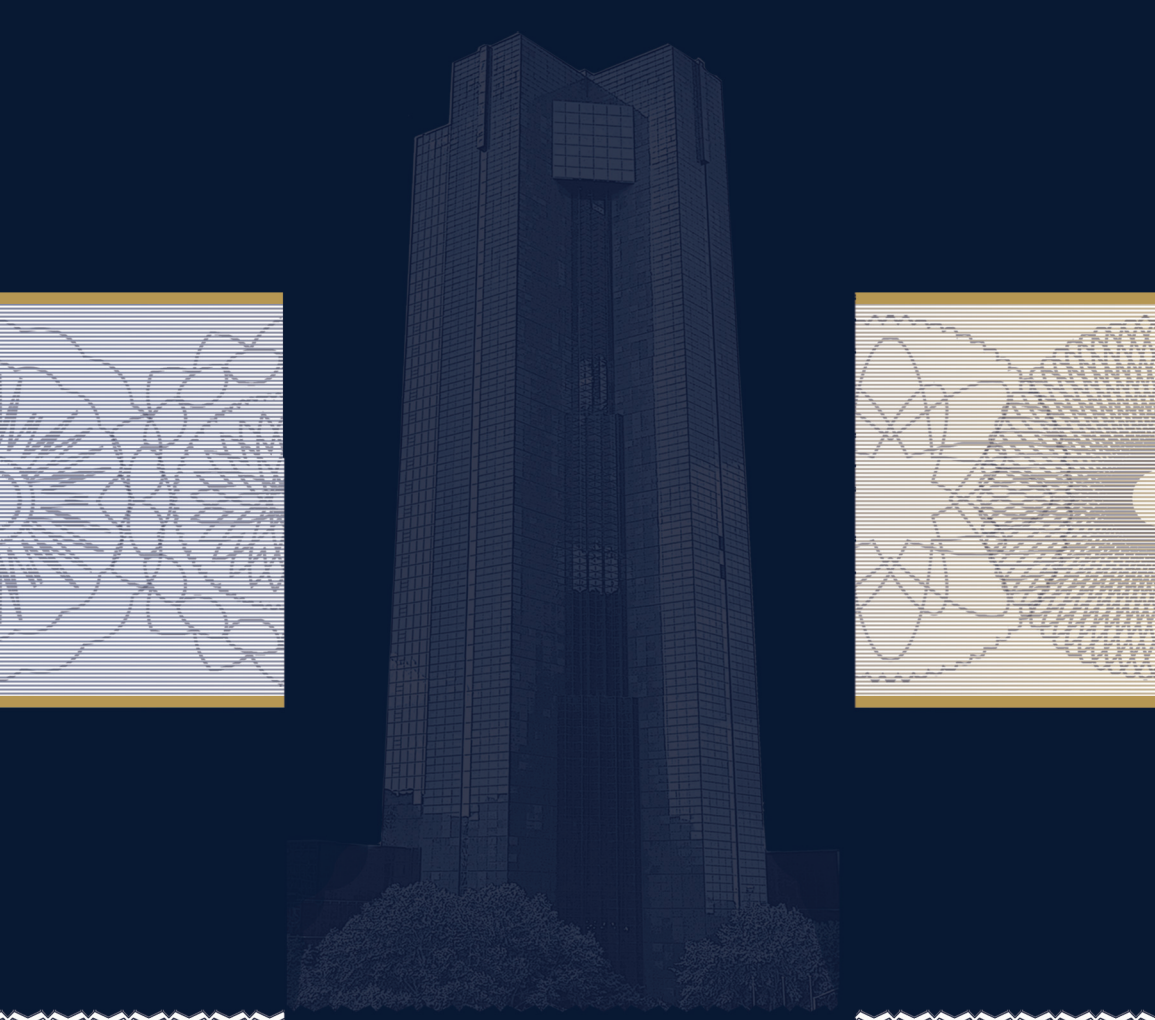

Monetary Policy and Financial Stability in the Post-crisis Era

South African Reserve Bank
Conference Series
2010

South African Reserve Bank
90th
Anniversary

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Foreword

This publication contains the proceedings of the third in a series of biennial conferences hosted by the South African Reserve Bank (the Bank). The conference was titled "Monetary Policy and Financial Stability in the Post-crisis Era" and held at the Bank's Conference Centre from 4 to 5 November 2010. The purpose of the conference series is to stimulate debate on current topical issues and to add value to these discussions. In order to ensure this, we invited a number of well-respected local and international economists from the policy arena, the private sector and academia, and we were fortunate to have had the opportunity to interact with them.

The previous conference, held in late October 2008, took place after the outbreak of the global economic crisis. At that time, the full implications of the crisis were still unclear. Two years later, the world has emerged from what is now referred to by some as the 'Great Recession', but we are still not out of the crisis and the global economic outlook remains uncertain. In bodies such as the Group of Twenty (G-20), Financial Stability Board (FSB), the Bank for International Settlements (BIS) and the International Monetary Fund (IMF), considerable attention is focused on the appropriate regulatory responses to prevent a recurrence of such a disaster. Achieving global consensus on these issues has not been easy and, while progress has been made, significant differences still remain.

The crisis also has implications for how monetary policy is viewed. In particular, the role of monetary policy and its relationship with financial stability has come under intense scrutiny. During the 2000s, economists at the BIS were at the forefront of warning against a singular focus on price stability at the expense of financial stability. There is still much debate about the interaction of monetary policy and price stability, the practical implementation of these policies, and the appropriate policy instruments.

To consider these issues, the Bank was fortunate to host several world-renowned speakers in the fields of monetary policy, financial stability and bank regulation. I am grateful to these contributors for giving their valuable time and ideas to the conference discussions, and to the discussants and panel members who stimulated lively debates.

