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**Nonperforming Loans in China: Do We (Still)  
Need to Worry?**

MASTER THESIS

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## **Abstract**

This thesis overviews and discusses the issue of nonperforming loans in general and in China, and financial sector development from the beginning of Deng Xiaoping's reform era in 1978. The focus is put on the underlying institutional framework as it is found to be one of key contributing factors of NPLs in China. Utilizing a sample of 23 countries over the period 2000-2009, we estimate the impact of macroeconomic determinants on nonperforming loans. One of the regressors, output gap, is estimated via Kalman filtering technique based on the multivariate unobserved component (MUC) method. Consequently, out-of-sample method forecasts for five subgroups of countries, thus providing different benchmarks for China, are compared with official data. The conclusion argues the NPLs ratio to be understated in official statistics, especially towards the end of the series, which might be a sign of increasing macroeconomic instability in China.

JEL Classification E02, E51, P39

Key words nonperforming loans, China, out-of-sample method, institutional framework

## **Abstrakt**

Táto práca vytvára prehľad a analyzuje problematiku nedobytných pohľadávok v Číne a vo svete a zaobráva sa vývojom finančného sektora od počiatku reformných snáh Deng Xiaopinga v roku 1978. Dôraz je kladený na inštitucionálne prostredie, ktoré je jedným z hlavných faktorov pochybných pohľadávok. Použitím dát 23 krajín počas rokov 2000 až 2009 skúmame vplyv makroekonomických veličín na nedobytné dlhy. Jeden z determinantov, produkčná medzera, je odhadnutý na základe metódy rôznorodých nepozorovaných komponentov (MUC) s technikou Kalman filtra. Použitím „out-of-sample“ metódy aplikovanej na päť skupín krajín, ktoré tak Číne nastavujú zrkadlo z viacerých strán, prichádzame k záveru, že nedobytné dlhy sú v oficiálnych čínskych štatistikách podhodnotené, najmä ku koncu študovaného obdobia, čo je možným znakom zvyšujúcej sa makroekonomickej nestability v Číne.

JEL klasifikácia E02, E51, P39

Kľúčové slová nedobytné dlhy, Čína, „out-of-sample“ metóda, inštitucionálne prostredie

## **Declaration of Authorship**

The author hereby declares that she compiled this thesis independently, using only the listed resources and literature.

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Prague, January 9, 2012

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Signature

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# Master Thesis Proposal

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Author: Bc. Alžbeta Sočuvková

Supervisor: PhDr. Adam Geršl, Ph.D.

Proposed topic: Selected issues of banking sector in China

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**Topic characteristics** Despite the reforms being conducted for decades already, the characteristics of banking sector in China, in comparison to those of the developed world, are different. Unique formal and informal institutions play highly significant roles in determining the ongoing development. The first aim is thus to compare and criticize a wide variety of literature studying the institutional framework of banking environment in China. However, the emphasis is put on the factors considered to be crucial based on our Central European experience.

Prior China became a member of World Trade Organization in 2006, China made a pledge to reform its banking sector in many aspects. While many promises have been kept, plenty of them are successfully evaded. Therefore, the focus is put on the description of undertaken reforms. At the same time, the explanation of failure to change, based on the institutional environment, is offered.

Finally, we estimate Non-Performing Loans (NPLs) ratio based on out of sample method as Balász, Backé and Zumer (2006) did for Central and Easter Europe. However, the model is applied on both developed and developing Asian countries with a different set of determinants. That should lead to a more correct estimate of NPLs as opposed to official statistics.

**Methodology** Comparison, critique and synthesis of literature and out of sample method.

## Outline

1. Introduction
2. Related literature
3. Banking sector in China
  - 3.1 Description
  - 3.2 Institutional factors
  - 3.3 Reforms
4. Econometric analysis
  - 4.1 Methodology, dataset, estimation technique
  - 4.2 Regressors
  - 4.3 Results
5. Conclusion

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# Acronyms

|       |  |
|-------|--|
| ABC   | Agricultural Bank of China                       |
| ADB   | Asian Development Bank                           |
| AMCs  | Asset Management Companies                       |
| BD    | Board of Directors                               |
| BOC   | Bank of China                                    |
| BP    | Band-pass  |
| CBRC  | China Banking Regulatory Commission              |
| CCB   | China Construction Bank                          |
| CCP   | Communist Party of China                         |
| CEE   | Central Eastern European countries               |
| CEO   | Chief executive officer                          |
| CESEE | Central, Eastern and Southeastern Europe         |
| CPI   | Consumer Price Index                             |
| EDG   | Electronic Discussion Group, IMF                 |
| FSI   | Financial Soundness Indicators                   |
| GDP   | Gross domestic product                           |
| HP    | Hodrick-Prescott                                 |
| ICA   | Bureau of Industry and Commercial Administration |
| ICBC  | Industrial and Commercial Bank of China          |
| ICF   | Industrial and Commercial Federation             |
| IMF   | International Monetary Fund                      |
| IPO   | Initial Public Offering                          |
| LIBOR | London Interbank Offered Rate                    |
| MENA  | Middle East and North Africa                     |
| MGE   | Mean group estimator                             |
| MUC   | Multivariate unobserved component                |
| NPD   | Non-performing debts                             |
| NPLs  | Non-performing loans                             |
| PBC   | People's Bank of China                           |
| PEA   | Private Enterprise Association                   |
| RCCs  | Rural Credit Cooperatives                        |

|       |  |
|-------|--|
| SA    | Shareholders' Assembly                                       |
| SASAC | State-Owned Assets Supervision and Administration Commission |
| SELA  | Self-Employed Laborers Association                           |
| SOBs  | State-owned banks  |
| SOEs  | State-owned enterprises                                      |
| TICs  | Trust and Investment Corporations                            |
| TVEs  | Township village enterprises                                 |
| UC    | Unobserved components  |
| UCCs  | Urban credit cooperatives                                    |
| WTO   | World Trade Organization                                     |

## **Chapter 1**

# **Introduction**

In 2000, the ratio of nonperforming loans to total loans in the banking sector of China equaled 22.5% according to official statistics, which many scholars perceived as overly optimistic estimate. In 2009, the figure dropped to mere 1.58%. In only ten years the ratio of bad debts in China is reported to achieve a spectacular drop. Is there no reason left to worry?

China has experienced a miraculous economic rise with two-digit growth rates since the Deng Xiaoping reforms commenced in 1978. It is currently the second most important global player while its ability to maintain macroeconomic stability through market instruments has not been tested yet. Typically, the instruments utilized are of a bureaucratic nature, ranging from price controls, various regulations to other administratively imposed restrictions. Such measures are, however, ineffective in the long term perspective. Should the “true” value of NPLs ratio be increasing contrary to the official figures, it might be an utterly important sign of the underlying economic ineffectiveness with far reaching consequences for the global economy, especially now when the economy may be on a verge of yet another crisis.

The main contribution of this thesis is the evaluation of the official Chinese statistics of NPLs ratio based on both theoretical and empirical analyses. To introduce the reader into the subject, we firstly overview and discuss the phenomenon of nonperforming loans in general and in China. The extensive literature surveys help us to gain useful hints about the nature and magnitude of the problem.

Aiming for a deeper insight about the triggers of nonperforming loans, the development of financial sector in China is examined. The topic is viewed from the perspective of the underlying institutional framework, as this was found to be of an utmost importance also in post-soviet transformation economies. We believe that studying both formal and informal rules gives us important benefits for recognizing the root causes of the current state of NPLs and useful intuition to evaluate the measures undertaken to tackle this issue.

The goal is to answer a question whether the official statistics significantly misreport the NPLs ratio figures between 2000 and 2009, accounting for China being part of the broader

Asian region. Estimated elasticities of macroeconomic regressors of 23 countries are employed in the panel FE OLS model to calculate out-of-sample forecasts. Dataset is split into five panels, which are composed of (1) emerging Asian economies, (2) newly industrialized Asian economies, (3) transformation economies in Europe, (4) developed European countries with transformation experience, and (5) advanced European economies. One of the explanatory variables, output gap, is estimated using a multivariate unobserved component (MUC) method via Kalman filtering technique.

This thesis proceeds as follows. Chapter 2 reviews some stylized facts about nonperforming loans in general, intricacy of the NPLs definition and sketches the related research. Chapter 3 scrutinizes the development of Chinese financial sector. Chapter 4 describes the issue of NPLs in China and surveys their estimates. Chapter 5 assesses the “true” value of NPLs ratio in China, provides the estimates of output gap, and discusses the results. Chapter 6 concludes.

## **Chapter 2**

# **Nonperforming Loans**

Nonperforming loans have sparked intellectual endeavors for few years now and have received considerable attention recently. This chapter gives a brief overview of the problem and should facilitate the introduction of reader to the topic so as to gain a better grasp of the subject of Chinese NPLs in the next parts.

Firstly, the definition of NPL is introduced and is followed by some stylized facts. Consequently, the level of NPLs ratio in various regions is shown and finally, models having NPLs for endogenous variable are described.

### **2.1 Definition: Not an Easy Task**

NPLs are commonly used as a measure of the asset quality and the first NPLs emerged in the USA in 1987 as a result of severe financial crisis at stock markets. Generally, their ratio to outstanding bank loans significantly increases during financial crises worldwide. A sharp raise in domestic credit very frequently implies inability of bankers to extend the credit selectively, potentially implying a weakening banking system due to a deteriorated NPLs ratio. For example, experiences of double-digit annual growth rates in domestic credit in Indonesia, Malaysia, Thailand, and South Korea were associated with worsening NPLs ratios already prior to the crisis in 1990s in every country (Krueger 2000, p. 39).

NPLs have become more closely observed so as to eliminate possible exposures and ensure a stable financial system. Interestingly, there is not yet a single classification system to facilitate not only the monitoring and management of credit risk in the loan portfolios within a bank, but also to facilitate international recognizing and accounting for credit losses by banks. To facilitate the comparison across the countries, the Institute for International Finance uses five categories (Bloem & Gorter 2001, p. 7):

1. **Standard:** credit is sound, repayment difficulties are not foreseen and full repayment is expected.
2. **Watch:** if conditions of asset uncorrected, it may raise concern about full repayment.
3. **Substandard:** full repayment is in doubt due to inadequate protection, and/or interest or principal or both are more than 90 days overdue. Risk of becoming an impaired asset, i.e. its carrying amount is greater than its estimated recoverable amount.
4. **Doubtful:** collection or liquidation of asset in full is determined as improbable due to current conditions and/or interest and principal or both are overdue more than one year. Asset is impaired but not considered total loss because some pending factors might strengthen the asset's quality, e.g. capital injections and merger.
5. **Loss:** asset is virtually uncollectible and/or principal and interest or both are overdue more than one year.

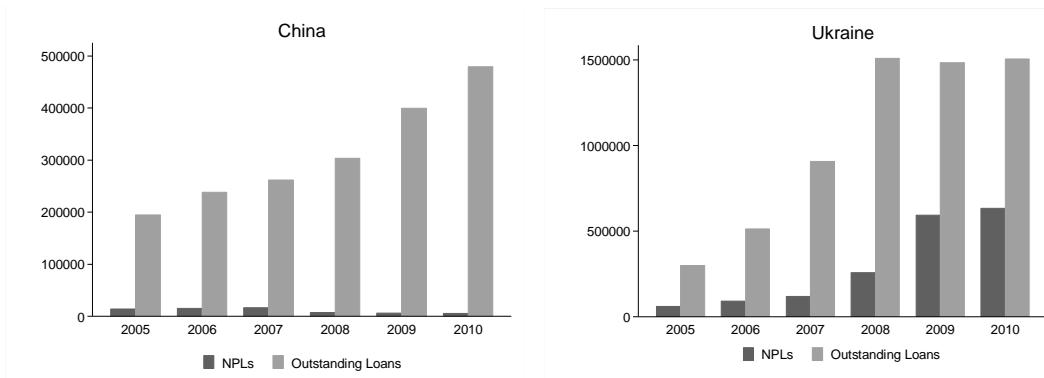
Gross classified debt, which is the sum of the last three categories, is then reported as the NPLs ratio in relation to total loans. NPLs are then commonly described as loans in arrears for at least 90 days.

Aiming for a discussion regarding the suitable treatment of NPLs in macroeconomic statistics, IMF set up an electronic discussion group (EDG). The original criteria used in the System of National Accounts 1993 for the treatment of loans were based on such considerations as aiming for avoidance of entries in the accounts for which there is no sound basis in observable transactions, the need for valuation of loans to be consistent with debtor's legal obligations, and the need for accounting practices to facilitate comparisons between different economic agents and countries. The aim of EDG is to determine if additional criteria should be applied and to make sure their compliance with the other major macroeconomic statistical systems, e.g. banking and money statistics. Thus, many aspects such as definition and valuation of loans and nonperforming loans, when such loans should be written off and how interest accruing and arrears should be measured. One of the recent comments is about the observable convergence about the 90-days overdue criterion in international community. (Bloem & Gorter 2001, p. 4).

## 2.2 Background

NPLs are often used as an explanatory variable for other banking outcomes such as bank performance, failures, and bank crises (Boudriga *et al.* 2009). However, the issue has received a considerable increase in attention and thus has been treated as an endogenous variable as well. Multiple triggers have been studied in literature so far, ranging from macroeconomic factors, e.g. GDP growth, inflation and interest rates, institutional factors, e.g. regulatory framework, rule of law, disaster myopia, perverse incentives, principal-agent problem, microeconomic variables, e.g. size and lending policy, then degree of concentration in different sectors (Guy 2011, p. 7), small stock of people sufficiently skilled for the purpose of evaluating the credit risk especially in developing countries, to plain bad luck, e.g. inclement weather and unexpected price changes (Bloem & Gorter 2001, p. 4), for more details see part 2.4.

NPLs are also indirectly affected by the state of economy and government policies. For example, one might argue that China has been devaluating its currency for some time now, which raises debt-servicing obligations in domestic currency of debtors, while the asset side of banks' balance sheets is influenced to a smaller extent. Then, tightening monetary policy and raising interest rate pushes the cost of outstanding debt higher, thus possibly bringing questionable debtors over the line into nonperforming status (Krueger 2000, p. 39). Interest rate was increasing from 2003 to 2009 on average and at the same time, official NPLs ratio was decreasing meanwhile. However, a decrease in the NPLs' official data is questionable, should reflect a concurrent surge in bank credit as depicted in Figure 2.1, and does not include NPLs transferred to AMCs etc. Another source of the problem aggravation is if the country has an experience of existing euroisation/dollarisation, for example in Serbia, Romania, or Philippines. Should the economies face depreciation of domestic currencies, the repayment of loans would be even more troublesome.

**Figure 2.1:** Total and nonperforming loans

*Note.* Total loans in Ukraine do not include loans extended by National Bank of Ukraine, which might be one of the main determinants of non-increasing volume of total outstanding loans after 2008.

To tackle the issue, many countries established Asset Management Companies, which manage the disposal of the bad loans, or other longer term restructuring agencies, as depicted in Table 2.1 for selected countries in the beginning of their reform efforts (Tang *et al.* 2000, pp. 39 – 40, and Claessens 2005, p. 17). Gradually, many of them became privatized. However, although one stream of literature argues in favor of taking the NPLs off the banks' balance sheets, e.g. Krueger (2000, p. 41), other authors criticize this step as a deficient incentive for banks to tackle the issue more effectively and as failing to prevent banks from repeating their ill-advised lending patterns.

**Table 2.1:** Measures of selected countries

|                | <b>Centralized</b>   | <b>Decentralized</b>  |
|----------------|--|---|
| Hungary        | The <b>Credit Consolidation Fund</b> was created at the Hungarian Industrial Development Bank in 1992 to manage bad debts. One third of assets only was transferred, the remaining were kept at banks balance sheets subject to contracts with the Ministry of Finance.  | (1) The creation of decentralized work-out units at banks as a part of 1992 <b>Loan Consolidation Program</b> .<br>(2) The <i>good bank/bad bank</i> approach was applied on Magyar Hitel Bank. Bad debts were transferred to its newly established subsidiary, which was to be wound up in three years, while the “good bank” was successfully privatized. |
| Kazakhstan     | <b>Rehabilitation Agency</b> (1994) took over loans of the largest failed debtors, mostly mining and metallurgical firms, <b>Agricultural Support Fund</b> (1994) took over debts from agricultural sector, and <b>Exim Bank</b> (1994) took over most of the trade-related loans, which carried government guarantees.  | Government assigned a mandate to a special enterprise restructuring agency in 1998 to provide creditor-led restructuring in case a farm or an enterprise was viable and had prepared a restructuring plan.  |
| Czech Republic | The establishment of <b>Konsolidační banka</b> (1991) to restructure inherited debts on commercial banks' balance sheets. The NPLs of commercial banks were later transferred here. <b>Česká Inkasní</b> (1993), which took over debt obligations of foreign trade companies to facilitate privatization of Československá Obchodní Banka – a foreign trade bank from pre-transition period. <b>Česká Finanční</b> (1996), which was established as a subsidiary of central bank in order to finance the 1996 Stabilization Program which has the objective of preventing liquidity crises in small banks. | ČR was considering a government sponsored out-of-court process for banks and debtor enterprises without recourse to enterprise liquidation proceedings on a broad-scale, the so called London approach. In the end, large not-in-court corporate restructurings were registered.  |

## 2.3 Estimates Worldwide

Generally, the NPLs ratios differ greatly around the world. The developed world maintains the figures at much lower levels than developing countries, while nearly all economies experienced deterioration in NPLs statistics after the 2008 crisis. A quick review of some reported or estimated numbers follows.

Barisitz (2011, p. 54) addresses the intricate issue of different definitions of NPLs across the countries by careful examination of national loan-quality classifications. The most known definition is given in the IMF Financial Soundness Indicators Compilation Guide, which states principal or interest to be due for 90 or more days. He applies this definition on national statistics to complement NPLs data on FSI website, which are not yet comprehensive, thus guaranteeing only limited comparability. Consequently, he concludes ten countries in Central, Eastern and Southeastern European region to be divided into three groups based on the amount of NPLs in country according to 90days+ definition over the period 2005-2010 (the estimated NPLs ratio following author's methodology is reported in the brackets):

1. Bulgaria (2.2–11.9 percent), Slovakia (5–5.8%), Croatia (6.2–11.2%), the Czech Republic (3.9–6.2%), Hungary (2.3–9.7%), and Poland (11–8.8%) feature relatively small level of NPLs from 2005 to 2010.
2. Romania (1.4–11.9%) and Russia (2.6 – 8.2%) have to cope with clearly higher amounts.
3. Serbia (11.3–16.9 % for 2008-2010) and Ukraine (5.6–15.3%) are relatively the worst-off countries as regards bad debts.

In contrast, the World Bank Database reports the figures of NPLs ratios, which differ significantly for some countries, over the same time period:

1. Slovakia (5– 6%), Czech Republic (4–5%), Hungary (2–8%), and Poland (11–8% from 2005 to 2009)
2. Romania (3–18%) and Russia (3 – 10%)
3. Serbia (11–17% for 2008-2010) and Ukraine (20–42%).

The NPLs ratios are generally much lower in developed countries during 2005–2009 according to the World Bank Database, for example USA (1–5%), Germany (4–3%), Switzerland (1–0%), United Kingdom (1–4%), and Sweden and Norway (1–2%).

Finally, most of the central banks of Asian countries studied in Chapter 5 tend to report lower NPLs ratio than ADB's online database. The official ratio over the period 2005–2009 ranges from 4.3–36.5% in Kazakhstan, to 1.4–1.1% in Hong Kong.

## 2.4 Root Causes of NPLs – Literature Survey

The literature on NPLs ratio movements worldwide has identified various triggers with econometric analysis finding its way in research later. The studies differ greatly based on use of firm-, bank-, or macro-level data complemented with institutional factors. Further, approaches concentrate on diverse economic, political, and social aspects, which vary greatly across countries, and that is why authors usually address this issue by building large datasets containing many countries. The regressors, but mostly their combinations, can be divided into three main subgroups: (1) macroeconomic, e.g. GDP growth, inflation rate, and nominal interest rate, (2) bank-specific, e.g. return on equity, capital requirement, and loan loss provisioning, and finally, (3) institutional, e.g. state and foreign ownership, rule of law, regulation, and political instability shocks. To facilitate comparison with our study, this part describes some of the research conducted so far. As most of the studies use the combination of all three groups of explanatory variables, five subgroups are identified based on having certain regressors in common.

