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What Keeps NPLs Low? Regulatory, Supervisory and Policy Lessons from Resilient Jurisdictions

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Systematic Review

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Introduction

Non-performing loans (NPLs) remain a persistent challenge for the financial and banking sector, regulations, financial stability, and economic development. The huge accumulation of impaired assets can weaken banks' balance sheets, constrain credit intermediation, and undermine profitability. Consistently higher NPL ratios are not only serious challenges for the financial stability of a particular jurisdiction, but also spread quickly globally, as banks and financial institutions (FIs) are closely interlinked in the age of online banking and globalisation. The global financial crisis (GFC) exposed the weaknesses in financial regulation, corporate governance, credit-risk management systems, and supervisory oversight of both advanced and emerging nations. Therefore, policymakers advocated substantial regulatory and policy reforms, both domestically and internationally [1]. After the GFC, bank bailouts, systemic risk, and 'too big to fail' dominated academic and policy debates about the effectiveness of financial regulation and the possible risks within the banking system [2]. The need for an appropriate regulatory and policy framework that prevents banks and FIs from taking excessive risks, absorbs losses, and manages financial distress effectively was urgently warranted [3].

Therefore, in addition to the response of national regulatory and supervisory authorities, the international standard-setting institutions, including the Basel Committee on Banking Supervision, the World Bank, the International Monetary Fund (IMF), and the OECD, also promoted research to develop regulatory, policy, and supervisory mechanisms to strengthen banking-sector resilience and address deteriorating asset quality [4]. The Basel Committee's framework for identifying non-performing exposures and forbearance sought to improve the consistency of supervisory approaches to problem assets [5]. Nevertheless, differences in regulatory structures, accounting standards, supervisory practices and institutional capacities continue to influence how jurisdictions recognise, manage and resolve NPLs. These differences raise important questions concerning the effectiveness, consistency and cross-border implications of banking regulation [6].

The global economy was recovering from the GFC when the unprecedented COVID-19 pandemic created pandemonium, posing a serious challenge to maintaining financial stability worldwide during lockdowns [7]. However, out of caution and timely recognition of the potential impact, governments, central banks, and supervisory authorities worldwide introduced several measures to address COVID-19-imposed distress. Loan moratoria for 3-6 months, deferred repayments, public guarantees, liquidity assistance, and temporary regulatory adjustments to protect borrowers were common measures adopted by jurisdictions worldwide to counter COVID-19-associated risk

[7]. However, it was later realized that efforts to contain the pandemic's impact and the recognition of credit deterioration delayed assessment of complications in underlying asset quality. The Organisation for Economic Co-operation and Development (OECD) consequently emphasised the continuing importance of effective NPL resolution strategies, supported by appropriate insolvency, debt-restructuring and secondary-market frameworks [8]. The pandemic and subsequent monetary tightening therefore provide an important setting for evaluating the resilience of national banking regulatory and supervisory arrangements [8].

Therefore, this research critically analyses the trend in NPLs from 2015-2025 and the regulatory, policy, and supervisory measures adopted by these jurisdictions to address NPLs across the pre-pandemic, pandemic, and post-pandemic periods. It also synthesizes the research findings to provide an overview of NPL restructuring and resolution, primarily relying on regulatory, policy, and supervisory approaches and drawing on doctrinal and comparative methods. It finally suggests that jurisdictions with high NPL ratios can learn from this research by integrating a comparative framework that combines supervisory oversight, loss-absorbing capacity, and effective restructuring mechanisms to address distressed assets [8]. However, it also suggests that a more in-depth study of macroeconomic and bank-specific determinants could provide a more comprehensive overview of NPLs restructuring and resolution strategies.

Literature Review:

The academic literature on NPLs has largely developed around two interconnected questions: why bank loans become impaired and how accumulated distressed assets affect the financial stability and economic performance of a particular jurisdiction, thereby posing a threat to global financial stability. Substantial empirical research identifies macroeconomic conditions, borrowers' financial conditions, and bank-specific practices as important determinants of NPL ratios. However, the relationship between these variables and asset quality is neither uniform across jurisdictions nor independent of the regulatory and institutional environment in which banks operate.

In a sample of 75 jurisdictions worldwide, the authors identified GDP, share prices, exchange rates, and interest rates as significant determinants of NPLs, showing that credit deterioration is closely linked to macroeconomic conditions [9]. A study investigated the determinants of NPLs in euro-area countries and concluded that economic conditions and banking-sector vulnerabilities play significant roles [10]. Similarly, while examining NPLs in Central, Eastern and South-Eastern Europe, the importance of macroeconomic and bank-specific conditions and their impact on NPLs

and consequences for economic activity was assessed [11]. These studies establish that NPL ratios cannot be understood independently of the economic environment, and it cannot be claimed that favourable macroeconomic conditions will always be correlated with persistently low NPL ratios [10] [11][12]

Bank-specific research highlights that institutional characteristics are closely associated with credit quality. Bank capital and lending behaviour also determine the importance of capital regulation in shaping banks' incentives and capacity to extend credit [12]. An empirical investigation of Switzerland and Gambacorta and research on Italy provide relevant evidence concerning the relationship between capital requirements and lending behaviour [13]. However, capital adequacy should not be treated as a direct measure of loan quality. Nevertheless, stronger capitalisation may improve the loss-absorbing capacity of banks without necessarily preventing borrower default [14]. Thus, the literature on macroeconomic and bank-specific determinants identifies a range of economic and institutional indicators that influence NPL accumulation.

The GFC prompted greater attention to the preventive functions of banking regulation. In particular, macroprudential policy emerged as an important means of addressing the build-up of systemic vulnerabilities associated with excessive credit growth, leverage and asset-price inflation [14]. A study of 119 jurisdictions found that the effectiveness of policy measures varied by financial development, economic openness, and the phase of the financial cycle [15]. While analysing macroprudential policies in 57 advanced and emerging economies, the authors concluded that policy tightening reduced bank credit growth, housing credit growth, and house-price inflation, with targeted housing-sector measures appearing particularly effective [16]. This evidence is significant for the present study because mortgage lending and household indebtedness constitute important areas of regulatory concern in Canada, Sweden, Norway and Australia.

Prudential capital requirements, supervisory monitoring, risk governance, and loss-absorbing arrangements also influence financial institutions' capacity to withstand credit deterioration. The examination of capital requirements and bank behaviour in Switzerland provides an early empirical contribution to understanding the interaction between prudential regulation and banks' balance-sheet decisions [13]. Similarly, another study examined the relationship between bank capital and lending behaviour in Italy [14]. Therefore, it is relevant to evaluate whether regulations governing capital and lending incentives support the conclusion that higher capital ratios necessarily produce lower NPL ratios. For instance, in Switzerland, strong capital requirements and supervisory

oversight support financial stability despite banks remaining exposed to risks arising from concentrated lending, property-market developments, and vulnerabilities beyond the traditional banking sector [17].

A comprehensive examination of the regulatory and policy response of asset quality highlights the absence of a universally applied loan-classification framework and the resulting difficulties in comparing NPLs across jurisdictions [15]. The Basel Committee on Banking Supervision's guidance on non-performing exposures and forbearance represents an important effort towards greater supervisory consistency [18]. Nevertheless, international standards do not eliminate differences in national implementation, reporting and the treatment of particular exposures. The relationship between banking insolvency and problem loans demonstrates the importance of appropriate institutional arrangements for managing distressed banking assets [19].

A study of European problem loans proposed a three-pillar strategy comprising strengthened banking supervision, insolvency and debt-enforcement reforms, and the development of distressed-debt markets [20]. Their analysis recognises that NPL resolution depends not only on banks' willingness to recognise losses but also on the legal and institutional environment governing restructuring, enforcement and asset disposal. Another study examined approaches to resolving non-performing exposures in euro-area banks, including internal restructuring and external disposal mechanisms [21].

Therefore, the existing literature on NPLs has largely focused on macroeconomic and bank-specific determinants, the effectiveness of prudential regulation, and the legal and institutional mechanisms for NPLs resolution. Greater attention has also focused on capital adequacy, provisioning requirements, supervisory intervention, loan restructuring, and insolvency frameworks. The COVID-19 pandemic accentuated the importance of regulatory flexibility and government support in preventing asset quality deterioration. However, relatively little attention has been paid to how jurisdictions with persistently low NPL levels have combined regulatory, supervisory, and policy interventions to sustain banking sector stability across different phases. Therefore, this research attempts to bridge this gap by comparatively assessing the measures taken by six jurisdictions over 2015–2025 and contributing to the existing literature on NPLs resolution and restructuring.

