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# The Japanese banking crisis and economic growth: Theoretical and empirical implications of deposit guarantees and weak financial regulation ☆

Robert Dekle [a,*] and Kenneth Kletzer [b]

[a] *University of Southern California, Los Angeles, CA, USA*
[b] *University of California, Santa Cruz, CA, USA*

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An endogenous growth model with financial intermediation is used to show how government policies towards the financial sector can lead to banking crises and persistent growth slumps. The model shows how government deposit guarantees and regulatory forbearance can lead to permanent declines in the growth rate of the economy. The effects of inadequate prudential supervision on asset price dynamics under perfect foresight are also derived in the model. The policies that are used in the analysis are based on essential features of Japanese financial regulation. The implications of the model are compared to the experience of the Japanese economy and financial system during the 1990s. We find that the dynamics predicted by our model are generally consistent with the recent behavior of economic aggregates, asset prices and the banking system for Japan. A policy implication of the model is that the impact on future economic growth depends upon the length of time the government fails to enforce loan-loss reserving by banks. *J. Japanese Int. Economies* **17** (3) (2003) 305–335. University of Southern California, Los Angeles, CA, USA; University of California, Santa Cruz, CA, USA.


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* Corresponding author.
*E-mail address:* dekle@usc.edu (R. Dekle).

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## 1. Introduction

The persistent weakness of the Japanese financial sector and its contribution to the poor growth performance of the Japanese economy are among the most important current challenges to macroeconomics. The high levels of non-performing assets held by Japanese banks have led to a credit contraction and contributed to declines in economic growth. The current difficulties faced by the government in resolving the banking crisis echo a recent history of weak prudential regulation and supervision that are a primary source of the banking crisis in the first place. This paper considers the possibility that public policy towards the financial system is a root source of the Japanese growth crisis. The model presented here shows how a banking crisis can evolve endogenously and lead to a long-run drop in the growth rate. It implies that the longer the government allows banks to carry non-performing assets on their balance sheets, the further the growth rate falls.

We develop a simple endogenous growth model with financial intermediation and solve for its equilibrium dynamics. The model incorporates three simple stylized facts about the Japanese financial system. Investment is financed primarily by bank loans and equity issues. The government guarantees the bank deposits of domestic savers. The government allows banks to raise its deposit insurance liability over time through weak prudential supervision and regulatory forbearance. This is represented in the model by the accumulation of non-performing loans against deposit liabilities when the government fails to monitor additions to bank loan-loss reserves.

Production in the theoretical model displays constant returns to a single accumulable factor, capital, and is subject to idiosyncratic productivity shocks. Under standard informational assumptions, bank finance dominates direct lending by savers to firms, and bank loans are constrained optimal contracts. Productivity shocks are independent across a continuum of firms at each date and over time. There is no aggregate uncertainty, and both banks and households (as holders of corporate equity) hold perfectly diversified portfolios. This framework focuses the analysis on the role of government deposit guarantees (more generally, government bailouts) and inadequate enforcement of loan-loss reserves in a developing banking crisis and persistent growth decline.

If the government continuously requires loan-loss reserving by banks, then the growth rate is constant over time in the model. With regulatory forbearance, the output growth rate declines gradually as non-performing assets held by the banks rise. The long-run growth rate falls towards zero with the length of time that the government forbears. If the government fails to intervene before a critical date, the banks will become unable to meet the deposit withdrawal demands of households for consumption and a banking crisis occurs. At moment of a crisis, the growth rate of consumption suddenly falls. The model allows us to solve for the equity value of banks and of output-producing corporations and how these change before and after the banking crisis. It also predicts a collapse in the market for collateral at the moment of the crisis.

The dynamics for output, consumption and investment predicted by the model under regulatory forbearance and deposit guarantees are compared to the recent experience of Japan. We also compare the implications of the model for the stock market value of corporations and for banks, non-performing loan accumulations by the banking system and the value of collateral assets. The strict interpretation of the model in terms of the data