Gill Marcus
Governor
South African Reserve Bank

The contributors

Stephen Cecchetti, *Economic Adviser and Head of the Monetary and Economic Department*
Bank for International Settlements (BIS), CH-4002 Basel, Switzerland
stephen.cecchetti@bis.org.

Stephen Cecchetti holds an undergraduate degree from the Massachusetts Institute of Technology and a doctorate from the University of California Berkeley. In addition to his positions as Economic Adviser and Head of the Monetary and Economic Department at the BIS, he is also a Research Associate of the National Bureau of Economic Research in Massachusetts and a Research Fellow of the Centre for Economic Policy Research in London.

Before joining the BIS in July 2008, he held a number of positions, including the Barbara and Richard M Rosenberg Professor of Global Finance at the Brandeis International Business School, Brandeis University in Waltham, Massachusetts; Executive Vice President and Director of Research at the Federal Reserve Bank of New York; and editor of the *Journal of Money, Credit and Banking*. In addition to a textbook entitled *Money, banking and financial markets*, he has authored numerous articles in top scientific and policy journals focusing on macroeconomics and monetary policy. He has been a regular contributor to the *Financial Times* and is a founding contributor of VoxEU.org, a policy portal.

Stan du Plessis, *Professor of Economics*
Department of Economics, Stellenbosch University, Private Bag X1, Matieland, 7602, South Africa
stan@sun.ac.za

Stan du Plessis is a macroeconomist at Stellenbosch University in South Africa where he is a Professor in the Department of Economics and an economist at the Bureau for Economic Research. He studied at Cambridge (MPhil) and Stellenbosch (PhD) universities and is the President of the Economic Society of South Africa, and formerly Treasurer and Secretary of the African Econometric Society. He was a member of the Harvard group of local and international economists who have advised government on policy reform since 2006. He teaches macroeconomics, monetary economics and advanced econometrics, mainly to graduate students. His academic publications have focused on monetary policy and the business cycle but he has also written on the economic impact of the 2010 FIFA World Cup™

tournament, fiscal policy, economic growth, the exchange rate, institutional economics, and law and economics.

Charles Goodhart, *Professor Emeritus of Banking and Finance*
London School of Economics, Financial Markets Group,
Houghton Street, London, WC2A 2AE, United Kingdom
caegoodhart@aol.com

Charles Goodhart (CBE, FBA) is a member of the Financial Markets Group at the London School of Economics (LSE), having previously been its Deputy Director from 1987 to 2005. Until his retirement in 2002, he had been the Norman Sosnow Professor of Banking and Finance at the LSE since 1985. Before then, he had worked at the Bank of England (BoE) for 17 years as a monetary adviser, becoming a Chief Adviser in 1980. In 1997 he was appointed one of the outside independent members of the BoE's new Monetary Policy Committee, a position he held until May 2000. Earlier he had taught at Cambridge and the LSE.

Besides numerous articles, he has written a couple of books on monetary history; a graduate monetary textbook; two collections of papers on monetary policy; and a number of books and articles on financial stability, on which subject he was Adviser to the Governor of the BoE from 2002 to 2004; and numerous other studies relating to financial markets, and to monetary policy and history. In his spare time he is a sheep farmer (loss-making).

Dale Gray, *Senior Risk Expert*
Monetary and Capital Markets Department, Financial Sector Policy Division,
International Monetary Fund, 700 19th Street NW, Washington DC,
20431, United States
dgray@imf.org

Dale Gray obtained a PhD from the Massachusetts Institute of Technology Interdisciplinary Programme in Economics and Finance. He graduated from Stanford University with BSc and MSc degrees in Geophysics.

He has been the President of the Macro Financial Risk Corporation, Inc; Senior Consultant at Moody's Investor's Service; Senior and Principal Economist at the World Bank; and Adviser to the Ministers of Finance, and of Mines and Energy in Indonesia, Jakarta. He also lectures at the International Monetary Fund as an academic guest lecturer.

He has published more than 30 papers and articles on, among other things, macrofinancial links to banking system risk; a risk-based debt sustainability framework; modelling financial crises and sovereign risk; and systemic risk,

macrofinance and new frameworks for analysing spillovers from sovereign and fiscal risk. He has published a co-authored book on macrofinancial risk analysis, which integrates macroeconomics with finance and risk analysis.

Razia Khan, *Head of Macro-Economics and Regional Head of Research, Africa*
Standard Chartered Bank, 1 Basinghall Avenue, London, EC2V 5DD, United Kingdom
Razia.Khan@sc.com

Razia Khan graduated from the London School of Economics with a BSc (Honours) degree in Economics and an MSc (Economics) in Development, including Monetary Economics and International Trade Law. She started her career with Standard Chartered Bank in 1997 and currently works both in the bank's African Regional Office, advising the Executive Committee on matters relating to Africa, and in the Wholesale Bank, where she provides in-depth analysis on African economies to the bank's clients.

At the bank she has been acknowledged as the leading analyst on African economies. She advises key multinational corporations and funds with African interests in Europe, the United States (US), Asia and the Middle East; she shares her insights on African economies with policy-makers; and is frequently called on to provide analysis of African markets on BBC, CNN, Bloomberg, CNBC, and the BBC World Service. She also provides regular African updates to institutions such as the US Treasury, the African Development Bank, and a range of African central banks and multilateral institutions with an interest in Africa.

Desmond Lachman, *Resident Fellow*
American Enterprise Institute for Public Policy Research, 1150 17th Street NW, Washington DC, 20036, United States
dlachman@aei.org

Desmond Lachman is a Resident Fellow at the American Enterprise Institute (AEI), a Washington-based think-tank, and he also teaches economics at Georgetown University, Washington DC. At the AEI, he has written extensively on global currency issues, the eurozone sovereign debt crisis, the United States (US) housing market and on the multilateral lending agencies.