Methodology

This research paper is the outcome of an investigation of primary and secondary sources using doctrinal and comparative research methods. It examines regulatory, supervisory, and policy measures adopted by six jurisdictions vis-à-vis the Republic of Korea, Canada, Sweden, Norway, Switzerland, and Australia with persistently low NPLs during 2015–2024. The researcher initially collected NPL-to-gross-loans data for 130 jurisdictions for ten years from the World Bank's website under World Development Indicators (WDI) and also from country-specific central bank reports where data gaps persisted.

Table- 1 presents the distribution of jurisdictions across different hierarchies (categories) developed based on the average NPL ratio over ten years. The jurisdictions were arranged in ascending order based on average NPLs score and grouped into six categories vis-à-vis no impact (below 1%), low impact (above 1–2%), moderate impact (above 2–5%), high impact (above 5–10%), very high impact (above 10–20%), and critical impact (above 20%). These thresholds constitute analytical classifications adopted for this research rather than internationally prescribed regulatory benchmarks. The selection of NPLs thresholds for each hierarchy was random and based on existing visible natural breaks.

Table1 Classification of Jurisdictions Based on Average NPL Level

NPL Ratios	**Category**	**No of Jurisdictions**	**Interpretation**
0-1%	No Impact	07	Very strong asset quality, negligible credit risk
>1 – 2%	Low Impact	19	Stable system, minor and manageable stress
>2 – 5%	Moderate Impact	43	Early deterioration, requires closer supervisory monitoring
>5 – 10%	High Impact	38	Significant asset quality concerns, potential constraint on lending
>10 – 20%	Very High Impact	16	Severe banking stress, systemic vulnerabilities are evident
>20%	Critical Impact	07	Crisis conditions, urgent regulatory and resolution measures required

Of the 130 jurisdictions, only seven had an average NPL ratio below 1% over the past ten years. However, we selected only six jurisdictions for the present study from this hierarchy under the no-impact category, with average NPL ratios up to 1%. Hong Kong SAR, China, was intentionally excluded because insufficient literature was available to examine its regulatory and policy response. Therefore, the selection was primarily based on the availability of primary and secondary

data from different sources. It is also clarified that, after preparing the hierarchy, the NPLs data for 2025 were also collected for the jurisdictions included in the study, and no major change was observed in the ranking of these jurisdictions. The researcher plans to produce a series of research papers (two from each hierarchy) that critically examine the relationship between regulatory policy and supervisory measures and macroeconomic and bank-specific determinants.

The comparative analysis examines three interrelated dimensions vis-a-vis ex-ante credit-risk prevention, banking-sector resilience, and ex-post distressed-asset resolution. Accordingly, the impact of these measures on NPLs was examined for the pre-COVID-19 (2015–2019), COVID-19 (2020–2021), and post-COVID-19 (2022–2025) periods.

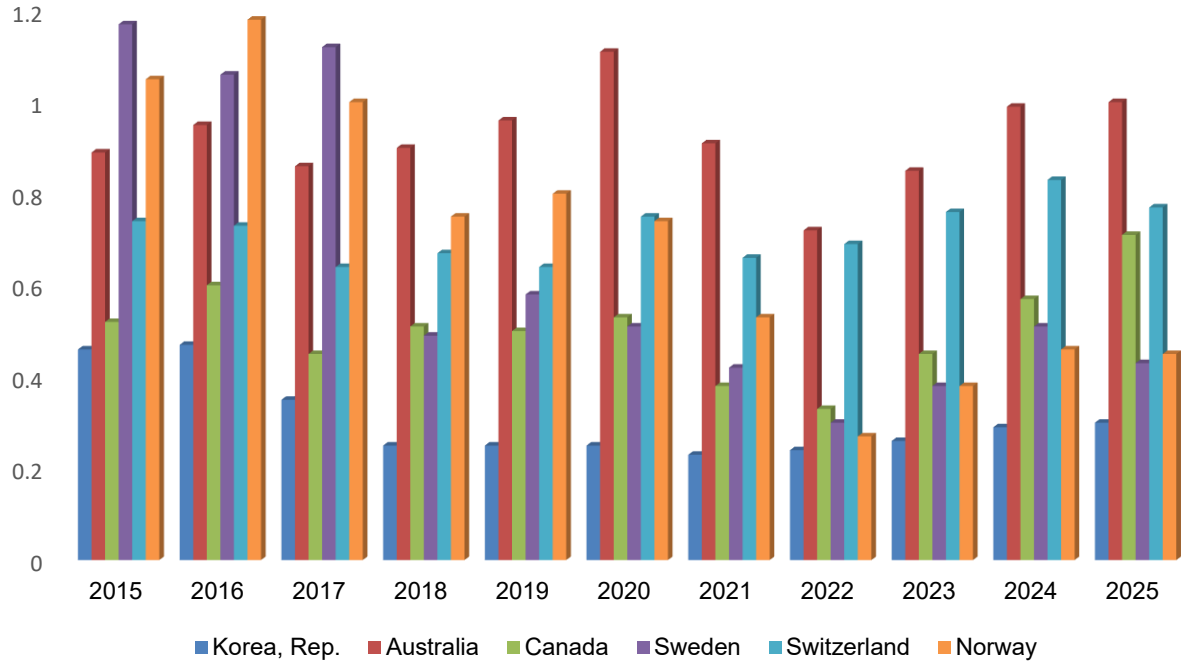
Analysis of NPLs with no impact Jurisdictions

Table- 2 and Figure- 1 present the trend of NPLs in these jurisdictions, and we note that NPLs in jurisdictions with no impact ranged from 0.23% in the Republic of Korea in 2021 to 1.18% in Norway in 2018. Over these eleven years (additional data for 2025 added later), NPLs exceeded 1% only eight times. For instance, in Sweden and Norway from 2015 -2017 and Australia in 2020 and 2025. Australia was the only jurisdiction with a relatively high average NPLs ratio (0.92%). The average NPL ratio was lowest in the Republic of Korea (0.31%).

Table-2 Trend of NPLs Ratio in Jurisdictions with No Impact

	NPLs in Pre COVID-19				During Pandemic		NPLs in post-COVID					Average NPL Ratio
Jurisdictions	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Korea, Rep.	0.46	0.47	0.35	0.25	0.25	0.25	0.23	0.24	0.26	0.29	0.30	0.31
Canada	0.52	0.60	0.45	0.51	0.50	0.53	0.38	0.33	0.45	0.57	0.71	0.50
Sweden	1.17	1.06	1.12	0.49	0.58	0.51	0.42	0.30	0.38	0.51	0.43	0.63
Norway	1.05	1.18	1.00	0.75	0.80	0.74	0.53	0.27	0.38	0.46	0.45	0.69
Switzerland	0.74	0.73	0.64	0.67	0.64	0.75	0.66	0.69	0.76	0.83	0.77	0.72
Australia	0.89	0.95	0.86	0.90	0.96	1.11	0.91	0.72	0.85	0.99	1.00	0.92

Figure-1: NPLs Trend in the Jurisdiction with No impact (%)



Korea of Republic

NPLs in the Republic of Korea remained consistently low from 2015 to 2025, peaking at 0.47% in 2016. No significant variation was noticed when we compare the NPLs in pre-, during, and post-COVID-19. It remained marginally higher at the beginning, but since 2019 it has consistently been between 0.25% and 0.30%, representing an ideal situation for the banking sector's financial stability (Table- 2). However, persistently low NPL ratios in Korea could be attributed to several preventive measures, including effective credit-risk management, timely assessment of borrower repayment capacity, macroprudential regulation, systematic corporate restructuring, an established NPL disposal mechanism through KAMCO, and strong bank capitalisation and provisioning [22]. Korea also adopted extensive COVID-period loan forbearance for affected SMEs and small businesses. The extremely low NPLs ratios during 2018-2025 were because of maturity extensions and payment deferrals, which delayed recognition of underlying credit deterioration. [23] An empirical study concludes that changes in mortgage-loan structure and borrower credit assessment significantly contributed to the improvements in bank asset quality [23].

