Government failures and non-performing loans in Asian countries

Maria Daniela Giammanco
Department of Political and Social Sciences, University of Catania, Catania, Italy, and

Lara Gitto and Ferdinando Ofria
Department of Economics, University of Messina, Messina, Italy

Abstract

Purpose – Non-performing loans (NPLs) may determine an overall weakness of the banking system within a country. The purpose of the present study is to analyze the impact of government failures on NPLs in Asian countries in the time span 2000–2020. The variables employed as proxies of government failures are public debt as % of gross domestic product (GDP) and a government ineffectiveness index proposed by the World Bank.

Design/methodology/approach – The econometric approach employed is a panel generalised time series (GLS) model with heteroskedasticity and autocorrelation specific to each panel.

Findings – The results confirm that public debt as % of GDP and governmental ineffectiveness impacted significantly on NPLs for Asian countries in the observed period.

Originality/value – The literature offers similar results only for some individual Asian countries, while a wider analysis is lacking for Asian macroareas. The present paper considers 31 Asian countries, and supports the idea that a healthy financial sector is correlated to institutional quality and political regime. Hence, policy makers are advised to monitor governance indicators to reduce NPLs.

Keywords Non-performing loans (NPLs), Government failures, Government ineffectiveness, Public debt, Asian countries

Paper type Research paper

1. Introduction

A bank loan can be classified as non-performing when payments of principal and interests are 90 days or more overdue, or when future payments are not expected to be received in full. Non-performing loans (NPLs) are also called "bad debts" or "bad loans", and their level plays an extremely important role for the financial system and financial institutions (The World Bank, 2022).

The ratio of NPLs to total gross loans is a measure of the health of the banking system. Banks, which aim to profit in the long run, should keep bad loans to a minimum (Kuzucu and Kuzucu, 2019). The stability of the banking system is a precondition for economic stability and for sustained growth: uncovering the determinants of NPLs is of great interest to banks, banking supervisors and governments, to enable them to take appropriate preventive measures against instability of the banking system and of the economic system as a whole (Ali *et al.*, 2020). Laeven and Valencia (2013) offer evidence that peaks in NPLs are among the outcomes of the systemic banking crises occurred during 1970–2011. Boumparis *et al.* (2019)

JEL Classification — C23, D53, G21, H63, N25

stress the circumstance that growth and investments may depend on sovereign rating assessments, which are determined by NPLs.

The relevant literature has investigated a wide strand of macroeconomic variables that may influence NPLs, among which it is possible to cite the unemployment rate, the growth in gross domestic product (GDP), the inflation rate and foreign direct investment (FDI). Nevertheless, the relevance, for NPLs, of so-called "Government failures", such as the amount of public debt, measured as % of GDP, or the soundness of the institutional context, has not been studied in depth, especially for Asian countries.

Government failures (Coase, 1964; McKean, 1965), according to the school of Public Choice (Buchanan, 2003), represent the inefficiencies and iniquities that may be associated with public action (Wolf, 1979; Keech and Munger, 2015). Ofria and Mucciardi (2022), studying the surge in NPLs that marked the global financial crisis of 2007–2009, confirm that the proxies of government failures (corruption and public debt as % of GDP), significantly affected the NPLs of EU countries and of these neighboring states: Switzerland, Iceland, Norway, Montenegro and Turkey. Regarding Asia, only scanty and partial evidence has been published. In fact, the studies that have considered the relation between NPLs and some proxies of "Government failures", focusing on Asian countries are, to our knowledge, few and, as will be shown in the second section, alternatively, deal with a limited subset of Asian countries (e.g. Arham *et al.,* 2020); pool some Asian countries together with some other countries (e.g. Liu *et al.,* 2020) and consider a single country (Umar and Sun, 2018).

The present contribution examines the effects of government failures on the NPLs for 31 Asian countries in the time span 2000–2020, controlling for traditional macroeconomic variables. Hence it not only enriches the limited literature on NPLs determinants in Asia, but also makes it possible to abandon its partial nature by considering almost all Asian countries [1]. A further value added of the present contribution stems from considering, for the first time, the relation between NPLs and Asian countries' political regime.

The data employed in the analysis are drawn from the World Bank, the International Monetary Fund and United Nations Conference on Trade and Development (UNCTAD) databases, as detailed, for each variable, in Table A1, of the Appendix.