Before joining the AEI, he was a Managing Director and Chief Emerging-market Strategist at Salomon Smith Barney in New York, where he closely monitored the 1998 Asian crisis and the 2001 collapse of the Argentine Currency Board. He previously served as Deputy Director in the International Monetary Fund's (IMF) European Department, and in its Policy Development

and Review Department. At the IMF, he was actively involved in analysing Sweden's 1992 exchange rate crisis and in staff formulation of IMF policies.

Elna Moolman, *Economist*
Renaissance BJM, 24 Fricker Road, Illovo, 2193, South Africa
emoolman@rencap.com

Elna Moolman graduated with BCom (Actuarial Science) and PhD (Econometrics) degrees from the University of Pretoria, as well as an MA (Economics) degree from New York University. She received a Fulbright Scholarship, and awards from the Mellon Foundation and National Research Foundation, and was the Reuters Economist of the Year in 2006 and rated best South African economist in the *Financial Mail* analyst ratings in 2009 and 2010. She has been extensively involved in the Regional Network for Development Policy Analysis Program of the United Nations in which economists from the central banks of 15 African countries were trained in economic modelling at the University of Pretoria.

She has published several scholarly articles in *Economic Modelling, Emerging Markets Review, South African Journal of Economics, South African Journal of Economic and Management Sciences,* and the *Journal of Studies in Economics and Econometrics*.

Ipumbu Shiimi, *Governor of the Bank of Namibia*
P O Box 2882, Windhoek, Namibia

Ipumbu Shiimi graduated with an MSc (Financial Economics) and a Postgraduate Diploma in Economic Principles from the University of London, and a BCom (Honours) in Economics from the University of the Western Cape, South Africa. He also holds a Diploma in Foreign Trade and Management from the Maastricht School of Management, the Netherlands, and several other specialised qualifications.

He is an economist by profession, whose wealth of knowledge and experience in central banking spans from an impressive record of technical and managerial engagements in the Bank of Namibia since 1995, including Chief Economist and Head of the Research Department, and Senior Manager in the Banking Supervision Department. Before his appointment as the Governor of the Bank of Namibia in March 2010, he served as the Assistant Governor and Head of Financial Stability at the Bank. He has served in various capacities on the following Boards and Committees: Member of the Namibia Financial Services Authority Board; Deputy Chairperson of AgriBank Board; Member of Namibia's Vision 2030 Core Team; and Member of the International Monetary Fund Balance of Payments and the Technical Experts Group.

Peter Sinclair, *Professor of Economics*
Department of Economics, University of Birmingham,
J G Smith Building, Birmingham, B15 2TT, United Kingdom
p.j.n.sinclair@bham.ac.uk

Peter Sinclair qualified with a BA, MA, PPE and DPhil from Oxford University. He taught at Oxford for 24 years, mainly in economic theory, monetary policy and international economics, and as fellow and tutor in economics at Brasenose College. He was the Director at the Bank of England's Centre for Central Banking Studies and the Chairperson of the Royal Economic Society Easter School. He has served as consultant to the Financial Services Authority and the United States (US) Department of Labor. A former visiting professor at the University of British Columbia and Queen's University in Canada, he has also lectured in Europe, Asia and the US. He has also been the Chairperson of the International Economics Study Group.

His research interests include international, monetary, and public economics, and the theory of economic policy. He is the author of numerous articles and books on economics.

Yvette Singh, *Deputy Registrar of Banks: Analysis*
Bank Supervision Department, South African Reserve Bank,
P O Box 427, Pretoria, 0002, South Africa
Yvettte.Singh@resbank.co.za

Yvette Singh holds BCom (Honours) and Master of Business Leadership (MBL) degrees, and a Diploma in Financial Markets from the University of South Africa (Unisa), and various certificates from the Institute of Bankers of South Africa. She also completed the senior executive course offered jointly by the University of the Witwatersrand and Harvard University, Boston, United States.

She has been with the Bank Supervision Department of the South African Reserve Bank (the Bank) for the past 15 years. Before joining the Bank in 1995, she worked at First National Bank for 20 years, the last 10 years of which were spent in corporate lending. She has been a consultant to the International Monetary Fund (IMF) during a Financial Sector Assessment Program (FSAP) to review compliance with the Basel Core Principles for Effective Banking Supervision. She also assisted the IMF in reviewing the FSAP methodology, in order to increase the effectiveness of future FSAP assessments.

When her banking industry expertise is required, she acts as an external examiner for Unisa’s MBL students.

Benjamin (Ben) Smit, *Professor of Economics and Director of the Bureau for Economic Research*
Department of Economics, Stellenbosch University, Private Bag X1, Matieland, 7602, South Africa
bws@sun.ac.za

Ben Smit studied at the University of Stellenbosch where he received a DCom (Economics) degree. He has participated in a number of South African government policy initiatives, including the Growth, Employment and Redistribution (GEAR) strategy and the international team that advised the government on the Accelerated and Shared Growth Initiative for South Africa (AsgiSA) strategy. He has been a consultant to the World Bank, the South African National Treasury and a large number of South African companies, and a visiting scholar at the South African Reserve Bank.

His research interests focus on macroeconometric modelling, international finance and macroeconomic policy. He has published articles in journals such as the *Journal of African Economics, Studies in Economics and Econometrics* and the *South African Journal of Economics*.

Nicola Viegi, *Chair in Monetary Economics*
School of Economics, University of Pretoria, Private Bag X20, Hatfield, Pretoria, 0028, South Africa
nicola.viegi@up.ac.za

Nicola Viegi graduated from the University of Strathclyde in Glasgow with a PhD in Economics and from the University of Glasgow with an MSc in Economics. He has held teaching positions at the University of Strathclyde and the universities of KwaZulu-Natal and Cape Town in South Africa. He is currently Visiting Scholar at De Nederlandsche Bank.

He has published extensively on economic policy theory, macroeconomic modelling and regional macroeconomic integration. Current research includes inflation targeting under uncertainty, monetary policy and assets prices, fiscal and monetary policy co-ordination, and macroeconomic integration in southern Africa.