### 2.4.1 *The Form of Ownership*

**Micco *et al.* (2004)** regress 50 000 observations from 119 countries during the period of 1995–2002 and include performance indicator, state ownership dummy, foreign ownership dummy, and country-year fixed effect to control for country-specific factors, e.g. institutions, and country-year specific variable, e. g. change in regulation and political instability. They conclude that state-owned banks, especially in developing countries, have usually higher volume of bad debt due to their weak credit recovery capacity in comparison to private-owned banks. The opposite holds for foreign-owned banks. A positive effect of foreign ownership on

soundness of banks is found in a study **Berger et al. (2009)** as well, as opposed to Barth *et al.* (2004), see below.

Another paper by **Boudriga et al. (2009)** studying NPLs in Middle East and North Africa (MENA) region states that foreign participation from the developed parts of the world reduces NPLs, as well as lagged GDP growth and unemployment; state ownership of banks is not found as a contributing factor; high credit growth stimulates improvement in bad loans numbers, which completely contradicts the conclusion of the study by **Pasha (2009)** in Guyana; relevance, scope, accessibility and quality of credit information published by public and private bureaus also support the credit quality of banks; and again, the institutional framework counts, i.e. corruption control, regulatory quality, enforcement of rule of law, free voice and accountability. In case of Guyana the real exchange rate has significant positive effect on NPLs. However, the state control of exchange rate in China questions the relevancy of this argument.

Further analysis of **Wu (2002)** describes the impact of transition economy characterized by triangular relations between state-owned commercial banks, state-owned enterprises and fiscal policy in China; the real estate bubble in 1990s; underdeveloped credit culture and institutional infrastructure; and lack of transparency in the banking sector. Focusing on the persisting social role of banks, their state ownership and resulting pressure on lending decisions, as well as contradicting interests of local and central governments are considered to be the other causes of NPLs, e.g. **Dobson & Kashyap (2006, p. 145)**. Collapse of land prices has received a considerable attention in Japan (**Inaba & Sekine 2005, p. 114**).

**Hu et al. (2004)** employ panel data on 40 Taiwanese commercial banks from 1996 to 1999 using regressors of political lobbying, civil corruption, and joint ownership. Based on Hausman test, Random effects model is chosen over fixed effects, which is better method than OLS. The ownership type shows that higher government shareholding in a bank decreases NPLs up to 63.51 percent, while the opposite is true for a share higher than that. Bank size is found negatively correlated to the amount of bad debt. Further, banks established after deregulation have a lower size of NPLs on average than those established before deregulation. Authors also argue that risky behavior is less common in case of private and state shareholders checking and balancing each other. In contrast, collusion between them, especially in societies with weaker rules, results in higher NPLs.

### 2.4.2 Macroeconomic Factors

Next used method by **Foglia (2008)** estimates credit risk of banks based on loan performance in China. Data from aggregate, industry, and bank levels are used. The loan performance is put into relation with macroeconomic indicators such as nominal interest rate, inflation rate, change in real GDP, economic growth, unemployment, and the change in terms of trade. One of the problems of such approach, i.e. taking macroeconomic variables as exogenous, is that they are concurrently affected by a distress in the banking sector.

**Espinoza & Prasad (2010)** used panel data on Bahrain, Kuwait, United Arab Emirates, Oman, Qatar, and Saudi Arabia. The dependent variable, NPLs ratio is a logit transformation to ensure that it spans over the interval  $< -\infty, +\infty >$ , as opposed to between 0 and 1, and is distributed symmetrically. The regressors include non-oil real GDP growth, stock market returns, interest rates, world trade growth, the VIX index which is a proxy for global risk aversion and tight financing conditions, and a 1997-1998 dummy for the Asian crisis. The following firm-level determinants were chosen: capital adequacy ratio, the expenses/asset ratio, the cost/income ratio, the return on equity proxied by the logarithm of equity, the lagged net interest margin, and lagged credit growth deflated by the CPI. Authors applied for example OLS method, fixed effects, and used the collapsing method of Holtz-Eakin, Newey, & Rosen (1988) to reduce the number of instruments in the end. The results show negative correlations of NPLs with non-oil real GDP growth and interest rates, and VIX to be significant determinant.

### 2.4.3 Firm-level Determinants

Another paper by **Boudriga et al. (2009)** utilizes pooled regression method on aggregated data on 59 countries during 2002-2006 to find out the determinants of NPLs. The baseline specification regresses NPLs ratio on one year lagged regulatory capital to risk-weighted assets minus the required minimum capital, one year lagged loan loss reserves to total loans ratio, one year lagged return on assets ratio, percentage of state-owned banks, percentage of foreign ownership, percentage of assets held by the five largest banks, one year lagged real GDP growth, and a measure of the level of country financial development. The results imply that higher capital adequacy ratio and prudent provisioning policy are correlated with a decrease in NPLs. Improved NPLs is reported when considering private ownership, foreign

participation and bank concentration. Interestingly, the regulatory devices are either counterproductive or do not significantly improve the credit risk exposure for countries characteristic with weak institutions, corruption environment and little democracy. Further, the presence of state does not enhance the NPLs problem either.

The NPLs are regressed on three sets of factors in India in a study by **Ranjan & Dhal (2003)**, i.e. terms of credit, banks size induced risk preference and macroeconomic shocks. The panel regression models show the terms of credit variables to be significant. The estimated coefficient on changes in cost of credit because of expectation of higher interest rate is positive. On the contrary, horizon of maturity of credit, better credit culture, and favorable macroeconomic and business conditions decrease the NPLs. Business cycle effects differ based on a differential response of borrowers and lenders.

Among the identified bank-industry triggers of NPLs by **Hasan & Wall (2004)** is loan loss provisioning, because higher level of NPLs is associated with high rate of provisioning. The logic behind is that banks that expect higher level of capital losses may create higher provisions aiming for a decrease in earnings volatility and for reinforcement of a medium term bank solvency. **Godlewski (2004)**, using the adjusted return on equity as a proxy for performance, estimates that profitability of banks leads to a decrease in the level of NPLs ratio. On the contrary, **Garcia-Marcos & Robles-Fernandez (2007)** show on the panel of 129 Spanish banks during 1993-2000 that the higher level of return on equity, the greater risk in the next period. The banking industry concentration is found to be another relevant factor by **Petersen & Rajan (1995)**. Their findings indicate that in concentrated banking systems younger firms, hence supposedly of a lower quality, are financed by banks as opposed to other means, which results in a higher level of bad debt. On the contrary, firms would not accept being charged with interest rates above the market rates in more competitive markets (Boudriga *et al.* 2009, p. 3).

**Shehzad *et al.* (2009)** employs Random effects model on data of 500 commercial banks from more than 50 countries over 2005-2007 to find concentrated ownership, proxied by different levels of shareholding, negatively correlated with NPLs ratio. The explanatory variables include a dummy equaling one if the bank is listed, income per capita of the country where bank resides, loan growth as a proxy for a growth opportunities of bank, etc.

#### 2.4.4 Regulation

The study of impact of banking regulation and supervision factors on the bank outcomes was pioneered by **Barth et al. (2004)**. The use generalized method of moments method applied on 107 countries and their conclusion is that the stricter the restrictions imposed at securities investments, real estate investments, and bank ownership of non-financial firms, the higher NPLs. However, they do not control for non-regulatory determinants or whether the influence of regulatory restrictions varies depending on bank charter value, nor whether the regulatory restrictions have an effect on bank charter value (González 2005, p. 2). Building on this stream of research, Boudriga *et al.* (2009), mentioned above, examine the power of regulatory variables in explaining NPLs after controlling for bank industry factors. Similar conclusion draws **Godlewski (2004)**, where capital requirements increase risk-taking behavior, while taking excess risk leads to an increase in NPLs ratio. Godlewski argues that stringent constraint on capital adds a pressure on asset returns, which is possible to achieve through higher risk taking. Additionally, using data from transition economies, study of **Delis et al. (2008)** implies that capital requirement is not statistically significant determinant of productivity. Further, Barth *et al.* (2004) finds a negative relationship between supervisory power and NPLs or credit rating, especially inside closed political systems (Boudriga *et al.* 2009).

**Suzuki et al. (2008)** postulate that policy lending is not sufficient explanatory variable for the actual performance of Chinese banking industry. The authors employ a financial-restraint model, which justifies government control over both lending and depository rates, so as to create rent incentives for banks to monitor borrowers effectively. If the government imposes ceiling on the deposit rate which is below the market clearing rate, lenders have a cushion when performing screening and monitoring activities (Suzuki *et al.* 2008, p. 63).

**Breuer (2006)** use OLS regression on 52 countries using bank-specific data comprising 1881 banks to estimate coefficients of 25 explanatory variables, out of which 12 are related to banking institutions. The variables cover legal, political, sociological, economic, and banking institutions. The results show for example a negative effect of foreign ownership. Further, they prove that having banks obliged to disclose off balance sheets decreases bad loans, while interventionist governments, as regards price and wage controls, worsen the amount of bad debt, etc. In general, the institutions that ameliorate potential conflict of interest between banks and borrowers, and banks and depositors reduce amount of bad debt.

To conclude, authors have used a wide variety of explanatory variables and estimation techniques depending on countries of interest and data used. Moreover, the theory explaining the determinants of NPLs is not yet well established, based on which models do not always achieve high predictive power, even after studying large data samples consisting of tenths of countries. As a consequence, the results of studies sometimes converge while other times, conflicting findings occur.

## **Chapter 3**

# **Chinese Financial System**

A large amount of literature that conducts the analysis of financial sector soundness in China emerged in the past few years and big part of the discussion is the role of NPLs.

In order to better grasp the intricacies of the current state of non-performing loans, to identify its triggers, and to contribute to the ongoing discussion by estimating the level of NPLs ratio, we look closer at the history of financial sector. The focus is put especially on its institutional path, as that gives us useful insights on the current state of NPLs and their possible future development.

### **3.1 A Review of the History of Financial Sector in China**

The Chinese socialist banking system, inspired by the Soviet model, was established in late 1940s. The banking sector was, however, well developed prior to 1949 with the earliest form of capitalism back in Ming Dynasty in the 17<sup>th</sup> century. In 1875, there were already more than 105 lending institutions (*qianzhuang*), five of the first modern banks were founded between 1897 and 1908, and by 1936, there were 28 foreign banks set up in Shanghai (Allen *et al.* 2008, p. 6). The central bank, People's Bank of China (PBC), was founded in 1948. Between 1950 and 1978, it was a so called mono-bank, i.e. being a central bank and concurrently the only commercial bank. Enterprises could keep only small amount of cash and the rest had to be deposited. There was a possibility of withdrawing but PBC had to confirm that it served the purposes stated in the central plan. Although it was temporarily deprived of many functions during the Cultural Revolution (1966 – 1976), in the end of the period it controlled about 93% of the total financial assets of the country, absorbed 80% of deposits, and handled almost all financial transactions (Allen *et al.* 2008, p. 6). Its competence was limited to an accommodation of politicians and state enterprises needs articulated in the industrial output growth goal stated in the central plan (Yusuf *et al.* 2006, p. 48).

By the end of 1979, PBC was separated from Ministry of Finance with three state owned banks taking over some of its agenda. The “Big Four” group of state owned banks consisted of the Agriculture Bank of China (ABC, 1979) dealing with banking business in agricultural areas and supervising a network of 60 000 Rural Credit Cooperatives (RCCs) that provided small-scale rural banking, the Bank of China (BOC, 1912) devoted to foreign trade, exchange and investment transactions, the People’s Construction Bank of China (PCBC, 1954) handling fixed investment transactions in manufacturing, and the Industrial and Commercial Bank of China (ICBC, 1984) covering the rest of commercial transactions of the PBC. The banks were later allowed to engage in all sectors but the competition was far from fierce (Berger *et al.* 2009, p. 5 and Shirai 2002, p. 21). On the top of it, the incentives and responsibility to engage across the regions were missing and they continued to carry out the administrative production plans of the State and Regional Planning Commissions (Yao *et al.* 2007, p. 631).

Banks were mainly the cashiers of state planning body with no independent decisions. Capital was allocated in banks based on a plan. Resources were mobilized by price manipulation and wage determination of the state, not via banks. Investments were mostly financed by interest-free budgetary grants and to a lesser extent, from retained profits of enterprises. Saving volume was rather small as a result of low wage policy with high welfare benefits secured. However, many attributes were to be changed in the decades-long and still ongoing reform process.

### ***3.1.1 First Stage of Reforms***

The reforms during the first stage (1980 – 1993) replaced direct grants to enterprises with interest bearing loans to address the soft budget constraint issue. PBC was appointed to conduct monetary policy, however, upon the approval of the State Council, and to supervise financial system. In order to combat inflation, the bank formulated a national credit plan, which specified an aggregate credit ceiling for each of its branches. The branches were then given autonomy to allocate the credit but they were often subject to intervention by central and local governments. The central bank further allowed banks to adjust their lending rates, but not their deposit rates, within bounds set administratively (Kumbhakar & Wang 2007, p. 110).

During the 1980s, multiple forms of financial intermediaries outside the Big Four proliferated, e.g. Rural Credit Cooperatives (similar to credit unions in the U.S.), Urban Rural

Cooperatives, regional banks in the Special Economic Zones in coastal areas, which were partially owned by local governments, and non-bank financial intermediaries, such as Trust and Investment Corporations (TICs), operating in banking and non-banking services with restrictions on the sources of deposits and loans made (Allen *et al.* 2008, p. 7). Shirai describes how the proliferation of TICs addressed two sources of demand for a financial intermediation. Firstly, specialized banks were not able to satisfy a demand for credit given the rapid economic growth in the 1980s. Trust branches, which could conduct forms of business prohibited to the formal banks, were thus encouraged and later created separate trust and investment subsidiaries or affiliates of the banks. The second motive for their establishment was the local governments' interest on raising funds directly, which could then be used for supporting their local industries, upon which growth rates they were evaluated. That still partly explains the current situation in Guangdong, which is the fastest growing region in China, with almost all of the recent high profile bank scandals happening there while the average NPLs ratio is one of the highest from all regions (Leng 2009, p. 187).

Foreign banks, which had withdrawn by 1959 after communist's assumption of power in 1949, started to be given a permission to enter the market after 1979 reform. Their status and operations were legalized in the Special Economic Zones in 1985, while the geographical restrictions on foreign funded banks were gradually somewhat relaxed (China Banking Regulatory Commission, 2011). The scope was to render exchange services to foreign firms and foreign residents. The first national banking law regulating the entry and scope of business of foreign banks was not effective until 1994 though (Rigby *et al.* 2003, p. 22). The Shanghai and Shenzhen Stock Exchanges were created in 1990 and grew extensively throughout 1990s. The institutional and legal frameworks of money and bond markets were, however, lagging behind.

### ***3.1.2 Second Stage of Reforms***

The second stage of reforms (1994 – 2000) witnessed a continuing deterioration of asset quality resulting from the inability and/or unwillingness of SOE to repay their loans. It was also understood that the government would cover the ultimate losses of, for example RCCs and UCCs. The Ministry of Finance issued RMB270 billion (USD 32.6 billion) of 30-year government special bonds to recapitalize the Big Four banks in 1998. BPC also arranged a debt-equity swap of about RMB5 billion in 1996 for Everbright Trust and Investment

Company so as to avoid its bankruptcy and protect its biggest creditors like a state oil firm and two state-owned commercial banks (Shirai 2002, p. 26).

Another reason for a deterioration of asset quality was that in reality, most of loans were received as a result of request or because of the interference of their political patrons. The standard analysis of project, e. g. its rate of return, was not conducted at all (Yusuf *et al.* 2006, p. 73). The goal was expansion and whether or not it made a profit was not relevant. For example, long-term loans to fixed-asset projects that were likely to remain solvent in the short run but were considered to be very risky in the long run were highly encouraged after 1998 (Shih 2004, p. 927). Tongsan Wang in 2002 said that the goal of seven percent growth had forced government and state banks to support many second, third and even fourth rate projects (Shih 2004, p. 927). The categories relevant for credit approval were changes in market share, continuation of even loss-making unit, and changes in employment, as loosing a job at SOE meant finding oneself outside the social welfare net and the rise of discontent. If needed to cover the losses, taking on more loans was accepted. Moreover, central bank could even be induced to raise the limit by creating more high-powered money (Yusuf *et al.* 2006, p. 74). Further, the tendency to follow a boom-bust cycles with overlending practices during good times in China is called *white elephant syndrome*. This practice has been recognized by Chinese officials as well, for example the current premier Wen Jiabao commented in March 2007 that “Chinas economic growth is unsteady, unbalanced, uncoordinated, and unsustainable”. The formation of the so called “triangular debt chain” (*san jiao zhai*) did not help to improve the quality of aggregate amount of assets from yet another perspective. A triangular debt chain is formed when Unit A owes unit B money, Unit B owes unit C money, and Unit C owes unit A money. The chain can be formed in four, five, or more ways (Li 1995, p. 306). One of the consequences was that it became difficult to determine whether an enterprise was viable in the long run or not (Yusuf *et al.* 2006).

Three policy banks were established which were supposed to alleviate the policy lending role of Big Four in 1994 and created a de facto two-tier commercial banking system. The commercial banks were to follow strict regulations under the supervision of the PBC while three policy lending banks were not subject to the Commercial Bank Law of 1995 and had individual charters regulation. Nevertheless, the governmental pressure on Big Four pertained, whereas these special policy banks did not succeed in replacing Big Four perfectly because of the lack of branch network and capital (Yao *et al.* 2007, p. 631).

The competition was to be promoted by allowing regional bank and even non-state banks to enter the market. For example, 88 locally restricted banks named city commercial banks

emerged by consolidation of 2,000 local UCCs in 1995-1998. They adopted a shareholding ownership structure and were designed to operate on a pure commercial basis with the goals of market share and profit maximization. However, the other side of the story talks about the heavy pressure from local governments to conceal the problem of NPLs for a while, or shifting the responsibility to the central government by bundling the problematic UCCs into the city commercial banks. Nevertheless, the Big Four concentration ratios of total assets, loans and deposits were 84.93%, 84.26% and 88.51% in 1998, respectively, whilst the concentration ratio of profits mere 55.33% (Yao *et al.* 2007, p. 632). Additionally, a fifth bank called Bank of Communications, which is much smaller but fast growing, is sometimes included in the group denoted as the Big Five then (Dobson & Ashyap 2006, p. 106).

PBC lacked control over credit allocation and non-bank financial institutions during the economic overheating in 1992-1993. It led to inflow of funds to unregulated sectors driving bubble rise in the real estate and stock markets, which further led to a decrease in bank deposits and liquidity squeeze. Furthermore, until the late 1990s, local banks were under dual leadership of PBC and local governments, and provincial party secretary played a key role in choosing head of PBCs provincial branches. In order to reduce local influence, PBC was confirmed as a central bank in 1995 and the power of local governments on credit allocation was reduced by law, e.g. local government had no longer a right to appoint senior officials for the local branches of PBC (Shirai 2002, p. 22). In 1998, the influence of provincial leaders became reduced and the appointment power was recentralized. PBC established nine regional branches with heads directly appointed by PBC.

The central bank's increasingly used monetary instruments were interest rates and reserves. Back in the late 1980s, PBC set lower and upper bounds on deposits (not granted) and loans while leaving the room for commercial banks to set the actual rates within the limits (Allen *et al.* 2008, p. 8). In 1989, the liberalization process was halted and in 1993, PBC imposed a lending rate ceiling at 20, 30, 60% on commercial banks, UCCs and RCCs, respectively, and identical floor at the level of 10 percent. In 1996, the ceiling was imposed at 30% and floor at 10% levels for commercial banks, while it was 40% and 10% with respect to RCCs (Shirai 2002, p. 23). Lending and deposit interest rates were heavily regulated and set far from the market clearing levels. As a result, the lending rates in the informal sector sometimes reached as high as 200-300% above the official rate.

Shirai describes an example of official lending and deposit interest rates being set below the rate of inflation from 1993 to 1995. The households, however, continued to deposit. One of the reasons was the government policy of subsidizing the difference between the inflation

rate and an official deposit rate in 1993, which stopped in 1997 as inflation declined. Another reason was the lack of alternative financial instruments for households' savings. For example, Chinese share market recognizes three types of bonds with only one type being accessible to Mainland residents, so called A shares<sup>1</sup> quoted in Renminbi. Central bank also shifted from setting administrative targets (*guimo guanli*) for credit volume to direction based on a maximum ratio between loans and deposits (*bili guanli*) in 1994 (Park & Sehrt 1999, p. 14).

Among other prudential norms emanating from the Commercial Bank Law were capital adequacy requirements, firstly introduced in Shenzhen, and loan-deposit ratio. The implementation of norms was undertaken only before the entrance to WTO in many cases (Shirai 2002, p. 25). Moreover, state-owned commercial banks gradually became more prudent, e.g. they enacted a unique "lifetime responsibility system", which is supposed to penalize bank managers with bad lending practices even after their retirement (Shirai 2002, p. 24).

