

Financial stability: theory and applications

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In the ECB *Financial Stability Review* (December 2005, p. 131) it is stated bluntly that, “Financial stability assessment as currently practiced by central banks and international organisations probably compares with the way monetary policy assessment was practiced by central banks three or four decades ago — before there was a widely accepted, rigorous framework.” It is the aim of this publication to provide a set of papers that could help to point the way towards such a framework.

It should be no surprise that the analysis of financial stability issues lags behind that of monetary policy. The former is just that much more difficult to model. In particular, financial (in)stability is generated by the probability of default (PD) and bankruptcy. PD lies at the heart of each of our six papers. In contrast, most mainstream macro and monetary analysis makes the assumption that no economic agent ever defaults. This latter assumption enormously simplifies modelling and allows for the use of representative agents, whereas a considered treatment of PD must face heterogeneity, i.e. some agents follow a riskier strategy with a higher PD than others.

Given the inherent implausibility of a world without default, it is quite remarkable how much such current mainstream models can achieve in monetary and macroeconomic analysis and policy prescription; Woodford’s, *Money and Interest* (2003), is an icon in this respect. Whether, or not, such monetary

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policy analysis would retain all its validity in a more realistic setting, it is just not possible to approach an analysis of financial stability without addressing bankruptcy, PD, and the heterogeneity of agents, both banks and their clients, head on.

PD, and the effects of bankruptcy, can be assessed in many ways. Amongst our papers Suarez and Sussman look at the interaction between financial distress and bankruptcy law; Calomiris examines how the Argentinian government's response to their financial crisis affected various categories of borrowers and lenders; Kupiec reviews how various ways of modelling credit risk would affect regulatory capital requirements.

The other three papers explore how time-varying PD can interact within a macro-economic setting to influence the wider economy. In order to do so one needs to integrate default within a macro-economic setting/model. This is not easy to do since default is by definition a discontinuity. In our own view, as expressed in Goodhart et al. (2006) "A model of financial fragility", the best way to do so that has yet been devised was developed by Dubey et al. (2005) and Shubik and Wilson (1997).

Shubik sees every agent as choosing a strategy, depending on his/her risk aversion, which will generate differing PDs, and losses given default (LGDs), depending on the state of the world. There have to be penalties for bankruptcy, which penalties may be non-pecuniary; otherwise no one would ever repay and no one would lend. The penalties cannot be extreme, or no one would borrow. Anyhow risk aversion is one of the primitive fundamentals in the resulting general equilibrium (GE) models that we have constructed, alongside endowments, preferences, resources, technologies.

It has not proven easy to integrate the mainstream DSGE models into the regular forecasting and decision-making processes of the monetary authorities, perhaps because of the artificiality of the assumptions; indeed in a world without default it is hard to see why there should be any need for money or banks, the basic paraphernalia of a monetary system. Be that as it may, the purpose of our work is not to provide the equivalent of an intellectual Sudoku puzzle, but to develop techniques which can be used in practice, on real live data, to analyse and to help maintain financial stability and thereby to enhance social welfare. So we are pleased that three (half) of the papers in this volume describe alternative ways in which this general approach can be adapted to the practical empirical study of financial stability.

Turning to the individual papers more directly, they address issues concerning financial stability both from a theoretical as well as from an applied viewpoint. Our purpose has been to include original research employing a variety of methodologies and analytical frameworks.

1. Suarez and Sussman (2007), "Financial distress, bankruptcy law and the business cycle," investigate the dynamic implications of financial distress and bankruptcy law. The effect of liquidations on the price of capital goods, due to financial imperfections, generate endogenous cycles. In addition, the amplitude of the cycle in the long run depends on bankruptcy law. They

- argue that ‘softer’ bankruptcy law will increase the amplitude whereas active bail out policy and interest rate policy stabilizes the economy.
2. Aspachs et al. (2007), “Towards a measure of financial fragility,” propose a measure of financial fragility that is based on economic welfare in a general equilibrium model with heterogeneous investors and banks, incomplete markets, and *endogenous* default calibrated against UK data. They address the impact of monetary and regulatory policy, credit and capital shocks in the real and financial sectors and how the response of the economy to shocks relates to the proposed measure of financial fragility. The relationship of factors that characterize financial fragility, i.e. banks’ probabilities of default and banks’ profits and a proxy of welfare, are investigated using panel VAR techniques.
 3. Saade et al. (2007), “An equilibrium approach to financial stability analysis: the Colombian case,” study in detail the performance of a general equilibrium model of the financial system when applied to the case of Colombia. This model was designed following closely the work by Goodhart et al. (2006). The results suggest that the model performs satisfactorily, especially in the prediction of short-run trends (2 years). A shortcoming of the results is a slight overestimation of several trends in the medium to long-term.
 4. Kupiec (2007), “Financial stability and Basel II,” compares the Basel II advanced internal ratings (AIRB) approach to capital requirements using an equilibrium structural credit risk model. He argues that the AIRB approach undercapitalizes credit risk relative to regulatory targets and allows wide variation in capital requirements. In contrast, the foundation internal ratings based (FIRB) approach may overcapitalize credit risk relative to supervisory objectives.
 5. Akram et al. (2007), “Pursuing financial stability under an inflation-targeting regime,” evaluate two main approaches to pursue financial stability within a flexible inflation-targeting regime. Their results suggest that the potential gains from an activist or precautionary approach to promoting financial stability are highly shock dependent. They conclude that the preferred target horizon depends on the financial stability indicator and the shock. However, an extension of the target horizon in order to improve financial stability may contribute to relatively higher variation in inflation and output.
 6. Calomiris (2007), “Devaluation with contract redenomination in Argentina,” offers empirical microeconomic analysis of the effectiveness of dollar debt and contract redenomination policies to mitigate adverse financial and relative price consequences from a large devaluation. An analysis of Argentina’s policy of devaluation with redenomination in 2002, in contrast to Mexico’s policy of devaluation without debt redenomination in 1994–1995, shows that devaluation benefited tradables firms, and that dollar debt redenomination in Argentina benefited high-dollar debtors. Stock return reactions to Argentine debt redenomination indicate large, positive, unanticipated effects on high-dollar debtors from debt redenomination.

Energy concession contract redenomination likewise increased investment by high energy users in Argentina.

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