The Corporate Restructuring Promotion Act (CRPA) plays an important role in loan restructuring, as Article 13 provides for the formulation of a corporate improvement plan for out-of-court settlement, Article 14 requires an agreement between creditors and the enterprise to implement the

restructuring plan, and Article 17 permits extension of repayment periods [24]. Similarly, the Financial Services Commission of Korea (FSC) identified four bank holding companies and one bank as domestic systemically important banks (D-SIBs). These institutions were required to set aside additional capital of 1%, with 0.25% each year from 2016 to 2019 (pre-COVID-19 period) [25]. The banks and bank holding companies identified as D-SIBs were required to maintain an average BSI ratio of 13.99% for banks and 13.68% for bank holding companies. This provision was higher than the CAR suggested by the Basel (BCBS) [25]. Thus, this measure strengthened the loss-absorbing capacity of systemically important institutions and provided an additional prudential buffer against the crystallisation of credit losses in the pre-pandemic period [25].

The Republic of Korea also introduced several temporary measures during COVID-19. For instance, the FSC introduced emergency lending and guarantee facilities for SMEs and small businesses, with a financial support package exceeding KRW 175 trillion [26]. It also extended the maturity date by one year and postponed principal repayment for one year [27]. The new financial support was for SMEs struggling with purchase-order payments. In addition, this relief was also provided to small merchants and the self-employed to help them cope with the pandemic's impact [27]. In addition, the government constantly strengthened efforts to monitor and prevent market-abusive activities in the capital markets. The emergency monitoring and response framework (EMRF) includes financial support, infrastructure, and a marketing team, and it was also effective in controlling NPLs [27].

Korean Asset Management Company (KAMCO) also played an important role as a permanent public asset-management and corporate-restructuring institution from 2015 to 2025 [28]. However, its role shifted from large-scale NPL acquisition towards preventive restructuring and market-based resolution. For instance, it supported the restructuring of financially distressed shipping companies and helped protect financial institutions' asset quality. It also expanded its Sale and Leaseback programme to provide liquidity to viable distressed SMEs [29]. The programme had supplied KRW 232 billion to 17 companies. In March 2018, KAMCO established the Corporate Structure Innovation Support Centre, connecting distressed SMEs with capital-market investors and providing loan acquisition, DIP financing and other restructuring support [30]. However, critics argued that KAMCO's performance was neither good nor bad because its high operating expenses wiped out its recovery efforts. Moreover, its efforts to maximise profits opened up new avenues for banks and financial institutions to manage their credits effectively [31].

In the post COVID-19 arena, financial stability in the Republic of Korea remains generally stable despite increased vulnerability in real estate, non-banking financial institutions, household mortgages, and corporate credit [31]. It was also highlighted that the capital adequacy ratio (CAR) and liquidity have remained favourable, with continuous improvements in financial institutions' resilience to prevent systemic risks. Therefore, the jurisdiction effectively strengthened liquidity management in vulnerable sectors and also polished business continuity plans [32]. This was possible due to enhanced monitoring of domestic and external developments in the financial sector and timely market stabilisation measures in the event of unexpected market turmoil [32]. Korea also developed a policy mix to prevent the expansion of financial imbalances in the medium to long term, implementing macroprudential policies proactively, consistently maintaining smooth funding conditions for temporarily vulnerable firms, maintaining close monitoring of borrowers and financial institutions, and identifying risks in non-bank financial intermediation and non-traditional financial instruments [33].

Thus, KAMCO established an institutional mechanism for distressed-asset restructuring and disposal, which substantially contributed to exceptionally low NPL ratios during 2015–2025. However, we may argue that despite continued success in resolving distressed assets since the Asian Financial Crisis in the late 90s, this success does not, by itself, establish that these efforts were the main determinant of low NPL ratios during the period under examination. We may conclude that improved borrower creditworthiness, prudential supervision, bank capitalisation and macroeconomic conditions have also contributed to this positive result [33]. Nevertheless, the Korean experience shows that asset management companies like KAMCO play significant roles in resolving and restructuring high NPLs, highlighting the need to recognize the importance of each resolution strategy that contributes to improved asset quality [22] [31]

Canada

The gross NPLs ratio in Canada remained below 1% during 2015-2025, with the lowest (0.33%) in 2022 and 0.71% in 2025, with an average NPLs ratio of 0.50% over the reference period. There was no significant variation in the NPLs ratio in Canada across these periods (pre-, during, and post-COVID-19). The NPLs ratio was relatively low immediately after the pandemic, recorded at 0.38% and 0.33% in 2021 and 2022 (Table 2). The six largest Canadian banks, which were Domestic Systemically Important Banks (D-SIBs), account for approximately 94% of banking-sector assets in Canada, and their credit performance remained strong while capital and liquidity buffers stayed above the regulatory minimums [34]. The capital buffers increased substantially and

remained high, at 15.2% in 2024, while NPLs were at their lowest**.** Therefore, the high capital buffers are proportionally related to NPLs ratio [34].

The Canadian government took several initiatives to address NPLs during this period which include conservative bank supervision, strong capital and liquidity buffers, stringent mortgage underwriting standards, macroprudential stress testing [35], the domestic stability buffer, and effective monitoring of household credit risks remained the key features. The IMF Financial Soundness Indicators provide a consistent measure of NPLs to gross loans for the Canadian banking sector. Policy emphasis therefore focused primarily on prudential supervision, capital adequacy, and mortgage-market surveillance, rather than resolving a large stock of legacy NPLs [34].

In the pre-pandemic period, stress tests were mandatory for high- and low-ratio mortgages and, from 2016 onward, were extended to all government-backed insured mortgages. The Canadian government and the Office of the Superintendent of Financial Institutions (OSFI) updated Guideline B-20 (Residential Mortgage Underwriting Practices and Procedures guidance), requiring Federally Regulated Financial Institutions **(**FRFIs) to conduct stress tests for uninsured low-ratio and fixed-rate mortgages with terms of five years or more [36]. The 2018 stress tests concluded that delinquencies decreased after the recent rise in interest rates. Stress tests also improve borrowers' resilience to financial shocks, such as large interest-rate increases [36]. Mortgage stress tests are important because they promote financial stability and help households manage the issue of mortgage payments without lagging behind on their credit obligations, even during challenging economic conditions [36].

During the COVID-19 pandemic, extensive payment deferrals and government support measures contained the immediate increase in arrears and NPLs. Canada's NPL resolution strategies were mainly preventive and resilience-oriented. The exceptionally low NPL ratios during the COVID-19 pandemic may be partly attributed to temporary payment-deferral programmes, which reduced immediate repayment pressure [37]. During the pandemic, 14% of homeowners with mortgages and 10% of renters have asked for deferrals on some kind of debt repayment. It was also found that 1 in 3 borrowers who asked for deferrals did so as a precaution or to repay other debt, not to manage income losses due to COVID-19 [37]. Payment deferrals during COVID-19, government income support, and monetary easing prevented a sharp increase in household and business defaults. Bank of Canada concluded that payment deferrals and policy support substantially limited the projected increase in arrears and NPLs [38].

However, a study suggests that only 7% of credit card revolvers chose to defer, while 24% deferred on their mortgage. Thus, actual savings were about 11% of the potential approximately $4 billion in interest over six months [38]. Therefore, low take-up rates suggest that Canadians left significant money on the table not taking the advantage of the debt relief programme**.** In addition, the government has launched a range of support programmes to help millions of households and businesses cover financial gaps. Moreover, the financial institutions were well capitalised to meet the financial challenges and remained 'flexible about debt repayments without risking their own solvency'. Therefore, the Canadian financial system continued to serve Canadians well through the pandemic as it did during the 2008–09 GFC [39].

In the post-pandemic period, particularly during 2023–2024, increasing interest rates also made consumer credit and the highly indebted household sector vulnerable. However, aggregate banking-sector NPLs did not deteriorate substantially by the end of 2024 [34]. Nevertheless, it was very difficult to contain NPLs due to increased interest rates, which also significantly influenced households' debt-servicing costs, particularly in a situation when mortgages were refinanced or repriced [34]. However, the IMF reported that mortgage delinquency in Canada remained extremely low, even as arrears in auto loans and installment loans rose above pre-pandemic levels, along with rising business insolvencies, including sole traders, partnerships, and companies [34].

As per the IMF report as of December 2024, the NPLs ratio in Canada was 0.6%, along with 0.2% mortgage delinquency and a 13% CET1 capital ratio. The jurisdiction had strong liquidity buffers to counter financial distress [34]. The IMF report also highlights that a marginal increase in NPLs (0.57%), was mainly due to credit card and auto loan borrowers who have obtained loans without mortgages. There was no broad-based deterioration of mortgage portfolios in the jurisdiction [34]. Thus, we may conclude that, due to a strong prudential regulatory framework, rigorous mortgage underwriting standards, proactive supervisory oversight, and robust capital requirements and stress testing, Canada could address the NPLs problem during the reference period effectively.

