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Country Case Studies on Resolving Problem Loans in Asia: Crises, Policies, and Institutions

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5.1 Introduction

The impact of the 1997–1998 Asian financial crisis warranted a proactive approach from crisis-affected countries in addressing the problem of nonperforming loan (NPL) proliferation. To manage and dispose of bad assets during the crisis, most Asian economies relied on centralized public asset management companies (AMC) as a key strategy. Authorities also restructured financial sectors at the onset of the crisis to facilitate effective government bank bailouts that only benefited solvent and healthy financial institutions. Also central to strategies for reducing NPLs, many Asian governments reformed insolvency laws and established out-of-court workout mechanisms to assist debt restructuring. Finally, governments strengthened financial institution supervisory bodies and tightened prudential regulations to curb the buildup of risks.

Despite substantial Asian NPL history, empirical studies on Asian resolution cases are lacking in documenting the effectiveness of the region's policies for reducing NPLs during banking crises and mitigating NPL growth amid banking stability. The Asian experience during and after the Asian financial crisis has been largely discussed through case studies, such as in Fung et al. (2004a); Kim, Kim, and Ryoo (2006); and Fujii and Kawai (2010).

This chapter contributes to the NPL reduction literature in two ways. First, it constructs case studies of Asia's NPL reduction policies implemented by selected ASEAN+3 economies resting on four main pillars: operation of AMCs, financial sector restructuring and bailouts, insolvency frameworks,

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and prudential measures during and after the Asian financial crisis.[2] These case studies are also the basis for constructing the novel dataset of NPL reduction policy dummy variables used in the analysis. Second, the study analyzes the effectiveness of reduction policies using a dynamic panel dataset of 78 financial institutions from six Asian countries during 2002–2017 in an effort to close the empirical gap in Asian NPL reduction studies.

The empirical results indicate that the most effective policy for reducing NPLs is to establish centralized public AMCs. Although government bank bailouts also have a significant impact, the results are not robust when analyzed using different bank-level indicators. The results suggest that public AMC operations are effective during banking crises as well as to reduce bank-level NPLs amid banking stability by providing a feasible platform for NPL transactions.

The next section reviews the literature on the determinants of NPLs and the effectiveness of reduction policies. The chapter summarizes the four main pillars of NPL resolution in Asia, and describes the data and provides the empirical and theoretical framework used to identify the best NPL reduction measures implemented in the ASEAN+3 region, and presents the results of the empirical analysis.

5.2 Literature Review

Empirical evidence on the effectiveness of NPL reduction programs and policies in Asia are relatively scarce in comparison to the traditional NPL literature, which studies the determinants of NPLs. Existing literature tells us that NPL cycles are closely related to external macroeconomic factors and micro-level bank-specific performance indicators. While many empirical studies examine the effect of macroeconomic factors (Quagliariello 2009; Mohaddes, Raissi, and Weber 2017) and bank-level indicators individually (Berger and De Young 1997), others have chosen to illustrate the interplay between the two factors. Salas and Saurina (2002) use the generalized method of moments (GMM) method to estimate the interplay of macroeconomic variables and bank-level indicators on the NPLs of commercial and savings banks in Spain from 1988 to 1997. They illustrate that while commercial bank NPLs are more susceptible to changes in the economic cycle, savings banks are more affected by bank-level indicators, due to the historical differences in the customer base of commercial banks (firms) and savings banks (families).

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[2]   ASEAN+3 includes the members of the Association of Southeast Asian Nations plus the People's Republic of China, Japan, and the Republic of Korea.

Similarly, Louzis, Vouldis, and Metaxas (2012) replicate this methodology and apply it to the dynamic panel data of Greece's nine largest banks from the first quarter (Q1) of 2003 to Q3 2009. They show that management effectiveness (return on equity [ROE]), leverage (loans-to-assets [LA] ratio), and operating inefficiency were significant explanatory factors when applied alongside macroeconomic variables—gross domestic product (GDP) growth, unemployment, and real lending rates.

Klein (2013) extends the existing dynamic panel methodology regionally. Using difference GMM and system GMM, he analyzes 135 banks in Central, Eastern, and Southeastern Europe from 1998 to 2011. The chapter verifies the "bad management" and "moral hazard" hypotheses—originally proposed by Berger and De Young (1997)—by illustrating the negative relationship of ROE and the equity-to-assets ratio (EA) on NPLs, respectively. The study also verifies the positive relationship of increasing leverage on bank-level NPLs using LA and the loan growth rate.

Similar to previous studies, Ari, Chen, and Ratnovski (2019) highlight how a strong pre-crisis economy and well-managed and profitable banking and corporate sector lead to better NPL management. Using ordinary least squares (OLS) in conjunction with a "post rigorous least absolute shrinkage and selection operator" selection method, the study analyzes NPL dynamics in 88 banking crises since the 1990s. The study illustrates that GDP per capita alongside strong banking and corporate sector conditions reduce the likelihood of elevated NPLs. Findings also suggest that floating exchange rates help cushion real and financial shocks and help with banking sector and economic recovery. Finally, the study suggests that higher pre-crisis growth, exchange rate depreciation, and high bank profitability and good management aid the likelihood of NPL resolution.

However, the traditional NPL literature has been instrumental in the development of empirical studies on NPL reduction. Building on existing NPL determinant literature, Consolo, Malfa, and Pierluigi (2018) improve existing panel data models by including the quality of insolvency frameworks as an additional explanatory variable. The study constructs a novel Insolvency Framework Index based on the average of four variables from the World Bank's Doing Business Survey that measures: (i) the strength of legal rights in getting credits, (ii) the cost of resolving insolvency, (iii) the time needed to enforce contracts, and (iv) the cost of enforcing contracts. Using a simple time-fixed effects model, the study analyzes 41 countries from the European Union and Organisation for Economic Co-operation and Development.

The results illustrate that better insolvency frameworks expedite NPL reduction and lower NPL proliferation during severe economic crises.

Similarly, Wolski (2014) uses six resolving-insolvency and enforcing-contract variables derived from the World Bank's Doing Business Survey as additional NPL determinants. Using country-level data from 18 Economic and Monetary Union members, the study uses a fixed-effects estimation and finds that while all three enforcing contract variables are insignificant, resolving insolvency variables—cost of insolvency and recovery of insolvency—are positively and negatively related to the change in NPL stock, respectively.

Related studies by Balgova, Plekhanov, and Skrzypińska (2017) and Plekhanov and Skrzypińska (2018) construct a (i) novel database of NPL ratios from 1990 to 2015 covering more than 190 countries and a (ii) novel dataset of NPL reduction policies deployed to address NPL crises in many countries from 1990 to 2015. Using macroeconomic variables and bank performance indicators as control variables, both studies focus on analyzing the effectiveness of five NPL reduction policies: (i) establishment of AMCs, (ii) publicly funded bank recapitalization, (iii) macroprudential tightening, (iv) changes in loan classification, and (v) changes in provisioning stringency.

Plekhanov and Skrzypińska (2018) seek to capture (i) the effectiveness of NPL reduction policies, and (ii) the cross-border spillover effects of NPL reduction policies on foreign subsidiary branches. They do this using a fixed-effects regression that captures the interplay of foreign ownership dummies and policy variable dummies. Results indicate that AMCs and bailout packages deployed in the parent's home country, when implemented each by themselves, have no significant spillover effect on foreign subsidiary NPLs, but do have a significant negative relationship when deployed together. Likewise, the study indicates that macroprudential tightening, changes in loan classification, and provisioning stringency have no significant effects on foreign subsidiary NPLs. However, results also indicate a direct effect of AMCs only, macroprudential tightening, and loan classification tightening on reducing NPLs within the jurisdiction where they are implemented.

Balgova, Plekhanov, and Skrzypińska (2017) employ a novel approach in the NPL reduction literature, using a two-part model. The first part measures the likelihood of a sharp drop in NPLs within 3 years of the implementation of a policy and the second the magnitude of the subsequent NPL reduction

conditional on a sharp drop.[3] The study finds that the best NPL reduction policies are a combination of AMCs and public bank bailouts. AMCs are associated with a significant increase in the likelihood of an NPL reduction and a greater magnitude of NPL reduction. While bank recapitalizations have no significant effects on NPL reduction likelihood and magnitude, AMCs are found to have a higher likelihood and magnitude when implemented together with bank recapitalization programs.

5.3 Case Studies on Asian Nonperforming Loan Resolution

Case studies reveal that Asian NPL resolution[4] measures rest on four main pillars: (i) operation of AMCs, (ii) financial sector restructuring and bailouts, (iii) insolvency reforms and resolution frameworks, and (iv) prudential tightening including loan classification and provisioning stringency.