Introduction

Nicola Viegi

The world is slowly recovering from the most dramatic and persistent financial crisis of the past 80 years. The severity of the crisis and its long-term consequences continue to dominate the economic and policy debate. In a first phase the attention of scholars and commentators was concentrated on the causes of the crisis seen as a perfect storm created by a combination of financial innovation, regulatory failure and lax monetary policy (Blanchard 2009). Although this debate is still very lively, the attention is rapidly moving towards the long-term consequences of the crisis and the way it will shape the world economic environment. The third biennial policy conference of the South African Reserve Bank (the Bank) focuses the attention on three specific consequences of the crisis that are bound to have a significant influence on the South African economy and its economic policy.

The first consequence of the crisis is a sustained effort to reform the national and international systems of financial regulation. In his contribution to this volume, Charles Goodhart gives a comprehensive review of the present efforts of financial regulatory reforms and provides a framework to evaluate the effectiveness of these efforts. Regulation is always imperfect and always lags behind financial innovation. Goodhart's paper reminds us that the best way to think about financial regulation is to focus on the fundamental objectives that financial regulation might and can achieve. As Goodhart affirms: "[T]he main reason for enhanced and reformed financial regulation is to counter externalities, whereby the actions of those operating in the financial system have costs and benefits that impinge on others beyond themselves." The most evident externality is the amplifying effect on the leverage and credit cycle that the operations – and collapse – of financial institutions have. The paper proposes a method to evaluate financial regulatory reforms on the basis of their ability to diminish the extent and volatility of credit and leverage cycles.

The failure of regulation has also been a failure to assess correctly systematic risk exposure of financial institutions during the upward economic trend, and to incorporate risk exposure into fiscal and monetary policy models. Dale Gray's contribution gives an account of recent research on developing models

that are able to assess the influence of systemic risk on the macroeconomic equilibrium. This research programme is aimed at integrating, in a single framework, financial, monetary and fiscal policy so that the feedback mechanism between macroeconomic policies and financial stability can be better understood and controlled.

The South African experience shows the advantages of a regulatory system that stresses prudence and anti-cyclical intervention. Yvette Singh reviews the South African regulatory regime and assesses its contribution in avoiding the propagation of the crisis to the national financial institutions. Her paper shows not only the usefulness of capital requirement higher than the international norm, but also the importance of intense supervision by the regulatory institutions during the expansion years to avoid the accumulation of excessive risk in the financial system.

Although much effort is concentrated on crisis prevention, a big challenge ahead is to design a robust system of crisis resolution. As argued by Goodhart, "any system, such as fractional reserve banking, which combines debt and leverage with maturity mismatch, is quite largely dependent on confidence for survival". Confidence itself is subjected to cyclical swings from optimism to collapse, instigating financial crisis. If crisis cannot be ruled out, regulation should provide bankruptcy laws that minimise the negative externality of financial institutions' liquidation. This effort is complicated by the nature of financial institutions, their centrality in the economic system and their international linkages, which requires a system of "special laws" distinct from the current regime of general bankruptcy laws and strong international co-ordination.

The second long-lasting consequence of the crisis is the dramatic fiscal crisis in the periphery of the eurozone, which is certainly the main source of uncertainty in the world economy today. This crisis is of particular interest for South Africa, given its economic ties with the European region. Desmond Lachman makes an alarming assessment of the European situation, which is viewed as a demonstration of the weakness of the entire European project. The financial origin of the crisis, with burst credit bubbles suddenly opening an unpredictable hole in governments' budgets, serves to highlight the inability of the euro institutions to deal with persistent asymmetries among euro members in their economic structure and cyclical behaviour. If there was any need to demonstrate that Europe is not an optimal currency area (Mundell 1961), this financial crisis has certainly put an end to that discussion. As Lachman succinctly explains: "The essence of the eurozone periphery's

present economic predicament is that the countries in that periphery have all run up very large internal and external imbalances that will be extraordinarily difficult to correct without the benefit of having separate domestic currencies. Stuck within the eurozone, these countries cannot resort to currency devaluation to restore the very sizeable losses that they have registered in international competitiveness. Nor can they devalue their currencies to boost exports as a cushion to offset the highly negative impact on their economies from the major fiscal retrenchment that the International Monetary Fund (IMF) and the European Union (EU) are requiring as a condition for their financial support." Given these considerations, the prognosis for the euro area is either many years of painful deflationary and recessionary conditions for the affected countries (which might soon include larger members of the union), or sovereign default and debt restructuring with possible heavy consequences on the European banking system or, finally, a dissolution of the euro in its present form.

The crisis in Europe is particularly important for the African continent for two reasons: the first is that it can potentially affect the prospects of economic recovery and development on the continent, which is experiencing one of the most hopeful periods in its post-colonial economic history. In her paper, Razia Kahn gives an assessment of this risk for the African economy. Africa has experienced a relatively mild financial crisis and most of the countries have taken advantage of past economic adjustment that has given these countries enough fiscal room to exercise expansionary fiscal policy (IMF 2010). It has also seen growth coming largely from expansion of internal private consumption and demand for primary commodity coming from expanding Asian economies. But, as Lachman assesses, a worsening of the European crisis will weaken one of the most important economic partners for the continent and affect the risk appetite of international investors, possibly drying up capital inflow for low-income countries.

The second reason is that the process of European integration is the prototype of similar processes of economic integration currently promoted in Africa. In his contribution to this volume, Governor Ipumbu Shiimi gives an assessment of the crisis in Europe from the point of view of the lessons that it contains for the process of economic integration in the southern African economic community. The main lesson is that in the process of economic integration countries should take seriously the conditions that define an optimal currency area, as defined in the work of Mundell and others. Not doing so or assuming that they are of secondary importance relative to the political dream of economic unification has been the most serious error made by the

euro designers. Thus closer fiscal policy co-ordination, the respect for strict fiscal rules and the integration of labour markets should be central in the economic integration process. The European experience also shows the importance of addressing any uncompetitive characteristics of the economy. In this respect, as highlighted in the contribution of Elna Moolman, South African is not making sufficient progresses in solving the real causes of its underperformance, and the national debate is still too concentrated on the role of monetary policy and the exchange rate, and not enough on the overall cost structure of the South African economy.