Sweden

The gross NPL ratio in Sweden varied from 0.30% in 2022 to 1.17% in 2015, with 0.63% average NPL ratio from 2015 to 2024. It has been noticed that in the pre-COVID-19 period, the NPLs ratio was relatively higher, and there was a significant decrease in NPLs after 2018. No significant variation was noticed in Sweden's NPL ratios during the pandemic and post-pandemic period

(Table 2, Figure 1). The Swedish case can therefore be presented as a 'prevention and resilience' model of NPL management**,** rather than an 'NPL clean-up' model**.** The regulatory response emphasised reducing probable NPLs through leverage controls and capital requirements. Efforts also focused on recognising credit deterioration through Expected Credit Loss (ECL), protecting banks against severe property-related risks [40]. Sweden also established a more explicit framework for purchasing and restructuring NPLs. This distinction is useful when comparing Sweden with Korea, Canada, and other countries where NPL resolution mechanisms and distressed-asset disposal played a more prominent role [41].

In August 2018 (pre-pandemic period)**,** Finansinspektionen [42] introduced a 25% risk-weight floor for Swedish mortgage exposures under Article 458(10) of the Capital Requirements Regulation (CRR) [43]. Finansinspektionen applied this measure to banks using the Internal Ratings-Based (IRB) approach. FI later extended the measure because the underlying risks of high household indebtedness and residential property prices remained significant. The banks were required to maintain greater capital against mortgage exposures. This reduced the risk that historically low mortgage loss rates and low model-generated risk weights would leave insufficient capital buffers if credit quality deteriorated [44].

The COVID-19 pandemic led to temporary measures designed to prevent temporary income disruptions from developing into widespread loan defaults. In March 2020, FI recognised COVID-related income losses as potentially constituting special grounds for exemption from mortgage amortisation [45]. In April 2020, banks were permitted to grant temporary amortisation exemptions to both new and existing mortgage borrowers, maintaining cash flow and reducing immediate repayment pressure [45]. This facility was available until 31st August 2021 to ensure recovery from the pandemic. In addition, Finansinspektionen also provided COVID-amortisation relief to individuals. Thus, this facility was available for all new and existing mortgagors, already experiencing income loss. The Swedish National Debt Office (SNDO) also provided payment relief for SMEs under a government loan scheme to maintain liquidity and avoid credit deterioration. Sweden also re-launched the temporary lending programme in 2020, virtually identical to the one during the GFC, although it includes a larger set of taxes eligible for deferral, such as value-added taxes [46].

Additionally, the Swedish Government introduced a corporate loan guarantee programme with a ceiling of SEK 100 billion, under which the state guaranteed up to 70% of qualifying new loans to

support the viable businesses affected by the pandemic [47]. The Riksbank complemented this initiative by offering banks funding of up to SEK 500 billion against collateral, conditional on supporting lending to non-financial companies, thereby helping to maintain the supply of corporate credit during the crisis. Moreover, government-backed loan guarantees and funding-for-lending programmes also helped sustain bank lending during the pandemic, particularly to SMEs [56].

Thus, this payment relief avoided defaults and prevented NPLs from piling up. The SNDO also extended the period for the banks to meet MREL [48] requirements to maintain credit supply. Therefore, at the end of 2020, the bank's subordinated liability was SEK63bn, representing 20.6% of total estimated issuance. The bank extended the subordination requirement deadline from 1 January 2022 to 1 January 2024**.** Thus, MREL provides additional loss-absorbing resources, and the bank can potentially be resolved without disrupting critical services even if NPLs increase [49]. In addition, the EBA COVID moratoria treatment was also applied to SME payments, avoiding their classification as forbearance.

Sweden, enacted Purchase and Servicing of Non-Performing Credit Agreements Act [50] by transposing the EU Non-Performing Loans Directive (EU) 2021/2167 [51] into Swedish law. The legislation sought to facilitate the development of a secondary market for NPLs by establishing a regulatory framework for their acquisition and servicing. The chap 2 requires credit institutions to provide relevant information on transferred NPLs and report such transactions to Finansinspektionen [51]. Chapter 3 establishes an authorization framework for credit servicers, and chap 4 introduces borrower-protection requirements, including fair treatment, transparency, and accessible complaint-handling procedures [51]. Thus, these provisions seek to facilitate the transfer and professional management of distressed credit exposures while strengthening regulatory oversight and borrower protection. However, critics argued that this agreement is not appropriate for a jurisdiction like Sweden, which already had a significantly low NPL ratio. Moreover, it facilitates creditors' mobility rather than addressing the structural problem related to NPLs [52].

Thus, during this period, Sweden adopted a predominantly prudential and market-oriented NPL management approach, combining regulatory supervision, temporary COVID-19 payment relief and government-backed lending support with measures to facilitate the transfer and servicing of distressed credit agreements. These interventions strengthened the banking-sector institutional framework for NPL disposal. The overall approach remained more focused on financial stability and market efficiency than on comprehensive borrower rehabilitation and preventing future loan defaults.

Norway

Non-performing loans (NPLs) in Norway peaked at 1.17% in 2016 and fell to 0.27% in 2022, before rising to 0.46% in 2024, with an average ratio of 0.69% over the eleven years. The NPL ratio was relatively low during COVID-19; however, it increased marginally over time (Table 2, Figure 1). Low NPLs in Norway mainly resulted from effective regulatory measures that restricted excessive household leverage, strengthened creditworthiness assessments, improved banks' capital adequacy, and enhanced early recognition of credit deterioration. In addition, employment conditions, household income, interest rates, and the composition of bank lending have influenced credit performance [53].

The Financial Supervisory Authority of Norway (FCA) (Finanstilsynet) introduced binding residential mortgage lending regulations in June 2015, building upon supervisory guidelines issued by the FCA in 2011 adopting a preventive approach. This regulation is important because it established requirements for mortgage loan-to-value (LTV) ratios, borrowers' debt-servicing capacity, and principal repayments [53]. This framework was further strengthened in January 2017 by introducing a maximum debt-to-income (DTI) ratio of five times gross annual income. In addition, it introduced restrictions on secondary residential properties, extending mandatory principal repayments to mortgages exceeding 60% LTV. The purpose of the strict measures was to restrain excessive leverage and reduce the chances of an increase in distress repayments [54].

The Survey Report of FCA (2019) revealed that new installment loans had an average DTI ratio of 343%, as 45% of such loans were granted to borrowers whose debt exceeded four times of their annual income [55]. Therefore, mortgage lending restrictions were not a sufficient deterrent, and the supervisory authority also noticed increasing concentrations of mortgage lending close to the maximum permitted DTI and LTV thresholds [64]. These results indicate that despite regulatory restrictions, with highly leveraged mortgage lending within permitted regulatory limits, the borrowers' vulnerability persisted, questioning the effectiveness of this measure.

Norway introduced several temporary macroprudential measures and government support to address distressed assets during the COVID-19 pandemic, resulting in a consistently low NPL ratio. [56]. This jurisdiction also reduced CCyB in March 2020 to provide additional capital to absorb potential loan losses and maintain sufficient credit supply [57]. However, rising interest rates and debt-servicing costs exposed the continuing vulnerability in highly indebted households and property-related borrowers. Moreover, in December 2020, mortgage and consumer-credit

restrictions were further consolidated and extended to other loan types from January 2023 [58]. The regulatory framework was further consolidated through the Lending Regulation, effective from January 2021.

The LTV ratio for installment mortgages remained 85%, and the home-equity credit line had a 60% ceiling during 2023–2024. Borrowers were required to show enough repayment capacity if interest rates rose to 7%. The maximum DTI ratio during this period was 500% of gross annual income. Therefore, the principal repayment requirements continued to apply to mortgages with LTV ratios exceeding 60%, which indicates that Norway adopted a preventative framework that focused on improving the borrower's capacity to absorb financial shock [58].

Norwegian banks maintained strong capital buffers to address non-performing loans and keep their ratios relatively low. The Financial Stability Report (2025) highlighted high household indebtedness and exposure, as well as commercial real estate, as continuing sources of financial susceptibility. Therefore, the government amended the Lending Regulations [59]. It has provisions to increase the LTV ratio for residential mortgages from 85% to 90%, to take effect from 31 December 2024 [60]. The DTI ceiling of five times gross annual income has also been retained. It also modified the debt-servicing assessment to recognise the risk-reducing characteristics of fixed-rate mortgages [59]. These measures demonstrate that Norway's macroprudential framework was adaptive rather than uniformly restrictive.