Foreign banks' entrance to market was contemplated very carefully. The total value of loans granted by foreign bank branches increased from USD 2.05 billion in 1991 to USD19.4 billion in 1996 but it was still only 3.1% of total assets and 26.9% of net foreign assets of the state commercial banks in 1996. The foreign investors were to contribute not only with capital, but also with foreign management skills, new products, and their independent supervision over the bank governance. The first case of foreign investor allowed to buy a minority stake in domestic banks was Asian Development Bank in 1996, when it purchased a 1.9% stake in China Everbright Bank.

Another reform in 1994 addressed the issue of bank taxes, which height every enterprise had to negotiate with government every year. A further amendment was issued in 1997 stating an explicit uniform 33% tax rate. Allegedly, the purpose of the reform was to reduce the huge reliance of government on enterprise profits. In reality, state simply had to find another source of revenue since SOEs were not very profitable and many of them run in loss. However, the decline in profits was observable in non-state sector as well. The reasons were the freeing up

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<sup>1</sup> However, the restriction relaxed in 2002 with the new mechanism of QFI. Further, B shares in Renminbi listed in Shanghai and Shenzhen are targeted for overseas investors. Recently, it has been made accessible for locals with forex and selected institutional investors. H shares priced in HKD are traded on Hong Kong Stock Exchange. Finally, a new type of Chinese stocks emerged recently, because of the increasing demand, listed on the New York Stock Exchange or Nasdaq (Calomiris 2007). However, China is about to open more channels for foreign investment in its stock markets so as to support share prices and to tackle the issue of capital outflows as the economy slows. For example, renminbi held off-shore can now be used to buy equities in China, which should promote the use of the currency outside the country (Financial Times: China to ease path for foreign investors. December 19, 2011).

of prices and entry of new firms which led to increased competition and lowered profits. (Lin & Zhu 2001, p. 309). As a result, the state revenue as a percentage of GDP fell from 31 percent in 1978 to 14 percent in 1992. Foreign banks have received a preferential tax treatment as a part of foreign investment incentives policy since 1991 (Berger *et al.* 2009, p. 6). New accounting principles were enacted, which were more in accordance with the International Accounting Standards in 1993, and regional inter-bank markets were unified through a computer network system in 1996 (Kumbhakar & Wang 2007, p. 110).

### ***3.1.3 Third Stage of Reforms***

Speeding up the reforms is now to be achieved through bringing in international and strategic investors, public listing of Big Four, and recentralization of control over banks. By the end of 1999, foreign banks opened 155 branches with total assets of USD310 billion but were restricted to certain areas and business, e.g. 47% of them operated in Shanghai, 22% in Guangdong, and 14% in Shenzhen. Their starting value of assets represented 1.5% of national total only. Generally, the composition of banking sector by asset value was in 2004 as follows: state-owned commercial banks 53.5%, policy banks 7.7%, joint stock commercial banks 14.9%, regional commercial banks 5.4%, foreign banks 1.8%, and other financial institutions 13.0% (Ngo 2010).

Another banking industry monitoring body was established in 2003 called China Banking Regulatory Commission (CBRC) to take over bank supervision from PBC. One part of its agenda was an amendment of foreign share purchases regulation now allowing foreigners to own up to 25% of any domestic bank, with one investor being allowed to own between 5–20%, subject to approval (Berger *et al.*, 2008, 6). As a result, banks do not only face the quasi-fiscal lending pressure from the local governments, but are also pushed towards better credit practices and transparency by regulatory agencies like CBRC and PBC, which authors argue, is not that unfamiliar situation to city-level banks in the US or Europe (Hoffmann & Enright 2008, p. 177).

The capital supply is now dominated by banking system which does not necessarily implicate allocation of credit to credit-worthy applicants only. The management of banks persists to perform poorly as for example the Beijing Branch mortgage fraud case of Y81 millions in 2005 illustrates.

## **WTO Accession**

After successful WTO entry in December 2001, a new set of rules became effective, while some existing ones were aligned with the WTO agreement. The negotiations were 10 years long and two opposing groups formed prior to the entrance. The first one was strongly against because of the status quo benefits it wanted to preserve. However, the second group was aware of the fact that it could be a very powerful and centralistic tool in combating all kinds of different treatments lobbied by local interest groups. There were also other reasons which brought China into aiming for WTO membership. Firstly, it was the growing importance of foreign trade for Chinese economy. Secondly, it spurred realization of reforms. Thirdly, it enhanced the attractiveness of China's market and gave foreign investors greater confidence in reform process. Taiwan factor played a role as well, as it had been a member already while China not yet. Finally, it flattered a national price and gave leverage for diplomacy issues. The dualist approach, which allows opening of special zones like Shenzhen while the rest is still closed to outside investment, came to an end. All policy information should be made available for public. Court became the avenue for arbitration of business conflict. There had to be public tenders for government procurement of services. It also provided an impetus for legal reform as compatibility with international standards and practices was required. China had to relax 7,000 tariffs, quotas and other trade barriers. The interest rates were pledged to liberalize, more equal tax treatment, and generally more freedom in the Chinese banks industry were promised. For example, foreign banks were allowed to enter more areas in the market and provide foreign currency services for Chinese residents starting in 2002, after being restricted to serving only foreign clients for the first two years. Regional restrictions, i.e. RMB business being allowed in only four cities in the first two years and four more in the next two years, were abandoned in 2005. Finally, Citigroup Inc., HSBC Holdings PLC, Standard Chartered PLC, and Bank of East Asia Ltd. obtained approval to accept deposits in RMB in April 2007 (*Berger et al. 2009, p. 6*).

China made a pledge to open its banking sector, insurance companies and other non-bank financial institutions' market to foreign banks from December 2006 as part of the WTO accession agreements; however, China made it quite impossible by imposing new requirements in late 2006, which led to a delay. The requirements stated that any bank wishing to open a new branch doing both yuan and foreign currency business must reserve Y600 million (\$73 million) of operating capital for each new branch. As a result, only few banks, e. g. Hong Kong and Shanghai Bank, Citibank, were able to comply with this rule.

Further, the Ministry of Finance levied a turnover or “business tax” (*yingye shui*) of 7% off the top of bank income before any deductions for costs. Hence, it was very difficult to become more than marginally profitable, while the SOBs did not have to worry as the government was backing any shortage in their capital (Yusuf *et al.* 2006, p. 85). However, the other factor is the lack of knowledge of local market, which makes it more arduous to identify potential clients. On the top of it, Hoffmann & Enright (2008) argue that Mainland is already one of the most overbanked economies in the world as broad money M2, which is the sum of cash, demand and time deposits in the banking system, is nearly 200% of GDP, which is twice the Asian average height and three or four times the average in the US and the EU. Since that does not make things easier for new Greenfield entrants, the acquisition strategy looks more attractive.

Anyways, as the example above shows, the rule of law is not, and never was, a powerful force in China for both historical and contemporary reasons (Yusuf *et al.* 2006, p. 48). In the history, Chinese county magistrates, who were the lowest rung of the executive branch of the imperial government, worked also as judges in criminal trials. They had to settle the commercial disputes only rarely since they were usually solved through guild rule or more informal procedures by the merchants themselves. The legal profession was then abolished by Mao Zedong during the Cultural Revolution (Yusuf *et al.* 2006, p. 104). Much later, the commercial law kept changing to be consistent with the market-oriented conditions. A big challenge was also a creation of judiciary that was technically competent, had authority to enforce the judgments, and acted without interference from other branches of the government. On the top of it, there is a difference in China between what the rules state and whether and how these rules are actually implemented or evaded, which is illustrated with the WTO example above (Yusuf *et al.* 2006, p. 85).

Ten years of membership proved to be highly beneficial for China as it has grown into the world's greatest exporter and second-biggest importer. On the contrary, the trading partners are complaining about many issues still being present, e.g. subsidization by undervaluing renminbi, hoarding essential inputs for domestic firms, and skewing its market against foreign competition by slow implementation of WTO rules, for example on piracy. Further wrinkles are caused by sudden imposing of unwritten rules, which are unknown or unfavorable to foreigners, as opposed to building a transparent and strong rule of law. Although many expressed a hope of progressive change in economic philosophy as a result of membership, it is not a case. Long Yongtu, who helped China to become a member of WTO, commented recently that China's acts are diverging further away from the spirit of the organization. Many

foreign companies expressed that they feel like competing not with Chinese firms but with Chinese state. The high ratio of SOEs, both central and local government strongly supporting national companies, protection and promotion of home-grown technologies, etc. violate the principles of WTO. However, The Economist comments that the reason of hopes looking less promising now in comparison to ten years ago is just because the lights have been turned on (The Economist: All change. December 10, 2011). On the other hand, Chinese growth has supported the exports of other countries, consumers have benefited from cheap Chinese goods, and the remaining barriers are often exaggerated. For example, its tariffs are capped at 10% on average as opposed to Brazil with its 30%; it is more open to imports than Japan at the same stage of development; and it is more open to foreign direct investment than South Korea was before the 1990s (The Economist: Shades of grey. December 10, 2011).

## 3.2 Institutional Framework

The second part of Chapter 3 focuses on the development of both formal and informal institutions, upon which interaction with financial sector many insights can be gained. It is said that political regime types interplay with economic development considerably. Socialist market economy with Chinese characteristics, which is the official term referring to China after the reforms of Deng Xiaoping in 1978, shares many problems studied also from the experience of the post-soviet transition economies. As we believe that setting the problem of NPLs into the framework of existing formal and informal rules casts quite a remarkable light on this issue, several institutions relevant for the financial sector performance are studied. Among others, ownership system rules, gaizhi, bankruptcy practice, and transformation path are described.

### 3.2.1 *Ownership System*

The institution of ownership system recognizes two major historical periods. Firstly, from 1949 to 1979, there was an effort to establish a socialist planned economy based on a complete public ownership. The result was “command economy”, however, being different from the Soviet-type (Guo 2003, p. 556). State ownership meant that state-owned enterprise was also state-run enterprise. The monitoring was difficult since public ownership implied that manager bore very little financial consequence for losses. Further, material reward was

not enforced and thus did not create an incentive. The supervisor was always ready to help because firstly, if SOE failed, the final responsibility lied in the supervising department, and secondly, SOE could not go bankrupt because of its welfare role, through which social control was maintained. As a result, quantity was emphasized over quality, acquiring political capital through networking and bargaining was given a priority, and resources were hoarded because of the unreliability of trade and state agents. Moreover, since enterprises had no information about the true supply and demand, the efficiency was hard to be addressed. Taking a lower profit margin than competitor and trying a new product were not allowed as well, which did not improve the profitability either. The small variety of available consumption goods and the absence of more direct sharing of the fruits of economic progress resulted in disincentive for work and general discontent (Ngo 2010).

The reforms in the post-Mao area can be divided into two main stages. During the first one, from 1979 to 1991, firms were allowed to retain more profits and they increased from 5% in 1979 to 45% in 1987. At the same time, state was still hold responsible for covering the losses. Managerial autonomy of SOEs increased but no significant ownership reforms were undertaken (Guo 2003, p. 556). To sum it up, emphasis was put on enterprise autonomy and material incentive, while ownership reform was not yet an agenda.

On the other hand, from 1979 to 2000, a complete public ownership was supposed to be replaced by a mixed system dominated by public ownership but coexistent with other non-state forms. The reason for recognizing non-state sector was aiming for a tougher competition in state sector, which gave an incentive to work more efficiently. Non-state actors response more to market signals, which also results in better resource allocation. The more clarified ownership structure results in harder budgetary constraint and higher responsiveness to market change. Further, the private sector was a much needed source of jobs. The contributing factors were two; firstly, the unemployment crisis emerged in late 1970s as youth was allowed to return from villages to urban areas at the end of the Cultural Revolution. Secondly, rural reforms granting more freedom to peasants caused huge flows of migrant workers to cities as well. Currently, the non-state sector is the major provider of jobs in China, when 7+ million workers are employed at foreign enterprises, 70+ million at urban private enterprises, and 130+ million at TVEs. State managers were also prone to the idea of mixed system as they hoped for higher profit retention ratios in state sector from a spill-over effect from private sector (Shirk 1993). Last but not least, the state could not manage everything anymore, both fiscally and ideologically.

On the top of it, the non-state sector was not a result of deliberate decision but rather a consequence of series of development and policy changes with government simply endorsing these trends. The policy changes were justified with *The Theory of Primary Stage of Socialism*. The stated ultimate goal was to give “to each according to his needs”. As unprecedented level of productivity was a precondition to achieve this stage, pragmatism was employed. The gradual shift in a way of reasoning is manifested through the following statements about the non-state sector (Ngo 2010):

- In 1982, “*individual economy is a supplement* to socialist economy of public ownership”.
- In 1998, “*private economy is a supplement to socialist economy of public ownership*”.
- In 1999, “*the non-public sector, including individual and private businesses, is an important component of the socialist market economy*”.
- In 2004, “*the legal right of private ownership of citizens is not violable*”, and “*the State protects private ownership and inheritance rights in accordance to laws*”

The change in attitude towards the private sector is visible also in a modified Party constitution using the *Three Represent Theory*: “CCP represents the advanced force of production, advanced culture and basic interests of all people”, implicating that private entrepreneur or anyone who can contribute to the cause of socialist modernization is justifying a party membership. In other words, no matter whether the cat is black or white, as long as it achieves the chased goal of high productivity (Ngo 2010).

The non-state (*People-run*) enterprises are further divided into private, collective, foreign, shareholding, and township village enterprises. Two categories fall within the category of a private sector. The first one is *Private*, which is owned by individual(s) and employs more than seven workers; on the contrary, *Individual* employs seven or less workers. *Collective enterprises* are form of public ownership since they are owned by local governments or local organizations such as village neighborhood committee and street committee. *Foreign enterprises* have various forms described below. *Shareholding enterprises'* structure is more complicated and challenges the domestic/foreign and public/private division. Further, multiple hybrid forms are present such as state-owned people-run or people-owned people-run. *Rural enterprises* can be either Collective enterprises or *Township village enterprises* (TVE).

The private sector growth is rapid with the average annual growth of output from 1992 to 2001 equaling 57.6%, share of national retail sales 60%, employment growth 30%, and tax contribution growth rate 31% (Ngo 2010).

## **Foreign Invested Enterprises**

Still more foreign-owned companies of various ownership forms start to establish in China with the market being gradually opened. The foreign invested enterprises can be divided into three categories: equity joint venture, contractual joint venture and wholly owned, based on the differences in two main areas: (i) ownership, and (ii) corporate governance structure. Since enterprise enjoys bigger benefits if it is in a form of joint venture, Chinese partner can usually hold maximum of 51% so as to prevent him from cheating (Ngo 2010).

### **(a) Ownership structure**

#### *1. Equity joint venture*

- foreign and Chinese investors
- foreign partner must hold more than 25%
- share distribution clearly delineated by contribution of respective parties

#### *2. Contractual joint venture*

- foreign and Chinese investors
- no minimum share requirement for foreign investors

#### *3. Wholly owned*

- 100% owned by foreign investor
- e.g.: ING, HSBC, Microsoft

### **(b) Corporate governance structure**

#### *1. Equity joint venture*

- compulsory introduction of board of directors
- chairmanship of the board must be taken by Chinese
- limited company by shares with rights and responsibilities of partners distributed according to possession

#### *2. Contractual joint venture*

- alternative form of decision-making body is acceptable

- rights and responsibilities are shared according to the agreement between partners, not share distribution
3. *Wholly owned*
- decision power in the hands of foreign investor

The state of ownership rights and rules has undergone a significant progress. However, there is a big room for improvement as the loopholes are continually found and misused, and the ownership right protection is by no means at the same level as in the developed world. A suggestion for addressing these perplexing patterns is to improve the existing rules and enforce their following in a coherent manner by everyone.

### 3.2.2 *Gaizhi*

*Gaizhi* is closely connected with the ownership system transformation. However, its definition is not limited to this sense and that is also why it deserves a closer look.

The term *gaizhi* is used to describe three different concepts. Firstly, it refers to any form of social networking, creation and maintaining of important relationships that empower both you and the partner. Firms even hire persons responsible for these matters as *gaizhi* is of an utmost importance in order to “get things done” in China, e.g. to get official permits for business related matters. The forms of *gaizhi* vary from dinner invitations and giving gifts to helping out while expecting something in return.

Secondly, this Chinese term meaning “transforming the system” is any structural change to a firm. In other words, it is a reallocation of property rights over enterprise assets and liabilities. A wide variety of forms and mechanisms has developed: public offering, internal restructuring, bankruptcy, reorganization through debt-equity swaps, ownership diversification by e.g. introducing new investors, employee shareholding, open sale or leasing to management, employees, outside private firms, another SOE, etc, joint ventures, or a combination of the above (Garnaut *et al.* 2005, p. 46). Out of the possible means of restructuring, privatization, i.e. increase in a private share, or even a full privatization has become very common. For example, the number of SOEs in industrial sector has rapidly fallen from 114,000 in 1996 to 34,000 in 2003 with the average number of privatized firm's employees being around 600. Hoffmann & Enright (2008) even expect state to become a minority shareholder by the end of this decade, which does not appear likely so far. The

privatization has hit the employment figures quite hard as about 30 million workers have been dismissed since 1998. However, there exists strong complementary relationship between SOEs and banking reforms because Big Four are the principal lenders to SOEs and at the same time, SOEs are the main contributor to the NPL problem in the banking sector (Leng 2009, p. 184). Hence, if competitive environment for enterprises is a goal, successfully implemented privatization is not enough, as it needs to be complemented with banks not basing their decisions on policy purposes and with hard budgetary constraint.

Further, different restructuring methods result in different outcomes. For example, the state still holds a majority stake guaranteed by law when a firm decides to undertake IPO. Internal restructuring, e.g. debt-equity swaps is not connected with a change in ownership. Employee shareholding, where firm is sold to both insiders and outsiders, bore the least political risk in the beginning of the reform. Finally, joint venture or merger with a domestic or foreign firm facilitate an access to technology, know-how, and capital (Garnaut *et al.* 2005, p. 42)

Several important issues have been raised since the launch of the program. The first problem is that the firms are very creative in ways of avoiding responsibility or simply refusing to take over the debts of the old firms. One example is that they set up a new private firm to lease the assets and employ most of the workers while leaving the old firm to carry the bank debts. The old firm with only few employees is very likely to go bankrupt in the end. The central European transition economies of post-soviet bloc characterized privatization as a process when someone that does know neither the real owner, nor the real value of property, sells something to someone knowing that the buyer does not have capital (Kouba *et al.* 2004, p. 30). The situation in China could possibly be described as a practice when someone that does know neither the real owner, nor the real value of property, sells anything to anyone aiming for the highest profit possible.

Further, as one interviewed CEO said, enterprises are more concerned about debts that are owned to employees than about the overdue bank loans, which they see as being owned to the government by the former SOE (Garnaut *et al.* 2006, p. 50). According to the authors' survey, 493 SOEs from 2001 owed Y25 billion in total out of which bank loans with interest made up 59 percent. Most of the overdue loans were owed to SOBs. Gaizhi firms do not strive to pay back accumulated debts and even if they do, they are usually unable to do so. Not only would it make them to struggle to stay in operation, it also would be difficult to attract new capital then. On the top of it, some medium-sized SOEs, for example in Harbin in 2002, were actually delaying their gaizhi programs hoping for government extension of write-offs and

debt-equity swaps of large SOEs to small and medium-sized ones based on their past experience. The government did not fulfill their expectations this time though and their debts were not canceled (Garnaut *et al.* 2006, p. 50).

Further, the government has to think about creating an environment such that *gaizhi* firms perform well and do not fall into new debts again. Thus, the remedy suggests balancing the interests of debtors and creditors somehow. At the same time, imposing hard budget constraint on firms should walk hand in hand with making the bank credit accessible (Garnaut *et al.* 2006, p. 52). However, the opposite is true and the credit is actually being tightened now. Moreover, restructuring has been criticized for alleged asset stripping. The paper, however, states that local governments' lower selling price was exchanged for a new owners' pledge to maintain slower rate of employment reduction, as employment is too big a priority. The authors also posed a question whether *gaizhi*, in the form of privatization particularly, has improved the financial discipline of firms. Their study is based on three indicators: 1. performance on meeting obligations on bank debts, which generally constitute the largest part of enterprise's obligations, 2. taxes, and 3. social security. The first indicator studies the relationship of a firm with bank; the other two reflect its relationship with the government. Further, their definition of a firm having a soft budgetary constraint is that it can postpone its due payment to the bank or the government. The conclusion they arrive at is that the performance improves after *gaizhi*. Furthermore, *gaizhi* with privatization hardens the budget constraint more than *gaizhi* without privatization. As labor productivity and investment rate have not changed rapidly, they assume the old business model based on expansion mainly to be gradually replaced with a new cost-saving model.

