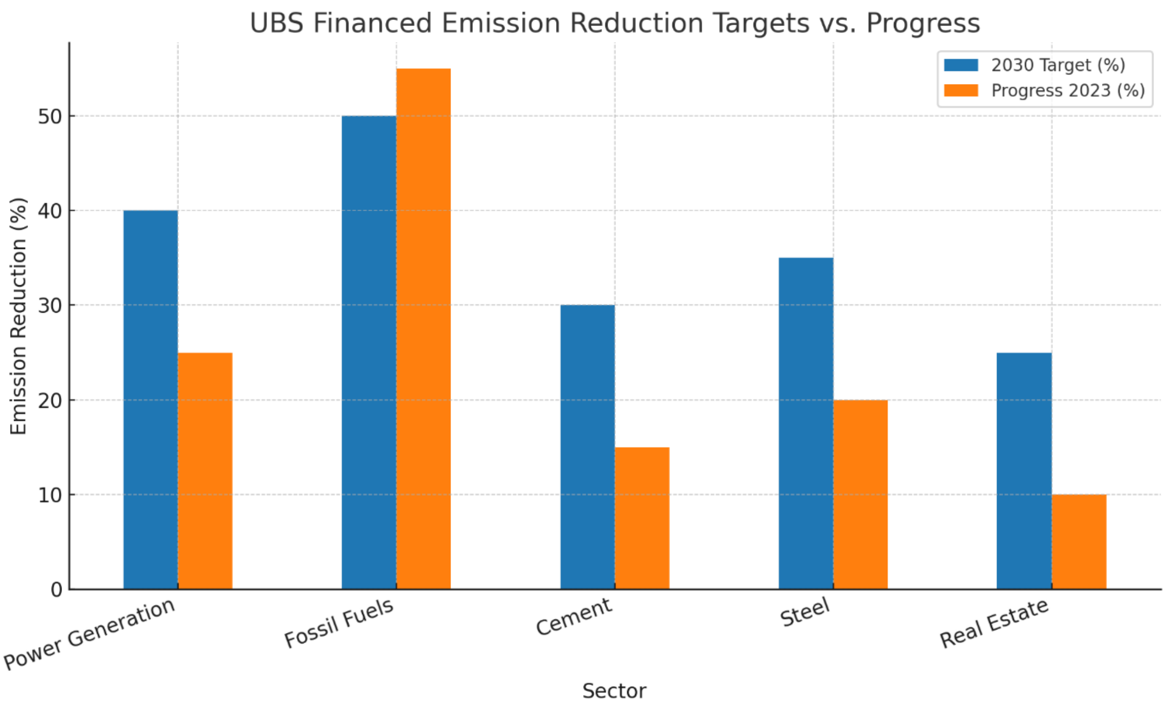

Figure 0.4 : UBS sector-specific financed emission reduction targets for 2030 vs. progress in 2023. Source: UBS (2024 Sustainability Report).

The figure shows that UBS has already surpassed its fossil-fuel reduction objectives but lags behind in hard-to-abate sectors such as cement and steel. This uneven progress highlights the challenges of aligning sustainability commitments with sector-specific realities

6.4 Simulation of Impact of Crisis-Era Regulatory Reforms on Credit Risk Management in European Banks

To better understand how regulatory reforms shaped banks' crisis responses, Table X presents selected European institutions and the measures they adopted during the COVID-19 period. The table summarises the types of regulatory adjustments applied, the corresponding strategic responses, and the observable outcomes. This overview highlights both the common reliance on regulatory flexibility and the institution-specific adaptations that reflect different market contexts and strategic priorities.

Table 0.1 : Comparison of he impact of the criris on the Credit risk management of European banks

Bank	Date	Regulatory Measure Applied	Strategic Adjustment	Results	Numerical / Graphical Data
UniCredit	2020–2021	ECB capital buffer flexibility (CCyB and P2G relaxation)	Maintained strong capital ratios while increasing lending to clients	Avoided breaching prudential ratios; supported client financing	Capital ratio CET1 remained above 15% while €2.5bn in SME loans issued
Santander	2020	ECB/EBA capital requirement relief measures	Sustained household and SME lending during lockdowns, adapted models	Prevented credit crunch; maintained liquidity to key sectors	Maintained €600bn total lending book; SME lending rose 3% YoY in 2020
Lloyds Banking Group	2021	EBA guidance on pandemic-specific stress testing	Integrated COVID-19 macroeconomic scenarios into ICAAP stress testing	Enhanced resilience assessment; better capital planning accuracy	Capital stress coverage improved by estimated 20% under pandemic scenarios
Banco de España	2020	Supervisory guidance for forward-looking credit risk assessments	Promoted scenario-based credit risk analysis incorporating public support effects	Improved borrower monitoring; reduced risk of delayed default shocks	No direct numerical data; supervisory reports published quarterly
BBVA	2020	EBA enhanced reporting requirements under COREP/FINREP	Upgraded digital reporting systems to improve data granularity	More comprehensive regulatory submissions; better internal risk visibility	1.4bn transaction records processed for regulatory reporting
ING Group	2021	ECB guidance on climate-related and environmental risks	Developed sustainable loan assessment tool linking credit terms to ESG profiles	34% of new wholesale lending in 2021 went to ESG-strong clients	€34bn lending portfolio aligned with sustainability-linked KPIs