5.3.1 Asset Management Companies

To address NPL problems in the aftermath of the Asian financial crisis, most economies in Asia established public AMCs as a key strategy for managing and disposing of impaired bank assets (Fung et al. 2004a). The crisis-affected countries—Indonesia, Japan, Malaysia, the People's Republic of China (PRC), the Republic of Korea, and Thailand—established public, centralized AMCs to clean up bad assets in financial institutions (Table 5.1). According to Terada-Hagiwara and Pasadilla (2004), a large and systemic NPL problem (and a weak banking sector and poor legal infrastructure) called for crisis-affected countries to choose a centralized AMC model.

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[3] Balgova, Plekhanov, and Skrzypińska (2017) define a sharp drop as a 7-percentage-point decline in the NPL level.

[4] See also Appendix 1: Tables of NPL Resolution Cases.

Table 5.1: Summary of Asian Asset Management Companies' Operations

AMC Feature	PRC	Indonesia	Japan	Rep. of Korea	Malaysia	Thailand
Public asset management companies	Big 4 (Orient, Great Wall, Cinda, Huarong)	IBRA	RCC IRCJ	KAMCO	Danaharta	Thai Asset Management Company (TAMC)
Set up	1999	1998	RCC – 1999 IRCJ – 2003	1962 (Role expanded in 1997)	1998	2001
NPL acquisition period	1999–2000 2004	1999–2000	1999–2006	1997–2002	1998–2001	2001–2003
NPL acquisition (LCU billion)	1999 – 1,394.0 2004 – 320.1	391,870.0	9,800.0	111,400.0	47.7 (19.7 acquired NPL + 28 managed for government) 775.8	
Peak NPL ratio (year – %)	1999 – 28.5	1998 – 48.6	2002 – 8.1	2000 – 8.9	1998 – 18.6	1998 – 42.9
NPL ratio + 5 years (year – %)	2004 – 13.2	2003 – 6.8	2007 – 1.5	2005 – 1.2	2003 – 13.9	2003 – 13.5
Sunset clause	No[1]	Yes	RCC – No IRCJ - Yes	No	Yes	Yes
Closing date/ Recovery period	-	2004	IRCJ – 2007	2012	2005	2006
Recovery rate (recovery/ acquisition, %)	20.84 (68.6% of portfolio sold)[2]	22 (60% of portfolio sold)	-	43.2 (100% of portfolio sold)	58.0 (96.4% of portfolio sold)	19.4 (~100% of portfolio sold)

AMC = asset management company, Cinda = Cinda Asset Management, Danaharta = Pengurusan Danaharta Bhd., Great Wall = Great Wall Asset Management, Huarong = Huarong Asset Management, IBRA = Indonesia Bank Restructuring Agency, IRCJ = Industrial Revitalization Corporation of Japan, KAMCO = Korea Asset Management Corporation, LCU = local currency unit, NPL = nonperforming loan, Orient = Orient Asset Management, PRC = People's Republic of China, RCC = Resolution and Collection Corporation.

Notes: Appendix 1 provides a more detailed comparison of Asian AMCs.

[1] The "Big 4" asset management companies were supposed to have a sunset clause of 10 years, but are still operating;

[2] Recovery value as of 30 June 2006 (Bihong 2006).

Sources: Authors' calculations using data from Haver Analytics; CEIC; World Bank, World Development Indicators; Bihong (2006); Cerutti and Neyens (2016); RCC (2019); Okina (2009); Financial Supervisory Service (Republic of Korea); Bank Negara Malaysia; Danaharta (2006); Bank of Thailand; and Santiprabhob (2003).

Indonesia

On 26 January 1998, Indonesia established the Indonesia Bank Restructuring Agency (IBRA) to assist in the country's restructuring and recapitalization program. IBRA acquired the NPLs of all banks recapitalized by Bank Indonesia and closed banks that were ineligible for the recapitalization program. During its acquisition period from 1999 to 2000, IBRA acquired Indonesian rupiah (Rp) 346.7 trillion in NPLs. Unlike most Asian AMCs established during the Asian financial crisis, the acquisition price for acquired NPLs was set at 0, as the capital injection provided by the government could be considered the payment. IBRA was relatively unsuccessful in the management of its NPL portfolio relative to other Asian AMCs established during the Asian financial crisis. IBRA's operations were constrained by the lack of strong political support, in particular conflicting views within the government on how best to maximize asset recovery and reluctance to sell assets at discounts. In its lifetime from 1999 to 2004,[5] IBRA only sold 60% of its NPL portfolio (Cerutti and Neyens 2016). At that time, this was one of the world's most costly bank recapitalization efforts, at 40% of GDP, causing a large increase in public debt and yielding an NPL recovery rate of 28.5% (IMF 2004).

Japan

On 1 April 1999, Japan established the Resolution and Collection Corporation (RCC). RCC was tasked to purchase NPLs from failed financial institutions and mortgage lenders. Loan purchases were focused on loans given to small to medium-sized enterprises and nonviable firms that were classified "bankrupt" or "in danger of bankruptcy." A special assessment of bank loans to large borrowers conducted in 2001 by the Financial Services Agency led to a large-scale reclassification of loans to 149 companies, causing a dramatic, 25% increase in NPL volume, from Japanese yen (¥) 33.6 trillion in 2000 to ¥43.2 trillion in 2001. In response, the government enacted the Program for Financial Revival, which aimed to accelerate bank loan restructuring through three main strategies: (i) reduce bank equity holdings equivalent to 100% of Tier-1 capital by 2006; (ii) strengthen NPL classification and provisioning; and (iii) reduce NPLs to half of 2002 levels (8.4% of total loans) by 2005. To facilitate the implementation of the program, the Financial Services Agency established a new AMC, the Industrial Revitalization Corporation of Japan (IRCJ),

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[5]   After the end of IBRA's sunset period in 2004, PT Perusahaan Pengelola Aset (Persero) absorbed its remaining assets.

in 2003. The IRCJ focused on higher-quality NPLs classified as those that "need special attention" extended to larger firms compared to RCC. IRCJ was designed to promote the restructuring of relatively large firms by purchasing NPLs from secondary banks.[6] It is estimated that RCC and IRCJ purchased approximately ¥9.8 trillion in nonperforming assets in face value (Fujiii and Kawai 2010). IRCJ liquidated all of its portfolio on 2 March 2007 (IRCJ 2007), while RCC is still operating (RCC 2019). Based on data from the Deposit Insurance Corporation of Japan, as of Q2 2020, RCC has managed a 103.9% collection rate, collecting a cumulative total of ¥10.2 trillion against a cumulative transfer of ¥9.8 trillion.

Republic of Korea

The reorganization of Korea Asset Management Corporation (KAMCO) and creation of the NPL resolution fund within KAMCO in November 1997 facilitated KAMCO's role as lead actor and purchaser of NPLs from financial institutions (Fung et al. 2004a). From 1997 to 2002, KAMCO acquired about Korean won (W) 111.4 trillion in NPLs in face value (more than 300,000 NPL accounts) at an average haircut of 64.8%, or W39.1 trillion (KAMCO 2010). KAMCO's acquisition program was 95% funded by KAMCO bonds, which were used to purchase NPLs from troubled financial institutions. KAMCO bonds were 100% guaranteed by the government and therefore have a 0% risk-weight, thereby having improved financial institutions capital bases to meet the 8% minimum capital adequacy ratio (CAR) requirements (Fung et al. 2004a). By the end of KAMCO's acquisition period in November 2002, it decreased domestic bank NPLs by 69.7% from their peak of W30.86 trillion in Q4 of 1999 to W9.2 trillion, or 2.38% of total loans by Q4 2002.[7]

Cerutti and Neyens (2016) report that KAMCO's overall performance was mixed. Unlike most Asian AMCs established during the Asian financial crisis, the AMC had no sunset period and the recovery of its NPL portfolio was relatively slow. By 2013, KAMCO was able to recover 100% of its NPL portfolio, gaining W48.1 trillion—122.70% of its NPL acquisition amount, or 43.18% of the face value of acquired NPLs (KAMCO 2014). However, KAMCO's disposal methods paved the way for the creation of a distressed debt market, which proved instrumental during the global financial crisis. KAMCO's resolution experience showed how a centralized AMC could play a role in market-making and market-promoting of distressed assets.

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[6]   Eligibility criteria for support relies on the feasibility of the company's submitted reorganization plan. The reorganization plan must include measures that enable a company to achieve at least one of the following: (i) increase in ROE of more than 2%; (ii) increase in turnover ratio of tangibles exceeding 5%; and (iii) increase in valued added per employee exceeding 6% (Takagi 2003).

