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Overview and discussion: Moderator's comments

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"Systemic risk, bank behaviour and regulation over the business cycle"

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* These comments reflect the views of the moderator and not necessarily those of the BIS or of central banks participating in the meeting.

CCA conference "Systemic risk, bank behaviour and regulation over the business cycle"

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At their meeting in Sao Paulo on 10 November 2008, the Governors of the Consultative Council of the Americas (CCA) asked the BIS to coordinate a joint conference for economic research experts of CCA member central banks. At the time, the Governors expressed preference for the topic "Financial stability, macro-prudential regulation and the business cycle". With that in mind, the BIS convened a scientific committee composed primarily of the Directors of Research of the six CCA-member central banks. A call for papers was announced (attached) and, from the 19 submissions 8 papers were selected to be presented at the conference hosted by the Central Bank of Argentina in Buenos Aires on 18-19 March 2010 (see attached conference programme).

The papers presented fell into three broad topics: i) pro-cyclicality; ii) systemic risk; and iii) markets and performance. This overview summarises what was learned, and highlights a set of questions that might guide the way forward.

Pro-cyclicality

The idea that the financial system is procyclical is now generally accepted. One mechanism through which it can occur is a "financial accelerator" in which endogenous developments in credit markets work to amplify and propagate shocks to the macroeconomy. Due to the amplifying effects, procyclicality is also a factor behind financial instability: credit expands in booms and tightens in busts.

The first session, chaired by Allan Crawford (Bank of Canada), provided insights on three aspects of procyclicality: *empirical relevance*, the *role of capital* and the *role of regulation*.

Turning first to *empirical relevance*, in their provocative contribution to this conference **"A new look into credit pro-cyclicality"** Ricardo Bebczuk, Tamara Burdisso, Jorge Carrera and Máximo Sangiácomo of the Central Bank of Argentina show that credit is not procyclical as few countries display positive correlations between GDP growth and credit growth. They also conclude that credit has a weak impact on private expenditure: credit does not Granger-cause GDP, and there is no relationship between bank capital, credit and output.

How to interpret these results? Given the evident role of high degrees of leverage in the most recent crisis and in previous crisis episodes, it is still necessary to worry about credit and its

role in output fluctuations. At the same time, it is clear that we must continue trying to understand these striking facts. Our models of procyclicality are about credit supply, so maybe demand effects are responsible for the observed quantities. Or, more generally there may be theoretical or structural explanations. Kevin Cowan (Central Bank of Chile), who discussed the paper, focussed on the former. He also noted that the correlation depends on the perceived nature of the shocks. By contrast, the authors examine a few of the latter, including suggesting that the lack of a correlation can possibly be a consequence of a relatively unimportant external finance or of asymmetries. In general it is evident from the discussion that more work is required in testing the financial accelerator mechanism and, in examining the interrelationship between lending decisions by financial intermediaries and macroeconomic variables.

Next, there is the *role of bank capital*. In their paper "**The role of bank capital in the propagation of shocks"**, Cesaire Meh (Bank of Canada) and Kevin Moran put bank capital into an otherwise standard DSGE model. The fundamental rationale for bank capital in their model is the following: banks have a screening technology that they use to make loans to entrepreneurs (whose effort cannot be directly observed). At the same time banks are intermediaries for investment but depositors can't monitor banks. Thus to invest, depositors require banks to allocate capital into the investment project. In this context capital serves as a mechanism to deal with a double moral hazard problem and ends up influencing the propagation of shocks and the nature of the business cycle. The authors conclude that (i) bank capital amplifies the effects of technology (supply) shocks more than it amplifies the effects of monetary policy (demand) shocks on output, investment and inflation. At the same time, an economy with more bank capital is better able to *absorb* negative technology shocks than an economy with less bank capital; (ii) banks can also be a source of shocks to output because a fall in bank capital leads to a decline in bank lending, investment and output; (iii) capital adequacy ratios fluctuate counter-cyclically; capital-asset ratios rise when economic activity weakens (eg under a negative technology shock or negative monetary policy shock) and decrease when economic activity recovers.

The discussant, Dimitrios Tsomocos of Oxford University, noted a number of potential extensions of the model. In particular, he pointed to the desire to include endogenous default in the model. While surely worthwhile, Tsomocos did point out the difficulty of this undertaking, as it would require specifying the movements away from complete markets.