The econometric approach used to test the hypotheses set is a panel generalised time series (GLS) with heteroskedasticity and autocorrelation specific to each panel.

The work is structured as follows: the next section illustrates the literature background against which the hypotheses to be tested are set. It briefly presents the most relevant studies that have considered the relation between NPLs and government failures all over the world, and illustrates the empirical studies focusing on Asian countries published in the last two decades [2]. The third section shows the econometric model, the variables used and the empirical results achieved. Finally, the fourth section discusses the results and draws some conclusions relevant to policy.

2. Empirical background and hypotheses setting

Various studies have considered the impact on NPLs of government failures all over the world. In what follows, we will briefly present the most relevant contributions tackling this issue.

Ofria and Mucciardi (2022) confirm that both corruption and public debt to GDP had a significant positive effect on NPLs for EU countries for the years 2005–2015 [3]. A high public debt is assimilated to a government failure because deteriorating public finances place a "ceiling" on the market evaluation of credibility for the national banks, and, consequently, banks become hard-pressed for liquidity (Fallanca *et al.,* 2020): banks have to cut lending and thus debtors cannot refinance their debts (Ghosh, 2015).

Ghosh (2015) finds that public debt as % of GDP is positively and significantly correlated to NPLs for commercial banks and savings institutions across 50 US states and the District of Columbia, for the period 1984–2013. Similar results, on aggregate data for the Eurozone, are obtained by Makri *et al.* (2014) and Anastasiou *et al.* (2016, 2019a). Only for Greece, Anastasiou *et al.* (2019b), for the time span 1996–2016, highlight the significant effects on NPLs of a new variable, "Governance index", the latter resulting from a principal component analysis, performed using the Worldwide Governance Indicators (2022) (WGI) [4].

Boudriga *et al.* (2010), studying 46 banks located in 12 countries in the Middle East and North Africa (MENA) region during the period 2002–2006, show that institution quality, namely, lower levels of corruption, solid regulatory quality, superior rule of law and effective free voice and accountability impact on NPLs. Also, Breuer (2006) offers evidence that the institutional framework impacts on NPLs [5].

In what follows the contributions referring to Asian countries will be presented.

Liu *et al.* (2020) use the presence of a high public debt as proxy of government failure, to investigate its impact on NPLs, for a sample of 25 developed and emerging countries, among which there are India and China, for the time span 2006–2017. They offer support to the hypothesis that the importance of the relation between sovereign debt and NPLs, found for non-Asian countries, also applies to these two Asian regions. Umar and Sun (2018), on a sample of 197 Chinese banks for the period 2005–2014, highlight that the public debt to GDP ratio positively impacts NPLs only when unlisted banks are considered.

Arham *et al.* (2020) investigate, for the years 2007–2017, the effects on NPLs of the ratio of debt on GDP, as well as three out of six WGI, which, as has been said, are proxies of governance quality: in particular, they focus on *corruption control*, i.e. the extent to which the government exerts its power for private gains; *government effectiveness*, the degree of the government independence from political pressure; and *regulatory quality*, the capacity of the government to formulate and execute efficient policies and establish regulations that assure the development and promotion of the private sector. The Asian countries considered in their analysis are China, Hong Kong, Indonesia, India, Malaysia, Philippines, Singapore, South Korea, Thailand and Vietnam, and the results outline how country governance has a significant impact in mitigating the positive effect of the ratio of debt/GDP on NPLs.

Diverse authors suggest a positive association between the government failure proxied by the institutional quality/weakness as measured by the WGI and increased bank risks [6]. They assert that the vulnerability of institutions fosters the adoption of bad practices by financial institutions and encourages banks not to respect the law.

Büyükoğlu *et al.* (2021) posit that poor institutional quality and the lack of rule of law negatively impact on the market competitive functioning and deteriorate the status of both borrowers and lenders. They investigate the relation between NPLs and a unique governance indicator, derived by means of a principal component analysis, and study 22 emerging countries, from America, Europe, Africa and Asia, during the time span 2002–2018. Their country level results offer evidence of a strong significant negative relation between NPLs and the governance indicator in Indonesia, the Philippines and a weakly significant relation in China. For Thailand and India the relation is positive.