[7]   Data based on the Republic of Korea's Financial Supervisory Services.

Malaysia

Pengurusan Danaharta Bhd. (Danaharta)—established on 20 June 1998 to remove nonperforming assets from the banking system and manage them to maximize proceeds from recovery (Fung et al. 2004b)—was among Asia's most successful AMCs. During its acquisition period from September 1998 to December 2001, Danaharta was able to acquire Malaysian ringgit (RM) 19.71 billion from private financial institutions (priced at RM8.94 billion) and an additional RM27.96 billion NPL (no transfer price) managed on behalf of the government (Danaharta 2006). By the end of its operations in 2005, Danaharta managed a recovery rate of 58%.[8]

Thailand

Thailand's centralized AMC—the Thai Asset Management Company (TAMC)—was only established in June 2001, unlike other Asian centralized public AMCs which were established or strengthened within a year of the Asian financial crisis in 1997. Thailand originally favored a decentralized approach to addressing the Asian financial crisis, partly due to fiscal concerns (Terada-Hagiwara and Pasadilla 2004). At the onset of the crisis, the country enacted the Emergency Decree on Asset Management Company (1998), which facilitated the establishment of 12 private and 4 public AMCs. Its private AMC initiative was largely ineffective due to unfavorable situations,[9] but four decentralized AMCs—Bangkok Commerce AMC, Sukhumvit AMC, Petchburi AMC, and Radhanasin AMC—were more effective and removed Thai baht (B) 977.24 billion in NPLs from five of the country's state-owned corporate banks from 1998 to 2001 (Santiprabhob 2003).

A change in government in 2001, however, prompted the establishment of TAMC as an Emergency Decree on 8 June 2001 (Terada-Hagiwara and Pasadilla 2004). During its acquisition period from Q3 2001 to Q4 2003, TAMC acquired a total of B775.78 billion in NPLs, with an average transfer price of 34%. However, of the total acquisitions, only 19% were new NPL acquisitions from private institutions, with 81% of the NPL transfers mostly from old AMCs with significant NPL portfolios, such as Petchburi AMC and Sukhumvit AMC (Bank of Thailand 2004, 2007).

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[8]   Data are from Table 5.10 in Cerruti and Neyens (2016).

[9]   Even though many private financial institutions had established AMCs, most of them could not transfer large amounts of their NPLs to AMCs after the Institution of Certified Accountants and Auditors of Thailand in 2001 issued a new operational guideline on the transfer of financial assets. Under the guideline, financial institutions would be worse off financially after transferring NPLs to their own AMCs because they would in effect be required to maintain capital adequacy against both the NPLs and AMCs' bonds issued to purchase the NPL. Excerpted from Santiprabhob (2003).

TAMC was successful in NPL resolution but, like IBRA, was relatively unsuccessful in its NPL recovery partly due to legal limitations in its ability to sell loans to third parties (Terada-Hagiwara and Pasadilla 2004).[10] By 2006, TAMC had resolved 99.98% of its NPL portfolio, but only managed to recover B150.12 billion—19.35% of the acquired NPL book value (Bank of Thailand 2007).

Viet Nam

In June 2003, Viet Nam established the Debt and Assets Trading Company under the Ministry of Finance. It was renamed as Vietnam Debt and Assets Trading Company (VDATC) in 2014 and was tasked with purchasing and disposing of distressed debt and assets from businesses, but mostly state-owned enterprises and state-owned commercial banks (VDATC 2018a). VDATC was also tasked to carry out the restructuring of state-owned enterprises in line with the Viet Nam government's roadmap. Over the years, VDATC has mainly implemented corporate restructuring. From 2004 to 2017, VDATC restructured nearly 180 enterprises, contributing significantly to restructuring and equitizing state-owned enterprises (VDATC 2018b). From the start of its operations in 2004 to November 2018, VDATC purchased approximately Vietnamese dong (D) 90 trillion in debt and supported more than 3,000 debt-processing enterprises in the process of equitization (Viet Nam News 2018).

Recent public, centralized AMCs in Asia

Initiatives since the global financial crisis by Asian economies to establish public and centralized AMCs include the establishment of the Vietnam Asset Management Company (VAMC) on 18 May 2013 to cope with the surge in NPLs in the aftermath of the global financial crisis in Viet Nam (Borst 2015). VAMC is a state-owned company established by the State Bank of Vietnam, the central bank, to address the NPLs of Vietnamese credit institutions. It was given broad power, such as to (i) purchase the bad debts of credit institutions by special bonds and market value; (ii) sell debts and collateral; (iii) restructure the debt; (iv) develop a roadmap to convert debt into capital; (v) guarantee loans; (vi) exploit, use, and lease collateral; and (vii) brokerage advice on the sale of debt and property.

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[10]   One of the key differences between TAMC and other AMC structures, however, is that the TAMC does not have the power to sell loans to third parties (Fung et al. 2004b).

VAMC buys bad debts paid for by special bonds at market value. The credit institutions may use the bonds as collateral for refinancing from the State Bank of Vietnam (VAMC 2018).[11] VAMC purchased all NPLs of banks with an NPL ratio greater than 3% (in a mandatory requirement for sales of NPLs by banks) and aimed to reduce total banking sector NPLs to 3% by 2015, playing an important role in reducing NPLs below 3% in recent years. Since its establishment and up to 2018, VAMC acquired D340 trillion ($14.7 billion) and D3.4 trillion through special bond instruments and market price purchases, respectively.[12] The AMC had recovered D119 trillion by 31 December 2018 (Vietnam Insider 2019).

Other established AMCs

Other Asian countries did not establish public and centralized AMCs during the Asian financial crisis. The PRC, for example, established four decentralized AMCs—Orient Asset Management (1999), Great Wall Asset Management (1999), Cinda Asset Management (1999), and Huarong Asset Management (1999)—to acquire the NPL of its four largest banks—Bank of China, Agricultural Bank of China, China Construction Bank, and Industrial and Commerce Bank of China. The approach of establishing four different AMCs may have well reflected the fact that the "Big 4" Chinese banks held nearly 70% of the market share and were specialized in different areas of business (Fung et al. 2004b).

The Philippines' NPL resolution measures were centered on private special purpose vehicles (SPV), due to lack of government funds and the seemingly non-systemic nature of the banking problem (Pasadilla 2005). In January 2003, the Philippines enacted the SPV Act of 2002, which facilitated the establishment of SPVs as the corporate vehicle to acquire NPLs and other nonperforming assets from banks' balance sheets. The SPV Act incentivized nonperforming asset transfers by providing lower taxes and fees on such transfers. By the end of its implementation period from 2003 to 2008, the SPV Act of 2002 facilitated the transfer of Philippine pesos (P) 119.98 billion NPLs from the banking system—P88.02 billion from its first implementation in 2003 to 2005, and an additional P31.96 billion from its second implementation in 2006 to 2008.[13]

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[11]   The special bonds are issued at zero coupon and have a maximum maturity of 5 years, no more than 10 years in the case of buying bad debts of credit institutions.

[12]   IDS Argo's executive board member Akira Kondoh said Viet Nam's NPL market is bigger than estimated (Deal Street Asia 2019).

[13]   Assessment of Republic Act No. 9343 Entitled "An Act of Amending Republic Act No. 9182, otherwise known as the Special Purpose Vehicle Act of 2002 for the Purpose of Allowing the Establishment and Registration of New SPVs and for other Purposes" (NTRC Tax Research Journal, XXII.6).

5.3.2 Financial Sector Restructuring and Bailout

Other pillars are instrumental in creating the enabling environment for the success of AMC operations. According to Balgova, Plekhanov, and Skrzypińska (2017), the best NPL resolution measures and strategies combine availability of public funds and establishment of specialized AMCs. Such was the case for Asian economies during the Asian financial crisis, where financial bailouts accompanied the transfer and acquisition of NPLs by AMCs (Table 5.2). Financial sector bailout programs were often preceded by or done in conjunction with a financial sector restructuring program to limit moral hazard and ensure the appropriate disbursal of important government funds. According to Santiprabhob (2003), financial sector restructuring through the separation of good financial institutions from bad mitigates the risk of moral hazard from bad banks and ensures that only solvent and healthy financial institutions remain to benefit from the government's expensive capital support schemes.