In the Norwegian banking system, the CCyB has also remained an important measure to ensure banks hold sufficient capital during crises. It helps banks build additional capital and avoid financial vulnerability [59]. Therefore, it also allows authorities to release capital during economic downturns, supporting banks facing hardship through appropriate measures. For instance, to counter the pandemic shock, the CCyB was reduced from 2.5% to 1.0% to support banks' capacity during COVID-19. Nonetheless, the buffer was subsequently rebuilt, returning to 2.5% with effect from 31st March 202[61]. The restoration of CCyB indicates a preventive focus that helped address the deterioration in asset quality. This also helps banks maintain a smooth credit supply and absorb losses.

Norway also strengthened structural capital requirements through a 4.5% systemic risk buffer for domestic exposures and minimum average risk-weight floors for banks using internal ratings-based models. From the end of 2020, Norway applied a 20% average minimum risk-weight to residential mortgage exposures and a 35% risk weight to commercial real estate exposures. Subsequently,

the residential mortgage weight increased to 25%, and the commercial real estate weight was maintained at 35% from 1 July 2025 onwards [62]. These measures were applied so that banks remained sufficiently capitalised against property-related risk where internal risk models might generate relatively low risk weights [62]. These measures are highly relevant to managing NPLs effectively, as they strengthen banks' loss-absorbing capacity rather than directly reducing the incidence of impaired loans.

In addition, Norway also implemented the International Financial Reporting Standard 9 (IFRS 9). A thematic inspection of nine Norwegian banks assessed their implementation of IFRS 9 credit-loss recognition requirements, including the application of impairment models and related financial disclosures [63]. IFRS 9 strengthened the framework for identifying and provisioning against credit deterioration. Therefore, the early recognition of expected losses may improve risk management and supervisory transparency [63]. In addition, Norway implemented the EU Bank Recovery and Resolution Directive (BRRD) through Chapter 20 of the Financial Institutions Act [64].

This also made the national resolution authority responsible for preparing resolution plans and setting minimum requirements for own funds and eligible liabilities (MREL). This framework is also an important tool for recovery planning, bail-in, and other resolution measures to preserve banking functions and allocate losses to shareholders and creditors [64]. Norway's experience between 2015 and 2025 demonstrates the importance of combining preventive credit regulation with banking-sector resilience and effective recovery and resolution arrangements to maintain relatively low NPLs. Therefore, lending restrictions and stress testing helped contain credit risk at origination, while capital requirements and early recognition of credit deterioration strengthened banks' capacity to absorb financial shocks. However, low NPL ratios cannot be attributed solely to these regulatory measures. The correlation between economic conditions and NPLs also influences credit performance. Therefore, an integrated regulatory framework that addresses both the prevention and resolution of NPLs cannot be ignored.

Switzerland

Switzerland's regulatory and policy response to NPLs during 2015–2025 was predominantly preventive and resilience-oriented, rather than centred on resolving accumulated distressed loans. The Swiss banking sector maintained relatively low reported NPL ratios throughout the reference period, ranging from 0.64% in 201919 to 0.83% in 2024, with an average of 0.72% (Table 2 and Figure 1). Key measures Switzerland took to maintain such a low NPL ratio included mortgage-

lending standards, amortization requirements, the CCyB, effective prudential supervision, and timely recognition of credit deterioration [65]. In addition, the consistently low NPL ratio also reflects other associated factors in the jurisdiction, including borrower characteristics, employment conditions, property-market developments and the composition of Swiss banks' loan portfolios [66].

Swiss Bankers Association (SBA) introduced a self-regulation framework for the mortgage lending system, duly recognized by the Swiss Financial Market Supervisory Authority (FINMA) as binding minimum standards [67]. This supervisory framework required borrowers to contribute sufficient equity and amortize their mortgages, and to assess creditworthiness, thereby reducing leverage and limiting potential losses in the event of default. The amortization standards were further strengthened in 2014, and remained applicable until 2021. Therefore, Switzerland relied on principles-based affordability assessment measures rather than uniform, legally prescribed quantitative DTI limits [68].

Switzerland strengthened the regulatory framework in August 2019 when FINMA recognised amendments to the SBA's mortgage-lending standards for investment properties. This provision took effect on 1 January 2020. The minimum equity contribution for relevant investment-property mortgages was increased from 10% to 25%, while the period for amortization of the majority of the property's lending value (two-thirds) was reduced from 15 to 10 years. The purpose of these measures was to address growing vulnerabilities in investment-property lending and reduce the accumulation of highly leveraged mortgage exposures [69]. One limitation of this reform was that it did not cover privately owned buy-to-let properties, which also posed potential credit risk. Moreover, the revised rules applied to new lending rather than automatically reducing leverage in existing mortgage portfolios. Therefore, this measure was not regarded as sufficient to eliminate systemic mortgage risk [69].

Switzerland not only adopted preventive mortgage regulation but also used prudential capital requirements to strengthen banks' loss-absorbing capacity in the event of credit deterioration [70]. Therefore, Article 1 (1) (2) of the Capital Adequacy Ordinance stressed that 'banks should mitigate risks appropriately and maintain adequate capital commensurate with their business activities and risks, covering credit, market and operational risks'[70] In addition, FINMA also included additional capital requirements and adjustments to risk models where property-related exposures warranted closer scrutiny. These measures were particularly relevant because Swiss banks' extensive

mortgage exposures could produce significant losses if property values fell or widespread borrower defaults occurred [70].

The sectoral countercyclical capital buffer (CCyB) provision in Articles 42 and 43 was maintained at 2% of relevant residential mortgage risk-weighted exposures during 2015–2019. It aimed to increase banks' resilience against risks arising from the mortgage and residential property markets. Switzerland countered the impact of COVID-19 by suspending the capital buffer requirement in March 2020 and this eventually gave banks greater flexibility to extend credit during the economic disruption [71]. Such measures were seen as the countercyclical function of prudential regulation, supporting credit availability. Nevertheless, the measure did not directly improve borrowers' underlying repayment capacity or restructure impaired loans. However, banking sector resilience and maintaining an appropriate credit supply to reduce risk were the main factors in keeping the NPL ratio low [71].

Another equally important credit impairment treatment was IFRS 9, which introduced forward-looking expected-credit-loss accounting internationally in January 2018, and all Swiss banks were required to apply IFRS 9. In November 2019, FINMA adopted revised accounting requirements through the FINMA Accounting Ordinance and the associated Accounting–Banks circular, which became effective on 1 January 2020. These reforms introduced differentiated approaches to recognising expected losses, inherent default risks and latent default risks, depending on the category and accounting framework of the institution [72]. The reforms strengthened the regulatory treatment of credit deterioration but did not establish a uniform IFRS 9 model across the Swiss banking sector. However, these accounting reforms need critical assessment to recognize them as a mechanism for absorbing credit deterioration rather than as a direct instrument for reducing and managing low levels of NPLs [73].

Therefore, Switzerland's response to the COVID-19 pandemic included macroprudential flexibility along with extensive liquidity and credit-support measures [74]. In March 2020, the Federal Council introduced a federally guaranteed bridging-loan programme to assist businesses experiencing liquidity shortages. This programme effectively allowed eligible enterprises to obtain emergency credit with the help of banks and also supported them to meet operating expenses during the disruption [74]. The Swiss National Bank (SNB) complemented this intervention by establishing the SNB COVID-19 refinancing facility in March 2020 [74]. This arrangement was highly effective, helping banks obtain central-bank liquidity against eligible credit claims, including federally

guaranteed COVID-19 loans. The main purpose of this scheme was to support the rapid provision of credit and reduce liquidity constraints [75]. These interventions helped maintain low NPLs during the pandemic by providing temporary liquidity assistance to banks, enabling them to help viable borrowers avoid repayment difficulties.

Therefore, FINMA's role in continuously identifying vulnerabilities in residential and investment-property lending is highly important [76]. Efforts such as mortgage affordability assessments and a focus on information asymmetry to identify gaps in assessing risks in outstanding mortgage portfolios are also control measures to keep NPLs consistently low [76]. Therefore, Switzerland also emphasized on supervisory stress-testing because it was presumed that severe real estate crisis involving sharp property-price corrections could generate losses amounting to tens of billions of Swiss francs. It was pointed out that in the stress test, half of the banks could not meet minimum capital requirements under the adverse scenario [76]. This indicates that a low NPL ratio does not guarantee low potential credit losses or the absence of systemic vulnerability.