Also Dutta and Saha (2021) derive a single governance indicator using the six WGI and isolate the common component for all these variables within a principal component analysis. Employing a panel dataset for 124 countries, among which there are also 17 Asian countries, for the time span 2000–2017, they offer evidence that the quality of governance, together with macroprudential policies, is an important factor in determining NPLs. They consider, in their Generalised Methods of Moments (GMM) approach, the Gini coefficient among the instrumental variables, as they assume that this variable is strongly correlated with governance, without having a direct influence on NPLs.

Rachid (2019) finds that for the time span 1997–2016, the goodness of institutions, proxied by rule of law, i.e. the degree of the agents' trust in both the rules of the society and the quality of contract enforcements, is negatively related to NPLs in Central and Eastern European and positively in the MENA regions. It is also worth mentioning Nor et al. (2021), who tackle with NPLs in the Middle East and Southeast Asia between 2000 and 2014 and offer evidence of the relevance of the institutions on NPLs. They find a positive and significant relation between NPLs and supervisory power: "*the increase in the supervisory power will only lead to the inefficient economic outcomes*" (p. 440). Overall, the above discussion suggests a negative relation between NPLs and institutional quality.

The literature examined in the previous paragraph encompasses different control variables that overall support the choice of the regressors used in our econometric analysis. These will be briefly discussed in what follows.

Liu et al. (2020) run a Gaussian copula marginal regression analysis, for each country, in which they use diverse control variables (GDP, the inflation rate, government fiscal expenditure and government fiscal revenue): the signs of the coefficients vary across countries. They outline a weakly significant negative coefficient for government fiscal revenue for India, and a strongly significant negative coefficient for inflation for China.

Umar and Sun (2018), on the other hand, offer evidence of a positive relation between the inflation rate and NPLs issued by unlisted banks; they also find a negative relation with the percentage change of GDP for all bank categories. Among the other determinants of NPLs, with differences between the two bank categories, the following variables are significant: the exchange rate, the type of bank, the bank's risk-taking behavior, ownership concentration, leverage and credit quality. Dutta and Saha (2021) also offer evidence of a negative relation between GDP growth and NPLs.

Arham et al. (2020) find that good country governance, apart from mitigating the positive effect of the ratio of debt on GDP on NPLs, reduces the impact on NPLs of three macroeconomic variables: firstly, *inflation*, which is negatively and significantly correlated, suggesting that the prevailing effect of inflation is to reduce the real value of the debt, though the authors acknowledge that inflation may cause an increase in the risk premium; hence, an increase in interest rates could reduce the payment capacity of the borrowers and be positively correlated to NPLs; secondly, *unemployment*, which is positively and significantly correlated, advocating that a deteriorated economic situation will lead to an increase in NPLs; And thirdly, the *real interest rate*, which is positively and significantly correlated, purporting that the higher the interest rate the higher the cost of credit and the likelihood of borrower default.

Büyükoğlu et al. (2021) control for diverse macroeconomic variables, among which are bank concentration; GDP growth; and the unemployment rate. They find that *bank concentration* is significantly related to NPLs in diverse Asian countries, although the sign of the relation is not conclusive. A significant negative relationship between NPL and GDP growth is found in United Arab Emirates, Indonesia, Philippines, Malaysia and Pakistan; a positive though weak relationship is found for India. The relationship between NPL and unemployment is positive for Indonesia, India and Thailand, and negative for China.

Rachid (2019), apart from institutional quality, tackles the impact of other macroeconomic variables on NPLs and finds, in line with the relevant literature, that NPLs are significantly associated with inflation (negative coefficient) and unemployment (positive coefficient).

Before concluding this section, it is worth mentioning the contribution of Kuzucu and Kuzucu (2019), who offer evidence of a positive relation between FDI (net inflows as a percentage of the GDP, that stimulate economic activity and increase income levels), and NPLs for emerging countries among which China, India and Malaysia are considered for period 2001–2015. The results of the relevant literature concerning the expected sign of FDI are however ambiguous [7].

On the basis of the evidence offered by the relevant literature investigating NPLs' determinants we set the hypotheses to be tested (see Table 1).

3. Data and methods

Overall 31 countries were observed for a time span of 20 years, from 2000 to 2020.