The third definition of *gaizhi* is restricted to the managers' buyout at the prices based on the recent profitability. The simple benchmark of current performance was established because of the underdeveloped asset evaluation markets at that time (Dranove & Lu 2007). The authors show that managers intentionally suppressed the performance of the firm before the buyout to purchase it at a lower price based on two empirical findings: net margin is four percent lower in comparison to trend one year prior to privatization, and secondly, there is no significant difference between the margin after privatization in comparison to the period of one year or more prior to privatization. The contrary result relative to Yao *et al.* (2007) is explained by using the performance indicators after *gaizhi* in comparison with performance indicators prior to the announcement of policy change. As performance deteriorates after the announcement, it should not be contrasted with performance after *gaizhi* to prove that *gaizhi* had positive effect. This result is more in line with findings about the insider acquisitions not

significantly improving the performance of firms in the Czech Republic, Poland, and Hungary during their transformation to free market. However, the authors acknowledge that underlying reasons for the findings may not be the same as the privatization process in those countries differed from the Chinese one greatly.

### ***3.2.3 Initial Public Offering***

The reform efforts aimed for strengthening the banks' corporate governance, risk management, external oversight of conducted operations, and high quality external audit to assess their financial positions. Bank managers confirm in interviews that the bank management is pressured to emphasize the rates of return on assets and increased profitability when aiming for initial public offerings (IPOs), as opposed to previous goals of growing assets and market share. The first player was BOC, which raised more than USD2 billion in June 2005 in Hong Kong. CCB raised USD8 billion in Hong Kong October the same year and by listing A shares in Shanghai raised a revenue of USD2.5 billion. The IPO of ICBC, the largest commercial bank in and one of the largest in the world in terms of assets, was greatly oversubscribed with revenue reaching USD21.9 billion in Hong Kong and Shanghai in October 2006, making it the largest one in history (Dobson & Ashyap 2006, p. 112). However, Chinese companies listed in the US can find their way around the IPOs scrutiny and thus bring fraud concerns to the picture. A lot of the firms have used "reverse mergers", i.e. joining a listed shell company to go public and thus avoiding the screening process connected with IPO. Further, poor disclosures, failure to interview key customers, shortage of qualified auditors, etc. make harder to distinguish bad from good, and that raises a question, how bad might things be in Singapore, Hong Kong, or in Mainland (The Economist: Red alert. June 11, 2011).

While the banks were in the process of preparation for listing on stock exchanges, central bank made USD45 billion worth capital injections from the foreign exchange reserves to CCB and BOC through established Central Huijin Investment Company in 2004, instead of writing off their NPLs ("pilot state-owned bank-overhaul program"). These pilot banks then met quantitative targets for NPLs ratio and capital adequacy set in 2005 (Podpiera 2006, p. 4). All of them became publicly listed and traded either on the Hong Kong Stock Exchange and/or the Shanghai Stock Exchange (Allen *et al.* 2008, p. 528). ICBC commenced to receive a similar treatment as CCB and BOC, when it received capital injections of USD15 billion in

2005 and transferred USD35 billion of its NPLs to AMCs (Dobson & Kashyap 2006). Under the assumption of loss loans having zero value and doubtful loans being worth 30 percent of their face value, the estimate of this government financial support for ICBC exceeds USD80 billion (Podpiera 2006, p. 8). The calculations of cost of cleaning up Big Four's loans differ among authors. Kashyap estimates the cost to equal roughly 10.4 percent the GDP through 2005, or 18.5 percent of GDP when adding Ma's (2006a) estimates. The effect of bailouts was single digit NPLs ratios before the end of 2005 for all Big Four except of ABC. ABC is the worst performing as regards the credit quality while being least transparent of the bunch, which might be explained by the smallest reforming progress.

Three of Big Four has been partially privatized, which alleviated a dual responsibility of government to be both regulator and majority owner. Bank of America acquired a 9% stake in CCB in 2005, as well as Singaporean investment firm Temasek reached a deal to buy 5.1% stake and then invest a further USD1.5 billion in shares after bank's IPO. Stakes in BOC were bought in 2005 by Temasek and Bank of Scotland under condition of locking up their shares for three years. Goldman Sachs Group Inc., Allianz AG, and American Express Co. signed a contract to purchase 10% stake of ICBC in 2006, since when Goldman Sachs has been providing assistance in risk-management, corporate governance, staff training, etc (Berger *et al.* 2009). Furthermore, an example of foreign investment in commercial bank is Newbridge Capital Ltd, a US investor group, buying around 18% of Shenzhen Development Bank Co. in 2004, and thus becoming the foreign controlling shareholder of a national domestic bank for the first time.

However, the state has not ceased to be a key player by no means. For example, ICBC, ABC, CCB, and BOC lost together over USD109 billions in market value from August 1<sup>st</sup> to October 7<sup>th</sup> 2011 counting both their A and H shares, as investors became worried about formal and informal credit markets being tightened. Just afterwards, a government agency Central Huijin Investment, which owns controlling stakes in Big Four, made an announcement of buying more A shares in all of them. According to Bloomberg, the purchase was not that big: USD31 million. However, that spurred a reaction worth more than 1,100 times that amount and over USD36 billion of market value was recovered by October 12<sup>th</sup>. Thus, the government strongly signaled that it is ready to act to back the economy and its banks any time if needed (The Economist: The A-share team. October 15, 2011).

Further, the international banks are deterred from entering IPOs because of rules thwarting foreign participation in the financial sector, an interfering securities regulators and rash of small and risky firms. As is described in part 3.2.1, foreign banks can enter the market only

through a joint venture with local firm and they can own up to one third of stake only, thus getting only slice of profits for all the work. Further, the size of individual IPOs is rather small with the average capital raising about USD147 million in 2011. It is also hard to know beforehand whether the firm just aims for a cash out. Bigger IPOs can be risky as well, as for example official Chinese media blamed the bank of misleading investors after bringing to market two companies, which later reported steep drops in profits. The China Securities Regulatory Commission still interferes in the decision process of which IPOs go ahead, favoring most worthy sectors and limiting overall equity raising. The foreign banks have done better with IPOs of H shares, while also domestic banks' participation at the H-share market increased from 20.8 percent in 2007 to 27.4 percent in 2011. Foreign bankers thus suggest that Beijing does not need to be afraid as Chinese banks do well even after opening the market for foreign entrants. The head of a securities joint venture puts it in an epic way: China has got to grow up (Financial Times: Chinese 'hoops' hold back foreign banks. December 19, 2011).

### ***3.2.4 Shareholding System: Corporate Governance***

The assets of many enterprises started to be converted into shares and offered for a sale. The governance structure changed from the previous one where manager was appointed by the supervising department and party secretary played a key role in management. On the contrary, it consists of the following: 1. Shareholders' Assembly, which is the highest decision body and all shareholders can attend its meetings, 2. Board of Directors (BD) elected by SA, which is a representative body of all shareholders, 3. Supervising Committee monitoring the performance of BD and entitled to enquiry for information and sit in BD meetings. Finally, CEO is appointed by BD. The new mechanism tackles the principal-agency problem since the owner/principal, which is not a state solely anymore, is able to monitor the performance of management better. The first reason why is that if shareholders are mostly people working in the enterprise, they are motivated to make the enterprise perform well. Secondly, greater transparency is supposed to be delivered because of the accountability to shareholders. Thirdly, after listing public, share price becomes a good indicator of company's efficiency, which partly resolves the information asymmetry. Thus, the enterprise achieves a needed separation from politics. Another advantage of shareholding system is its cheaper way of financing in comparison to bank loans. Further, insider privatization is thought to be a quicker

way to realize enterprise reform. Not only does it create an incentive and reward for management, it also is a way to keep key management personnel.

Percentage of state shares remains at a high level though. The official opinion explains that state, as a representative of all Chinese people's interests, should maintain a strong ownership position in SOE. However, that brings harmful effect of limited supply of stocks on market as the performance is again not the only trigger of a price of stock. Another issue is asset stripping with an example of Shandong Luneng case, where asset value was estimated to reach RMB70+ billion in 2005 and was sold only for over RMB4 billion in 2006. Part of the picture is the lack of skills for an accurate assessment of the value of state assets (Ngo 2010).

Shareholding system as a source of cheaper credit is deemed to be of a very high importance for non-state enterprises as only 1% of SOBs loans is accessible to private sector, which consequently resorts to unofficial and much more expensive sources of credit. Talking about “back-alley bankers” that make up informal financial system in city Wenzhou famous for its entrepreneurs, its size and scope spurred significantly over the last one or two years as a result of a shortage of credit, which caused around a fifth of Wenzhou's non-state firms to interrupt their production process. Astonishingly, SOEs even borrow cheaply from SOBs and pass the credit further at higher rates to other businesses in need through established financing arms. Credit Suisse estimates that about RMB10.7 trillion of off balance sheet lending including RMB4 trillion of informal loans, should be added to RMB54.7 trillion loans from official channels on banks' books in June 2011. To combat inflation, the lending has been tightened by central bank which made the demand for informal credit even higher; with some of the borrowers paying 6% interest a month. Further, Credit Suisse estimates this credit crunch to be shifting 60% of informal credit to property developers who hope for higher prices if government changed its mind and canceled the restriction on multiple home purchases (The Economist: Hitting the kerb. October 22, 2011). Another episode from this year earlier illustrates the limited power of central government to held things under control sometimes. As a result of CPI rising by 4.6% a year, PBC raised reserve requirement ratios seven times since January 2010 while it did not rely on other instruments like interest rates, which increased by 0.75 percentage points only since mid-2009. It also restricted banks to lend RMB7.5 trillion (USD1.1 trillion) at most, which was an increase of 19%. However, banks extended RMB7.95 trillion of new loans, which do not include off-book loans hidden in “trust companies” as financial products (The Economist: Trust belt. February 12, 2011). The similar pattern in monetary policy tightening was observable in early 1990s. Consumer prices rose by an average of 19 percent per year in 1993 to 1995. Interest rates on loans were raised

twice in 1993 but meant no restraint on loan seeking at all since they were below the rate of inflation. Instead, Zhu Rongji, then head of the central bank set lending quotas for commercial banks with penalties instead.

The non-preferential treatment of private firms continues with having different tax obligations, and accessibility to raw materials. One way to circumvent the discriminating treatment of non-state enterprises and to insure against the possible negative future treatment represents a so called *fake collective*. The private firm is registered as a collective enterprise because of the benefits connected with doing so. In other words, the private company is “*Wearing a Red Hat*”. However, a conflict over the property rights might arise easily with not rare cases of misappropriating the original owner, who has no left possibility to claim the ownership back (Ngo 2010). Besides this practice, enterprises tend to hide profits and thus evade tax because of the capital starvation (Leng 2009, p. 103).

Few business institutions for defending private owners' interests were established. Firstly, Self-Employed Laborers Association, which is an arm of the Bureau of Industry and Commercial Administration (ICA). SELA cadres are at the same time ICA officials. Secondly, Private Enterprise Association (PEA), which is also under ICA, with cadres who tended to see themselves as distinct from the smaller individual operators. Thirdly, Industrial and Commercial Federation was originally created in the 1950s as the officially administered mass organization for private business owners. It stopped functioning after the transformation to socialism was completed late in that decade and it was revived in 1977. Since 1991, the focus of the ICF has been the private business. However, their ability to represent private enterprises remains doubtful. Among other things, a top down communication is prevalent as opposed to bottom up flow, and national coordination is not encouraged. Since these institutions are rather weak and nearly voiceless, a lot of businessmen prefer to join party to enjoy the valuable network etc. (Ngo 2010). The study of Li *et al.* (2008, p. 1) finds that the Party membership contributes positively to the performance of their firms when controlling for human capital and other relevant variables. The affiliation with the Communist Party also facilitates to get loans from banks or other state institutions and the effect is stronger in regions with weaker market institutions.

### 3.2.5 ***Bankruptcy Practice***

The first bankruptcy law on a trial basis was enacted already in 1986 but the formal Company Law of 1994 was not widely applied until the mid 1990s, when bankruptcy started to be used by the central government as a way to restructure SOEs (Garnaut *et al.* 2006). In 1990, there were only 32 cases of bankruptcy. In the second half of 1990s several thousands of SOEs were declared bankrupt and 126.1 billion yuan in bank loans were written off with funds provided by central government (Yusuf *et al.* 2006, p. 103). Further, the government converted 350 billion yuan in state enterprise debt of the banks, or of the AMCs, into equity shares (Yusuf *et al.* 2006, p.109). Further, the bankruptcy did not necessarily involve firm being dissolved or at least having the owners or management changed in many cases, although it also often generated a diversification of the ownership resulting in partial or full privatization. Another problem is that most decisions are at the discretion of officials in the executive branch of the government. Creditors of bankrupt enterprises or courts do not have a big say in deciding the fate of enterprises, while government authorities often intervene and order a healthy enterprise to absorb a poorly performing one (Garnaut *et al.* 2006, p. 42).

Notwithstanding, SOEs gained a lot after China started to clean up the books of SOBs and the bankruptcy became quite popular. Many SOEs used bankruptcy as a mean to evade repayment of bank debts. For example, it was a common practice to file for bankruptcy and establish a new company cleared off the debts. That is why central government tightened up the regulation so the bankruptcy pace decreased in the late 90s. However, the incidence of bankruptcy increased again as gaizhi reached its peak in 2000-2001. In one survey, 90 percent of CEOs of gaizhi firms thought that bankruptcy was a feasible tool of resolving their enterprise's debt problems. Consequently, banks preferred firms not to be restructured if that might involve bankruptcy (Garnaut *et al.* 2006, p. 51).

To combat that, central government issued several regulations, for example creation of a register of firms that have tried to avoid debts. Further, a schedule for repayment of firm's debts was created. If they fail to meet the schedule, they cannot apply for new loans or open new bank accounts. Also financial institutions can reduce their credit rating, suspend the review of new projects and the granting of new loans for specific regions. That directly affects the interests of local government. Also Supreme Court issued a decree clearly stating that the evasion of bank debts through bankruptcy was illegal.

Local commercial banks generally like to help gaizhi firms in their region by discounting and rescheduling their debts or reducing interest payments, so they act based on policy

principle. Even if banks try to recover loans through suing enterprises, the lawsuits often end up in a stalemate: banks are not able to recover the loans and firms are unable to continue with restructuring. One interviewed bank manager said that although they can sue debtors, they can never get a single cent from the gaizhi firm whether they win the lawsuit or not. Some banks do not try to seize the assets of the gaizhi firms any more since the revenue might not cover the cost of auctioning the assets. One possible strategy is not to give new loans to the firms defaulting on loan repayment (Garnaut *et al.* 2006, p. 51). To conclude, it is still a long way to go for China to accommodate the original purpose of bankruptcy and its rules as they are known in the developed world.

### ***3.2.6 Transformation Path***

In the beginning of reform efforts, a discussion over the transformation path was led. The question was whether to free prices in the fastest possible way or whether to firstly restructure SOEs and establish their property rights more firmly (Yusuf *et al.* 2006, p. 64). In other words, “Big Bang approach”, also known as “Shock therapy”, which destructs legacy of command economy and creates market mechanism within the shortest possible time, was compared with the method of “Crossing the river by feeling the stone”, which is based on gradual approach starting with less controversial measures. The concept is not new as there is Chinese proverb saying: “The wise man tests the stones before crossing river the river” (Wolf 1999, p. 3). That would allow a coexistence of a planned economy and market reforms during early years, while success of reforms would generate support before commencing the most radical changes. The first route was followed in countries of former Soviet Union. In the case of China, the second way of transformation was chosen and a dual track system was introduced.

As a result, a method based on “particularistic contracting” emerged. It meant in practice that no priorly set, standardized and uniform rules were to be applied to everyone. On the contrary, the reforms were being negotiated ad hoc by government for each individual unit or set of units. Further, exemptions and special treatments were granted regularly. The power was decentralized to subordinate administrative units, which also increased material rewards. Local governments were now in control of resources and rewards, which led to a decline in central state revenue. A greater freedom for marketing the surplus of SOEs, after fulfilling the quota, was granted. The enterprise was free to decide on three things: on what to do with the

surplus capacity, to whom to sell the above-quota product, and where to buy the raw materials. At the same time, the quota was sold to supervisor at administrative price, while the above-quota product was sold at the market price, which in effect meant that one product had two prices, market and plan price, which were coexisting with each other (Ngo 2010).

The second stage, from 1992 to the present, tries to establish “socialist market economy with Chinese characteristics” by further transformation of ownership system into a mixed structure. The level of debt accumulated and fiscal unsustainability were supposed to be alleviated by keeping the public sector dominant while allowing various other types of ownership to participate (Guo 2003, p. 557). As a result, much more diversified ownership structure emerged. According to State Statistics Bureau and the State Administration Bureau of Industry and Commerce, mixture of eight sectors is present: state-owned, collective-owned, private-owned, individual-owned, cooperative or joint-ventured, shareholding, foreign-owned. The resulting system can be described as some kind of party-state controlled market socialism dominated by corporatized public ownership (Guo 2003, p. 572).

Before the Company Law in 1994, enterprise was seen as an appendage of a government unit. However, the enterprise started to be held responsible for its action after 1994 and the economic disputes were to be settled through civil law. Further, a limited liability concept was introduced as state-ownership no longer guaranteed unlimited support, which can be seen as a first attempt to separate management from politics. Moreover, a new employment contract system was introduced in 1994 which assigned more power to managers in personnel matters. The egalitarian principle in employees reward was dismissed and the wage was finally linked with the growth in enterprise profit, which created a material incentive. The greater autonomy resulted in more horizontal linkages with suppliers, distributors, workers and banks, complementing then limited vertical interaction with administrative supervisor. As a result, it was possible to reap more profit by making right decisions in sourcing, marketing and production.

These reforms, however, raised issues of self-interest. It was not clear how to balance interests of managers and workers, how to prevent the neglect of long term needs of enterprise development, or how to make sure that fiscal interests of state are met. The solution was a “contracted managerial responsibility” system designed to separate ownership from management. A contract for operating a SOE over a fixed period of time between manager, whose autonomy is protected, and administrative department is negotiated and it includes a full list of indicators and expectations. The SOE's responsibility is to (a) realize the pre-specified amount of taxes and profit and (b) to finance technical upgrading by its own fund.

Finally, the wage bill of manager is linked to total realized profits. Eventually, some problems connected with this system arose: 1. punishment of the more efficient since better performance may lead to higher quota in next contract, 2. short-sightedness of managers since they care about the current administration only. The reason is that their evaluation is based on the current tenure: “No one cares what happens in the next administration” (*meiyou ren guan xiayijie de shi*), 3. insufficient punishment of inefficient since the enterprise is responsible for profit but not loss, in other words, soft budget constraint is still imposed, 4. growth rate exceeds the agreed rate, frequently for example in Guangdong province, which leads to undesired outcome of higher inflation rate, 5. the articulation of contracts depends on the bargaining power of respective officials, and thus provides a room for rent-seeking behavior (Ngo 2010).

The idea of “grasp the large and let the small go” (*zhuada fangxiao*) in 1997 should have addressed the problem of fiscal unsustainability more directly. Rational was based on the success of Asian miracle, i.e. success of state-led industrialization and contribution of big business groups like Japanese keiretsu and Korean chaebol. However, the approach is not so unique since market concentration is high also in capitalist economies, for example in car and media industries. To sum it up, the growth was not to be based on neoclassical small and medium enterprises, which become more efficient under strong competition pressure (Guo 2003).

China started to corporatize and restructure SOEs into giant conglomerates, shareholding companies or shareholding cooperatives so as to gain international competitiveness, enjoy economies of scale, reduce inter-enterprise transaction costs, create an internal capital market that could substitute for missing financial institutions, and assist with the enforcement of property rights (Yusuf *et al.* 2006, p. 96). However, it is impossible to maintain support for all state enterprises. Although SOEs performances have been improving over the last 20 years, it is still heavy drainage on state finances. The central government picked up 120 core enterprises by 2000, which then expanded through mergers and acquisitions. At that time, they were contributing 50% of all SOEs profit, 25% of tax, total assets and sales, 35% of China’s total industrial output, and 25% of China’s total industrial profit (Ngo 2010). These core enterprises enjoyed preferential treatment when more autonomy and direct access to planning process at top state departments were enabled. Access to bank loans and listing was a state priority and more funding for technological upgrading was provided. One such example is internal finance company Huxia Bank with well over 200,000 employees. It is, however, hard to tell whether these reforms led to efficiency and competitiveness

improvement. The state presence in economy remains strong, it probably does not harden budget constraint, it is questionable whether protection of indigenous industry is an acceptable behavior for WTO member, and it also raises the question whether competition or protection is a better way to enhance competitiveness (Ngo 2010).