Finally, the *role of regulation*. In this groupthere is the paper **"Regulatory solutions for bank loans pro-cyclicality: is the cure worse than the illness"**, by Veronica Balzarotti and Alejandra Anastasi of the Central Bank of Argentina. These authors analyse the role of

regulations in dealing with pro-cyclicality. The innovation in this paper is to show that regulatory measures implemented countercyclically can have offsetting effects on the cyclicality of credit. On the one hand, they stabilise the cyclical path of net intermediation margins and bank credit supply over the cycle. On the other hand, the cyclicality of bank behaviour is not eliminated because of the impact on financing requirements of banks. Smaller (rather than higher) net intermediation margins during a downturn, at a time when default rates are higher, reduce liquidity and exacerbate funding needs. The result is higher cost of funds for banks, and more procyclicality. They show that among the alternative countercyclical measures available, time-varying liquidity requirements are best at smoothing the credit cycle, while capital requirements amplify the credit cycle. This result is intriguing, and calls for further work in understanding where it is coming from.

Systemic Risk

The next session focussed on systemic risk. Manuel Ramos-Francia (Banco de Mexico) chaired the session and opened by setting out a series of questions central to the issue: (1) Do we believe markets can allocate risk efficiently and can they allocate systemic risk? (2) What can regulatory bodies do to prevent crises, and what can they do to resolve them? And (3), what is systemic risk and how can we take account of individual finanical institutions contributions?

Three papers were presented:

1. Céline Gauthier, Alfred Lehar and Moez Souissi (Bank of Canada) **"Macro-prudential regulation and systemic capital requirements"**, with comments by Dairo Estrada (Bank of the Republic, Columbia)
2. Wagner Piazza's and Ricardo Schechtman (Central Bank of Brazil) **"Macro stress testing of credit focused on the tails"**, with comments by Simone Manganelli (European Central Bank)
3. Serafín Martínez, Calixto López, Omar Pérez, Fernando Avila and Fabrizio López (Bank of Mexico) **"Systemic Risk, Stress Testing and Financial Contagion"**, with comments by Andrew Patton (Duke University).

Three general conclusions can be taken away from the presentations and discussions:

- *Capital adequacy in a systemic framework*. Financial stability can be enhanced significantly by implementing a system perspective on bank regulation. In particular, the paper by Gauthier and colleagues shows that capital adequacy calculations differ considerably when taking a systemic view, incorporating externalities. They compare

several methods for breaking down the overall risk of the banking system into the contributions from individual institutions and they show one might set capital requirements to reflect those. An important feature of the paper is that it does not take overall risk as given, instead it shows how reallocating bank capital changes the overall risk of the banking system – in particular under contagion. Importantly, a natural by-product of this exercise is that systemic capital requirements are not easily related to bank size. As an aside, it should be noted that this sort of work requires that we have detailed bank level data. And, importantly, we need to have international sharing of the supervisory information that is needed to do the computations.

- *The usefulness of focusing on the tails of the distribution rather than on the conditional mean stress scenario outcome.* The tails of the distribution are a better indicator of large losses that financial institutions might incur during episodes of financial stress. Piazza and Schechtman propose to estimate a quantile regression model that focuses on conditional tails, and where the relationship between a macro variable and the credit risk indicator depends on the quantile of the distribution (ie it could be larger at the tail than at the mean). While their exercise did not show very large differences in the qualitative conclusions reached using either method, under some scenarios (eg a 3-standard deviation GDP shock) the quantile-regression model appears to identify vulnerabilities not captured by methods that focus on mean stress scenarios.

- *Network effects imply that policymakers should not focus exclusively on size. Small institutions can be "too big to fail".* This is illustrated by the stress test scenarios studied in Martinez et al. The authors show how a shock to a small bank can trigger a financial crisis: A severe shock to the stock market and foreign and domestic interest rates on bank portfolio composition could induce the failure of a small bank. On its own, this failure would have been ignored. However, in their stress scenario, the fact that everyone is weakened significantly by the first round shock means that contagion leads to the failure of medium sized banks and eventually to the collapse of almost the entire financial system. A key question here is how small is small? In this respect Stephen Cecchetti was able to give a sense based on the US. In particular, he mentioned that the FDIC reports that between 1980 and 1992, 1219 banks failed. These were pretty small banks, since there is tremendous concentration in the system. Of the roughly 7000 banks in the US nowadays, something like 6400 have assets less than $1billion, accounting for something like 11% of total banking system assets in the US.