In alphabetical order, they can be listed as follows: Afghanistan, Armenia, Bangladesh, Bhutan, Cambodia, China, Cyprus, Georgia, India, Indonesia, Israel, Japan, Jordan,

		Dependent variable: NPLs as a ratio of total gross loans	
Authors	Independent variables	Main findings	Asian countries observed in the study (Period)
Umar and Sun (2018)	Public debt/GDP, GDP growth, effective interest rate, inflation rate, foreign exchange rate, bank risk-taking behavior, ownership concentration, leverage and credit quality	Public debt/GDP (+)*, GDP growth (−), inflation rate (+)* and *only for unlisted banks	China (2005–2014)
Kuzucu and Kuzucu (2019)	FDI, GDP growth, unemployment, inflation, exchange rate and current account balance	FDI (+), GDP growth (−) and inflation (−)	China, India and Malaysia (2001–2015)
Rachid (2019)	GDP growth, inflation rate, unemployment, ROA, domestic credit provided by the banking sector and rule of law	Rule of law (−), inflation rate (−) and unemployment (+)	Middle East (1997–2016)
Arham et al. (2020)	Control of corruption, government effectiveness, regulatory quality, total gross external debt/GDP, Unemployment rate and Real interest rate	Good country governance mitigates the effect of total gross external debt/GDP (+), inflation(−) and unemployment (+)	China, Hong Kong, Indonesia, India, Malaysia, Philippines, Singapore, South Korea, Thailand and Vietnam (2007–2017)
Liu et al. (2020)	Public debt/GDP, GDP growth, inflation rate, Government fiscal expenditure and Government fiscal revenue	Public debt/GDP (+) and inflation (−) only for China	China and India (2006–2017)
Büyükoğlu et al. (2021)	WGI, inflation rate, Deposits/GDP, ROA, GDP growth, Unemployment and Bank concentration	WGI in Indonesia, Philippines and China (−), India and Thailand (+), GDP in Indonesia, Philippines, Malaysia and Pakistan (−), India and United Arab Emirates (+), Unemployment in China (−), Indonesia, India and Thailand (+)	China, India, Indonesia, Korea, Kuwait, Malaysia, Philippines, Russia, Saudi Arabia, Thailand, Turkey and United Arab Emirates (2002–2018)
Dutta and Saha (2021)	WGI, Macroprudential policies index and GDP Growth	WGI (−) and GDP growth (−)	Armenia, China, India, Indonesia, Jordan, Kuwait, Malaysia, Pakistan, Philippines, Russian, Saudi Arabia, Thailand, Turkey Israel, Japan, Korea-Rep, Malaysia and Singapore (2002–2016)

Table 1.
The observed scenario for Asian countries

Kazakhstan, Republic of Korea, Kuwait, Kyrgyz Republic, Lebanon, Malaysia, Maldives, Nepal, Pakistan, Philippines, Russian Federation, Singapore, Sri Lanka, Tajikistan, Thailand, Turkey, Uzbekistan and Vietnam. The countries in the sample are heterogenous: They differ by size, level of wealth, economic conditions and political assets, and every analysis aimed at describing the relationship between NPLs and any explanatory variable, should consider such heterogeneity. Compared to the other studies dealing with NPLs in Asia, mentioned in the previous section, our work may make it possible to draw wider conclusions, given the higher number of Asian countries examined.

We studied the relation between NPLs and the overall institutional quality. The latter was specified by considering variables such as public debt as % of GDP, one out of six WGI, namely, effectiveness of government (that "*captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies*") [8].

3.1 Hypotheses tested [9]

The hypotheses tested can be summarised as follows:

H1.1. There is a positive relation between public debt as % of GDP and NPLs.

H1.2. There is a negative relation between effectiveness of government and NPLs.

The above literature review outlined the need to control for diverse macroeconomic variables, which all contribute to determining the degree of the soundness of the banking system.

In what follows, we present an additional hypotheses set, H2, emerging from the choice of the controls selected among the variables suggested by the reviewed studies.

Hence, we verify if there is a correlation between NPLs and

H2.1. the growth of GDP, expected to be negative

H2.2. the Gini index, that gives a picture of each country regarding equality and income distribution and which is expected to be positive [10]

H2.3. the price index

H2.4. unemployment.

The expected signs of the correlations with these last two variables are, respectively, negative and positive, confirming the macroeconomic trade-off between inflation and unemployment.

H2.5.1. The foreign investments in relation to GDP (FDI/GDP) may represent a higher level of internationalisation (expected negative sign) [11].