Table 5.2: Asian Recapitalization Programs

Feature	PRC	Indonesia	Japan	Republic of Korea	Malaysia	Thailand
Agency	State Council	Government	Deposit Insurance Corporation of Japan	Korea Deposit Insurance Corporation	Danamodal Nasional Berhad (Danamodal)	Financial Institutions Development Fund
Recapitalization Period	1999–2008	1997–2000	1997–2006	1997–2003	1998	1998–2002
Amount (LCU billion)	1999–270 2003–45 2005–15 2008–130	650,000	Direct injection–12,400 Monetary grant–18,900	160,400	6.15	Public–716.93 Private–0.71

LCU = local currency unit, PRC = People's Republic of China.
Note: Appendix Table A.2 provides a more detailed comparison of Asian recapitalization programs.
Sources: Bing (2005), Bihong (2006), Fung et al. (2004a), Sato (2005), Fujii and Kawai (2010), Lim and Hahm (2004), Lee (2017), and Santiprabhob (2003).

Indonesia

Indonesia had the most expensive financial sector bailout program among countries affected by the Asian financial crisis. Its banking sector exhibited the highest NPL ratio, at 48.6% at its peak in 1998. By the end of 2000, Indonesia's financial sector bailout program amounted to Rp650 trillion (31.6% of 2000 GDP), where Rp431 trillion was used for bank

recapitalization, Rp144.5 trillion was used for emergency liquidity assistance, and Rp73.8 trillion was used for a temporary blanket deposit and liability guarantee issued from 1998 to 2004 to protect the banking sector from bank runs (Fung et al. 2004).

Due to the high cost of the program, the country implemented a comprehensive bank restructuring program to limit moral hazard in the banking sector. During this period, it closed 67 private banks; nationalized/ took over 12 private banks; and recapitalized 26 banks consisting of 7 state banks, 7 private banks, and 12 regional development banks. Although the program started in 1997, the country was only able to set up clear guidelines on closure and reconstruction in 1999. The guidelines established enforcement actions based on a banks' capitalization. Banks with a capital adequacy ratio (CAR) less than -25% were closed, while banks with a CAR between -25% and 4% were recapitalized under necessary conditions. An exemption was given to all seven state-owned banks, which were all recapitalized despite all having a CAR of less than -25% (Sato 2005).

Japan

The main actor during the Asian financial crisis was the Deposit Insurance Corporation of Japan. The revision of the Deposit Insurance Act and enactment of the Financial Revitalization Act and Early Financial Correction Law gave the Deposit Insurance Corporation of Japan measures to maintain stability of the financial system during significant turmoil. Measures include capital injection, full deposit protection, and temporary nationalization.

In 1998, a total of ¥60 trillion was allocated for financial support. ¥1.8 trillion were injected into the 21 major banks to meet the required capital adequacy standards. Japan temporarily nationalized two major banks, Long-Term Credit Bank of Japan and Nippon Credit Bank, and subsequently sold the banks to private investors. In 1999, Japan injected an additional ¥7.5 trillion into 15 of Japan's leading banks. The Program for Financial Revival enacted in 2002 implemented stricter loan classification and provisioning requirements, which prompted an additional public sector bailout amounting to ¥2 trillion to 4 banks. From 1997 to 2006, the Deposit Insurance Corporation of Japan deployed ¥12.4 trillion in direct injections and ¥18.9 trillion in monetary grants for the effective closure of failed institutions and blanket deposit guarantees deployed during the 1990 Japan Banking Crisis and extended until the resolution of the 1997 Asian financial crisis (Fujiii and Kawai 2010).

Republic of Korea

To address the collapse of the Korean banks during the Asian financial crisis, the government set up a public bailout package amounting to W160.4 trillion (30% of the Republic of Korea's GDP in 2002) released from November 1997 to June 2003 (Lim and Hahm 2004). W60.3 trillion of the package was used for direct recapitalization of troubled banks and other financial institutions, W17 trillion for liquidity support, W29.8 trillion for deposit insurance payoffs, W14.3 trillion for purchase of other assets, and W39.1 trillion for NPL purchases by KAMCO.[14] Unlike drastic measures developed in Indonesia, the Republic of Korea focused on rescuing— either through NPL purchase or capital injection—banking institutions and insurance companies. However, by the end of 2004, five weak banks had closed through purchase and acquisition and nine banks had merged with others (Lee 2017).

Malaysia

Danamodal Nasional Berhad (Danamodal) was established in 1998 to recapitalize insolvent but viable financial institutions. In 1998, Danamodal recapitalized 10 financial institutions through its purchase of the various financial institutions' subordinated capital loans, amounting to RM6.15 billion. Recapitalized institutions were then required to sell all NPLs to Malaysia's asset management company—Pengurusan Danaharta Bhd. (Danaharta). Unlike Indonesia, Malaysia's banking sector was less affected by the crisis—although NPLs were still high—exhibiting an NPL peak of 20.9% during Q1 1999. Malaysia elected not to implement a comprehensive banking sector restructuring, but rather collaborated with international specialists to identify viable financial institutions to ensure the best use of public money (Fung et al. 2004a).

Thailand

Before implementing its public sector recapitalization program on 14 August 1998, from March 1997 to August 1998, Thailand closed down 56 weak financial institutions and took over 7 failed banks in 1996.[15] According to Santiprabhob (2003), the Bank of Thailand's financial sector restructuring mitigated moral hazard from bad banking institutions and ensured that

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14   The data are from Table 4 in Lim and Hahm (2004).

15   Bangkok Metropolitan Bank, Siam City Bank, First Bangkok City Bank, Union Bank, Laem Thong Bank, Nakornthon Bank, and Bangkok Bank of Commerce.

only solvent and healthy financial institutions remained to benefit from the government's capital support scheme. Thailand's comprehensive financial sector restructuring had similarities with Indonesia's, as Thailand's banking sector was one of the most affected in the region, with an NPL peak of 46% in Q1 1999.

Thailand's recapitalization program for public financial institutions started in 1998 to 2002. Of the B716.93 billion recapitalization effort (8.6% of 2002 GDP), only B16.57 billion was direct equity injections, while B429.57 billion was debt-equity conversions and B270.79 billion reserve reversals for accounting purposes.

Viet Nam

Viet Nam hoped that economic growth and banking sector improvement would resolve the country's bad debt problem without government involvement. However, as the necessary improvement in macroeconomic performance and bank management was slow after the Asian financial crisis, the government decided to intervene in clearing state-owned commercial bank balance sheets of the NPL problem. From 2001 to 2005, the government enacted a 5-year bank restructuring project that injected D10.9 trillion into Viet Nam's four largest state-owned commercial banks— Vietnam Bank for Agriculture and Rural Development, Vietnamese Bank for Investment and Development, Vietcombank, and Incombank (IMF 2006). The recapitalization program boosted the banks' equity against debt write-offs, which was the main form of NPL resolution then (World Bank 2006).

5.3.3 Insolvency Resolution Framework

Asian economies that were directly hit by the Asian financial crisis introduced legal and regulatory frameworks to create an enabling environment for the quick resolution of the AMC's acquired NPLs (Chapter 8). These policies included modernizing outdated insolvency frameworks and introduced out-of-court procedures to hasten and improve the corporate insolvency process (Appendix Table A.3).[16] In Thailand, the 1998 reform of the Thai Bankruptcy Act (Bankruptcy Act) introduced business reorganization procedures to rehabilitate financially distressed but viable businesses. Before this reform, the Thai Bankruptcy Act only dealt with liquidation proceedings. A 1999

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[16] Prior to the Asian financial crisis, insolvency laws of many Asian economies were considered out of date and lacking in judiciary capacity (Harmer 2000).

reform of the Bankruptcy Act established the specialized Bankruptcy Court to have sole jurisdiction over all liquidation and rehabilitation cases and over all civil cases related to the aforementioned cases (Broude 2002). A specialized bankruptcy court allows a sufficiently trained judiciary to ensure efficiency and proper exercise of discretion in insolvency cases (IMF 1999).

Economies hit by the Asian financial crisis also developed out-of-court insolvency mechanisms to assist corporate restructuring. Indonesia developed the Jakarta Initiative Task Force in 1998 (Tomasic 2001), the Republic of Korea developed the Corporate Restructuring Coordination Committee in 1998 (Chan 2002), Malaysia established the Corporate Debt Restructuring Committee in 1997 (Abdullah, Keong, and Khuan 2016), and Thailand established the Corporate Debt Restructuring Advisory Committee in June 1998 (Broude 2002). In Thailand, in particular, out-of-court insolvency was more successful compared to its formal insolvency proceedings, with creditors attracted to its shorter processes than in court-mandated reorganizations caused by the inexperience and inefficiency of the judiciary (Broude 2002). By the end of the committee's operations on 1 October 2006, it had facilitated debt restructuring of 11,655 cases amounting to B1.5 trillion (Bank of Thailand 2007).

