



Cross-Country Empirical Studies of Systemic Bank Distress

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A Survey of Banking Crises

- Before the 1990s, research on banking crises was inspired mostly by experiences of the 19th and 20th century
 - Studies of Great Depression..
- But beginning in the 1990s, a resurgence of banking crises provided both new impetus and new materials to researchers, leading to a rapidly growing literature
- This presentation surveys this work on causes and consequences of bank fragility and highlights lessons and directions for new research

Areas of Focus

- I. Determinants of banking crises
- II. Building early-warning models
- III. Effects of banking crises
- IV. Intervention policies and the costs of crises
- V. Directions for future research

Some Facts..

- Debt crises of 1980s were accompanied by bank distress, but bank fragility got little attention..
- In 1990s financial crises where banking sector played the central role were widespread (Scandinavian crises, Japan, Tequila, East Asia)..
- Indeed systematic country surveys showed that bank weaknesses extended to all regions of the world and all levels of development (Caprio and Klingebiel, 1996).

More crises, more data points..

- The surveys provided the raw material to construct a sample of crisis countries (Caprio and Klingebiel, 1996, 2002)
- Bank fragility was clearly pervasive and multifaceted, ripe for more systemic empirical estimation.

I. Identifying determinants of banking crises

- Two econometric approaches
 - The Signals Approach (Kaminsky and Reinhart, 1999)
 - The Multivariate Probability Model Approach (Demirguc-Kunt and Detragiache, 1998)

Signals Approach

- Incidence of currency, banking and “twin” crises in 20 countries over 1970-1995.
- Describe the behavior of 15 macroeconomic variables in the 24 months before and after crises and compare it to the tranquil times
- A variable “signals” a crisis if it crosses a particular threshold based on noise-to-signal ratios.

Best performing banking crisis indicators are..

- Appreciation of real exchange rate
- Equity prices
- Money multiplier

The best with lowest noise/signal ratio and leading to highest probability of crisis

...but they also have high type I error – miss the crises 73-79% of the time.

The indicator with lowest type I error (70%) is

- Real interest rate

Some problems of signals approach

- Each variable is considered in isolation - what if one indicator signals a crisis but others do not?
- Methodology focuses on whether the variable has crossed a threshold, but not really by how much – which is also important information.

Multivariate Probability Model Approach

- Probability that a crisis occurs is assumed to be a function of a vector of explanatory variables
- The model produces a summary measure of fragility - the estimated probability of crisis
- Demirguc-Kunt and Detragiache (1998) regressions updated to cover 1980-2002.

Findings

- Crises manifest themselves during periods of weak economic growth and loss of monetary control (low gdp growth, high inflation)
- A higher and more volatile real interest rate is also a source of fragility
- Vulnerability to currency crises also plays a role (M2/international reserves)

Findings

- Larger banking exposure to the private sector and a rapid credit growth are associated with greater banking fragility
- And so is explicit deposit insurance – indicating moral hazard
- To the contrary, better institutional development (GDP/cap) is associated with lower fragility.

Many other studies followed

Banking crises and...

- Individual bank vulnerability measures
- Financial liberalization
- International shocks, exchange rate regime
- Bank ownership and structure
- Role of institutions
- Political system

Individual Bank Vulnerability Measures

- Bank-specific as well as macro data to investigate systemic banking crises (Gonzalez-Hermosillo, 1999; Bongini et al. 1999)
- Non-performing loans and capital asset ratios deteriorate rapidly before crises, CAMEL variables do well in predicting systemic crisis

Financial Liberalization

- Financial liberalization can significantly increase bank fragility unless mitigated by a strong institutional environment.
- Demirguc-Kunt and Detragiache, 1998; Glick and Hutchison, 2001 and others.

External Shocks

- Eichengreen and Rose (1998) –OECD interest rates and growth affect bank fragility in developing countries. But Arteta and Eichengreen (2002) show that 1990s crises were different than earlier ones in that external factors did not play an important role.