The last effect of the crisis that this volume highlights is the redefinition of goals and instruments of monetary policy. The crisis has shattered the pre-crisis consensus that monetary policy should not target financial assets directly. The logic of this consensus was a simple "instrument-target" principle: given that the central bank effectively has a single instrument, namely the interest rate, it is more efficient and credible to target a limited number of goals, namely macro stability. Tightening monetary policy beyond what is required to achieve desired macroeconomic outcomes in order to control high and rising asset values would seem to involve trading off among goals with the consequence of monetary policy losing credibility. Obviously, this consensus underestimated the large negative externality that asset-price bubbles and busts would have on the real economy. Nevertheless, the target instrument problem remains and the search for a second instrument for monetary financial policy is under way. In his paper in this volume, Stephen Cecchetti provides an insightful analysis of the monetary policy nature of capital-adequacy requirements as a possible "second instrument" for central banking. The paper starts from the observation that capital requirements and central bank interest rates affect the cost of capital in a similar way. This equivalence result indicates the possibility that prudential instruments might contribute directly to reaching the macroeconomic equilibrium, thus reinforcing the capacity of the central bank to achieve macroeconomic goals.

As observed by Stan du Plessis, Cecchetti's analysis reminds us of the seminal work done by Poole (1970) on the optimal assignment of the instrument to target in a stochastic environment. As in Poole's analysis, the choice of the perfect combination of instruments is a function of the nature of the shocks. Moreover, and more importantly, from the point of view of central banks, co-operative solutions are always more efficient than other possible decision algorithms, thus pointing to the need to concentrate in one authority the complete set of monetary and macroprudential instruments.

The papers in this volume illustrate the complexity of the post-crisis situation, and the uncertainty and challenges policy-makers are facing in the aftermath of the financial crisis. They also give the reader a useful framework to analyse, understand and evaluate the future directions of the world economy, and its policy and regulatory environment.

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The emerging new architecture of financial regulation

Charles Goodhart

1. Introduction

A. What has been accomplished?

Now is a good time to take stock of progress in the reform of financial regulation. Much has been happening. The monumental Dodd–Frank Act was passed by the United States (US) Congress in July 2010. The deliberations and conclusions of the Basel Committee on Banking Supervision (Basel Committee) and the Financial Stability Board (FSB) are being put to the Group of Twenty (G-20) Heads of State in Seoul in November 2010. In the United Kingdom (UK) the Vickers Committee has been asked to report on the structure of the banking sector by summer 2011.

Some have argued from time to time that the momentum of financial regulatory reform was being lost; it is now two full years since the catastrophe of autumn 2008 and little seems to have been finally agreed. In fact, the reverse is nearer the truth. In view of the power and predominance of the US, it makes little sense for the rest of the world to try to press ahead with plans for the achievement of international regulatory agreements until the Americans have come to some outline decisions. In Congress the reform of financial regulation was given second priority, after the reform of the country's health-care programme, and this has resulted in the Dodd–Frank Act. Following that, financial regulators around the globe now can, and will, press forward to agree and then to implement revised and reformed plans for financial regulation.

The danger, as I shall try to document below, is not that enthusiasm and efforts for undertaking such reforms are dissipating and running into the sand, but rather that in several respects the proposed reforms are incomplete and/or partially misdirected.

B. Why official intervention in finance?

Financial regulation is normally purely reactive, introduced in order to prevent the factors deemed to have caused the previous crisis from happening again. Against the dramatic background of the recent crisis that is, naturally enough, recurring, the general populist consensus is that the crisis was caused by the bad behaviour of (Anglo-Saxon) bankers, and the proposed remedies are, all too often, to make them behave better, or suffer, or be constrained from such bad behaviour. But regulation should not be to make people behave better. It is normally achieved, in most business relationships, by some combination of competition, repetition in bilateral dealing and reputation, rather than by direct regulation or conduct of business rules.

Instead, standard microeconomic theory provides three main justifications for official intervention in otherwise free markets. Taking these in reverse order of importance as relates to the financial system, they are (i) the control of monopoly power; (ii) customer protection, also known as 'asymmetric information'; and (iii) externalities.

(i) The control of monopoly power

This has relatively little salience in financial systems, for example, as contrasted with utilities. There are strong network externalities in certain payment systems and in the establishment of some clearing and marketing systems. However, the involvement of the public sector in each country, especially the central bank, has usually prevented the exploitation of monopoly powers in the management of such network systems. Indeed, national pride has often led to an excessive plethora of national markets where a single, or at least smaller number of, international market(s) would have been more economic.

In several medium-sized, or smaller, countries most retail banking is done predominantly by a handful of large domestic banking chains. There are recurrent worries that such banks may operate as a restrictive cartel. However, the availability of electronic, online banking makes potential entry much cheaper than it used to be for undertaking many retail functions, and large corporates have access to many alternative sources of funds. So, this concern is pretty much limited to a worry that small and medium enterprises (SMEs), where proprietary information is still necessary, may be getting a raw deal from facing an oligopoly. This concern is perennial and not specifically related to the onset of the crisis, but it has been enhanced by the resultant tightening of credit conditions.

(ii) Customer protection, also known as 'asymmetric information'

This remains an important and popular aspect of financial regulation. Both the US and the UK have moved towards having a stand-alone agency with sole responsibility for such consumer protection, separate from bodies with wider responsibility for micro- and macroprudential oversight. There is no doubt that most investors or depositors have much less information about, and understanding of, financial conditions and of risks than their advisers and those proposing products and investments. The potential for leading the unwary and gullible astray remains considerable, let alone for purely fraudulent enterprises (Madoff).