5.3.4 Strengthening Supervisory Framework and Institutions

A key problem during the Asian financial crisis was the ineffectiveness of supervisory bodies and prudential regulations. Asian economies hit by the crisis, such as the PRC, Indonesia, and the Republic of Korea enacted laws that strengthened the supervisory and executory powers of supervisory institutions. Indonesia amended the 1998 Banking Act and passed the new Central Bank Act of 1999 to strengthen Bank Indonesia's independence from other organizations, and centralized the bank licensing, revocation, supervision, and sanctioning powers (Sato 2005).

The Republic of Korea centralized its supervision framework in 1998 with the establishment of the Financial Supervisory Commission and the consolidation of existing financial supervisory agencies into the Financial Supervisory Services as the administrative body of the commission. Amendments to the Financial Industry Restructuring Act gave the Financial Supervisory Commission and Financial Supervisory Services statutory authority to order write-offs, mergers, and suspension and closure of troubled banks

and financial institutions (Kim 2006). In the PRC, administrative measures on the supervision of the banking industry assigned the newly established China Bank Regulatory Commission (CBRC) to take over banking supervision and regulation from the decentralized handling of People's Bank of China, Ministry of Finance, and China Securities Regulatory Commission (Kossof 2014).

At the onset of the Asian financial crisis, supervisory bodies pressed for the implementation of stricter NPL classification. In the Republic of Korea, Financial Supervisory Services reclassified NPLs from 6 months in arrears to 3 months in arrears in September 1998. In December 1999, Financial Supervisory Services introduced forward-looking criteria in asset classification based on the borrower's capacity to pay (Kim, Kim, and Ryoo 2006). In March 2000, asset classification standards were strengthened, with the enhancement of forward-looking criteria classifying loans as NPLs when risks are significant even if interest payments have been made without a problem (Kim 2006). By the end of the first NPL reclassification in 1998, NPL estimates had grown to W118 trillion, almost double the W59.6 trillion NPLs valued using the old classification standards (Lim and Hahm 2004).

In Thailand, effective 1 July 1998, the definition of NPLs was changed to loans with unpaid principal and/or interest for 3 months or more, from 6 to 12 months or more. New rules on asset classification and provisioning were also implemented. Pass and special mention assets require 1% and 2% provisioning, respectively. Provisioning for substandard loans was increased to 20% from 15%. Doubtful loans decreased provisioning to 50% from 100% but loss loans maintained the 100% provisioning requirement (Santiprabhob 2003).

Other major reforms by Asian supervisory bodies at the onset of the Asian financial crisis included the establishment of prompt corrective action frameworks in Japan, the Philippines, the Republic of Korea, and Thailand, regulations on limiting short-term foreign borrowing and single-borrower limits, increased disclosure requirements of financial institutions, and increased capital requirements.

5.4 Data and Empirical Approach

Against the backdrop of these country case studies in Asia on resolving problem loans, the analysis empirically assesses the effectiveness of these measures quantitatively.

5.4.1 Data

The analysis uses panel data of (i) NPL resolution measure data from various sources, including case studies developed in conjunction with this report; (ii) individual bank-level indicators derived from S&P Global; and (iii) macroeconomic indicators from the World Bank's World Development Indicators. The analysis is based on annual data of 78 financial institutions from six Asian countries (Table 5.3).[17] Although most countries in the dataset implemented NPL resolution programs and policies at the onset of the Asian financial crisis, the analysis will only focus on the NPL resolution measures implemented by each country from 2002 to 2017 due to the lack of individual bank-level data before 2002.

The main concern of this study is illustrating the effectiveness of Asian NPL resolution measures and identifying the best policies and programs fit to address an NPL crisis. Based on the case studies, the analysis tests three main NPL resolution measures: (i) bank capital injection/bailout provided by the government, central banks, or deposit insurance companies; (ii) NPL purchases conducted by centralized public AMCs; and (iii) episodes of macroprudential tightening and increased banking supervision.

Data on bank bailouts is derived from the NPL resolution country case studies (Appendix 1) and cross-referenced with the contingent liability dataset from Bova et al. (2016). A bank bailout dummy variable is equal to 1 if the government conducted a financial sector capital injection/bailout program during the current year and 0 otherwise. Data on AMC NPL purchases is also derived from the country case studies and cross-referenced with the AMC database of Hallerberg and Gandrud (2015). Similarly, an AMC dummy variable is equal to 1 if a public centralized AMC is operating during the current year and 0 otherwise. Cerruti and Neyens (2016) is the source of data for macroprudential tightening. A dummy variable for macroprudential tightening is equal to one (1) if there is a positive change in the macroprudential index, negative one (-1) if there is a negative change, and 0 otherwise. This dataset is also cross-referenced with episodes of macroprudential reforms in the country case studies.

Based on existing NPL literature (e.g., Balgova, Plekhanov, and Skrzypińska 2017; Klein 2013; Louzis, Vouldis, and Metaxas 2012; Salas and Saurina 2002), the analysis also used two main factors in explaining the NPL ratio in Asian banks.

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[17] The analysis is restricted to six Asian countries (Indonesia, Japan, Malaysia, the PRC, the Republic of Korea, and Thailand) due to data restrictions.

First are external factors such as macroeconomic indicators that affect debtors' capacity to repay loan obligations. Like the previous studies, GDP growth, unemployment rate, inflation rate, and exchange rate depreciation are used as the macroeconomic control variables. The NPL ratio is expected to exhibit a negative relationship with GDP growth, and a positive relationship with higher unemployment, increased inflation, and exchange rate depreciation.

Second are internal factors such as bank-level indicators that reflect bank efficiency and risk management, which influence bank NPL levels. Based on the cited literature, the analysis used the following bank-level indicators: return on equity (ROE), equity-to-assets (EA) ratio, loan-to-assets (LA) ratio, and loan growth rate as bank-level control variables. Equity-related financial indicators—ROE and EA—are associated with bank management effectiveness and are expected to have a negative relationship with NPL growth. Loan-related indicators—LA and loan growth rate—are contentious, but are associated with leverage and risk-taking and are expected to have a positive relationship with NPL movement (Louzis, Vouldis, and Metaxas 2012). Table 5.4 presents the descriptive statistics of all the macro and bank-level variables used in the study.

Table 5.3: Banks per Country

Country	Banks (number)
People's Republic of China	5
Indonesia	4
Japan	48
Republic of Korea	1
Malaysia	8
Thailand	12
TOTAL	**78**

Source: Authors' calculations using S&P Global (accessed August 2018).

Table 5.4: Control Variable Summary

Variable (%)	Observations	Mean	Std. Dev.	Min	Max
NPL ratio	1,248	4.8796	5.4322	0.324	93.606
GDP growth	1,170	3.9127	5.8498	-7.4149	25.2549
Unemployment	1,248	3.7237	1.4083	0.4900	8.0600
Inflation	1,248	1.2101	2.1568	-1.3528	13.1087
Exchange rate depreciation	1,170	-0.2500	8.3255	-12.5074	22.3211
Return on equity	1,248	-0.7015	132.1986	-4306.764	76.3291
Earnings-to-assets	1,248	6.9649	4.0797	-11.8310	42.4246
Loans-to-assets	1,248	64.4542	12.6598	11.3786	185.6251
Loan growth rate	1,170	8.5581	25.3982	-58.1459	516.1056

GDP = gross domestic product, NPL = nonperforming loan, Std. Dev. = standard deviation.
Source: Authors' calculations.

5.4.2 Empirical Approach

Following dynamic panel studies on nonperforming loans (e.g., Klein 2013; Salas and Saurina 2002; and Louzis Vouldis, and Metaxas 2012), the analysis estimates the dynamic panel data specification (I) below using a two-step difference generalized method of moments (GMM) popularized by Arellano and Bond (1991), Arellano and Bover (1996), and Blundell and Bond (1998). The analysis also estimates the data using pooled ordinary least squares (OLS) and fixed-effects regression as a test for good estimates. Since OLS estimates produce upward dynamic panel bias, while fixed effects result in downward dynamic panel bias, good estimates of the true parameter estimate should lie between the two values (Roodman 2009).

$$y_{i,t} = \alpha_0 y_{i,t-1} + \beta_1 BI_{i,t} + \beta_2 BI_{i,t-1} + \beta_3 MI_t + \beta_4 RSN_t + \beta_5 RSN_{t-1} + u_{i,t}$$

The dependent variable, $y_{i,t}$ denotes the logit transformation of the nonperforming loan ratio of bank i at year t. The logarithmic transformation of the ratio ensures that the dependent variable spans over $(-\infty, +\infty)$ and avoids generally nonsensical predictions for extreme values of the regressors when using proportions (Baum 2008). The dependent variable is further explained by its lag ($y_{i,t-1}$), bank-level indicators (BI), macroeconomic indicators (MI), and NPL resolution measures (RSN). Similar to Klein (2013), bank-level indicators are modeled as predetermined (instrumented GMM style similar to the lagged dependent variable), while the macroeconomic indicators are treated as strictly exogenous (instrumented IV style). The RSN will also be modeled as predetermined.