Exchange Rate Regime

- Flexible or Fixed?
- Mixed evidence on crisis impact
 - Arteta and Eichengreen (2002) – no evidence
 - Domac and Martinez Peria (2003) find that fixed exchange rate diminishes the likelihood of crises, but once it occurs, its economic cost is larger under the fixed exchange rate.

Bank ownership

- State ownership – increases fragility
Caprio and Martinez-Peria (2000); Barth, Caprio and Levine (2001)
- Foreign ownership – lowers fragility
Demirguc-Kunt, Levine and Min (1998); Detragiache and Gupta (2004)

Market Structure

- Greater competition (fewer restrictions on bank entry and activities, national institutions that encourage competition) lowers fragility
- Bank concentration is also associated with lower fragility – due to better risk diversification by larger banks
 - Beck, Demirguc-Kunt and Levine (2004)

Institutions

- Better institutional development – lower fragility, Demirguc-Kunt and Detragiache (1998) and others..
- Poorly designed deposit insurance increases fragility unless mitigated by strong institutions, Demirguc-Kunt and Detragiache (2002)

Institutions

- Regulatory and supervisory practices that force accurate information disclosure, empower private sector monitoring of banks and foster incentives for private agents to exert corporate control, lower fragility
Barth, Caprio and Levine (2004)

Political system

- Disseminating information about costs of inefficient government policy
- Ensuring competition among interest groups
- Increasing the transparency of government decisions
- Improving the structure of legislative oversight of the regulatory process

Are all policies to improve financial sector policy

Kroszner (1997).

II. Early Warning Systems

- Both signal approach and probability models were used to develop early warning models.
- Examples are Kaminsky and Reinhart (1999), Goldstein et al. (2000), Demirguc-Kunt and Detragiache (2000).

..with limited success

- In-sample prediction accuracy cannot be replicated out-of-sample
 - New crises are different than those experienced in the past
 - After all crises are still rare events, so in sample estimates are based on few data points

To improve accuracy

- Develop alternative scenarios –low/high forecasts- for explanatory variables (stress –testing exercises)
- Explore movements in high-frequency variables such as spreads on the interbank market, on commercial paper issued by banks, stock market valuation of banks, and corporate vulnerability – significant data requirements

III. Effects of banking crises

- Credit crunch hypothesis
 - Bank fragility has adversely affected economic growth
 - Or is it the other way around, with exogenous growth slowdowns leading to greater fragility
 - The answer has important policy implications: if crises have real costs, the case for rescue operations is stronger

Mixed evidence..

- No crunch – 1990 US recession, Bernanke and Lown (1991); Thailand, Dollar and Hallward-Driemeier (2000)
- Credit Crunch – Malaysia, Korea, Domac and Ferri (1999); Indonesia and Korea, Ghosh and Ghosh (1999) only in the first few months; Dell’Ariccia et al.(2005) using industry level panel.

IV. Intervention policies and crisis costs

- The more generous the intervention policies, the higher the fiscal and economic costs (Honohan and Klingebiel, 2001; Claessens et al. 2003).
- Broad categories: blanket deposit guarantees, liquidity support to banks, bank recapitalization, financial assistance to debtors, forbearance. But the causality is very hard to disentangle.

Fiscal costs and politics

- Political economy of crisis resolution
Keefer (2001).
- With better informed voters, closer elections, and larger number of veto players governments make smaller fiscal transfers and are less likely to exercise forbearance.

V. Conclusions

- Cross-country econometric research on crises has progressed rapidly in recent years
- Thanks to all this work, we have a better understanding of causes of crises
- Empirical models have been more useful in identifying factors associated with crises rather than predicting them.

Going forward..

- More work on definition/identification of different types of bank crises – some are sudden events due to severe exogenous shocks, others are long-simmering problems
- Better prediction and search for early warning indicators would need to move towards high frequency data and more accurate dating of crisis episodes

Going forward

- More on the impact of institutional variables
 - Impact of BASEL II on fragility in developing countries
- More on the impact of policy choices and resulting market structures
 - Impact of globalization and consolidation trends

Going forward

- Studying banking crises requires an understanding of open economy macroeconomics and the microeconomics of banking and regulation
 - Better incorporating bank level information in cross-country empirical models of banking crisis would be useful