### ***3.2.7 Short Comment on Political Background of Economic Reforms***

The characteristic feature of China's financial system is that the financial and fiscal institutions are key components in the political calculus. Further, the current development in financial system is set in motion and the debate over the correct path of reforms still takes place while political reasons and multifarious interest groups meddle into the process. According to Shih (2004, p. 928), the reform and creation of sound economic policies are assigned less priority in contrast to political survival or short term retention of power. It is not important to "cross the river by feeling for stones" (*moshi guohe*); on the contrary, the objective is to politically survive, in other words, to remain standing while crossing the river. The bureaucratic capture and the shortsightedness of both central and local governments are significantly shaping the design and implementation of financial policies. The logic of "No one cares what happens in the next administration" (*meiyou ren guan xiayijie de shi*) is applied in the political sphere as well.

The slow pace of economic reforms is partly attributable to status quo beneficiaries. They especially benefited from particularistic approach and the resulting contracts. Particularistic culture looks at the relationships and circumstances in the specific situation to decide what is right, as opposed to universalistic culture where ex ante rules apply to any situation. In other words, as circumstances change so too should the terms of the agreement according to the particularistic point of view (International Business Cultures 2010). Consequently, bargaining process, various benefits and exemptions, and decentralization of power with strong local units then hinder a realization of reforms. Zhu administration then decided to proceed with recentralization during Zhu administration in late 1990s. The power was taken from local governments and shifted to central government institutions like State Economic and Commission, State Development and Planning Commission, the PBC, and the Ministry of Finance (Shih 2004). Hence, a cycle of strong centralization movement during Mao with decentralization actions at post-Mao era is observable to end with relatively recent centralization effort.

## **Chapter 4**

# **Nonperforming Loans in China**

Having acquainted the reader with the issue of NPLs in general and with the intricacies of financial sector development in China, we now turn to the issue of Chinese NPLs.

The definition of nonperforming loans (*buliang daikuan*) in China, which differs from the one used in international classification system, is introduced in the first part. The second part shortly describes the treatment of NPLs on balance sheets of Chinese banks, compares the series of ratio of nonperforming loans to total loans in China with the official statistics of other Asian countries. It also briefly touches the evergreening of loans. Finally, tools for indirect NPLs disposal described in Chapter 3, for example *gaizhi* and transformation to shareholding system, are complemented with a direct remedy: establishment of asset management companies. Undertaken counter-measures against NPLs in system are discussed in the light of both formal and informal institutional framework as it has been found to be a key contributing factor of NPLs in China.

### **4.1 Definition of NPL in China**

To put it simply, non-performing loan is a loan on which debtors have failed to make contractual payments for a predetermined time (Freeman 2004, p. 5). However, digging deeply for a more precise definition of NPLs is a must since it has always been a source of confusion. Till now, there is no single international standard. Not only the countries use different definitions, there also may be contrasting definitions within a single country depending on the sector involved. The definitions vary in terms of the classification system, the scope, and contents. The one used by IMF states the following: A loan is nonperforming when payments of interest and principal are past due by 90 days or more, or at least 90 days of interest payments have been capitalized, refinanced or delayed by agreement, or payments are less than 90 days overdue, but there are other good reasons to doubt that payments will be made in full (Freeman 2004, p. 9).

The definition of NPL in China is not perfectly clear although the progress has been made. Before 1998, only informal loan classification system consisting of three categories with no clear-cut rules was present. Firstly, *bad debt* presented a volume of loans with no chance of recovery from bankruptcy and liquidation proceeds. Secondly, *problem loans* when principal was overdue for more than three years while the interest was still being paid, and finally, *off concern* when principal repayments were past due for over one year. However, the main reason of these statistics being unreliable was a limit imposed on SOBs to report no more than 2%, 5%, and 8% of loans falling into the respective categories (Wu 2002, p. 15). Further, the classification of loans was based on payment status, as opposed to risk status. If one borrower held more loans, the loans did not classify as NPL unless the contractual terms were breached in case of each one of them. Furthermore, the recognition of loan to be NPL which was tied to not repaying the principal was often delayed because the repayment was not required until the end of loan period in many cases (so called bullet loans).

The Asian Crisis in 1997 shifted the attention to state-owned banks and their NPLs. Consequently, a new international loan classification system, in a more lenient and unsatisfactorily clarifying version, was officially enacted in 1998. However, many banks persisted to use conventional classification methods where loans were classified based on the length or arrears for some time. Notwithstanding, the new system consists of five categories classifying loans of commercial banks according to their risks: pass, special-mention, substandard, doubtful, and loss (CBRC). Three-tier system classifies loans to be NPLs when falling into one of the last three categories, which are defined as follows. *Substandard*: borrowers' ability to service loans is apparently in question, cannot depend on their normal business revenues to pay back the principal and interest of loans and certain losses might incur even when guarantees are executed. *Doubtful*: borrowers cannot pay back principal and interest of loans in full and significant losses will incur even when guarantees are executed. *Loss*: principal and interest of loans cannot be recovered or only a small portion can be recovered after taking all possible measures and resorting to necessary legal procedures (CBRC's Regulations, 2001). On the contrary, international standard currently divides NPLs into four categories: special mention, substandard, doubtful and loss. Besides that, non-performing loan is defined as a commercial loan 90 days past due and consumer loan 180 days past due (Wu 2002, p. 16).

## 4.2 Treatment of NPLs

NPLs are inherently connected to the financial system. That is why this section can extend the arguments from the previous chapter. Resources were misallocated and SOEs were supported unlimitedly because of their political, economic, and social roles. For example, SOEs represented a social welfare net and a tool for maintaining social stability, i.e. each SOE hosted a small society (*qiye ban shehui*) proving its members with education, job, food, medical services, accommodation, etc. Hence, the efficiency of enterprises was not taken into consideration, as opposed to other aspects (Wu, 2002, p. 19).

Many reforms to modernize and strengthen the financial sector have been conducted since. This paper assumes that the current level of NPLs is a consequence of broad range of factors characteristic to Chinese financial system described in Chapter 3, e.g. institutional infrastructure as bank regulation, credit culture, openness to foreign investors, ownership system, corruption in the country, pressure exercised by local and central governments, rolling over the bad debt, which is discussed in more detail below, and conflict of interest not only between bank and creditor or borrower, but also between managers and party representatives within a bank.

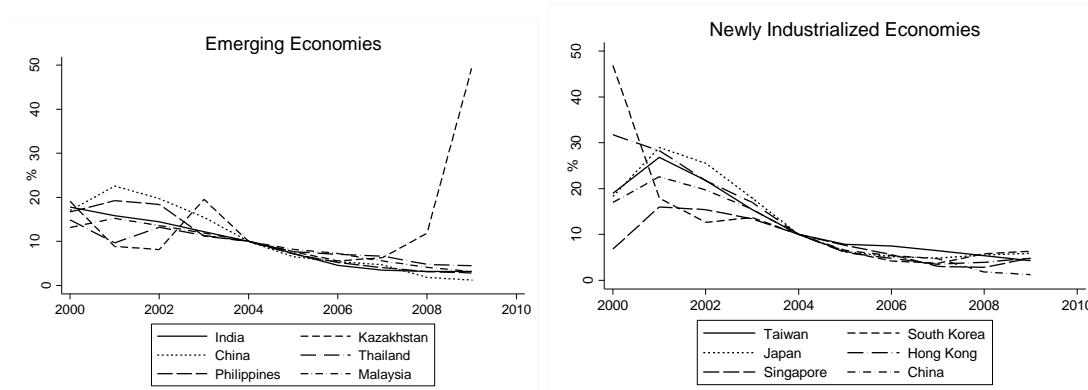
The first step to remove NPLs from bank's balance sheets was undertaken in 1998. The central government issued special bonds at total value of RMB270 billion (USD32.6 billion) acquired by banks themselves and then converted into equity. Consequently, Big Four doubled their capital base (Dobson & Ashyap 2006, p. 109). Later, four state-owned Asset Management Companies (AMCs), discussed in more detail in section 4.2.2, were established and purchased RMB1.4 trillion of NPLs of the Big Four at face value, which accounted for around 20% of their total loans.

In the current period after the establishment of CBRC in 2003, still over 60% of loans goes to SOEs, the policy loans make a big part of the overall loans volume, and the "commercial banks" continue to face strong political pressure to supply credits. Consequently, non-state sector is deprived of capital supply and has to resort to unofficial sources of credit. Further, high ratio of NPLs indicates the misallocation of resources, and budgetary constraint is not being hardened sufficiently (Ngo 2010). However, the argument of high ratio of policy loans is challenged by Hoffmann & Enright (2008, p. 176) who argue the opposite; the state does no longer dictate where the majority of loans go. The reason is that having about half of the loans on stock basis going to SOEs in 2007, while it was 75% or

more in the mid-1990s, implies a decline on a flow basis to 30 or 35% in 2007. Further, they observe significant improvements in the poor management skills of bank employees, banking supervision, quality of borrowers which improved by leaps and bounds, macroeconomic regulations, bringing by no means such bouts of overlending as in previous periods, e.g. during 1991-1995 bubble. However, such view is not shared by many.

The other side of the coin is already a huge starting pile of bad loans. Not until 1991 were SOBs obliged to set reserves for NPLs and almost no NPLs were written off from their balance sheets before. Commercial banks were then allowed to set aside some provision in case of NPLs loss, which was exempt of taxes and subjected to annual negotiation with Ministry of Finance. The reserve requirement ratio for commercial banks increased from 13% to 20% in 1992 and later decreased to 8% in 1998. PBC paid interest both on required as well as excessive reserves. Furthermore, the reserve requirement ratio was linked to total amount of loans, as opposed to classified loans only, and it was 0.6% in 1991, while it increased to 1% in 1997 (Wu 2002, p. 17). Wu argues that such low reserve requirements were set out of the worry about the tax revenue emanating from banks using an accounting mechanism to pay less tax. However, the situation has changed rapidly since then the reserve requirement ratio became a monetary policy tool against inflation and it was raised about eleven times just from the year 2010. The current level is 21% for major banks after the first cut in the last three years from 21.5% to ease the credit strains (Reuters: China cuts bank reserves in policy shift to lift economy. November 30, 2011).

The official level of NPLs ratio was still 6.17% in 2007. Already in 2009, it was mere 1.58%, which approximately equaled the estimate by ADB: 1.6%. In comparison to the group of newly industrialized Asian economies, the starting level in 2000 belonged to the highest ones, while China gradually became the best performer towards the end of time period. This striking improvement shall be put under scrutiny later. On the other hand, China performed quite well within the group of emerging Asian economies already in the beginning, and again should have the most prudential financial system out of them all in the end. These two observations are compared with our estimates in Chapter 5.

**Figure 4.1:** NPLs in Asia, 2004 = 100

However, domestic financial weaknesses in China are combined with extremely strong external financial position, as its reserves largely exceed their both domestic and external debt. That, however, does not allow China to avoid still other rounds of new NPLs, although the withdrawal of external finance is not a likely trigger. Further, even if China is exposed to global downturn, a refocusing on domestic consumers shall be a fuel for yet another period of credit and economic growth.

#### 4.2.1 Evergreening of Loans

Watanabe (2010, pp. 116–118) poses a question whether Basel I regulatory framework imposed on Japan in late 1990s led not only to quantity change, but also to quality change of the lending supply. The question has interesting policy implications. If the bank lending shifts from high-quality borrowers to low-quality borrowers (evergreening), prudent regulations makes banks to write off NPLs and consequently leads to a large loss of capital. That might redirect the financial support to unhealthy firms with a higher concentration of NPLs, and thus enforce misallocation of resources. If the opposite is a case (flight to quality), strict regulatory framework encourages the efficient use of resources. The logic behind is that firms realized the threat of falling below the regulatory minimum of the risk-based capital to asset ratio after more prudent standards for assessment of loans were imposed. Consequently, they hesitated to cut back on lending to inefficient firms since the firms would potentially go bankrupt after the bank's withdrawal, which would lead to even higher capital losses in the end. At the same time, lending to healthy firms had to drop. Except of resources misallocation, the authors expand two more arguments. Firstly, since the banks overinvested in loans collateralized by real estates during the real estate upturn, the vulnerability of banks to the real estate price risk significantly increased. Secondly, unless the fair accounting

standards were very strictly enforced, banks' incentives to "evergreen" were hard to oversee. This behavior of Japanese banks partly contributed to the introduction of Basel II.

In order to confirm this result for China, an analysis similar to Watanabe's would have to be performed. Notwithstanding, the strong urge to protect unhealthy enterprises, for example because of the political pressure to extend credit to strategic enterprises or managers being evaluated against the NPLs target, together with the good ability to misuse loopholes, would very probably lead to the same conclusion as in the case of Japan. Further, similarly to Japan, after the introduction of three tier system in 1998, the rules for loan classification and accounting were not strictly followed. When the loan became due, the maturity was simply lengthened instead of being reclassified many times.

If the banks became more reluctant to extend credit to healthy firms after 1997 Asian crisis, or more recently because of the spurring inflation, two of the implications might be as follows. First, non-state firms would have had to resort to more expensive sources of unofficial credit to a greater extent than before. Generally, it might have led to a contraction of credit supply, which probably would have not encouraged investment spending. Second, China's real estate prices have been rocketing for some time, which implies an increase in system vulnerability determined by the real asset prices risk proportional to loans collateralized by real estate assets.

#### ***4.2.2 Asset Management Companies: Once-off Prescription?***

One of the remedies introduced to decrease the burden of NPLs in SOBs was the establishment of four asset management companies by the central government in 1999. The NPLs were transferred at their face value from Big Four to China Huarong Asset Management Corporation, China Great Wall Asset Management Corporation, China Orient Asset Management Corporation, and China Cinda Asset Management Corporation. Each AMC capitalized at RMB10 billion was responsible for dealing with NPLs of one of Big Four: Cinda with the CCB, Great Wall with the ABC, Oriental with the BOC, and Huarong with the ICBC. The other goals were to restructure SOEs and to recover distressed assets. Upon establishing AMCs, the plan was to complete a disposal of NPLs within 10 years. However, the life of the AMCs is now being extended along with introduction of changes in their functions; for example, they are based on a more commercial basis now and on an involvement in failing securities brokerages.

## The Mechanism

The mechanism was to firstly assume NPLs accumulated, offer debt-for-equity swap to the bank, discounted payoff, loan pool sale, property auction, undertake legal proceedings, resale of loans to investors, etc. The condition for these banks to participate was formation of asset management joint ventures with China's AMCs. For example, Huarong contracted Ernst & Young in 2001 with respect to the bidding process for NPLs transferred from the ICBC. Afterwards, Huarong established a joint venture with a Morgan Stanley-led consortium and later, as the first AMC agreed to sell NPLs with a book value of USD 1.3 billion (Y10.8 billion) through the public bidding system to them in March 2003, which makes it to be one of the largest such portfolio sales of NPLs in China's history. Another example is Cinda establishing a joint venture with Goldman Sachs to dispose of bad assets. At the same time, banks tried to break the monopoly of AMCs in NPL disposal, e. g. CCB, while trying to become the first of Big Four to launch overseas listing, established a new type of distressed asset auction in February 2004. Firstly, collateral should have been auctioned after it had been separated from its collateral and the collateral was worth USD 600 million in this case. At the same time, BOC planned to auction NPLs with a face value of about USD724 million to foreign and domestic bidders directly and thus circumvent AMCs. If permitted by the CBRC, it would split the market share of NPL disposal business and consequently, bring competitive pressure on AMCs (Leng 2009, p. 190). However, the sale was blocked by Beijing because the price was considered to be too low. Later, six more licences have been issued to other companies interested in asset management business.

The supervising role is managed by PBC and Ministry of Finance. The government also created a super ministry directly under the State Council, the State-Owned Assets Supervision and Administration Commission (SASAC). Its role is to form the rules for the SOEs restructuring and supervise the largest firms, while the smaller firms are supervised by local state AMCs, which are under control of SASAC.

## Deficiencies So Far

At the same time, the NPL disposal process has revealed many of the loopholes in the institutional design. Firstly, the moral hazard of Big Four gives them an incentive to mis-categorize their problem loans and they inflate the number of NPLs transferred to AMCs and so misuse this government bail-out measure. Another source of fraudulent transfers by

forging documents is bank managers' desire to disguise business losses caused by poorly executed transactions or even financial crimes (Leng 2009, p. 191). Moreover, the SOEs to undergo the debt-equity swaps program of AMCs are chosen by State Economic and Trade Commission, not by the AMCs themselves. This structure, however, gives an undesirable signal of state as a "lender of last resort" (Yusuf *et al.* 2006, p. 104). Furthermore, the "eating disorder with Chinese characteristics" of the banks' and distressed firms' is not treated by AMCs. Not cutting off ties with defaulted borrowers results in accumulation of new NPLs. Furthermore, there are analyses showing that the effect of repeated bail-outs did not lead to performance improvement (Leng 2009, p. 197). At first, loans at face value USD170 billion were transferred, equivalent to more than one fifth of the banks' loan books. Almost all of those loans were policy loans without collateral. The government announced to the banks that it was their "last supper". However, another transfer valued at USD33.62 billion followed in June 2004 from CCB and BOC to Cinda in order to clean their balance sheets before the overseas IPOs. Consequently, both banks reported NPLs ratio of below 5 percent (Leng 2009).

Another issue was a dispute over allegedly under-priced "fire sales" by AMCs to foreign investment banks at the expense of potential domestic buyers and "national economic security". However, as Leng (2009, p. 189) argues, China had no previous experience and secondly, had underdeveloped market mechanisms for NPL disposal in its transition period. Thirdly, there were only few domestic buyers that showed interest in entering the market in the beginning. Further, there was a lack of a proper valuation system and standardized auction procedures, e. g. information disclosure, property documents authentication and risk assessment. Further, hurdles regarding government approval contributing to uncertainty and delay did not have a positive impact on NPL pricing. Besides, irregular dealings, low recovery rates at AMCs were also reasons for under-pricing, as well as corruption and embezzlement at both AMCs and Big Four; 38 cases of illegal practices at the four AMCs valued nearly USD 846 million were identified in a 2005 work report of China's National Audit Office (Leng 2009, pp. 192–193). Last but not least, according to many, China is missing the proper institutional design for dealing with the borrower that defaulted on the loan, in other words, institutions addressing foreclosure, asset disposal, corporate restructuring, and outright bankruptcy. A big part of NPLs were simply transferred to government-owned AMCs, which have not done much with the assets, and only small part of it was sold to asset recovery specialists. Since a lot of NPLs are just being stored in AMCs that might imply a slow progress in restructuring loss-making SOEs and no hardening of

budget constraint. That is why some authors suggest that the policy of transferring NPLs off the bank's balance sheets to government accounts is not correct and they should rather keep them there (Gang 2003). On the other hand, Hoffmann & Enright (2008, p. 196) argue that it is not important how long it takes to clear NPLs up as long as they are not present on balance sheet of bank. The systemic crisis arises when bank cannot meet its current market liabilities. Since AMCs are not banks, shifting the NPLs burden from banks to them has greatly reduced the financial risk to the economy notwithstanding the fact that most of it has just been shifted to these special-purpose vehicles (Hoffmann & Enright 2008). Allen *et al.* (2008), and Gang (2003) converge to the same conclusion by saying that since NPLs is treated as a fiscal problem because big part of it due to political and other non-economic reasons, the financial risk emanating from NPLs is still manageable given current growth rates and debt level. On the other hand, they recognize that new NPLs in China may grow much faster than in other countries. Secondly, government debt may increase sharply in the near future because if the higher fiscal spending in areas such as pension plans and other social welfare programs. Besides, the government spending has dramatically increased recently in order to spur the economy in the current crisis. Strong appreciation of renminbi might not help either as exporting business may become less attractive for investment.