Nevertheless, there is not much evidence that consumer protection (asymmetric information) issues had much relevance to the financial crisis, except that fraud and other forms of bad behaviour, vis-à-vis investors, tend to flourish more in the asset-price boom that, once again, preceded the bust. It is true that many borrowers in the sub-prime mortgage market were encouraged to take out mortgages that only made sense on the assumption that housing prices continued to rise. Unfortunately, the delusion that this would happen was just as prevalent among lenders and even regulators; so the delusion was general, rather than foisted onto borrowers by unscrupulous and knowing miscreants.

Indeed, apart from suffering from the economic downturn and credit squeeze like everyone else, the poor, ignorant and ill-informed have been at no greater disadvantage than usual. Madoff's victims were rarely indigent. Deposit insurance generally worked, and where it did not, because of delays in paying out, co-insurance and maximum limits, or from insufficient government funding (Iceland) the (other) governments generally moved swiftly to insure that no retail depositors lost any of their monies. In the recent crisis, in almost all cases, the retail depositor was fully protected. While this will have increased moral hazard severely, since 100 per cent deposit protection means that many will now place funds in the highest-yielding offer, irrespective of risk or reputation, it hardly means that the widows and orphans need yet more deposit protection.

(iii) Externalities

The main reason for enhanced and reformed financial regulation is to counter externalities, whereby the actions of those operating in the financial system have costs and benefits that impinge on others beyond themselves. So long

as all such assets or benefits were internalised within the financial system itself, there would be little cause for external regulation or intervention in the operations of financial institutions, or of markets.

What are the main externalities that justify such regulation? Hanson, Kashyap and Stein in their paper on "A macroprudential approach to financial regulation" (2010 forthcoming, 4) suggest that the main problem is the "credit crunch and fire sale effects". I would broaden this to the claim that the operations of financial intermediaries have amplifying effects on leverage and credit cycles. A particularly noxious amplification often results from the bankruptcy and default of an interconnected (and large) financial institution or market, for the reasons that I have set out in more detail elsewhere (Goodhart 2010b). Such amplification kicked in with a vengeance after the failure of Lehman Brothers in September 2008. The superimposition of contagious insolvencies in the context of a sharp downturn of the credit and leverage cycle can lead to a debt–deflation quasi-equilibrium of the kind described by Irving Fisher (1933).

In practice most organised markets with central clearing parties (CCPs) continued to operate well and smoothly throughout the crisis, and various loss-sharing rules and protective mechanisms already in place, such as margin and collateral requirements and position limits, seem to have worked as planned. The markets that failed to work well were certain bilateral, over-the-counter (OTC) markets, such as the credit-default-swap (CDS) market, where AIG built up, largely unbeknown to most, an excessive concentration of tail risk, and the interbank market, which became dysfunctional once a generalised fear of counter-party credit risk had spread. Proposals to introduce reforms into such OTC markets are discussed later on in this paper.

Instead, the main systemic externalities have arisen from the cumulative effects of levered financial institutions simultaneously expanding in the up (boom) phase of the financial cycle and cutting their positions (deleveraging) in the down (bust) phase. What was worse was that the regulatory system previously in place actually exacerbated the leverage/credit cycle. A key problem is that a risk-related (capital) ratio control mechanism is self-evidently sensible (so long as risk can be measured with any accuracy at all) on a cross-section basis, that is, when comparing one bank with another at a given moment. Alas, this makes little sense in the time domain. This is because all risks appear to decline during the up phase of the cycle, as profitability and ratings and repayment rates rise, and worsen during the subsequent down

phase. So, for a given portfolio, capital-adequacy requirements (CARs) relax in the boom and tighten in the bust, thereby reinforcing the leverage cycle; add to this the generalised shift to mark-to-market accounting, whereby asset-price changes (for assets held in the trading book) flow directly into profits (P and L) and capital. So, regulation itself was one of the driving forces behind the recent cycle. This is not to suggest that either risk-related CARs or mark-to-market accounting is wrong in itself and/or should be abandoned, but rather that the procyclical effects need to be appreciated and counteracted by other designedly countercyclical measures.

There is another (lesser) respect whereby regulation may have, unwittingly, led to more, rather than less, systemic risk. This is that a professed purpose of regulation was to bring all banks up to the standards of the best, in terms of risk management and so forth. But a side-effect of that is to make banks tend to behave in the same way and have similar portfolios. For obvious reasons, as pointed out by Persaud (2000) and Wagner (2006, 2008, 2010), the more self-similar and less diverse banks and other financial intermediaries are, the more susceptible the system is to collapse in the face of a common shock.

So, in my view, a touchstone for assessing whether the planned reforms to financial regulation are desirable is whether they will diminish the extent and volatility of credit and leverage cycles.

C. The coverage of financial regulation

Most of the proposed reforms have been directed just at banks and bankers. In the light of the above argument, that is mistaken. Any levered financial intermediary can play a role in amplifying the credit and leverage cycle. Moreover, it is not just intermediaries. Final borrowers, such as households, corporates and governments, can become over-indebted at one stage in the cycle, and then put others at risk by cutting back too hard and too fast in the downswing. When borrowers realise that they have got themselves into an over-extended, dangerous state, there is not much that regulation by itself (e.g., as contrasted with other policy measures) can, or should, do to stop them deleveraging. This indicates that financial regulation should focus on trying to deter the build-up of excessive borrowing in the boom phase; easier said than done.