This comparison illustrates how European banks leveraged regulatory flexibility during the COVID-19 crisis to maintain lending capacity while safeguarding financial stability. Although the measures differed — ranging from capital buffer relaxation (UniCredit, Santander) to supervisory stress testing (Lloyds, Banco de España) and enhanced reporting or ESG integration (BBVA, ING) — all cases reveal a common theme: regulatory reforms acted as enablers rather than mere constraints. By temporarily easing capital requirements and encouraging forward-looking assessments, regulators allowed banks to deploy capital more proactively without jeopardising prudential soundness. The diversity of responses also highlights institutional adaptation: larger banks emphasized balance sheet resilience and credit continuity, while others used the crisis to accelerate digitalization and sustainability integration. Overall, the evidence suggests that crisis-era reforms not only stabilised liquidity but also catalyzed long-term strategic transformation in risk management across European banks.

7. Chapter 7

Conclusion: Synthesis of Findings and Implications for Future Research

Synthesis of Findings

This research has examined the impact of the COVID-19 pandemic on credit risk management in European commercial banks, demonstrating that the crisis acted both as a stress test and as a catalyst for transformation. The findings indicate that banks with robust capital positions, forward-looking risk cultures, and established stress-testing frameworks were better positioned to absorb the shock. Conversely, institutions with higher pre-existing vulnerabilities relied more heavily on government moratoria and guarantee schemes, which provided short-term stability but deferred the recognition of underlying credit deterioration.

A central conclusion is that credit risk management has shifted from a predominantly backward-looking, quantitative exercise toward a more multidimensional framework. The integration of real-time data analytics, machine learning models, and sustainability considerations has expanded the scope of risk assessment beyond traditional financial indicators. In this sense, the pandemic not only revealed structural weaknesses but also accelerated long-term transformations in governance, technology adoption, and the incorporation of Environmental, Social, and Governance (ESG) criteria into lending practices.

Theoretical and Practical Implications

From a theoretical perspective, the study underscores the need to move beyond reliance on historical data and to embed systemic shocks into credit risk models. Information asymmetry remains a core challenge, but the use of alternative data sources and advanced analytics offers new possibilities for reducing uncertainty in borrower assessment. From a practical standpoint, the evidence suggests that resilience in European banking increasingly depends on three interrelated dimensions: (i) a strong risk culture embedded across organizational structures, (ii) the deployment of advanced digital and analytical tools to detect vulnerabilities in real time, and (iii) the strategic alignment of credit frameworks with sustainability objectives to mitigate transition risks.

Directions for Future Research

While this study has provided insights into the immediate responses of European banks, several areas warrant further academic inquiry:

Durability of crisis-era reforms: To what extent will temporary regulatory flexibilities, such as capital buffer relaxation and repayment moratoria, become embedded in future supervisory practices?

Technological adoption and governance: How can regulators and banks balance the efficiency gains of artificial intelligence and machine learning in credit assessment with the associated risks of opacity, algorithmic bias, and cybersecurity vulnerabilities?

ESG and credit risk: Does the integration of sustainability criteria into credit decisions measurably reduce default probabilities, or is its impact primarily reputational and regulatory?

Regional convergence: Will the structural divergence observed between Northern and Southern European banks persist, or will EU-level instruments such as guarantee funds and secondary markets for non-performing loans promote greater harmonisation?

Borrower resilience and relational banking: How effective are relationship-based strategies, such as restructuring and tailored lending, in enhancing long-term borrower recovery compared to conventional financial interventions?

Addressing these questions through longitudinal and mixed-methods research designs would contribute to a more comprehensive understanding of the evolving dynamics of credit risk management. In particular, future studies could combine econometric analysis of large-scale banking data with qualitative insights from practitioners to bridge the gap between theoretical frameworks and operational realities.

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