By 2000, more than Y1.4 trillion of debts, which makes about 20% of outstanding loans, were transferred to AMCs and 601 enterprises benefited from the program. The transfer was financed by issuing bonds of Y850 billion while PBC lend Y550 billion. The AMCs succeeded in selling off around 69% of the loans on their account by 2006 (Hoffmann & Enright 2008, p. 47). The ultimate loss incurred by the AMCs is expected to be covered by the central government, which mean that taxpayers pay the bill, and is likely to reach nearly Y1 trillion. Thus, the effect is far from hardening the budget constraint. The cash recovery on bad loans processed by AMCs ranged from 6.9 to 35 percent between 2001 and 2006, for example, the cash recovery ratio equaled 20.84% as of end-March 2006 (China Banking Regulatory Commission 2010). The asset recovery rates are slightly higher. The problem is that the process has gradually become more difficult since the high-quality assets have been disposed as first and the more troublesome ones are still in portfolio (Wu 2002). As a result, NPLs ratio of the Big Four decreased from 40% in 1998 to 15% in 2004 to 5% in 2006. However, the drop is also a result of the rapid rise in bank loans from RMB6.25 trillions in 1998 to RMB11 trillion in 2005 (Ngo 2010).

In accordance with many previous studies, we argue that the current setting of AMCs is inefficient for creating the proper incentives for decreasing the volume of bad debt.

Furthermore, their ability to recover the bad assets is rather limited. Hence, a pessimist might say that the functioning of this state agency is nearly limited to burying a significant part of the pile of nonperforming loans in the system.

## Chapter 5

# Official vs. “True” Value of NPLs Ratio

Various papers have estimated the non-performing loans ratios to be highly exceeding the official Chinese figures and we provide a short summary of related research in the first part of this chapter. This study contributes to contemporary research by applying the out-of-sample approach of Égert *et al.* (2006) and their later publications. They estimate the deviations from an equilibrium level of private credit to GDP, which is justified by economic fundamentals, in 11 Central and Eastern European countries. In contrast, the out-of-sample method in this paper is employed to put the official Chinese data in perspective of five other regions because of the low quality of statistics and secondly, for obtaining more robust results. If the Chinese reported values of NPLs ratio significantly differ from the predicted values calculated with the help of elasticities estimated from countries sharing similar or different development path, the discussion of likely reasons shall be carried out.

Both national statistics and data obtained from international organizations' databases claim NPLs ratio in China to be greatly improving in the past few years approaching the level of one percent in 2010. In the first part, the miraculous improvement over the last decade is put into a comparison with a group of eleven Asian countries, which is considered to be a useful benchmark for China sharing the characteristics of the region. To render yet another comparison, out of sample coefficients are generated for seven transition and five developed European economies. The group consisting of Slovakia, Czech Republic, and Hungary contributes to the discussion with their CEE region transformation experience. Romania, Russia, Serbia, and Ukraine offer different perspective as their transformations are yet to be accomplished. Finally, the relevancy of elasticities produced from the group of developed countries, i.e. Sweden, United Kingdom, Norway, Netherlands, and Germany, is discussed. We believe that the employment of more benchmarks alleviates the difficulty of evaluation whether official statistics under- or over-state the real NPLs ratio in China.

In this chapter, we estimate the output gap using the multivariate unobserved component (MUC) method for all but advanced European economies since the output gap is utilized as

one of the determinants of NPLs ratio and no reliable statistics from international databases are available for these countries to the best of author's knowledge. The estimation is carried out via Kalman filtering technique.

## 5.1 The Chinese Conundrum: Estimates of NPLs

Generally, the estimates of NPLs ratio in China are found to reach much higher levels in comparison to official estimates, thus indicating the official statistics to be significantly under-valuated. However, the external estimates vary as a result of utilizing different samples of data, specifications, and estimation techniques. Moreover, the lights have been turned on previously hidden information, thus making the attempts approach the “true value” better. In order to gain an insight into the topic of estimating Chinese NPLs ratio, findings of several authors are explained. The NPLs calculations are described and their rather frequent conclusion of improving ratio in the past few years is compared with our modest proposal later in the chapter. Many studies by Chinese authors claiming the official statistics to be correct are inaccessible because of no existing English translation yet.

### 5.1.1 *Intricacy of Official Statistics*

The official estimates are intriguingly different from other sources and updates of historical data are sometimes altered from year to year. For example, the average NPL ratio only at Big Four was 40 percent at the end of 2003, right after the write-off of bad loans by central bank and the transfer of bad assets to AMCs. Already one year later, CBRC reported a drop to 15.6% (Leng 2009, p. 191). Standard & Poor's estimated that a full and immediate bailout of bad debts in China would cost around USD656 billion, which is over 40 percent of forecasted 2004 GDP (Sprayregen *et al.* 2004, p. 38).

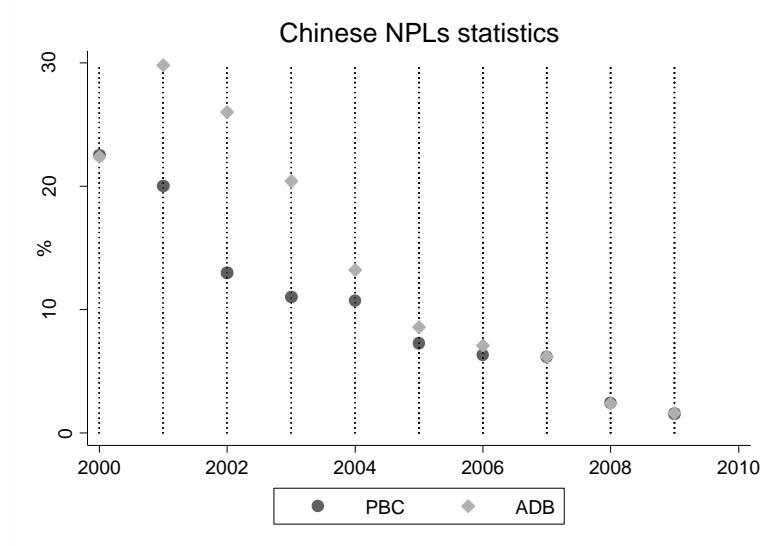
Furthermore, transferred NPLs to AMCs create a grey area in statistics and including them would result in the surge of real pile of NPLs. Allen *et al.* (2008, p. 525) estimate that the statistics on total NPLs within all commercial banks would increase by two-thirds in the first quarter of 2006 if NPLs held by four AMCs would be added. Another problem is reported by internal PBC studies which showed that banks that started to report loans in a five-category system increase their reported NPLs ratio by as much as 14 percent. The discrepancies

between the announced NPLs ratio by banks and by PBC were much less if bank used four-category classification (Shih et al. 2007, p. 19).

The intricacy of official statistics is also commented by Wu (2002, pp. 16–17), who explains that official statistics were clearly underestimating the NPLs in 2000, when central bank governor announced 2.7% of bad debt loans, and 8 to 9% of past due loans and doubtful loans combined in system. The value of loans in total was RMB9,062 billion in mid-1999 yielding less than RMB1,062 billion of NPLs. However, the value of NPLs transferred to AMCs from Big Four was around RMB1.3 trillion in 1999. Wu then calculates that the total value of bad debt would equal RMB2,719 billion, which is about twice the value of transferred NPLs to AMCs in 1999. Therefore, he tentatively concludes that the ratio could be 30% at the end of 1999; while in contrast, the official figure is 22.5%. Moreover, then governor of PBC admitted in March 2001 that without transferring NPLs to AMCs, the NPLs ratio would be as high as 35 percent in 2000 (Tung 2002, p. 2).

However, the statistics on NPLs ratio from various sources tend to converge towards the end of our study period as illustrated in Figure 5.1 for data both from the central bank and the Asian Development Bank.

**Figure 5.1:** NPLs ratio: official source vs. Asian Development Bank Database



### 5.1.2 Further Estimates

In Podpiera (2006, p. 10), the estimate of NPLs in major banks in 2002 was about 23.2%, which is slightly lower than the percentage given by ADB, as opposed to official ratio

equaling 13% indicating strong undervaluation in official statistics. No details of author's calculations are provided. The estimates in 2005 are much closer equaling around 11%, 8.6%, and 7.3%, respectively. The decline in this period is explained by three factors: NPLs write-offs, transfers to AMCs, and dilution of old NPLs by better performing new loans. Author also comments on the huge improvement in the reported credit quality of new loans in comparison to old loans, which would imply either significantly higher credit quality since 2000 or measurement problems. The average NPLs ratio for loans originating after 2000 to 2005 was around 2 percent in aggregate, as opposed to over 60 percent for some banks in the previous periods. It is explained to be a consequence of greater seasoning of the older loans, and slower growth in state commercial banks in comparison to other commercial banks.

Another study (García-Herrero *et al.* 2006, p. 304) estimates the NPLs ratio to equal 20% in 2003, which is approximately at the same level as ADB's and Podpiera estimates, which are 20.4% and 17.8%, respectively. At the same time, all figures are much higher than official statistics (11%). However, details of calculations are again not included. Suzuki *et al.* (2008, p. 58) explain these figures with stressing the central role of Big Four. They accounted for 51.3% of total assets in the banking sector in 2006, and at the same time, they suffer from the mounting accumulation of bad debt. For example, NPLs ratio equaled 30.07% in 2003 in ACB, which necessarily leads to low profitability. Authors identify underlying reasons as follows: poor credit culture, soft budget constraint imposed over SOEs, poor profitability resulting mainly from the bad asset quality, insufficient institutional framework, pervasive state ownership, weak corporate governance, and low capitalization.

Barth *et al.* (2009, p. 413) point out that some estimates of NPLs in China are not accurate any more for the following reasons. The first issue is that some of the earlier research examined a period before the reforms in banking sector in 2003. Other valuations did not take into account the writings off the bad loans after their transfer to AMCs. Thirdly, some calculations made a mistake of double-counting the NPLs. For example, they included NPLs held by AMCs at face value and at the same time, they counted also the loans extended by PBC to AMCs for the purchase of NPLs. Authors then calculate NPLs ratio as a sum of NPLs held by commercial banks, rural credit unions, AMCs, and PBC, which makes RMB3.94 trillion (USD540 billion) at the end of 2007. Further, authors argue the growth in total outstanding loans to be a major contributor to a fall in NPLs ratio, similarly to Ngo (2010) and Roubini & Setser (2005, p. 11). The later study estimates the NPLs ratio to be 15.4 percent in 2005, falling from the level of 25 percent in 2002. However, authors admit ignoring the ability of banks to use current profits to write-off of existing bad loans, not including bad

loans transferred to PBC, and the change of ratio after the sale of NPLs by AMCs. The estimate might be overly optimistic because of three more reasons. First, most analysts argue the initial burden of bad loans to be much higher than officially admitted, reaching 40 percent of loans in 2002. Secondly, the issue of ever-greening of old NPLs usually contributes to an increase of new bad loans. Finally, the expansion of credit since the end of 2002 might indicate big problems as Goldstein estimates roughly 40% of previously loans extended during the lending bubbles going bad. Accounting for a higher initial level of NPLs and a possibility of some portion of new loans going bad, they estimate the NPLs ratio to equal 37 percent in 2002 and 24 percent in 2005 (Roubini & Setser 2005, pp. 11–12).

Xiao (2005, p. 104) shows that the quality of enterprise debts improved over the period of 1995–2002, especially after 1998. The author argues that it was a consequence of the shift of financial resources from SOEs to non-state enterprises, the exit of poor-performing firms, and general improvement in the profitability. Non-performing debts in large Chinese enterprises are used as NPLs proxy because of the domination of bank financing. Further, if enterprises make profit, their debts are classified as “performing”. Should they not be profitable, the author classifies their debts as “nonperforming”. The author assumes a random distribution of differences between current and long-term profitability within a large group of enterprises, i.e. 23,000 large and medium-sized firms. Hence, the average non-performing debts ratio should be reliable for the group. However, the study suffers from the bias, as China's Bureau of Statistics reports no data on the exiting poorly-performing enterprises. Based on imputed profitability calculated with statistics covering wages, total assets, current depreciations, etc., author classifies enterprises into eight profit-, and loss-making groups. Based on this profit calculation, NPDs ratio decreased from 27–30 percent in 1999 to 18.4 percent in 2002 for the whole sample, while the official ratio equaled 13 percent. Disaggregated ratios of NPDs based on industry, ownership type, and region are then put together into regression equation. Specification explains NPDs ratio as a function of time trend variable (year) and categorical variable (ownership, industry, or region). The results show NPD ratio falling since 2000 implied by the greater emergence of better performing non-state enterprises, improved performance of SOEs, and the exit of poorly performing firms, which has been facilitated by merger and acquisition strategies. For example, the ratio by industry decreased from 23.9 percent in 2000 to 22.9 percent in 2002, which are figures higher than official statistics by mere three percents.

To sum it up, the estimates generally exceed the official figures significantly, especially before 2005, while the differences between the official statistics and estimated ratios diminish

afterwards. At the same time, the estimation techniques are not always explained properly and authors do realize the limits of their studies. Hence, the aim of this paper is to complement the research with an out-of-sample method applied on several countries using a different set of macroeconomic variables. The aim is to compare our findings with official figures of NPLs ratio in China.

## 5.2 Macroeconomic Model

The model is based on panel data of ratio of non-performing loans to total aggregate loans in the economy and five selected macroeconomic indicators. Annual data covering 10-year period from 2000 to 2009 are used due to the limited availability of statistics. Data have been mostly obtained from the Asian Development Bank's Statistical Database System, complemented with figures from World Bank Data Catalog, national statistical offices and regulatory agencies.

Eleven countries sharing some common characteristics with China are grouped into two panels so as to account for the dynamics emanating from the complex Chinese economy: (a) emerging economies, which consists of India, Kazakhstan, Thailand, Philippines, Malaysia, and Indonesia and (b) newly industrialized economies: Japan, South Korea, Singapore, Hong Kong, and Taiwan. The logic behind the split is that while the first dataset serves as a benchmark for China in the medium term perspective, the second group of countries shall serve as a comparison to China in the long run. The OLS regression undertaken for individual subgroups also indicates countries within these two groups to be less heterogeneous.

Aiming to diminish the measurement errors and improve the reliability of non-performing loans ratio statistics, two sources of data are used, and thus referring firstly to N\_1, which stands for NPLs ratio data published by national authorities of respective countries. Secondly, N\_2 series originates from ADB statistical database. Yet for the best of author's knowledge, only ADB source is available in the case of Korea and Hong Kong for some years and is used for both N\_1 and N\_2 data. One could also include NPLs that have been transferred to AMCs. Barth *et al.* (2009) would go further and take in also NPLs of central bank, and rural credit unions. However, AMCs still do not publish their balance sheets, and secondly, we have not found a free online database on these statistics. In order to avoid reusing the estimates of other authors, no such data cleaning procedure has been undertaken. Consequently, the results are going to be the best possible, while not reflecting the true values perfectly.

The aim to use data compiled with the same methodology; limited availability of statistics, a deluge of multifarious models explaining NPLs, and unclear macroeconomic triggers of NPLs in China lead us to finally consider the following explanatory variables:

#### 1. Inflation (*PI*)

Since it is one of China's most publicly observed economic indicators, a strong urge to combat high inflation should result in a lower level of credit. Lower availability should then be associated with higher loan standards and improved NPLs ratio. Inflation is measured in terms of consumer price index (CPI) annual average with the base year 2000. Gross rate is used for the sake of no reduction in data sample after taking logarithm of it because of some countries' experience of negative inflation during several years. Thus, index  $(1+x)$  is used instead of  $x$ , which is inflation expressed as a percentage per annum with period averages between two periods, based on formula  $\text{CPI} = \text{CPI}_{-1} * (1+x)$ .

#### 2. Credit by banking sector (*CBS*)

A positive sign is expected for credit by banking sector, computed as a percentage of GDP, illustrating the possible oversaturation of Chinese credit market caused by "quantity over quality" approach.

#### 3. Interest rate (*IR*)

Interest rate on time deposits of 12 months is one of the key Chinese monetary policy instruments. Thus, higher interest rate indicates undertaken austerity measures to slow down the overheating economy. Hence the negative expected sign of the estimated coefficient.

#### 4. General government expenditure (*EXP*)

Central government expenditure measured as a percentage of GDP serves as a proxy for the weight of policy goals and overall engagement of state. It is thought to be associated positively with the dependent variable.

#### 5. Monetary aggregate M2 (*M2*)

In order to render an alternative measure for GDP across the countries, the annual growth rate of M2 in a percentage is considered quite convenient a variable. The speed of an increase in M2 is expected to be positively correlated with an increase in credit and NPLs.<sup>2</sup>

#### 6. Output gap (*OG*)

The expected sign of the estimate of OG coefficient is positive. The reason is that positive OG indicates the growth of aggregate demand to be outpacing the growth of aggregate supply,

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<sup>2</sup> China used M2 as a measure to track a credit growth with a growth target equalling 16% in 2011 (Back, A.: "Beijing Will Use New Credit Gauge." The Wall Street Journal, March 7, 2011).

likely supported by an increase in credit availability. The estimates of output gaps are described in part 5.3 below.

The baseline specification is defined as:

$$(1) \text{ NPLs Ratio} = f\left(\bar{\text{PI}}, \overset{+}{\text{CBS}}, \bar{\text{IR}}, \bar{\text{OG}}, \overset{+}{\text{EXP}}\right)$$

The regression equation is altered by introducing an alternative variable so we get second regression equation:

$$(2) \text{ NPLs Ratio} = f\left(\bar{\text{PI}}, \overset{+}{\text{CBS}}, \bar{\text{IR}}, \overset{+}{\text{M2}}, \overset{+}{\text{EXP}}\right)$$

## 5.3 Estimating Output Gaps in Asian Countries: A Multivariate Unobserved Component Approach

In this part we estimate the output gaps, which serve as inputs to our main model, using two approaches. The first method measures the output gap from the logarithm of real GDP using Hodrick-Prescott filter, which is commonly used. The second model is a replication of a multivariate unobserved component (MUC) model proposed by Llosa & Miller (2004) for Peru and is carried out via Kalman filter technique. All modifications to the original model are discussed.

### 5.3.1 Literature

When estimating output gap for several Asian countries, i.e. Hong Kong, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, and Taiwan, Gerlach (2004) questions the assumption of mixed approach, i.e. the combination of time series data with structural economic information, which requires a stable relationship over time, for example between inflation and output gap. The use of unobserved components (UC) model might thus be debatable in Asian countries with large structural changes. For example, the production function approach, which utilizes data on employment and capital stock to fit production function, is problematic in this region because of high quality data requirements. His conclusion states that the output gaps in Asia seem not to be more problematic to estimate in comparison to advanced economies since the different methods yield broadly similar results, which are moreover consistent with the perceptions of business fluctuations there. Their results show that the output gaps generated by the HP filter, band-pass filter, and the

unobservable components (UC) approach seem to bring similar results. However, the limit of univariate filters is that only GDP information is used and they assume the output to be an isolate process from other macroeconomic series (Llosa & Miller 2004).

Scheibe (2003, p. 36) concludes that univariate methods tend to give extreme results, i.e. small or large output gap standard deviations, whereas multivariate methods, in his case a production function model, help to draw a more realistic conclusion. On the top of it, he suggests a decomposition into sector output gaps as that might improve the identification of an aggregate output gap.

Three methods of Gerlach (2004), i.e. HP and band pass filters together with UC approach, are applied on Mainland China data in Gerlach & Wensheng (2006). All of them bring similar estimates of output gap again and on the top of it, they seem to correlate with inflation.

In order to obtain more reliable results in comparison to the univariate methods and to avoid production function approach because of low quality data available, we turn our attention to multivariate component (MUC) model as described in Llosa & Miller (2004). They estimate the output gap in Peru based on two key concepts. First, Phillips curve defines short term relationship between inflation rate and output gap. Secondly, structural restrictions are defined over output stochastic dynamics. The Kalman filtering method is enacted. Their resulting estimate of output gap moves with inflation process more than those calculated with HP filter and production function methods. Further, MUC estimate improves the out-of-sample prediction of inflation. These arguments lead us to firstly consider HP filter technique, of which results are compared to the outcomes of MUC method.