Therefore, relatively low NPLs in Switzerland during the reference period (2015–2025) should be understood in light of mortgage concentrations, borrower affordability, collateral valuations, and the potential consequences of a property-market action [76]. Therefore, it reflects preventive mortgage regulation, capitalization, credit loss recognition, and crisis-related liquidity support. Thus, mortgage self-regulation and amortization requirements reduced excessive leverage and capital requirements, and CCyB strengthened banks' capacity to absorb credit losses, while accounting reform identified systemic credit deterioration. On the other hand, during COVID-19, credit guarantees, central-bank refinancing and the temporary release of capital buffers provided additional support to borrowers and financial institutions [77]. Therefore, evidence suggests that low NPL ratios reflect the effectiveness of extensive distressed-asset resolution [78].

Australia

Australia also had a low NPL ratio, but it was relatively higher than all the other jurisdictions, with an average NPLs ratio of less than 1%. The NPLs ratio in Australia varied from 0.72% in 2022 to 1.11% in 2019, with an average NPLs ratio of 0.92%. There was no significant variation in the NPLs when we compared them with three phases including pre-during and post COVID-19 (Table 2 and Figure 1). Australian Prudential Regulation Authority **(**APRA) primarily focused on reducing the probability of default through macroprudential intervention, strengthened underwriting standards, enhanced credit-risk governance and robust bank capitalisation [79] Moreover, APRA also

imposed restrictions on investor and interest-only mortgage lending between 2014 and 2018 to control higher-risk credit expansion and strengthen banking-sector resilience. APRA's prudential regulatory measures also strengthened accountable lending practices and reduced risky new mortgage lending [80].

APRA introduced a supervisory benchmark restricting annual investor housing credit growth to 10% in December 2014. It also strengthened its oversight of higher-risk mortgage lending, particularly loans involving high loan-to-value ratios, interest-only repayment arrangements and elevated borrower indebtedness [79]. In 2017, APRA introduced a 30% cap on the proportion of new interest-only residential mortgage lending. These measures sought to curb higher-risk mortgage lending and reinforce prudent underwriting standards [81]. These measures remained highly effective, largely because growth in higher-risk lending (investor lending) fell 3% by the end of 2018, compared with the 10% supervisory benchmark. The share of new interest-only lending also declined sufficiently for APRA to remove its 30% benchmark [79].

Like other jurisdictions worldwide, Australia adopted temporary repayment deferrals and prudential relief to assist borrowers experiencing financial difficulties due to COVID-19. Therefore, in March 2020, APRA permitted eligible repayment deferrals to be excluded from arrears calculations for specified capital adequacy and regulatory reporting purposes. This treatment was further extended to a maximum of ten months from the commencement of a deferral or until 31 March 2021, whichever occurred first. APRA also introduced temporary regulatory treatment for eligible restructured loans, while requiring banks to assess borrowers' financial conditions and recognise permanent impairment where appropriate [82]. Therefore, these measures provided temporary relief to borrowers and supported loan restructuring; nevertheless, it was argued that these reporting concessions delayed visibility of repayment difficulties in reported NPLs, which may have adverse effects in the future [83].

APRA increased the minimum mortgage serviceability assessment buffer from 2.5 to 3 percentage points in 2021, enhancing it above to the applicable mortgage interest rate and aiming to address the problem of rising household indebtedness and systemic risks [84]. It also reduced the maximum borrowing capacity of potentially defaulting borrowers and those seeking loans despite having reached their maximum borrowing limits. This provision remained effective, as it helped creditors assess debtors' repayment capacity at less adverse interest rates. It also provides protection against future increases in debt-servicing costs and deterioration in the financial conditions of debtors [85]. Therefore, despite higher borrowing costs, APRA continued this requirement until

December 2023 because NPLs increased marginally. In addition, APRA also increased the CCyB by 1% of risk-weighted assets to strengthen banks' capacity to absorb losses and maintain smooth credit supply [85]. Thus, the capital requirements significantly influenced banks' risk-taking capacity. However, the regulator's main focus remained on mitigating credit deterioration and its effect on the economy rather than directly impacting NPL ratios [86].

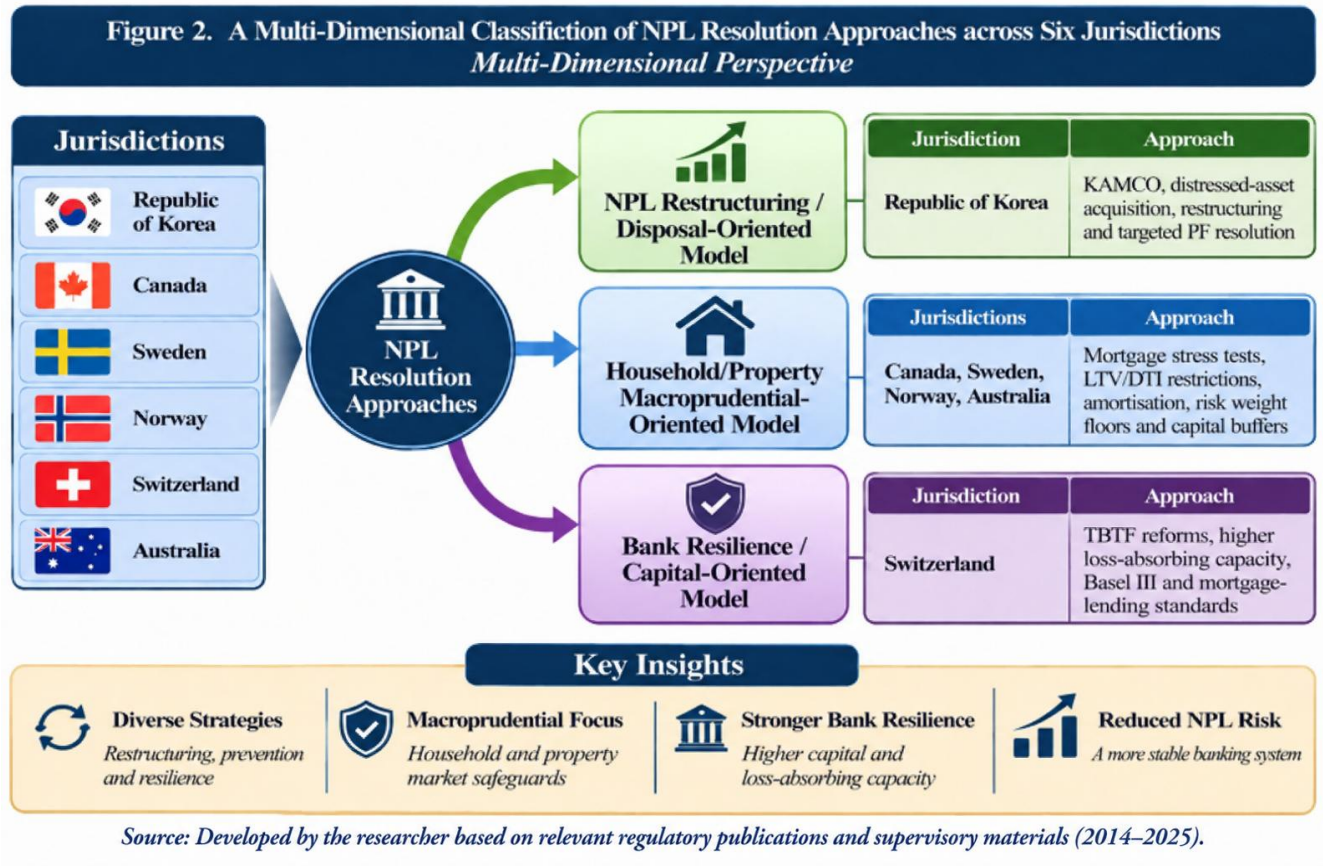
Strong labour market conditions and household liquidity buffers had contributed to borrowers' repayment capacity. By June 2024, Australia maintained a high CET1 ratio of 12.7%, providing substantial capacity to absorb credit losses. The increase in the NPL ratio to 1.1% in 2024 suggests that regulatory intervention cannot fully protect banks from macroeconomic shocks, particularly those arising from higher interest rates and inflation [87]. An in-depth study of macroeconomic and bank-specific determinants will further clarify how they affect NPLs.