By adding RSN as an additional predetermined variable, the analysis runs the risk of overidentification caused by a higher number of GMM instruments compared to the number of groups or cross-sectional units. To account for this issue, the analysis implements a "restricted" GMM procedure to account for the limitations on the number of instruments that can be used on the limited cross-sectional units. Similar to Louzis Vouldis, and Metaxas (2012), the analysis uses only a limited number of GMM-style instruments by restricting the lags of the GMM instruments and using only one bank-level indicator at a time to reduce instrument proliferation.

5.5 Results

The results in Tables 5.5 and 5.6 confirm that both bank-level variables and macroeconomic conditions affect NPL movements. Starting with macroeconomic indicators, an increase in the unemployment rate has a significant positive relationship with NPL growth using the two-step

difference GMM. Rising unemployment negatively affects household or business income, which leads to lower debt servicing capacity, and hence increasing bank-level NPLs. The analysis also finds that NPL ratios tend to be highly persistent, as indicated by a highly significant positive coefficient of the 1-year lagged NPL ratio, ranging between 0.69 and 0.85. This underpins the need for swift and preventive action in NPL resolution.

On bank-level indicators, ROE—as a measure of bank management effectiveness—exhibits a significant negative relationship with NPL movement during the current period and its 1-year lag (Table 5.5). This result confirms findings of previous studies, which indicate that effectively managed banks lead overall to better asset quality. Similarly, an increase in lending during the current period also leads to a statistically significant decrease in the NPL ratio (Table 5.6). This relationship is mainly associated with the effects of an increase in loans in the denominator of the NPL ratio.

Table 5.5: Effectiveness of NPL Resolution Measures, Bank Variable: Return on Equity

Variable	Dependent Variable: Log of NPL Ratio		
	OLS (1)	FE (2)	Two-step Diff. GMM (3)
Log of NPL ratio (t-1)	0.82447***	0.69096***	0.78066***
Macroeconomic variables			
GDP growth	-0.01047***	0.0023	-0.00151
Unemployment rate	-0.00889	0.04766**	0.06613*
Inflation rate	0.01355	-0.01804	-0.01643
Exchange rate	-0.0004	0.00004	-0.00007
Bank-level variables			
Return on equity (t-0)	-0.00017***	-0.00022***	-0.00023***
Return on equity (t-1)	-0.0001	-0.00016**	-0.00016***
Intervention variables			
AMC purchase (t-0)	0.0853**	0.09697**	0.07286
AMC purchase (t-1)	-0.03258	-0.05097	-0.0781*
Bank bailout (t-0)	0.07226*	0.08746*	0.09917
Bank bailout (t-1)	-0.08415**	-0.06424	-0.07837
Constant	-0.59604	-1.46424	
Observations	1,170	1,170	1,092
Number of banks	78	78	78
Number of instruments			74
A–B AR(1) test p-value			0.009
A–B AR(2) test p-value			0.168
Hansen test p-value			0.259

AMC = asset management company, FE = fixed effects, GDP = gross domestic product, GMM = generalized method of moments, NPL = nonperforming loan, OLS = ordinary least squares, ROE = return on equity.
Note: *** denotes significance at 1% level, ** denotes significance at 5% level, * denotes significance at 10% level.
Sources: Authors' calculations using data from Bova et al. (2016); Cerruti and Neyens (2016); Hallerberg and Gandrud (2015); S&P Global; World Bank's World Development Indicators (accessed August 2018).

Table 5.6: Effectiveness of NPL Resolution Measures, Bank Variable: Loans Growth Rate

Variable	Dependent Variable: Log of NPL Ratio		
	OLS (1)	FE (2)	2-step Diff GMM (3)
Log of NPL ratio (t-1)	0.84728***	0.69077***	0.80408***
Macroeconomic variables			
GDP growth	-0.01011***	0.0034	-0.00157
Unemployment rate	0.0009	0.05237***	0.08186**
Inflation rate	0.02479	-0.00305	-0.00339
Foreign exchange rate depreciation	-0.003	-0.0018	-0.00367
Bank-level variables			
Loan growth rate (t-0)	-0.00546***	-0.00488***	-0.00527***
Loan growth rate (t-1)	0.00048	0.00021	0.00021
Intervention variables			
AMC purchase (t-0)	0.12811***	0.13771***	0.09469*
AMC purchase (t-1)	-0.03802	-0.03191	-0.08573*
Bank bailout (t-0)	0.02901	-0.01748	0.0241
Bank bailout (t-1)	-0.06627**	-0.09385**	-0.10379**
Constant	-0.68378***	-1.41921***	
Observations	1092	1092	1014
Number of banks	78	78	78
Number of instruments			72
A-B AR(1) test p-value			0.000
A-B AR(2) test p-value			0.794
Hansen test p-value			0.099

AMC = asset management company, FE = fixed effects, GDP = gross domestic product, GMM = generalized method of moments, NPL = nonperforming loan, OLS = ordinary least squares.
Note: *** denotes significance at 1% level, ** denotes significance at 5% level, * denotes significance at 10% level.
Sources: Authors' calculations using data from Bova et al. (2016); Cerruti and Neyens (2016); Hallerberg and Gandrud (2015); S&P Global; World Bank's World Development Indicators (accessed August 2018).

On the main policy variable of interest, the 1-year lag of AMC operations, using both ROE and loan growth rate as bank-level indicators exhibited a significant negative relationship with bank-level NPL ratios. The results are similar for a 1-year lag of bank bailouts, using loan growth rate as a bank-level indicator, which resulted in a significant relationship with bank-level NPL ratios, though results were less robust when analyzed with ROE.

Table 5.7 presents a comparison of the results of four different bank-level indicators, confirming that for most specifications, AMC operations (1-year lag) were significantly associated with a reduction in bank-level NPLs. The other tested bank-level indicators—equity-to-assets ratio and loans-to-assets ratio—did not yield significant relationships with the movement of the bank-level NPL ratio.

Table 5.7: Comparison of Four Bank-Level Indicators

Variable	Dependent Variable: Log of NPL Ratio			
	ROE (1)	EA (2)	LOANS (3)	LA (4)
Log of NPL ratio (t–1)	0.78066***	0.78415***	0.80408***	0.79728***
Macroeconomic variables				
GDP growth	–0.00151	–0.0027	–0.00157	–0.00103
Unemployment rate	0.06613*	0.05832	0.08186**	0.06844**
Inflation rate	–0.01643	–0.00229	–0.00339	–0.00845
Exchange rate	–0.00007	–0.0012	–0.00367	0.00068
Bank-level variables				
Return on equity (t–0)	–0.00023***			
Return on equity (t–1)	–0.00016***			
Equity-to-assets (t–0)		0.03231		
Equity-to-assets (t–1)		–0.0275		
Loan growth rate (t–0)			–0.00527***	
Loan growth rate (t–1)			0.00021	
Loans-to-assets (t–0)				0.01354
Loans-to-assets (t–1)				–0.01075
Intervention variables				
AMC purchase (t–0)	0.07286	0.09006*	0.09469*	0.09599
AMC purchase (t–1)	–0.0781*	–0.0363	–0.08573*	–0.07021*
Bank bailout (t–0)	0.09917	0.04977	0.0241	0.05675
Bank bailout (t–1)	–0.07837	–0.09263	–0.10379**	–0.09852*
Observations	1092	1092	1014	1092
Number of banks	78	78	78	78
Number of instruments	74	74	72	74
A-B AR(1) test p-value	0.009	0.007	0.000	0.001
A-B AR(2) test p-value	0.168	0.145	0.794	0.171
Hansen test p-value	0.259	0.141	0.099	0.177

AMC = asset management company, EA = equity-to-assets ratio, GDP = gross domestic product, GMM = generalized method of moments, NPL = nonperforming loan, LA = loans-to-assets ratio, LOANS = loans growth rate, ROE= return on equity.
Notes: The estimation technique is a two-step difference GMM. *** denotes significance at 1% level, ** denotes significance at 5% level, * denotes significance at 10% level.
Sources: Authors' calculations using data from Bova et al. (2016); Cerruti and Neyens (2016); Hallerberg and Gandrud (2015); S&P Global; World Bank's World Development Indicators (accessed August 2018).