What this implies is that the focus of regulation should have been on the manifold sources of the leverage cycle, rather than so narrowly on banks, a line of argument also emphasised in the book by Acharya et al. (2010a)

Regulating Wall Street. At least the emphasis on banks has been widened to include other systemically important financial intermediaries (SIFIs). Unfortunately, this shift of focus just goes to reveal how little is really known about the assessment and measurement of "systemic importance". While a number of techniques are being developed to try to measure this concept, such as CoVaR, a measure for systemic risk: CoVaR, the value at risk (VaR) of the financial system conditional on institutions being in distress by Adrian and Brunnermeier (2008); systemic expected shortfall by Acharya and colleagues (2010a and b), and the consistent information multi-variate density optimisation (CIMDO) by Segoviano (2006, 2009, 2010); for the time being the main dividing line between a SIFI and a non-SIFI looks likely to be by size alone.

This is unfortunate. Much more academic work needs to be undertaken to increase an understanding of and capacity to measure systemic risk. In advance of such work, the focus of regulation may be too centred on banks alone and leave levered, but unregulated, financial intermediaries, including money-market mutual funds and shadow banks of varying shades of obscurity, with too much leeway (see Gorton and Metrick 2010), while at the same time even preventing the central bank from counteracting panic collapses in such near-banks out of a mistaken wish not to extend the safety net. To some extent, this is the position taken in the Dodd–Frank Act and, based on these arguments, that is wrong.

D. Taxonomy and plan of paper

Be that as it may, the outline of the rest of the paper is as follows: the main thrust of the work done to improve financial regulation comes under the general heading of enhanced "Crisis prevention mechanisms" (Section 2). This, in turn, can be decomposed into numerous subheadings. The subheadings that I employ here are as follows:

A. Revised and enhanced ratio controls (with numerous sub-sub-headings, such as sanctions and transitional arrangements)
B. Pigouvian taxes
C. Direct constraints on allowable financial practices
D. Remuneration and its reform
E. Reforms of market structures
F. Other regulatory reforms, such as margins on non-banks and reforms to credit-rating agencies (CRAs).

The second main field for such work comes under the heading of "Crisis resolution" (Section 3). This too can be divided into several sub-headings, as follows:

A. Some current problems in resolving financial crises
B. Shift resolution costs from taxpayers to banks and their creditors?
C. Special resolution regimes and "living wills"
D. Cross-border resolution mechanisms.

Finally, I turn to administrative arrangements for implementing such regulatory reforms (Section 4).

2. Crisis prevention mechanisms

A. Revised and enhanced ratio controls

(i) Some history

From the nineteenth century until the 1970s and 1980s, the key regulatory ratios were those imposed on various definitions of cash, or more widely on liquidity. Banks defaulted because they ran out of cash. Large banks could replenish their cash holdings rapidly and easily with little loss by holding certain types of liquid assets, which could be readily sold in broad markets and/or pledged as collateral with the central bank. Small (country) banks could replenish cash by holding balances with larger city banks. Moreover, the cash base of the banks could, up to a point, be controlled (it was thought) by the central bank, so a cash (liquidity) ratio control was supposed not only to act as prudential control against default, but also to constrain the total size/leverage of banks.

Meanwhile, capital was needed, not so much to prevent default, but as protection for the deposit holder, a senior creditor, *after* the event of bankruptcy, a form of support made stronger when unlimited or double liability for shareholders remained in force. In the years up until the Great Depression in the 1930s capital ratios were high, compared with current practice. From the 1930s until the 1970s in most countries banking practices were restricted and forcibly cartelised, often with direct constraints on lending amounts and on the interest rates that banks could offer, so that banks made a steady low rate of profit, with limited credit and leverage cycles, and few bankruptcies. Capital and CARs were not seen as a pressing issue then.

All this changed in the 1970s. The main catalyst was the growth of global wholesale money markets, notably the euro–dollar market. Now banks, when faced with a cash drain, could just borrow what they wanted in such wholesale markets, so long as they were perceived as sufficiently creditworthy to repay. Moreover, central banks could not stop their commercial banks expanding their books, that is, adding leverage, by such wholesale borrowing so long as these central banks wanted to hold interest rates and/or exchange rates, if only for the time being, at some fixed level.

The whole idea of cash, or liquidity, ratios serving as a protection against default, or as a constraint on overall credit and leverage expansion, thus began to fall out of fashion, with the partial exception of academic economists, among whom money multiplier analysis of the determination of the size of the money supply continued anachronistically to be taught to university students up until the 2000s! Meanwhile, the development of wholesale liquidity markets divorced the prior link between the growth of bank lending and of retail deposits. As documented by Schularick and Taylor (2009) from about that date (early 1970s) bank lending (credit) grew at a much faster rate than ordinary retail deposits, fuelled largely by wholesale funding (funding liquidity) whereas bank holdings of owned liquid assets (market liquidity) fell, often precipitously. In the 1980s the Basel Committee attempted to fashion an Accord on Liquidity, along the lines of the 1988 *Basel Capital Accord*, but that failed, partly because it was held to be much less essential than a CAR.

In this brave new world, where a banker could almost always expect to fund his cash requirements from wholesale funding, what *did* protect banks from default *and* limit total leverage and credit expansion? The answer was bank capital. A bank could not borrow on wholesale markets, certainly not unsecured, if there was any doubt about its solvency. So, (funding) liquidity, which soon became central for overall liquidity, was a function of perceived solvency and solvency was a function of having adequate capital. The capital ratio held by banks thus became both the effective protection against default, and the constraint on leverage and credit expansion.

The problem was that the bankers themselves preferred a lower, to a higher, capital ratio, because it enabled them to post a higher return on their equity (RoE), especially when borrowing cheaper, short-term wholesale funds. Economists argued that the structure of bank liabilities should not affect the value of the bank, under certain quite stringent assumptions; and that shareholders should be content with a lower RoE, when the CAR rose, since risk and volatility should decline, while fixed income creditors should

also be willing to accept a lower rate of interest for the same reason (less risk); the Modigliani–Miller theorem. There were, however, several flaws to this theorem in the case of banking. First, in so far as creditors thought that they were already explicitly or implicitly insured by a government guarantee (100 per cent deposit insurance or too big (or interconnected) to fail) the cost to the bank of raising debt finance would not decline commensurately when the capital ratio rose. Second, wholesale funding markets frequently do not work by calibrating lending *rates* to assessed risk. Instead, a bank can borrow from a counterparty at the going (risk-free) rate up to some limit, which may be zero. A change in perceived risk will thus change the quantum that a bank can borrow in such markets, sometimes suddenly and drastically, *not* the rate payable. Third, it is remarkably difficult for an outsider to distinguish between a high RoE based on superior skill and market positioning from one based on a higher-risk profile. Those involved will emphasise the former, even when the latter is the case, or in the jargon phrase: "beta dressed up as alpha".