Therefore, during 2015–2025, results-oriented macroprudential and supervisory interventions improved mortgage-lending quality, contained excessive household indebtedness, and strengthened banking-sector resilience. In addition, APRA, the RBA, and the Council of Financial Regulators adopted a preventive approach to emerging risks in residential mortgage lending. The examination of bank-level panel data revealed that macroprudential restrictions on investor and interest-only mortgage lending significantly reduced NPLs, partly through higher mortgage interest rates [88]. Nonetheless, the withdrawal of both temporary benchmarks in 2018 and improvements in lending practices shows the adaptive nature of Australian prudential supervision [89]. Therefore, Australian experience supports an integrated approach to NPL prevention and management while demonstrating the importance of distinguishing regulatory effectiveness from favourable economic circumstances [88].

Comparative analysis

Now, we present a comparative analysis of the regulatory and policy interventions adopted by the jurisdictions across different phases from 2025 to 2025 (Figures 2 and 3). These jurisdictions primarily focused on the NPL restructuring and disposal model (Republic of Korea), the macroprudential-oriented model (Canada, Sweden, Norway, and Australia), and the bank resilience/capital model (Switzerland). The Figure 3 provides more clarity while presenting a multidimensional comparative overview of the regulatory, policy and supervisory approaches adopted by these jurisdictions in pre- during and post COVID-19 to address the NPLs problem.

In the pre-COVID-19 phase, the Republic of Korea tightened LTV and DTI requirements and expanded the DSR-based lending assessment across banking and non-banking FIs [23]. OSFI B20 guidelines, mortgage stress testing, and stronger capital buffers remained important regulatory and policy responses in Canada [36], whereas Sweden introduced mortgage amortization requirements and 25% risk-weighted floors [42], while Norway tightened mortgage lending regulations, providing an 85% LTV and a five-times-income debt ceiling [54]. In addition, Norway also increased CCyB by 2% and strengthened bank capital requirements. Similarly, Switzerland maintained a 2% sectoral CCyB on residential mortgage exposure and also strengthened mortgage self-regulation and bank capital requirements. APRA in Australia strengthened mortgage lending supervision, effectively restricted excessive interest-only and investor lending, and enhanced mortgage serviceability assessment [79].



During COVID-19 (see Table 3), the major focus across these jurisdictions was temporarily deferring mortgage repayments and interest payments. For instance, the Republic of Korea extended loan maturities and deferred interest payments for eligible SMEs, and introduced government-backed credit guarantees and temporary prudential flexibility [27]. Canada reduced the

buffer from 2.25% to 1% besides deferring mortgage repayments, restricting dividend distributions and share buybacks [39] [90]. On the other hand, Sweden reduced CCyB to 0%, exempting borrowers from mortgage amortization, and introduced government-backed business loan guarantees [46]. Norway also reduced CCyB from 2.5% to 1%, along with temporary mortgage regulatory flexibility and government-backed business loan guarantees to address NPL-related issues [91]. Switzerland focused on releasing sectoral CCyB, loan guarantees, and temporary regulatory flexibility [71]. Australia also permitted temporary mortgage repayment deferrals and regulatory flexibility in capital and reporting requirements [82].

Figure 3: Comparative Regulatory, Policy and Supervisory Measures (2015–2025)

Jurisdiction	Pre-COVID-19 (2015–2018) *Preventive Strengthening*	During COVID-19 (2019–2020) *Support and Flexibility*	Post-COVID-19 (2021–2025) *Restore and Reinforce*
Republic of Korea	• LTV/DTI tightening, DSR introduced (2018) • Enhanced liquidity requirements	• Financial and credit support • Loan repayment relief	• Stronger DSR framework • Household debt management
Canada	• Mortgage stress testing (B-20, 2018) • Domestic Stability Buffer	• DSB reduced to 1% (2020) • Government lending support	• Qualifying rate at 5.25% floor (2021) • Continued B-20 supervision
Sweden	• Amortisation requirements (2016) • DTI-based measures (2018)	• CCyB reduced to 0% (2020) • 70% government guarantees	• CCyB restored to 2% (2023) • Mortgage risk-weight floor
Norway	• Lending Regulation (2015) • LTV and affordability rules	• CCyB reduced from 2.5% to 1% • Temporary lending flexibility	• Lending Regulation retained (2023) • 7% or 3-point interest stress test
Switzerland	• Mortgage self-regulation • Stricter investment-property rules	• Mortgage CCyB deactivated (March 2020)	• Mortgage CCyB reactivated (2.5%) • Basel III implementation
Australia	• APRA prudential measures • Responsible lending standards	• Loan repayment deferrals • Supervisory flexibility	• Serviceability buffer increased (2021) • Stronger credit-risk assessment

Key Objectives Across All Jurisdictions

Prevent excessive credit growth	Strengthen capital and liquidity resilience	Support borrowers and viable businesses	Enhance asset-quality monitoring	Reduce the risk of future NPL accumulation

Source: *Developed by the researcher based on OSFI (2018); Bank of Canada (2018); APRA (2018); Finansinspektionen (2015); Finanstilsynet (2015); FINMA (2018); Reserve Bank of Australia (2018); OECD (2021).*

The post COVID-19 approach (Figure 3) was to strengthen the financial position in the banking sector, and accordingly, Korea introduced stricter requirements for DSR and also introduced a mechanism for monitoring household debt and a borrower restructuring programme [26]. Canada retained the mortgage stress test, raising the qualifying rate to 5.25% or the contractual rate above 2%, whichever is higher, and strengthened mortgage underwriting and supervisory monitoring [35]. Sweden also restored CCyB to 2% and increased the residential mortgage risk-weight floor to 25%

and retained 35% for commercial real estate from July 2025 [92]. Switzerland increased CCyB to 2.5% and also implemented revised Basel standards [93], while Australia increased mortgage servicing buffers by 3 percentage points, strengthening capital standards and supervisory monitoring of household debt and commercial property exposure [94]. However, in-depth analyses of macroeconomic and bank-specific determinants (which the authors intend to analyze in the coming paper) also play an important role alongside these measures [95].