H2.5.2. The gross fixed capital formation (FDI gross fixed capital) includes land improvements, plant, machinery, and equipment purchases and the construction of roads, railways and other infrastructures (expected negative sign).

H2.6. The monarchy regime (monarchy): Some evidence offered by Houdi and Malik (2021) suggests that a monarchic regime is related to *bank concentration* as has been outlined in the previous section (see also Büyükoğlu *et al.*, 2021); *bank concentration* has been found to be significantly related to NPLs in diverse Asian countries. Nevertheless, since such a relationship is not conclusive, the sign of the correlation has to be assessed. Table A2 in the Appendix summarises the hypotheses tested.

3.2 The econometric analysis

The heterogeneity of the countries in the sample calls for an econometric approach that might consider such diversity, and the likely heteroskedasticity hence, a GLS model with heteroskedasticity and autocorrelation within panels was selected [12]. The choice of such a model depends on the circumstance that each sample unit – i.e. each observed country – may have a different variance under different socio-economic conditions; therefore, by considering the possible heteroskedasticity across panels, it is possible to avoid inefficiency in the estimated parameters. Likewise, as each observation can be correlated to the previous observations (such as, for example, the level of NPLs from one year to the other), the autocorrelation that may be present in each panel was checked for (Parks, 1967). Models for the analysis of cross-section data in historical series are considered the best tools to conduct a causal analysis (Stimson, 1985). Furthermore, they have the advantage of eliminating or reducing biases in the estimation and the risk of multicollinearity by increasing the number of observations.

4. Results

The 31 countries included in the sample present different characteristics in terms of geographic extension (there are countries consisting of one town only, such as Singapore, and countries among the largest in the world, such as the Russian federation, or China) and the number of inhabitants and per capita GDP (while Singapore is among the richest countries in the world, Afghanistan is among the poorest). The level of banking system development is also diversified, with the lowest value for NPLs registered for South Korea (0.25) and the highest value for Cyprus (47.75).

Some descriptive statistics related to the variables employed in the analysis can be seen in Table 2.

The observed sample encompasses almost all Asian countries, for a quite wide time span – 20 years. A crucial variable in the analysis is, as has been stressed, government effectiveness, as we agree that "*a more effective government can provide a better regulatory environment*" (Kaufman *et al.*, 2010).

The results of the estimated regression, which uses the variables described above, can be seen in Table 3.

Some considerations may be drafted on the results of the estimate, which allow us to confirm the entire set of H1 hypotheses related to NPLs and the chosen proxies of government failures:

First, the relationship between NPLs and the variable indicating the ratio debt/GDP is positive and significant; hence, H1.1 is confirmed.

	Mean	Std. dev.	Min	Max
Debt	55.261	47.777	0	346
Growth GDP	4.576	4.483	−33.50	26.11
Price index	102.353	34.967	20.59	263.22
Effectiveness	53.439	24.250	2.04	100
Unemployment	6.138	4.246	0.14	21.21
The Gini index	37.199	9.268	26.8	80.9
FDI gross fixed capital	29.985	115.382	−36.193	1621.81
FDI/GDP	6.128	19.368	−15.43	25.422
Monarchy	Mean = 0.30			

Table 2.
Descriptive statistics

GLS with heteroskedasticity and panel specific autocorrelation. Dependent variable: NPLs

Variable	Coefficient	Std. deviation
Debt	0.016[**]	0.006
Growth GDP	−0.037[***]	0.014
Price index	−0.016[***]	0.006
Effectiveness	−1.103[***]	0.344
Unemployment	0.018[***]	0.066
Gini index	0.071[**]	0.030
FDI gross fixed capital	0.031[***]	0.008
FDI/GDP	−0.152[***]	0.045
Monarchy	−2.275[***]	0.738
Constant	4.472[***]	1.571

Note(s): [***]99% significant; 95% significant; 90% significant; Wald χ^2 (9) = 71.44 Prob. > χ^2 = 0.000; estimated covariances = 31 number of obs. = 612 estimated autocorrelations = 31 number of groups = 31

Table 3.
Estimation results

The negative relation between NPLs and goodness of institutional quality, covered by assumption H1.2, is also confirmed. This result suggests the major role of government effectiveness in reducing NPLs; in fact, a higher value for this index reflects not only a stronger quality of public services and higher government independence from political pressures, but also the government's credibility in pursuing announced public policies; these latter dimensions might be fundamental in deterring (and punishing) the issue of NPLs.