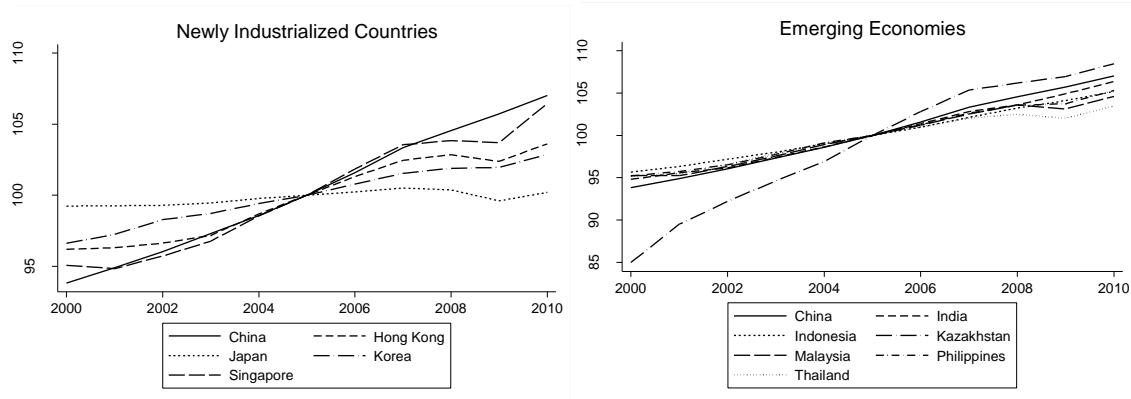
### 5.3.2 *Data*

As a preliminary, the Figure 5.2 show the logarithms of real GDP in China with both emerging and newly industrialized countries for years 2000 to 2010, while the series are normalized to equal 100 in 2005 to facilitate comparison. The plots indicate that the growth rates of some Asian economies have not been increasing over the whole time period, especially during the 2008 crisis.

We use OECD Statistics, World Economic Outlook Database of IMF, Asian Development Bank's Statistical Database System, World Development Indicators Database of World Bank

and central banks' websites databases. The sample consisting of annual data starts from 2000 to 2010 with some variables overreaching from 1999 data to 2011 estimates.

**Figure 5.2:** Logarithm of GDP in Asia, 2005=100



The real GDP in billions of 2000 US\$ is utilized as output. Foreign price level is approximated by CPI inflation rate in the U.S. for Asian countries, and by CPI in EU for European transition economies. As opposed to Llosa & Miller (2004), who use core inflation as a measure of inflation in Peru, CPI inflation rate is employed due to non-existent reliable statistics calculated using the same methodology. Imported inflation is computed as  $\pi_t^m = \pi_t^{US} + \Delta e_t$ , where  $\pi_t^{US}$  is US or EU CPI inflation rate and  $\Delta e_t$  is the local currency/USD or EUR exchange rate depreciation. International inflation is given by US or EU CPI rate while the international interest rate is approximated by LIBOR rate.

Inflation target rate is the Hodrick and Prescott trend of inflation with the restriction of the last announced target in year 2011. For the countries that do not practice inflation targeting (IT), i.e. Hong Kong, India, Japan, Malaysia, Singapore, and China in years 2000 – 2005, it is HP trend of CPI inflation decreased to the closest integer. A gross rate of inflation, which equals  $1 + \pi$ , is utilized in HP filter calculations in order not to loose observations after logarithm transformation. Lambda is set to equal both 6.25 and 100. The series with lambda = 6.25 are utilized for China and India, as they appear to be more stable towards the end of the series.

Ex post real interest rate is calculated as overnight interbank interest rate minus inflation. A simple error correction mechanism for inflation expectations, which can be related to adaptive learning expectations, is put to use. The rationale behind is that higher than target inflation raises inflation expectations and vice versa.

### 5.3.3 Multivariate Unobserved Component Model (MUC)

The model relies on an explicit short term relation between output gap and inflation rate (Phillips curve) and structural restrictions over output stochastic dynamics as stated in Llosa & Miller (2004). It is based on three behavioral equations: 1. Phillips curve, 2. Uncovered interest parity, and 3. Aggregate Demand. The uncovered interest parity helps to estimate the permanent and transitory components of real interest rate and real exchange rate. Consequently, the gaps of both real interest rate ( $\hat{r}_t$ ) and real exchange rate ( $\hat{q}_t$ ), which are computed using Kalman filtering technique, are utilized in a construction of a real monetary condition index, which is their combination.

$$rmci_t = -\theta * \hat{r}_t + (1 - \theta) \hat{q}_t$$

The coefficient  $\theta$  stands for a relative importance of both rates' channels in monetary transmission mechanism. Positive index then implies expansive orientation of monetary policy, and vice versa, affecting the aggregate demand in order to control inflation rate. Using this index, aggregate demand equation and Phillips curve, output gap related to the evolution of real activity and inflation is estimated.

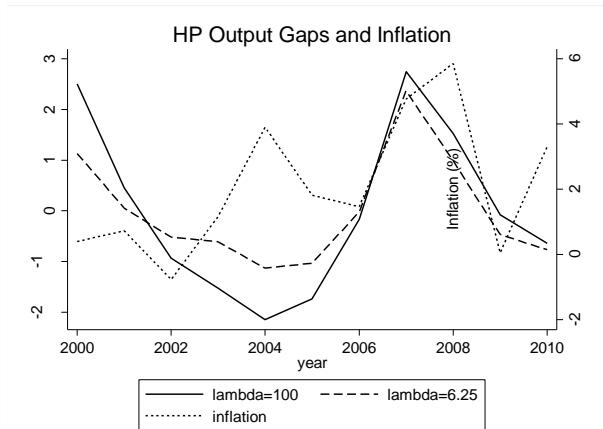
The first difference to the model of Llosa & Miller (2004) is us not decomposing CPI into its forecastable component  $\tilde{\pi}_t$  and stochastic shock  $\varepsilon_t^\pi$  for a later use in Phillips curve since we have data on overall inflation only. Further, the Table 5.1 shows the calibrated values of parameters in model. The coefficient theta ( $\theta$ ) is set to equal 0.6 as opposed to 0.88 in Llosa & Miller (2004). The lower value indicates that real interest rate is relatively less important in comparison to real exchange channel in monetary transmission mechanism in China than in Peru. A set value of  $\bar{\mu} = 0.75$ , as opposed to 0.01 in Llosa & Miller (2004), reflects significantly higher potential output growth in steady state.

**Table 5.1:** Parameters of the model

| Parameter   | Calibrated value |
|-------------|------------------|
| $\alpha_1$  | 0.7              |
| $\alpha_2$  | 0.15             |
| $\beta$     | 0.7              |
| $\gamma$    | 0.7              |
| $\theta$    | 0.6              |
| $\kappa$    | 0.1              |
| $\hat{\mu}$ | 0.75             |
| $\Phi$      | 0.8              |

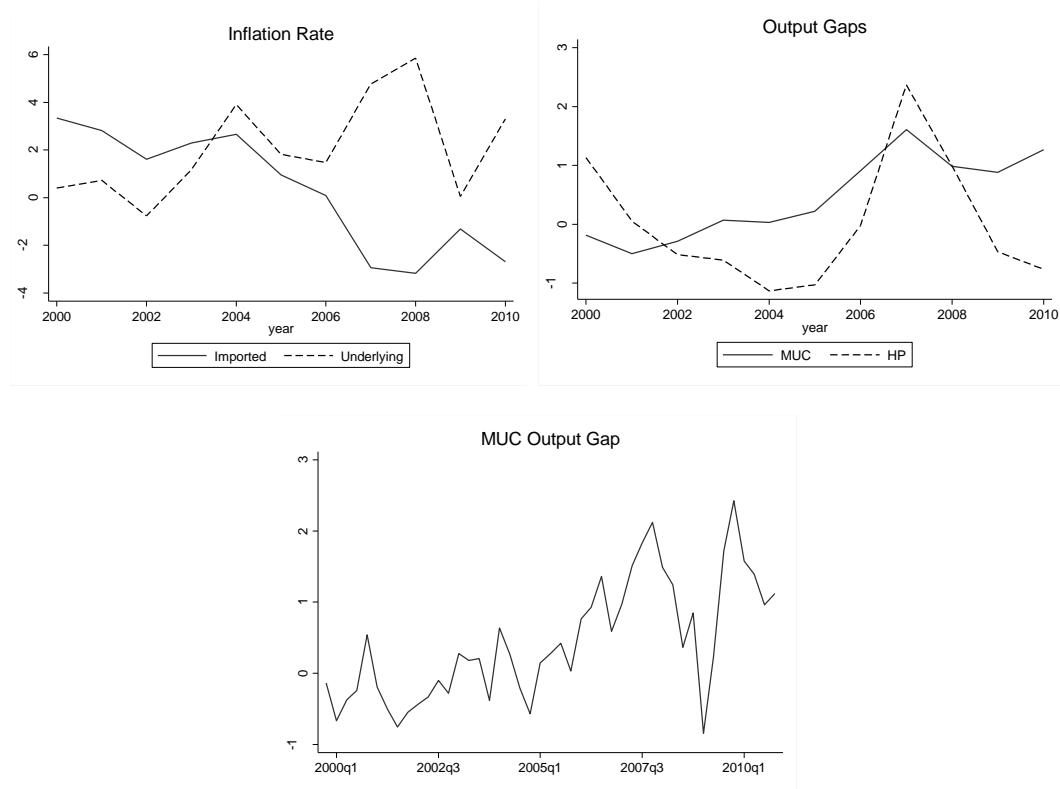
### 5.3.4 The Results

We firstly employ HP filter, which is easily accessible in software packages and simply calculates the series without estimation. HP filter generates the cyclical series Output Gap\_1 when  $\lambda=100$ , and Output Gap\_2 when  $\lambda=6.25$ . The cyclical fluctuations are very small, implied in the same place with some differences as higher  $\lambda$  results in smoother trend series. The output gaps appear to be positive from 2000 for more than a year, and again from 2006 for over two years, with inflation increasing in both periods except of the year 2008, which corresponds with a suggestion of inflationary pressure. Notwithstanding, the output gap was negative while inflation was increasing from 2002 to 2004, which does not permit to interpret easily.

**Figure 5.3:** Output gaps (HP filter) and inflation in China

Secondly, the MUC model is employed and estimates the output gaps via Kalman filtering method. According to the last panel in Figure 5.4, Chinese output gap fluctuated between –0.84 and 2.42 percent and followed a long term increasing trend. There are more recognizable periods exerting upward inflationary pressures, e.g. 2000Q1-2000Q4, 2007Q1-2007Q4, and 2009Q1-2009Q4. The most recent one in 2009 passed the level of two percent. There have been frequent and rather short term disinflationary pressure episodes as well, with the most significant one during 2008Q4-2009Q1 approaching the level of minus one percent in 2009Q1.

**Figure 5.4:** HP & Kalman filter output gaps and inflation



The first panel in Figure 5.4 shows that imported inflation was higher than underlying inflation from 2000 to 2003, which is phenomenon connected with a negative output gap (Llosa & Miller 2004), and the output gap was negative indeed during the most of the period. The opposite holds true from 2003 onwards. However, the series of inflations do not show high correlation unlike in Llosa & Miller (2004).

The striking difference between annualized MUC and HP output gap estimates in the second panel is that MUC method produces smoother series. The reason is the construction of Kalman filter, which estimates the output gap, in contrast to mechanical calculation. Furthermore, MUC estimate is lower than HP filter in two periods: 2000-2002 and 2007-

2008, i.e. in the beginning and nearly at the end of the sample. The first period shows relatively stable inflation environment, while the second period is associated with decrease in imported inflation, while the increasing domestic inflation is combined with the average output growth rates. That shows that MUC model estimate is not reduced to output information only, but is influenced by domestic and imported inflation as well. In contrast, HP method tends to link the output gap development with the economic cycle, even though the cycle did not affect the inflation rate, for example the combination of the rising output and positive HP output gap during 2000-2002, while the inflation seems not being greatly determined by the cycle.

Last but not least, the same MUC model is applied on all but advanced European economies producing estimates of output gaps used in our main model.

## 5.4 Results of the Macroeconomic Model

The dataset is divided into two subsamples with the first one consisting of emerging economies and the second one covering newly industrialized economies. Firstly,  $R^2$  and t test, reported in Appendix, clearly indicate variable OG to be of a highly superior explanatory ability over M2 in case of emerging countries so we proceed with the baseline equation only. On the other hand, the case of industrialized countries is not so clearly cut although F test does not confirm the model misspecification by equation (1) and  $R^2$  statistics do not greatly improve upon specification (2). For the sake of making sure that no important variable is omitted, the specification (1) is put into further use together with specification (2).

Secondly, OLS estimates are conducted with data in levels, as well as with transformed data into natural logarithms and first differences so as to find the data in levels to be the most appropriate based on  $R^2$  and F tests for the group of emerging economies, the details are provided in Appendix. Again, the results are more ambiguous for the industrialized countries, since first differencing the data improves  $R^2$  a lot. Since the interpretation of model in levels makes most sense, we neglect the improvement in  $R^2$  given by the first differences. Further, a new explanatory variable  $PI\_1 = PI - 1$  is defined in order to unify the unit of variables, which are all in percentages now.

Three tests for stationarity are performed with details stated in Appendix, which conclude data to follow I(0) process.

Cointegration, i.e. the existing long run relationship of explanatory variables with NPLs ratio, is demonstrated in case that error correction terms ( $\rho$ ) obtained via the MGE method fulfill conditions of a negative sign and statistical significance as Égert *et al.* (2006) state. The results in Table 5.2 indicate that the double criterion is fulfilled.

**Table 5.2:** Error correction terms

|               | Emerging  | Newly Industrialized |
|---------------|-----------|----------------------|
| N_1 & spec. 1 | -0.406 ** | -0.462 ***           |
| N_1 & spec. 2 | .         | -0.462 ***           |
| N_2 & spec. 1 | -0.345 *  | -0.495 ***           |
| N_2 & spec. 2 | .         | -0.494 ***           |

*Note.* \*, \*\* and \*\*\* indicate statistical significance at 1%, 5% and 10% significance level, respectively. The specification (2) is applied on emerging countries' data.

Égert *et al.* (2006) used three different regression techniques to earn the coefficient estimates: fixed effects OLS, panel dynamics OLS, and mean group estimator. The estimates produced using the fixed effects (FE) methods were then employed for the rest of the paper and its later versions. This paper operates with two estimation techniques: fixed effects ordinary least squares (FE\_OLS) and panel dynamic OLS estimates (PD\_OLS). Mean group estimator (MGE) is concluded to be unsuitable because of the short length of the series.

The fixed effects coefficients are to be proceeded with as they have more significant coefficient estimates with all but two bearing the expected sign in each equation. Firstly, the positive sign of interest rate coefficient estimate in all specifications might demonstrate monetary interference leading to improved trust in emerging economies and thus increased credit demand. Negative coefficient on government expenditure in emerging economies may be for example revealing that part of the expenditure expenses has been used to cover the bad debt losses or it might be an indirect effect of government support of foreign participation being transmitted to better credit environment. Interestingly, the sign of output gap coefficient is contra intuitively positive and not significant for industrialized economies. A possible explanation might be model misspecification as opposed to emerging economies, too short a data sample, or the intricacies of statistics published in this region. Further, the negative sign of M2 corroborates that the relationship between the growth rate of M2, which is used instead of GDP growth rate, and NPLs ratio is not easily to be clarified. Last but not least, specification (2), which uses M2 instead of OG for industrialized countries, seems to improve

the results only slightly as M2 coefficient in N\_1 equation is significant only at 10% confidence level.

**Table 5.3:** Estimation results

|  | <b>PD_OLS</b> |           | <b>FE_OLS</b> |           |
|--|---------------|-----------|---------------|-----------|
|  | N_1           | N_2       | N_1           | N_2       |
| <b>Emerging Economies</b>                        |               |           |               |           |
| IR   | 2.191***      | 0.706**   | 0.325         | 1.132**   |
| PI_1   | -0.639**      | -0.214    | -0.570***     | -1.315*** |
| EXP  | -0.464        | -0.635    | -0.394        | -0.423    |
| CBS  | 0.106**       | 0.132***  | 0.016         | 0.031     |
| OG   | -3.566***     | -3.126*** | -3.344***     | -3.806*** |
| constant   | 10.078        | 3.132     |               |           |
| <b>Newly Industrialized Economies, spec. (1)</b> |               |           |               |           |
| IR   | 0.994***      | 0.960***  | -0.246        | -0.183    |
| PI_1   | -0.637***     | -0.664*** | -0.228        | -0.317*   |
| EXP  | 0.306***      | 0.267***  | -0.122        | -0.129    |
| CBS  | 0.015         | 0.017     | 0.001         | -0.003    |
| OG   | 0.021         | 0.021     | -0.006        | 0.030     |
| constant   | -6.186**      | -5.833**  |               |           |
| <b>Newly Industrialized Economies, spec. (2)</b> |               |           |               |           |
| IR   | 1.001***      | 0.966***  | -0.419**      | -0.360*   |
| PI_1   | -0.575***     | -0.603*** | -0.112        | -0.191    |
| EXP  | 0.268***      | 0.229**   | -0.056        | -0.066    |
| CBS  | 0.015         | 0.016     | -0.001        | -0.006    |
| M2   | -0.093*       | -0.091    | -0.060        | -0.070    |
| constant   | -4.845*       | -4.516    |               |           |

*Note.* \*, \*\* and \*\*\* indicate statistical significance at 1%, 5% and 10 % significance level, respectively.

Further, the issue of no country-specific constant terms available for calculation of fitted values is addressed by authors. We replicate their use of the largest, median, and the smallest constant terms from in-sample estimates, which yield a range of possible estimated values of

NPLs ratio. Comparing these estimates with official statistics, we infer the under- or overvaluation of NPLs ratio based on the plots in Figure 5.5.

## 5.5 European Experience

In this part, we shortly and in an incomprehensive manner comment on the transformation of banking system in several CESEE countries. Consequently, the description of data used to calculate out-of-sample coefficients from both CESEE and advanced economies follows. The aim is to render comparison with the estimates obtained from the Asian region.

### 5.5.1 *Short Overview*

In the beginning, banks used to play not a big role in planned economies in Soviet era. The credit allocation was, similarly to China, dependent on central planning only and had the accounting character only. State enterprises faced soft budget constraint and could not exit the market via bankruptcy. Since no proper analysis of creditworthiness was required, the results were poor financial management skills, credit misallocation and moral hazard, for example emanating from the lack of shareholders pressure and repetitive government bail-outs. The mono-bank system with no existing private banks lacked a competition and did not support a creation of efficient system of prudential regulation, supervision, good internal governance, and accounting and payment systems (Alimkulov 1999, p. 5).

Regarding the transformation method, most CEE countries followed the rehabilitation approach, i.e. decentralization of the mono-bank into state commercial banks, recapitalization and eventual privatization of banks. Russia, on the contrary, employed the new entry approach, i.e. split-up of the mono-bank into the state specialized banks, liberal entry of new banks and privatization of state banks. Choosing different transformation methods can be attributed to various initial conditions. For example, joint ventures with foreign banks were formed already at the end of 1970s in Hungary and the split-up of the mono-bank system happened in 1987. As a result, banks could benefit from the foreign entrants' know-how, commercial banking skills and competition pressure. Consequently, Hungary enjoyed a lower inherited volume of NPLs and smaller inflation. On the other hand, the hyperinflation in Russia and other countries led to elimination of NPLs through negative interest rates, which left them with no need and funds to recapitalize banks because of the fall in fiscal revenues

and smaller scale of banking in the first period of transition so the authorities opted for the new entry approach. Consequently, the burden of NPLs in CEE countries was addressed with the comprehensive financial and operational restructuring of banks and enterprises, while the rest of the countries simply ignored the issue (Alimkulov 1999, pp. 8–9)

Part of the NPLs problem was a bank forbearance, which simply means a reluctance to address troublesome issues hoping for favorable changes in economic conditions contributing to bank growing out of the problems. Further, a clear evaluation of the volume of bad loans was quite impossible in the beginning of the transformation period, for instance in Czech Republic the estimates of the NPLs ratio varied from 2.4–19 percent to 50–66 percent (Tang *et al.* 2000, p. 8). Part of the problem was also that the statistics were heavily distorted before 1989 similarly to China, and had to be treated carefully (Siebert 2007, p. 2). Moreover, the banking system reforms were just one part of all transformation processes and were thus affected by for example fall in output, price liberalization, considerable economic uncertainty or tighter monetary policy. The increase in nominal interest rate and reduction in inflation led to an increase in real interest rate, which influenced the ability of borrowers to service the debt (Tang *et al.* 2000, p.11). No clear line between old and new bad debt was drawn and authorities sometimes extended their support to NPLs created after the collapse of the socialist system as well, likewise to China. For example, the government included bad loans created during 1992 in the bond/debt swap operation in Hungary (Tang *et al.* 2000, p.24).

Different kinds of institutions were introduced in order to address bad debt recovery. Equivalently to China, Czech Republic also established asset management companies to address the NPLs problem. However, although the ownership of NPLs was transferred to two debt recovery agencies, Česká Finanční and Česká Inkasní, the assets were kept on the balance sheets of the commercial banks, thus creating an incentive to pursue their recoveries (Tang *et al.* 2000, p. 41).