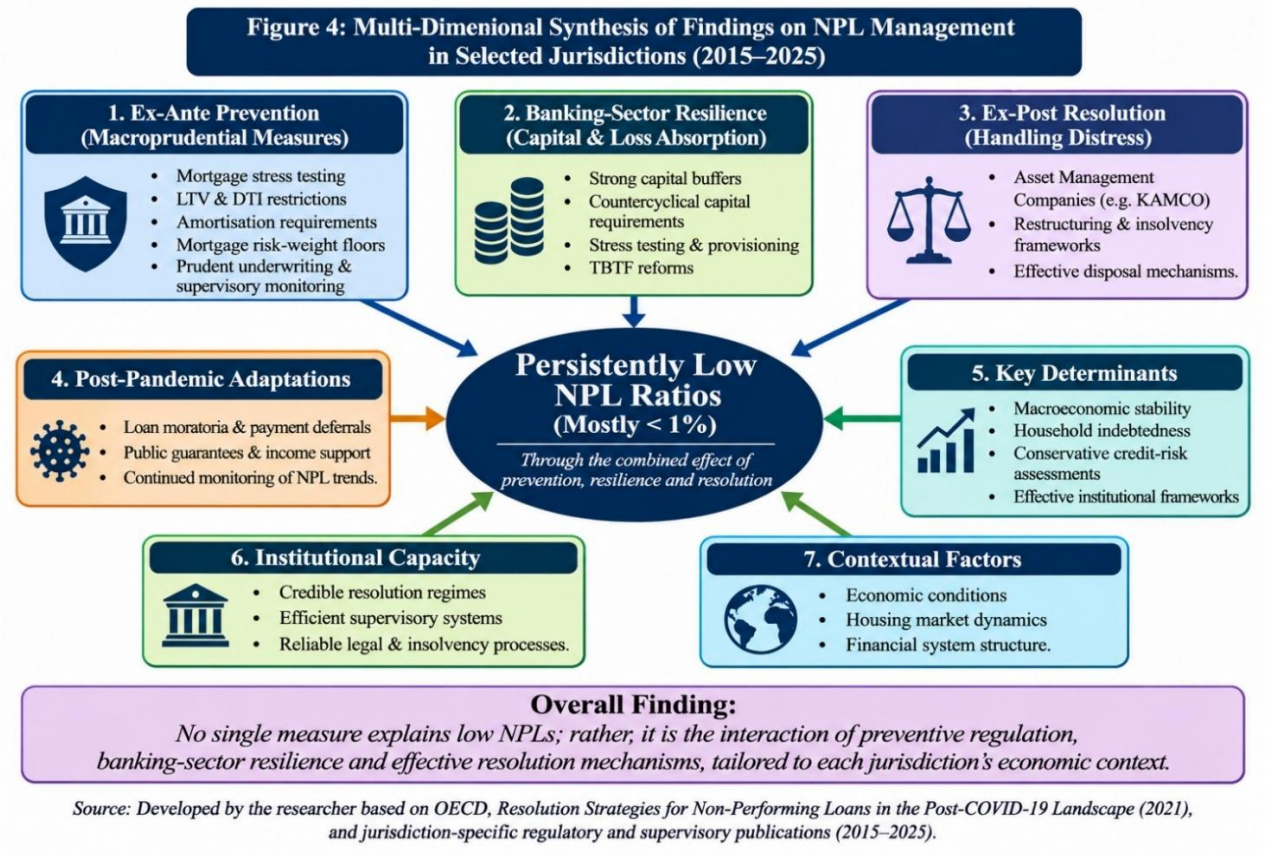
Findings of the study

A critical examination of these measures suggests that persistently low NPLs resulted not from a single NPL-specific intervention, but from a combination of interventions, prudential controls, conservative credit-risk assessment, capital adequacy, and institutional mechanisms to restructure and dispose of distressed assets. However, these jurisdictions' experience raises an important distinction between genuine credit-risk prevention and the temporary suppression or postponement of reported financial distress, such as during COVID-19. However, evaluating the sustainability of low NPL ratios requires critical examination of asset quality and associated support measures [37]. The synthesis of the research findings is discussed below, and Figure 4 presents them effectively.

- ***Patterns in NPL ratios (2015–2025):*** NPL ratios remained below 1% for most years, although some annual observations exceeded that threshold. For instance, Korea recorded the lowest reported ratio in the comparative series (0.23% in 2021). Sweden and Norway began the period with ratios above 1% and subsequently declined, whereas Australia reached 1.11% during the pandemic in 2020, suggesting that, on average, NPLs were below 1% across jurisdictions over the reference period. The data also indicate marginal deterioration in NPLs in some jurisdictions after the pandemic, including Canada and Korea (Table 2).
- ***Ex-ante prevention of credit deterioration:*** This research also finds that effective implementation of preventive prudential regulations remained a common feature in Canada, Sweden, Norway, and Australia. Thus, there has been a positive association between the implementation of mortgage stress testing, LTV and DTI restrictions [54], amortization requirements [46], mortgage risk-weight floors [42], underwriting standards, and supervisory monitoring and asset-quality deterioration. Therefore, early identification of deterioration and effective implementation of these measures were the key to the low NPLs throughout the reference period.
- ***Banking-sector resilience and loss absorption:*** It is also revealed that **s**trong bank capitalisation, capital buffers, stress testing and provisioning enhanced the capacity of

institutions to prevent credit losses without threatening solvency. For instance, Switzerland recognized the importance of capital and loss-absorbing requirements for systemically important banks, compared with mortgage-lending standards and comparable resilience measures in other jurisdictions [68] [76]. We may argue that capital adequacy reduces the impact of default rather than necessarily preventing a loan from becoming non-performing. Therefore, consistently low NPL should not be directly associated with an absence of systemic vulnerability, particularly where mortgage exposures, commercial real estate, and non-bank financial intermediation play significant roles [5].In this regard, Switzerland's capital adequacy, too-big-to-fail (TBTF) reforms, and loss-absorbing requirements contributed to banking-sector resilience, despite weaknesses in mortgage lending and real-estate markets.

- ***Ex-post restructuring and distressed-asset resolution:*** The institutionalized resolution of distressed assets was also an important measure, as in the Korean example with KAMCO and corporate restructuring, which was the best example from the Republic of Korea. Asset Management Companies effectively facilitate acquisition, restructuring, and disposal of impaired assets and complement ex-ante supervision [30] [31]. However, we may argue that KAMCO alone did not drive low NPL ratios in Korea during 2015–2025. The Korean case highlights the importance of credible resolution-instrument measures as part of regulatory frameworks [20].
- ***A shift from responsive NPL resolution towards an integrated preventive and resolution framework***: This research has also identified that the main focus remained on preventing the deterioration of loans and addressing large stocks of impaired assets. However, credible restructuring, insolvency, and distressed-asset disposal mechanisms remain essential to manage credit deterioration when preventive measures are insufficient.



Source: Developed by the researcher based on OECD, Resolution Strategies for Non-Performing Loans in the Post-COVID-19 Landscape (2021), and jurisdiction-specific regulatory and supervisory publications (2015–2025).

- ***Post-pandemic developments reveal differences in the resilience of national banking systems:*** During COVID-19, 'loan moratoria, payment deferrals, public guarantees, and temporary income support' remained very effective interventions to reduce immediate repayment pressures and prevent liquidity constraints [96]. NPLs in the Republic of Korea remained exceptionally low, while Canada and Switzerland saw a modest increase. The research suggests that historically strong banking systems remain exposed to changing macroeconomic conditions.
- ***Macroeconomic Conditions, institutional capacity, and contextual factors:*** Regulatory, supervisory, and policy responses and treatments alone cannot maintain a consistently low NPLs ratio. Assessment of macroeconomic determinants and their impact on NPLs is also important [9] [11]. In addition, a credible resolution regime, an effective role for supervisory agencies such as central banks, and reliable legal processes are also important. The economic conditions of a particular jurisdiction and housing market dynamics across the globe over time are also important. The researcher intends to cover them in detail in the next paper.

- ***No single regulatory or policy intervention adequately explains persistently low NPL ratios:*** Finally, this research suggests that the three models adopted by these jurisdictions for restructuring and resolving distressed assets were the key approaches. However, their relative importance varied across jurisdictions, indicating that effective NPL resolution depends on integrating regulatory measures, institutional arrangements, and a jurisdiction's economic conditions.

Conclusion

This study examined the regulatory, supervisory, and policy measures associated with persistently low NPL ratios across six jurisdictions during 2015–2025, encompassing the pre-COVID-19, pandemic, and post-pandemic periods. The findings show that maintaining sound bank asset quality does not necessarily result from an extensive distressed-asset resolution program. It is associated with the combined application of preventive macroprudential regulation, prudent credit-risk management, adequate bank capitalization, effective supervisory oversight, and institutional mechanisms for restructuring distressed assets.

The research revealed that these jurisdictions have adopted three different strategies to control NPLs. For instance, Canada, Sweden, Norway and Australia predominantly adopted preventive macroprudential frameworks, emphasizing mortgage underwriting standards, borrower-based lending restrictions, capital buffers and continuous supervisory monitoring. The focus of Switzerland remains on ensuring capital adequacy, loss-absorbing requirements, and enhanced prudential supervision. The Republic of Korea combined preventive regulation with institutionalised distressed-asset restructuring and disposal mechanisms, with the effective use of AMCs, particularly through KAMCO. The success of distressed loan restructuring and disposal depends on several factors, including banking system resilience, institutional capacity, and exposure to financial risk, besides the economic conditions of a particular jurisdiction.

We may conclude that all jurisdictions adopted largely the same measures during the COVID-19 pandemic. Thus, despite unprecedented economic disruption, these jurisdictions avoided substantial increases in NPLs through temporary repayment deferrals, loan moratoria, government guarantees, liquidity assistance and supervisory flexibility. However, the findings also suggest that temporary forbearance may delay recognition of impaired loans, creating a gap between reported asset quality and underlying credit risk. The analysis of post-pandemic developments revealed that challenges in the banking sector persist due to inconsistent interest rates, household indebtedness,

commercial real estate exposures, and vulnerabilities in non-bank financial institutions. These challenges also persist in the jurisdictions with consistently low NPL ratios during the reference period.

Finally, we may conclude that, from a policy perspective, an effective NPL management framework should integrate these three models vis-à-vis NPLs, ex-ante prevention (macroprudential measures), banking sector resilience(capital loss absorption) and post-resolution (handling distress through institutional mechanisms) to address the problem of NPLs by analysing credit risk assessment, provisioning, and effective oversight to identify vulnerabilities, etc. that may threaten financial stability. This scholarship may be particularly relevant to the jurisdictions experiencing persistently high NPL accumulation. Nevertheless, their domestic legal, institutional, and economic conditions are also very important and cannot be ignored. This research also aims to extend its investigation to jurisdictions with moderate to critical NPLs ratios and to capture the impact of macroeconomic factors, which remained an important limitation.

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