As far as the hypotheses related to the control variables are concerned

H.2.1 is confirmed by the inverse and significant correlation of NPLs with the GDP growth rate. In line with the relevant literature concerning both emerging economies and advanced economies (Kuzucu and Kuzucu, 2019) GDP positively and significantly impacts NPLs.

H2.2, the Gini index, that gives a picture of each country regarding inequality in income distribution, shows a positive sign, as expected.

Other macroeconomic variables, considered by the additional hypotheses H2.3 and H2.4 have also the expected signs: the price index is inversely and significantly correlated and, analogously, a significant correlation, although positive, exists with unemployment. The negative correlation between inflation and NPLs can be explained by the possibility that inflation might make servicing of the debt easier, as it reduces the real value of the loan (see Klein, 2013 [13]).

H2.5.1 and H2.5.2 concern the expected negative impact of foreign direct investment on NPLs.

While H2.5.1 is confirmed, suggesting a negative correlation between NPLs and FDI in relation to GDP (FDI/GDP), which should imply a higher level of business internationalisation, usually positively related to institutional quality, H2.5.2 is not confirmed, as the contribution of FDI to the formation of fixed capital (i.e. land improvements, equipment, construction of infrastructures, etc.) is significant, but exhibits a positive sign. This might be explained by what Krkoska (2001) suggests for transition economies: the increase in the percentage of capital formation financed by FDI may relax the credit constraint faced by the company by augmenting its credit ratings, and this circumstance may be related to the increased risk of NPLs.

Finally, the additional H2.6 shows an inverse relationship, that could be explained by the evidence offered by Houdi and Malik (2021). The authors suggest that a monarchic regime is related to bank concentration and might be due to a more restrictive financial attitude, which does not allow space for NPLs: in fact, the estimated correlation is inverse and significant.

5. Discussion and conclusions

Government failures could make the occurrence of risky financial behaviors that generate financial fragility with the increase in the share of NPLs more likely.

The evidence offered in this paper supports the idea that a healthy financial sector relates to institutional quality and political regime. These findings, verified on an ample sample of Asian countries, are mainly in line with the relevant literature investigating the determinants of NPLs in different geographic areas.

The relevance of the institutional setting calls for government actions aimed at instructing banks to fulfill the Basel III requirements, by raising their capital reserves, so as to avoid the deterioration of their assets quality stemming in NPLs.

The results suggest to policy makers that, in order to reduce NPLs, it is necessary to strictly monitor governance indicators. This advice may be framed within the 16th sustainable development goal of Agenda 2030, i.e. *"Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels"*. Specifically, among its targets, Goal 16 aims at fostering institutional effectiveness, accountability and transparency (16.6).

In Agenda 2030, effective institutions are considered tools to achieve sustainable development, and our contribution suggests one channel through which they may do so, i.e. by rendering more effective the financial system, the relevance of which is fully acknowledged by Goal 8, that among its targets envisages to *"strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all"* (Target 8.10).

The above considerations prompt policy makers and regulators facing high levels of NPLs to consider as a strategic priority the pursuit of government effectiveness.

It is worthwhile to offer some conclusive remarks drawn from the results concerning the control variables used in the econometric analysis.

Governments should also keep an eye on unemployment rates, as they affect borrowers' solvency and may eventually lead to default, both for individuals and financial institutions (Arham *et al.*, 2020). Moreover, the result of a positive relation between the FDI contribution to gross fixed capital formation and NPLs, that may be explained by a capital formation strongly dependent on abroad and may be related to higher exchange rate exposure, requires public and private companies to carefully pay attention to the management of foreign exchange risks.

Further possible developments of the analysis could consist in widening the sample considered in the present study. For example, it could be possible to include, together with Asian countries, South Eastern Pacific countries, Australia and New Zealand, to have a global vision of banking and finance policies and diverse forms of government.

Notes

1. All Asian countries for which the World Bank provides data on NPLs for the time span considered have been included in the analysis.

2. A complete review of these contributions is beyond the scope of the present analysis.

3. Analogously, Park (2012) uses aggregate data from more than 70 countries, from very poor countries like Bangladesh to very rich countries like the USA, in the time span 2002–2004, and shows that more corrupt countries have higher levels of NPLs. Bougatef (2016) gets similar results for 22 emerging countries over the period 2008–2012.