Finally, the analysis also tested macroprudential tightening as an additional NPL resolution variable, but the results were insignificant and shortened the dataset to 2002–2013 due to data availability constraints (Table 5.8). Additionally, using loan growth rate as a bank-level indicator also resulted in a positive relationship between the current period of AMC operations and bank-level NPLs. This relationship might reflect the ongoing turmoil that banks would experience during crises, which warranted the implementation of an NPL purchase program in the first place.

Table 5.8: Macroprudential Tightening

Variable	Dependent Variable: Log of NPL Ratio	
	ROE (1)	EA (2)
Log of NPL ratio (t-1)	0.75034***	0.77556***
Macroeconomic variables		
GDP growth	0.02074***	0.02338***
Unemployment rate	0.02753	0.03893
Inflation rate	-0.00614	0.00546
Exchange rate depreciation	0.04344	-0.31969
Bank-level variables		
Return on equity (t-0)	-0.00027***	
Return on equity (t-1)	-0.00019***	
Loan growth rate (t-0)		-0.00507***
Loan growth rate (t-1)		0.00014
Intervention variables		
AMC purchase (t-0)	0.05114	0.0862
AMC purchase (t-1)	-0.26715***	-0.2592***
Bank bailout (t-0)	0.11331	0.06092
Bank bailout (t-1)	-0.1297	-0.09192
Macroprudential tightening (t-0)	-0.0434	-0.07611
Macroprudential tightening (t-1)	-0.09329	-0.09966
Observations	780	702
Number of banks	78	78
Number of instruments	64	62
A-B AR(1) test p-value	0.013	0.000
A-B AR(2) test p-value	0.301	0.399
Hansen test p-value	0.287	0.046

AMC = asset management company, NPL = nonperforming loan, EA = equity-to-assets ratio,
GMM = generalized method of moments, ROE = return on equity.
Notes: The estimation technique is a two-step difference GMM. *** denotes significance at 1% level,
** denotes significance at 5% level, * denotes significance at 10% level.
Sources: Authors' computation using data from Bova et al. (2016); Cerruti and Neyens (2016); Hallerberg
and Gandrud (2015); S&P Global; World Bank's World Development Indicators (accessed August 2018).

Overall, the empirical results suggest public AMC operations are an effective
tool to remove NPLs from the banking sector, as found in the case studies.
Public AMCs established at the onset of the crisis were the key players in
Asian NPL reduction efforts by giving banks an option to sell their NPLs
to a readily accessible market or force these banks to offload problematic
assets. Interestingly, due to time-period restrictions, most of the analysis
is restricted to periods where AMCs established at the onset of the Asian
financial crisis are at the tail end of their NPL acquisition period or their
sunset date. Aside from Malaysia (2002–2005), Indonesia (2002–2004),
and Thailand (2002–2003), AMC operations in the dataset are restricted
to periods after the Asian financial crisis. The results therefore suggest that

the continued operations of public AMCs—such as the ones operating in the Japan, the PRC, the Republic of Korea, and Thailand—contributed to a significant decrease in bank-level NPL ratios during periods of relative banking stability by providing a readily accessible platform for NPL transactions when markets were not efficiently functioning.

5.6 Conclusion

This chapter looked at case studies of Asian countries in resolving NPLs and examined best practices in NPL resolution by analyzing the most effective Asian NPL reduction policies implemented to remove bad assets in banking systems and maintain banking stability. The analysis used dynamic panel data methods to analyze the effectiveness of NPL reduction policies on bank-level NPLs in 78 banking institutions in six Asian countries from 2002–2017. The chapter investigated the effectiveness of three NPL reduction policies—(i) AMC operations; (ii) government bank bailout/capital injections; and (iii) macroprudential tightening—implemented in 2002 as a crisis response during the tail end of the Asian financial crisis and as a bank stability measure after the crisis.

The NPL reduction literature has proposed novel methodologies in its analysis, such as the two-part model used in Balgova, Plekhanov, and Skrzypińska (2017) and the cross-border spillover effects of NPL reduction used by Plekhanov and Skrzypińska (2018). Other studies have sought to extend the simple literature on NPL determinants by adding new policy variables (Consolo, Malfa, and Pierluigi 2018; Wolski 2014). The study falls among the latter methods. The analysis builds on the dynamic panel data literature studying the determinants of NPL using difference GMM (e.g., Salas and Saurina 2002; Louzis, Vouldis, and Metaxas 2012; and Klein 2013) and include NPL reduction policy variables within the regression. The study contributes to the NPL reduction literature by analyzing the effects of NPL reduction policies in the Association of Southeast Asian Nations (ASEAN)—a region that implemented numerous policies at the onset of the Asian financial crisis, but with no studies of policy effectiveness aside from case studies.

Results indicate that AMC operations in selected Asian economies have a significant negative relationship with bank-level NPLs alongside macroeconomic factors and bank financial indicators. While bank bailouts have a significant relationship with bank-level NPLs, results are less robust when tested with different bank-level financial indicators. The analysis

does not find evidence of a significant relationship between episodes of macroprudential tightening and bank-level NPL reduction. An interesting insight derived from the results is the effectiveness of AMC operations during periods of relative banking sector stability. Outside the closure of Danaharta in Malaysia in 2005 and IBRA in Indonesia in 2004, the continued operations of public AMCs in Japan, the PRC, the Republic of Korea, and Thailand—even after its mandated NPL acquisition period—appeared to have contributed to a significant decrease in bank-level NPLs. While AMC operations during the Asian financial crisis sought to clean bad assets from banking institutions, public AMCs that continued to operate after periods of banking crisis ensured that banks remained healthy and continued operations by providing a readily accessible market for NPLs.

These findings can have implications for Asian economies considering the implementation of public AMCs as a policy to develop and strengthen substantial NPL management and markets as well as a crisis resolution mechanism. The establishment of public AMCs as part of crisis prevention and resolution mechanisms becomes increasingly necessary due to the risks brought by rising Asian financial integration regionally and globally. Domestic banking sectors would likely be more vulnerable to external shocks, financial contagion, or liquidity risks from cross-border bank lending within the region. With decades of experience in bad asset management, existing Asian AMCs can easily facilitate the transfer of knowledge and expertise to new AMCs to increase stability in the Asian banking sector.

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Appendix 1: Tables of Nonperforming Loan Resolution Cases

Table A1.1: Summary of Asian Asset Management Companies' Operations

AMC Feature	China, People's Rep. of	Indonesia	Japan	Republic of Korea	Malaysia	Thailand
Public asset management companies	Big 4 (Orient, Great Wall, Cinda, Huarong)	IBRA	RCC IRCJ	KAMCO	Danaharta	Thai Asset Management Company (TAMC)
Set up	1999	1998	RCC – 1999 IRCJ – 2003	1962 (Role expanded in 1997)	1998	2001
Governing agency/body	Ministry of Finance, CBRC	Ministry of Finance, Financial sector Policy Committee	RCC – DICJ IRCJ – FSA	Ministry of Finance, Financial Supervisory Commission	Bank Negara Malaysia (BNM)	Bank of Thailand (BOT), Financial Institutions Development Fund (FIDF)
Enabling laws/programs	Executive Order via State Council	Presidential Decree	RCC – Financial Revitalization Law IRCJ – Program for Financial Revival	KAMCO Act	Danaharta Act	Royal Decree via TAMC Act
Official mandate	Restructuring	Restructuring	RCC – Nonperforming loan (NPL) collection IRCJ – Restructuring	Restructuring/ Rapid Asset Disposition	Restructuring/ Rapid Asset Disposition	Restructuring
Special power	No explicit power	Special power to seize assets of noncooperative debtors without court approval	RCC – Assisted by DICJ special powers IRCJ – No explicit power	No explicit power	Special power to purchase and resolve nonperforming loans (NPLs) w/o court process	Special power to force debtors to enter into negotiation for loan repayment

Table A1.1 (continued)