Another analogy with situation in China is banks maintaining the relationship with their large clients, state-owned enterprises. Such lending was a result of politics and/or banks lacking risk evaluation skills. As a result, bad loans were problem not only because of the inherited volume, institutional framework, and poor credit culture in the previous era, but also because of the continuation of such perverse lending practices. The contributing factors were absence of independent market-oriented banking institutions, regulators lacking the proper incentives, and the inability to conduct expertise. However, another part of the explanation was the transition recession which must have been reflected on the balance sheets of banks (Bonin *et al.* 2008, p. 13). Anyway, the lesson to learn for China is that the legislation is not

enough to break the old patterns of behavior and other reforms have to be undertaken if the actual quality of credit portfolio should be revealed. The proper setting of incentives is a key factor in such relational activity as banking is, as bank officers try to protect clients with whom they wish to keep doing business (Bonin & Huang 2001, p. 30).

The transformation in the CESEE region, which started around 1990s, was accompanied by a drastic drop in GDP, e.g. Poland, Hungary, former Czechoslovakia lost roughly 20 percent of their GDP; it was around 40 percent in Russia. That was caused by several factors: the firms were not competitive under new conditions, the capital stock became obsolete, human capital had to adjust, and the general uncertainty implied by lack of rule of law, by insufficiently established property rights, and uncertainty about the future economic policies. In contrast, China enjoyed high average annual GDP growth since the commencement of Deng Xiaoping reforms in 1978 (Siebert 2007, pp. 1–2).

Contrary to China which opened the market for foreign investors gradually, the policies towards foreign banks arrival differed across the region. In some countries, foreign investors were lured by for example tax holidays like in Slovakia, whereas in others, foreign Greenfield entrants were given an option of only minority equity positions, for example in Czech Republic and Poland (Bonin *et al.* 2008, p.11). Notwithstanding, the results of study by Koutsomanoli-Filippaki *et al.* (2009, p. 566) point out that foreign strategic ownership resulted in a technology spillover gains and productivity improvement across the region of ten CEE countries in the period 1998–2003. Another difference to China is the attitude towards the ownership rights, which were introduced much faster and are protected and respected more, although in some countries less than in the others.

Slovakia, Hungary and Czech Republic managed to cope with the problems connected with the transformation of economy and banking system well and among other things decreased the NPLs ratio significantly. However, it is not quite a case for Serbia, Romania, Ukraine, and Russia although they also embarked some of the necessary reforms which resulted in improved banking environment. For instance, there are two main reasons for the recent situation of high NPLs ratios in Ukraine. Firstly, the economy in recession with increasing unemployment and downward pressure on wages does not help to decrease large-scale corporate defaults and households' debt-servicing capacity. Secondly, the combination of high percentage of foreign currency-denominated loans, which is more than 70 percent in case of households, together with a substantial depreciation of hryvnia, increases the default risk significantly (Barisitz & Lahnsteiner 2008, p. 74). In Serbia, where economy is still recovering from the war conflict, banks suffer from a large pile of NPLs inherited from the

past (Stubos & Tsikripis 2004, p. 5), and similarly to Ukraine, the balance sheets of banks are heavily foreign currency-denominated as the euroisation is rooted in a long history of macroeconomic instability. Hence, the concurrent strong credit growth increases the banks' credit risk.

To conclude, transition countries shared some of the problems characteristic to Chinese banking system as well while at the same time they developed issues unique to their conditions. Similarly to China, they inherited large volume of NPLs, insufficient institutional framework and poor credit culture. Soft budget constraint remained to be a problem as a result of government bail-outs and pressure to extend the credit and/or insufficient credit risk evaluation skills. However, this issue, among many others, did not prevail so persistently as in China. Further, the reforms were conducted not so gradually but at a higher pace aiming for the catch-up with more developed European economies while it was possible to put across as people were more willing to make sacrifices. As a result, the reforms contributed to an improvement of banking system relatively faster, especially in Central Europe. The story of Serbia, Ukraine, Russia, and Romania is slightly different. General conditions were less favorable while the imperfect reforms took even more time to execute than in Central Europe with one of the consequences being persistently high NPLs ratio. Hence, the situation seems more comparable to China. As a result, the coefficient estimates obtained from the group consisting of Slovakia, Czech Republic and Hungary are compared with Chinese empirical values from the longer time perspective, thus yielding a comparison to Newly Industrialized Asian countries. On the other hand, Serbia, Ukraine, Russia, and Romania confront the results of the Emerging Asian economies panels.

### **5.5.2 *Data***

Aiming for more homogeneity within the group, the first panel consists of Slovakia, Czech Republic, and Hungary, whereas the second one includes Serbia, Ukraine, Romania, and Russia. The series of N\_2 obtained from the World Bank Database with the specification (1) are utilized. The same approach as for Asian countries is employed and the resulting estimated coefficients for two subgroups produce fitted values for China depicted in Figure 5.5.

### 5.5.3 Developed Countries

To gain yet another perspective about the out-of-sample coefficients for China, the same method is applied on group of five developed countries: Sweden, United Kingdom, Germany, Netherlands, and Norway. However, World Economic Outlook Database of IMF publishes the output gap figures for advanced economies. Hence, these are put into use as opposed to estimating them via MUC method. The rest of data is collected from the World Bank Database and national central banks' websites.

## 5.6 Discussion of Out-of-Sample Results

Examining the fitted values of China given by the estimated coefficients of emerging Asian economies, newly industrialized Asian economies, both less and more developed transformation countries in Europe, and advanced economies in Europe, one might draw several conclusions.

First, the first two panels of emerging economies, i.e. Kazakhstan, India, Thailand, Philippines, Malaysia, and Indonesia, and transformation economies, i.e. Ukraine, Romania, Serbia, Russia, Slovakia, Czech Republic, and Hungary clearly indicate great underestimation of the NPLs ratio in China. The strength of the argument is also given by the fact that China is not an outlier in this group regarding the level of economic development, thus the estimated elasticities should be approximately appropriate. Especially panel depicting the fitted values based on elasticities of Slovakia, Czech Republic, and Hungary identifies significant undervaluation over the whole time span, and moreover, the fitted values calculated with the maximum constant term estimate approach 60% level towards the end of the sample. Part of the reason for such high percentage might be stricter credit classification culture due to more than a decade long transformation during which many problems were realized and had to be addressed, such as lower quality of statistics, insufficient institutional framework or deficient informal institutions, and finally, a higher level of economic development.

In contrast, one might infer intriguing result from the panel of newly industrialized countries, i.e. Japan, South Korea, Singapore, Hong Kong, and Taiwan. The reported statistics seem to account for the worse credit environment in China during the whole time span except of the period from 2008 onwards. However, two factors are sensible to take into account for interpretation of this quite startling finding. Firstly, one might argue that the 1997 Asian

financial crisis has unleashed much more prudent behavior as regards regulation etc., which has been perfectly followed since, not only to prevent history from repeating itself, but also to regain trust of their international trade partners, which is tremendously crucial for smaller open export-oriented economies. The logic behind the second argument strikingly differs from the first one. These countries might also not be found innocent when evaluating the misreporting of bad debts, which would suggest a divergence of statistics from "true" value of NPLs ratio, e.g. in Japan or South Korea.

To put the graph of developed countries, i.e. Sweden, Netherlands, United Kingdom, Germany, and Norway, in perspective, it is necessary to comment on the relevance of estimated coefficients. Noting a substantial variance in the level of economic development in comparison to China, the results presented here suggest the derived elasticities to be too small and inapplicable for China. That is why the elasticities obtained from the panel of emerging and CESEE countries are found to be more suitable and to possess stronger predictive power.

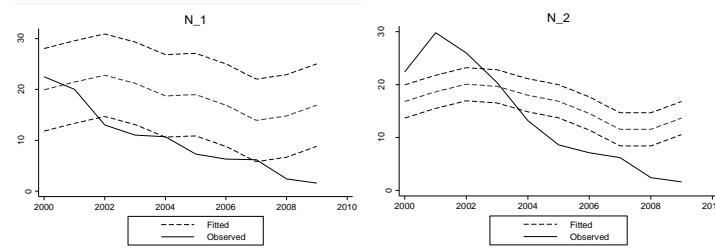
One of the most striking findings is that every singly fitted line implies a turn and a gradual shift upwards of NPLs ratio towards the end of the series, starting mainly from 2005. That appears to be in a harsh contrast with the published Chinese NPLs ratio figures, where a decreasing trend is illustrated quite clearly. Hence, the statistics not only seem to be considerably undervalued, but they might warn about the possibly spurring macroeconomic instability too. The ability of China to maintain its internal macroeconomic stability has not been put through a real examination yet. Even if the ability has been tested, it has been limited to a use of non-market instruments – bureaucratic measures such as regulation, price control, and other administratively imposed restrictions. These measures are, however, ineffective in a long run and the increase in NPLs may well reflect the deteriorating stability in the system. On the other hand, a decreasing trend in NPLs ratio might reflect a smaller exposure of Chinese banks to the 2008 crisis.

Further, the results of emerging economies suggest that official statistics (N<sub>1</sub>) overvalue bad debt values in the respective countries in comparison to ADB's estimates (N<sub>2</sub>). The panel of newly industrialized economies similarly comes to a similar conclusion, albeit to a lesser extent, thus suggesting higher quality of official national statistics. Further, applying specification (2) for newly industrialized economies with variable M2 instead of output gap used in specification (1) brings no added value as both specification draw the fitted lines much alike.

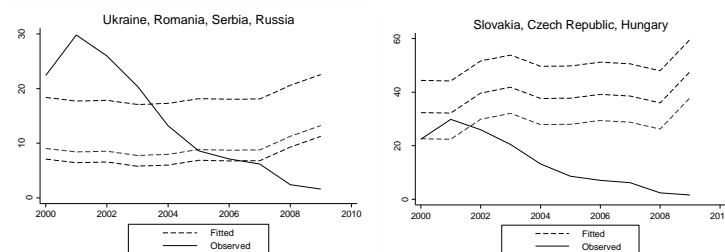
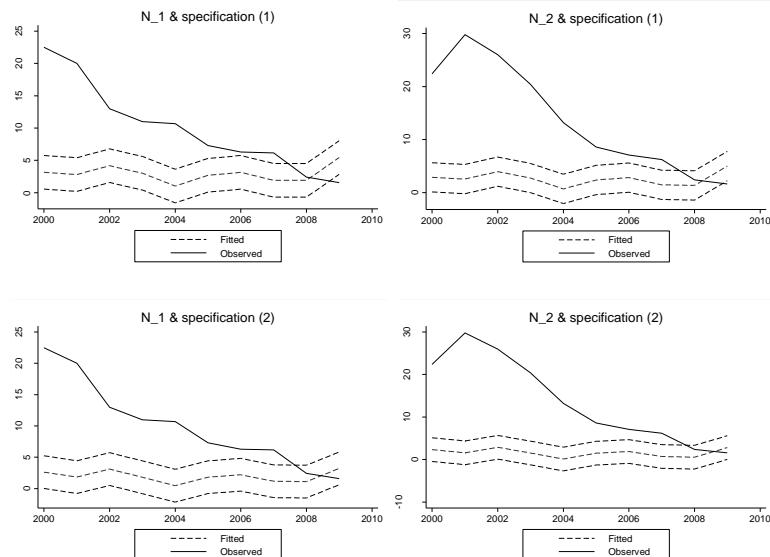
Last but not least, there is a room for estimation improvement because of no complete inclusion of all NPLs in economy in our calculations. For example, NPLs that have been

transferred to AMCs are missing, which leaves us with a possibility of further questioning of the spectacular drop in bad debts in China. Moreover, high standards of five-category credit classification system are yet to be met. Therefore, a closer examination of bad debt definition might yield another improvement in data.

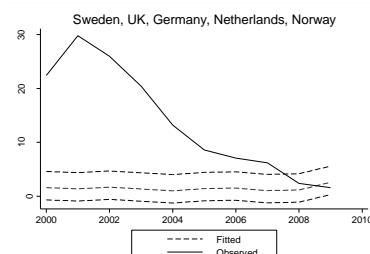
Notwithstanding, we offer a modest proposal that Chinese NPLs ratio is undervalued by official statistics, thus very possibly about to cause “white heads” of not only the Chinese officials again.

**Figure 5.5:** Official vs. estimated values of NPLs ratio (in %), 2000-2009**Emerging Economies**

*Note.* Countries included: Kazakhstan, India, Thailand, Philippines, Malaysia, and Indonesia.

**Transformation countries****Newly Industrialized Economies**

*Note.* Countries included: Japan, South Korea, Singapore, Hong Kong, and Taiwan.

**Developed Economies**

## **Chapter 6**

# **Conclusion**

This thesis answers the question whether the spectacular drop in NPLs ratio in Chinese official statistics from 2000 to 2009 has been undervalued, using both theoretical and empirical analyses.

Upon studying the development of financial sector in China and NPLs issue both worldwide and in the country, it is clear that the undertaken counter-measures against NPLs have been many times hindered by the deficiencies in the concurrent institutional framework, ranging from the design of reforms to informal behavior. For example, the repeated bail-outs of ineffective banks, as opposed to holding to the promise of a once-off prescription, have not greatly hardened the imposed budgetary constraint. Alternatively, the policy lending based on the relationship between bank and enterprise, or resulting from the local government pressure, persistantly remain an inherent part of the system. Hence, the implied dire consequences for NPLs ratio pose a question mark on the official statistics legitimacy, which reports a significant improvement in the last decade.

The next part of this thesis estimated Chinese NPLs ratio, controlling for China being part of the broader Asian region. The findings suggest strong undervaluation based on the panels of emerging economies, i.e. Kazakhstan, India, Thailand, Philippines, Malaysia, and Indonesia, and both more and less developed transformation economies, i.e. Slovakia, Czech Republic, Hungary, Ukraine, Romania, Serbia, and Russia. Using the panel of advanced economies, i.e. Sweden, Netherlands, United Kingdom, Germany, and Norway, the estimated elasticities are found to be too small and irrelevant as the level of economic development differs greatly from China. Interestingly, the group of newly industrialized countries, i.e. Japan, South Korea, Singapore, Hong Kong, and Taiwan, argues that the official data account for the worse credit environment in China. Two various interpretations suggest that firstly, effects of the 1997 Asian financial crisis imposed a radical change towards a very prudent behavior. Alternatively, the statistics might suffer from misreporting similarly to China, e.g. in Japan or in South Korea.

Further, the estimates of output gap, needed as inputs for the macroeconomic model, are produced using multivariate unobserved component (MUC) method via Kalman filtering technique. The estimates are found to be superior in comparison to those produced via HP filter method, as the series are smoother and are not reduced to output information only, but reflect domestic and imported inflation as well.

Another startling observation is that all series of fitted values imply a turn and shift upwards in NPLs ratio from 2005, as opposed to still decreasing trend in official data. Our understanding is that it might be a sign of increasing macroeconomic instability. China is the second most important economy in the world and testing its ability to maintain the macroeconomic stability has been limited to a use of non-market instruments, i.e. bureaucratic measures such as regulation, price control, and other administratively imposed restrictions. Such measures are, however, ineffective in the long run and an increase in NPLs ratio may reflect the deteriorating stability in the system. That would greatly affect the world economy, especially in this period on the verge of another crisis. Even before the 2008 crisis, China was a key element in the collapsing global macroeconomic stability as its savings financed the deteriorating balance of payments, especially the one of the USA. Should a great deleveraging in Chinese banking sector be under way due to a huge volume of NPLs, Chinese investment would probably start to withdraw with dramatic consequences for the EUR and USD exchange rates and for all the economies including Africa, which enjoys great inflows of Chinese investment, and Brazil, which has become the fifth world largest exporter especially thanks to its exports to China. The government cannot bail-out the banks forever, even with its huge stock of reserves. That is why we call for addressing the underlying problems of nonperforming loans in a much more efficient way.

Further research could refine the findings. First, NPLs on the balance sheets of central banks and asset management companies should be included. Building larger dataset might increase the robustness of results too. In addition, a closer look at the Chinese categories of credit classification system should yield higher quality data, as the definition of nonperforming loans is not yet well established and followed.

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## Appendix

Given the outcomes of OLS method applied on our macroeconomic model, which has NPLs ratio for endogenous variables, the  $R^2$  and F test results of various model forms are reported. Firstly, the specification (1) is employed for both emerging and newly industrialized economies, secondly, specification (2), which replaces factor OG with variable M2 for newly industrialized economies only. The aim is to compare the statistics, summarized in Table A.1, in order to choose the correct functional form.

**Table A.1:**  $R^2$  and F test results

|                             | Functional form   | $R^2$  | p-value (F test) |
|-----------------------------|-------------------|--------|------------------|
| <b>N_1</b>                  |                   |        |                  |
| Emerging countries, spec. 1 | Linlin            | 0.3993 | 0.0000           |
|                             | Loglog            | 0.2838 | 0.0111           |
|                             | Linlog            | 0.3469 | 0.0020           |
|                             | First differences | 0.3885 | 0.0001           |
| Newly I. countries, spec. 1 | Linlin            | 0.3394 | 0.0021           |
|                             | Loglog            | 0.2208 | 0.0153           |
|                             | Linlog            | 0.2726 | 0.1206           |
|                             | First differences | 0.4945 | 0.0000           |
| Newly I. countries, spec. 2 | Linlin            | 0.3872 | 0.0005           |
|                             | Loglog            | 0.2609 | 0.2896           |
|                             | Linlog            | 0.2870 | 0.2278           |
|                             | First differences | 0.5354 | 0.0000           |
| <b>N_2</b>                  |                   |        |                  |
| Emerging countries, spec. 1 | Linlin            | 0.6844 | 0.0000           |
|                             | Loglog            | 0.4650 | 0.0201           |
|                             | Linlog            | 0.3149 | 0.0049           |
|                             | First differences | 0.6565 | 0.0000           |
| Newly I. countries, spec. 1 | Linlin            | 0.3095 | 0.0048           |
|                             | Loglog            | 0.2087 | 0.2510           |
|                             | Linlog            | 0.2492 | 0.1598           |
|                             | First differences | 0.5419 | 0.0000           |
| Newly I. countries, spec. 2 | Linlin            | 0.3514 | 0.0014           |
|                             | Loglog            | 0.2267 | 0.3861           |
|                             | Linlog            | 0.2540 | 0.3078           |
|                             | First differences | 0.5735 | 0.0000           |

Furthermore, three unit root tests are applied in order to determine whether the series are stationary or not. Firstly, Im, Pesaran and Shin (2003) test estimates the t-test for unit roots in heterogeneous panels. Levin Li Chu (2002) assumes all panels to contain unit

roots. Finally, Hadri (2000) tests for heterogeneous panel data. The only variable not following I(0) process according to all three test results is N\_1 in emerging economies, although Hadri null hypothesis of stationarity cannot be rejected on 5% confidence level. The likely reason is too small a sample. That is why we run regression again to check the error terms. They seem to be a white noise, however, Wooldridge (2002) test rejects null hypothesis of no first order autocorrelation. Since the focus is put on the estimated coefficients given by OLS regression, which remain unbiased in a presence of autocorrelation, we proceed.

**Table A.2:** Unit root tests for panel data in levels

|                 | Variable | Emerging countries | Newly Ind. countries |
|-----------------|----------|--------------------|----------------------|
| Im Pesaran Shin | N_1      | 1.000              | 0.000                |
|                 | N_2      | 0.052              | 0.000                |
|                 | PI_1     | 0.028              | 0.121                |
|                 | CBS      | 0.945              | 0.145                |
|                 | IR       | 0.033              | 0.027                |
|                 | EXP      | 0.008              | 0.033                |
|                 | OG       | 0.015              | 0.000                |
|                 | M2       | 0.000              | 0.000                |
| Levin Li Chu    | N_1      | 0.273              | 0.000                |
|                 | N_2      | 0.000              | 0.000                |
|                 | PI_1     | 0.000              | 0.000                |
|                 | CBS      | 0.000              | 0.000                |
|                 | IR       | 0.000              | 0.000                |
|                 | EXP      | 0.000              | 0.000                |
|                 | OG       | 0.000              | 0.000                |
|                 | M2       | 0.000              | 0.000                |
| Hadri           | N_1      | 0.085              | 0.001                |
|                 | N_2      | 0.015              | 0.001                |
|                 | PI_1     | 0.154              | 0.741                |
|                 | CBS      | 0.000              | 0.015                |
|                 | IR       | 0.140              | 0.000                |
|                 | EXP      | 0.242              | 0.036                |
|                 | OG       | 0.001              | 0.450                |
|                 | M2       | 0.343              | 0.240                |

*Note.* No improvement in p-value achieved when taking logarithms, which are, therefore, not reported.