4. The six WGI elaborated by the World Bank (see WGI, last version 2022) are: Rule of Law, Control of Corruption, Regulatory Quality, Voice and Accountability, Political Stability and Absence of Violence/Terrorism and Government Effectiveness.

5. For a comprehensive review on the topic concerning all countries of the world, see Manz (2019) and Naili and Lahrichi (2022).

6. They have been already considered in other studies, for example, those of Li and Moosa (2015) and Uddin *et al.* (2020).

7. For example Festić *et al.* (2011) who find a positive relation, on the contrary Beaton *et al.* (2016) find a negative one.

8. Source: http://info.worldbank.org/governance/wgi/Home/Documents. It is worth noticing that among the diverse individual variables that contribute to the formation of this composite index there are State failure and Political instability. They are described by the World Bank as follows: State failure: *the risk the state is unable to exclusively ensure law and order, and the supply of basic goods such as food, water, infrastructure and energy, or is unable to respond to or manage current or likely future emergencies, including natural disasters and financial or economic crises*; and Policy instability: *The risk the government's broad policy framework shifts over the next year, making the business environment more challenging. This might include more onerous employment or environmental regulation; local content requirements; import/export barriers, tariffs or quotas; other protectionist measures; price controls or caps; and more "political" control of monetary policy, or simply more direct intervention into the operations and decisions of private companies etc.".*

9. The selection of the institutional variables in the estimation presented is the outcome of diverse preliminary specifications of the final model.

10. The higher the value of the Gini index, the higher the inequality.

11. We expected that the increase in FDI by boosting economic activity would limit NPLs (Beaton *et al.*, 2016).

12. An accumulating body of research has used the GLS technique to test the effects of political and institutional determinants of macroeconomic policies and their performances (Alvarez *et al.*, 1991).

13. Klein acknowledges the possibility that inflation might increase interest rates, because of policy measures enacted to combat it, which makes repayment of the debt even more difficult and should increase NPLs. Nevertheless, it seems that the counterbalancing force might prevail in the present scenario.

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(The Appendix follows overleaf)

Appendix

Name	Description	Source	Expected sign
NPLs	Bank non-performing loans to total gross loans (%)	The World Bank https://data.worldbank.org/indicator/FB.AST.NPER.ZS	
Effectiveness	Government effectiveness	The World Bank https://info.worldbank.org/governance/wgi/Home/Reports	−
Debt	General government gross debt as % of GDP	International Monetary Funds https://www.imf.org/external/datamapper/GGXWDG_NGDP@WEO/OEMDC/ADVEC/WEOWORLD/VEN	+
Growth GDP	Real GDP growth[1]	The World Bank https://databank.worldbank.org/reports.aspx?source=2&series=NY.GDP.MKTP.KD.ZG&country=#	−
Price index	Consumer price index	The World Bank https://data.worldbank.org/indicator/FP.CPI.TOTL	−
Unemployment	Unemployment, total (% of total labor force)	The World Bank https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS	+
Gini index	The Gini index	The World Bank https://data.worldbank.org/indicator/SI.POV.GINI	+
FDI gross fixed capital	The percentage of gross fixed capital formation	UNCTAD https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx	−
FDI/GDP	Foreign direct investments inflows as % of Gross Domestic Product		−

Table A1.
Variables used in the analysis

Note(s): [1]This variable represents the annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2015 prices, expressed in US dollars

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Main hypotheses

H1.1: There is a positive relation between the public debt as % of GDP and NPLs
H1.2: There is a negative relation between effectiveness of government and NPLs

Additional hypotheses
H2.1: There is a negative relation with the GDP growth and NPLs
H2.2: There is a negative correlation with equality and income distribution (the Gini index) and NPLs
H2.3: There is a correlation between NPLs and the price index
H2.4: There is a correlation between NPLs and unemployment
H2.5.1: There is a negative correlation between NPLs and the foreign investments in relation to GDP (FDI/GDP), i.e. a higher level of internationalisation

H2.5.2: There is a negative correlation between NPLs and the gross fixed capital formation (FDI gross fixed capital), that includes land improvements, plant, machinery, equipment purchases and the construction of roads, railways and other infrastructures

Table A2.
Hypotheses tested

H2.6: There is a correlation between NPLs the monarchy regime

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Corresponding author
Ferdinando Ofria can be contacted at: ofriaf@unime.it