Andrew Patton noted the problem of measuring asset values in times of stress. This is a very difficult problem. When there is no trading, what is the mark-to-market price?

Finally, it seems that the comment by Dimitrious Tscomocos indicating that the measurement of systemic risk should be derived from a model in which systemic collapse can arise endogenously seems to capture in spirit what our goal should be.

Markets and performance

The final session addressed the issue of "markets and performance" although it was really about correlations across countries and the international financial system.

In their paper **"High and low frequency correlations in global equity markets"** Robert Engle (NYU) and Gonzalo Rangel (Bank of Mexico) model the high and low frequency variation in global equity correlations using a sample of 43 developed and emerging market economies during the period 1995-2008**.** They find that the long-term (low frequency) correlation component – which can be associated with the evolution of macroeconomic variables - is driven by the low frequency volatilities of three global regional factors (North-America, Europe and Asia) and idiosyncratic (country-specific volatilities). Furthermore, high and low frequency correlations have increased during the recent financial crisis, but the effect has been unevenly distributed across countries. In particular, the average short and long-term components of global correlations doubled between 1995 and 2008, and 50% of this increase occurred between 2006 and 2008. Emerging markets have displayed greater increases in correlations with the rest of the world due to the dominance of systematic risk over the increasing idiosyncratic volatility. This result is seen as relevant in evaluating changes in the scope for diversification benefits, which have relied on emerging market investments.

In discussing the paper Roberto Rigobon from the Massachussets Institute of Technology pointed that EMEs were not that affected by the crisis. However Stephen Cecchetti added that it is important to keep in mind that they are not important in the MSCI either. Looking at the pre-crisis numbers, the total capitalisation weight of Latin America is roughly 1.5% of the total. The results suggest that the diversification that is there is going to come from the advanced countries – Australia, Canada, France, Germany, Italy, Japan, Spain, and Switzerland.

The results of the previous paper are echoed in Mark Carey, Laurie Pounder, Steven Kamin, Ugur Lel and Daniel Silver's (Federal Reserve Board) paper **"Emerging market decoupling and financial performance during the crisis"**. They examine the international

dissemination of the recent financial crisis in advanced and developing countries using stock prices and credit default swap spreads as measures of financial distress or decoupling, both in financial and non-financial firms. Using a number of macroeconomic factors to explain differences in firm performance, they find little evidence of decoupling of emerging markets from the advanced economies and little differences across nations in macroeconomic characteristics or in their financial sectors.

An important implication of these two papers is that decoupling between emerging and advance countries has not declined. But, in the end, these papers are about an investor's problem, as they show that international equity diversification works worst when you need it the most. That is to say, international diversification isn't diversification at all. They are not about coupling or decoupling of real economies.

With that in mind, I should note that my own sense is that output and growth correlations depend on the stage of the business cycle. That is, they are higher in downturns than they are in upturns. Put differently, countries have company in recession, but they recover alone.

The way forward

Stephen Cecchetti closed the conference with a series of questions raised by the work presented which might serve as a way forward:

1. Procyclicality
    a. To what extent is the financial system procyclical?
    b. Do we always care about procyclicality, or do we only care about it when it leads to serve outcomes?
    c. What happens to monetary policy if you use regulatory tools to reduce real-financial feedback?
2. Systemic Risk
    a. How can we measure systemic risk?
    b. What is the optimal level of systemic risk?
    c. Can we use regulatory tools to reduce it?
    d. What is the relationship between openness and the nature of risk?
    e. What lessons have we learned from efforts to cushion the impact of systemic events after the fact?

3. Cross-country Correlation

    a. Is there diversification when you need it?

    b. What can we do about the fact that real and financial integration makes countries susceptible to each other's shocks, increasing correlations?

4. 4. General questions

    a. Are data available to do what we need to do?

    b. How can we insure that the regulators themselves have the right incentives?

    c. How can we insure appropriate levels of international coordination and cooperation in financial reform and policy?