AMC Feature	China, People's Rep. of	Indonesia	Japan	Republic of Korea	Malaysia	Thailand
Centralized	No	Yes	Yes	Yes	Yes	Yes
Financing	AMC bond, and Govt. and Central Bank contribution	–	RCC – DICJ	KAMCO bonds	Government guaranteed bonds	BOT, Financial Institutions Development Fund
Source of NPL	Four state–owned banks (SOBs)	Banks with CAR = –25% to 4% SOB	RCC – Mortgage Lending (Jusen) IRCJ – Troubled financial institution	Troubled financial institution	Troubled financial institution and SOB	81% are old NPL from decentralized AMC
Asset selection	47% manufacturing 6% agriculture 16% commercial 7% real estate	84% corporate 9% commercial 7% SME	RCC – Small to Medium firms IRCJ – Large corporations	–	–	–
Pricing	Book value	Payment can be considered as the capital injection provided by the government	Market Value RCC – 24.6% avg. IRCJ – 36.0% avg.	Market value (35.2% average transfer price)	1. Value of collateral 2. Percentage of outstanding principal (10% for regular loans)	Market value (34% average transfer price)
Disposition and Resolution	Debt collection, portfolio sales, auctions, joint ventures, debt–for–equity swaps, and lease of collateral	Bank restructuring was the main priority resulting in delays in asset disposition and pursuit of shareholders	Bulk sale, asset securitization, and revitalization of firms	Bulk loan resolution, foreclosure, public auctions, loan sales, JV partnerships, rescheduling	Loan restructuring for viable loans. Loan sale for nonviable loans	Debt restructuring, business reorganization, or dispose/write off the asset and foreclose on the collateral
NPL acquisition period	1999–2000 2004	1999–2000	1999–2006	1997–2002	1998–2001	2001–2003

Table A.1 (continued)

AMC Feature	China, People's Rep. of	Indonesia	Japan	Republic of Korea	Malaysia	Thailand
NPL acquisition (LCU billion)	1999 – 1,394.0 2004 – 320.1	391,870.0	9,800.0	111,400.0	47.7 (19.7 acquired NPL + 28 managed for government)	775.8
Peak NPL ratio (year – %)	1999 – 28.5	1998 – 48.6	2002 – 8.1	2000 – 8.9	1998 – 18.6	1998 – 42.9
NPL ratio + 5 years (year – %)	2004 – 13.2	2003 – 6.8	2007 – 1.5	2005 – 1.2	2003 – 13.9	2003 – 13.5
Sunset clause	No[1]	Yes	RCC – No IRCJ – Yes	No	Yes	Yes
Closing date/ Recovery period	-	2004	IRCJ – 2007	2012	2005	2006
Recovery rate (recovery/ acquisition, %)	20.84 (68.6% of portfolio sold)[2]	22 (60% of portfolio sold)	-	43.2 (100% of portfolio sold)	58.0 (96.4% of portfolio sold)	19.4 (~100% of portfolio sold)

AMC = asset management company, CAR = capital adequacy ratio, CBRC = China Bank Regulatory Commission, Cinda = Cinda Asset Management, Danaharta = Pengurusan Danaharta Bhd., DICJ = Deposit Insurance Corporation of Japan, FSA = Financial Services Agency, Great Wall = Great Wall Asset Management, Huarong = Huarong Asset Management, IBRA = Indonesia Bank Restructuring Agency, IRCJ = Industrial Revitalization Corporation of Japan, KAMCO = Korea Asset Management Corporation, LCU = local currency unit, Orient = Orient Asset Management, RCC = Resolution and Collection Corporation.

Notes:

[1] The "Big 4" asset management companies were supposed to have a sunset clause of 10 years but are still operating;

[2] Recovery value as of 30 June 2006 (Bihong 2006).

Sources: Authors' calculations using data from Haver Analytics; CEIC; World Bank, World Development Indicators; Bihong (2006); Cerutti and Neyens (2016); RCC (2019); Okina (2009); Financial Supervisory Service (Republic of Korea); Bank Negara Malaysia; Danaharta (2006); Bank of Thailand; and Santiprabhob (2003).

Table A1.2: Asian Recapitalization Programs

Features	China, People's Republic of	Indonesia	Japan	Republic of Korea	Malaysia	Thailand
Enabling Laws/Programs	Executive Order via State Council	Comprehensive bank sector restructuring and recapitalization program	Financial Revitalization Act, Early Financial Correction Law, Program for Financial Revival	Financial sector restructuring program	National Economic Recovery Plan	Public sector recapitalization program
Agency	State Council	Government	Deposit Insurance Corporation of Japan	Korea Deposit Insurance Corporation	Danamodal Nasional Berhad (Danamodal)	Financial Institutions Development Fund
Recapitalization Period	1999–2008	1997–2000	1997–2006	1997–2003	1998	1998–2002
Amount (LCU billion)	1999–270 2003–45 2005 – 15 2008–130	650,000	Direct injection–12,400 Monetary grant–18,900	160,400	6.15	Public–716.93 Private–0.71
Recipient Institutions	Bank of China, Agricultural Bank of China, China Construction Bank, Industrial and Commerce Bank of China	Banks with CAR between –25% to 4%. Exemptions were made for seven state-owned banks.	Troubled financial institutions	Troubled banks and other financial institutions	10 insolvent but viable financial institutions	Bangkok Bank of Commerce, Bangkok Metropolitan Bank, First Bangkok City Bank, Krung Thai Bank, Siam City Bank, Union Bank

CAR = capital adequacy ratio, LCU = local currency unit.
Sources: Bing (2005), Bihong (2006), Fung et al (2004a), Sato (2005), Fujii and Kawai (2010), Lim and Hahm (2004), Lee (2017), and Santiprabhob (2003).

Table A1.3: Insolvency Resolution Frameworks in Asia

	Asian Financial Crisis Legal and Regulatory Reforms	Current Legal and Regulatory Framework
People's Republic of China (PRC)		• Jun 2007: The PRC implemented its first comprehensive bankruptcy law, Law of the People's Republic of China on Enterprise Bankruptcy "Bankruptcy Law" (2006). The Bankruptcy Law also introduced provisions for out-of-court workout (OOCW). • From 2007–2017, the PRC introduced specialized liquidation and bankruptcy trial court. As of Feb 2017, there are 73 specialized liquidation and bankruptcy courts in the country. • Financial Institution Insolvency: Article 38-39 of Law of the People's Republic of China on Banking Regulation and Supervision • Recovery and Resolution Planning: China Banking Regulatory Commission required the four globally systemically important banks to prepare and submit recovery plans annually for review, with resolvability assessment being conducted for three.
Indonesia	• Sep 1998: Reform of the court supervised insolvency process, Bankruptcy Act, in September 1998 – introduced measures for debt restructuring and establishment of specialized court for insolvency, Commercial Court. • Sep 1998: Establishment of Jakarta Initiative Task Force as facilitator of OOCWs.	• Court procedure: Law No. 37 of 2004 on Bankruptcy and Suspension of Payment (Bankruptcy Law) dated 18 October 2004. • Financial Institution Insolvency: Article 17 to 31 of the PPKSK Law (Law No. 9 of 2016 on Prevention and Resolution of Financial System Crisis) and Chapter V of the DIC Law (Law No. 24 of 2004 Concerning Deposit Insurance Corporation) • Recovery and Resolution Planning: OJK Regulation No. 14/POJK.03/2017 on Recovery Plan for Systemic Banks
Japan	• 1999: Civil Rehabilitation Law (1999) replaces Composition Law (1927). The new law is debtor friendly in nature. • 2001: Establishment of OOCW guidelines. • 2003: Reform of Corporate Reorganization Proceedings in 2002, which amended the previous version in 1967.	• 2007: Establishment of Turnaround Alternative Dispute Resolution as OOCW for medium and large companies. • 2013: Establishment of Regional Economy Vitalization Corporation of Japan as OOCW for small and medium-sized enterprises.

Table A1.3 (continued)

Republic of Korea	• Feb 1998: Reform of the court-based insolvency system and revised the bankruptcy law. • Jul 1998: Start of the Republic of Korea's out-of-court restructuring program. • 2000: Introduced the Corporate Restructuring Promotion Law (effective until 2005) to efficiently dispose of and reduce the nonperforming loans of financial institutions. • Mar 2001: Introduced a pre-packaged bankruptcy system that allowed creditors to negotiate out-of-court settlement with borrowers prior submission to court.	• Court procedure: Debtor Rehabilitation and Bankruptcy Act • Out-of-court procedure: Corporate Restructuring Promotion Act
Malaysia	• Schemes of Arrangement • 1998: Establishment of OOCW framework, Corporate Debt Restructuring Committee	• Court procedure: Companies Act (2016) • Financial Institution Insolvency: by Bank Negara Malaysia under the Financial Services Act 2013 or Perbadan Insurans Deposit Malaysia under the Malaysia Deposit Insurance Corporation Act 2011.
Thailand	• 1998: Reform of the Thai Bankruptcy Act • 1998: Establishment of Corporate Debt Restructuring Advisory Committee • 1999: Establishment of specialized Bankruptcy Court with sole jurisdiction over liquidation and rehabilitation cases	• Financial Institution Insolvency: Chapter 5 and 6 of the Financial Institutions Business Act B.E. 2551 (2008)

OJK = Financial Services Authority (Indonesia), POJK = OJK rules.
Source: Compiled by authors.