(ii) Basel I

For all these reasons bankers preferred to lower their capital ratios, in order to raise RoE. This put them at greater risk of default. Capital ratios declined quite sharply from the 1960s through into the 1980s. The resulting fragility of the banking system became exposed in the 1982 banking crisis in Mexico, Argentina and Brazil (MAB) when, on a mark-to-market accounting basis, some, possibly most, of the New York city centre banks with large loan exposures to the MAB countries (plus some other developing countries, such as Poland) would have been insolvent.

This experience led directly on to the 1988 Basel Capital Accord, on which I have written extensively elsewhere (Goodhart 2011 forthcoming, Chapter 6). This accord did succeed in its main aim, which was to check the downward trend in capital ratios. But it had several flaws.

The first of these was that, although Basel I was risk-weighted, the risk buckets adopted, especially in the case of bank loans to the private sector, were broad, indeed in the case of private-sector loans, simplistic. Since this meant that the regulatory capital requirement on good loans were higher, relative to the "economic capital" that banks would have wanted to keep on their own on them, banks were given a greater incentive to sell off such good loans (securitisation) to non-bank intermediaries, including to their own off-balance-sheet shadow banks, while keeping the worser-quality loans on their own books. Thus Basel I was threatening to turn "good" banks into "bad" banks.

(iii) Basel II

It was this anomaly that Basel II aimed to overcome, by aligning regulatory capital more closely with banks' own internal risk-based assessments. Basel II also took steps to impose a better regulatory control on banks' off-balance-sheet operations, though it failed to impose any equivalent controls on other non-bank leveraged intermediaries. But it failed to counter the greater procyclicality that a more sensitive risk weighting brought in its train and, of course, its attempts, as well as others such as the credit-rating agencies, to measure risk accurately were deficient, for example, giving too much weight to VaR measures, and insufficient attention to tail risk. Note that it is dubious whether it will *ever* be possible to assess risk with great accuracy, so that finance industry insiders will generally be able to dance around the regulatory framework.

Other problems also remained. The first was the definition of 'capital', which had generated so much painful discussion in the run-up to Basel I that no one had the courage to reopen it in Basel II. The problem here was that pure core equity could be supplemented by a variety of additional quasi-equity elements for meeting the Tier 1 requirement; elements such as minority interests and deferred tax credits, which could not be deployed as a buffer against insolvency. Hence Tier 1 core equity (TCE) could be as low as 2 or 3 per cent of total assets. So, a relatively small change in asset values could drive such a bank into insolvency; put another way, it would take massive delevering (asset sales) to restore the CAR after an asset-price shock. The required core equity base was just too low.

The next flaw was that, for reasons outlined in my book on the Basel Committee, the regulatory authorities there felt unable to consider sanctions for going below satisfactory levels of capital (or liquidity). Hence, the agreed ratios became, in effect, regulatory minima below which the banks could not fall without potentially life-threatening reputational damage. So Tiers 1 and 2 required capital could not be used as a buffer. The buffer was the margin in excess of requirements. However, banks still wanted to hold down any excess equity holdings, in pursuit of higher RoEs. So, the equity, or wider capital, buffer above the requirement was generally tenuous, and, of course, all such measures of capital and assets were accounting numbers which could be, to a degree (and were), manipulated.

For all such reasons neither Basel I nor Basel II provided a safety net that was sufficient to protect the banking system from severe asset-price shocks

and the bankers, if not the regulators, knew that well enough. When such an asset-price shock then did occur (US housing prices) banks knew that some of their counterparties could be at risk, *and* that they themselves might find it hard to refinance future roll-overs. The first major symptom of the crisis starting in August 2007 was a liquidity crisis, with wholesale markets becoming dysfunctional.

In the old days, when banks held liquid asset ratios of some 20 or 30 per cent of total assets, they could have met that liquidity squeeze by selling some of those assets. But these conditions were mostly long gone. There was no real alternative to a direct approach to the central bank for emergency lending assistance (ELA) *and* on the back of pledging collateral, such as mortgage-backed securities (MBSs) that once upon a time most central banks would have rejected. The problem of how to respond was made much worse by two factors. First, going to a central bank for ELA is a patent sign of weakness and carries a stigma. Banks would therefore not do so until it was too late. Second, both as a result of looming solvency fears and because it was generally cheaper, banks that were perceived as weaker were usually forced to borrow at shorter and shorter maturity, often mostly overnight. The moment they got shut out of wholesale markets, a fatal crisis was almost immediate. There was no time for orderly reflection or restructuring. Against this background in 2007/8 central banks put in place a increasing selection of somewhat ad hoc countermeasures to replace funding liquidity, which had dried up, with central bank liquidity, thereby expanding their balance sheets several times over. However, it was not a comfortable experience.

(iv) What needs to be done?

What have been the weaknesses that a current reform of capital and liquidity ratios should now curtail. On capital my own list would contain, not necessarily in order of importance, the following:

(C1) Raise basic requirement for TCE.
(C2) Have a much, much higher level that is regarded as fully satisfactory and impose increasing sanctions as actual equity falls below required equity.
(C3) Reduce procyclicality by having state- and time-varying CARs.
(C4) Realise that *any* assessment of risk will be inaccurate and hence support a risk-weighted asset (RWA) CAR with a pure leverage ratio, belt and braces.

(C5) Maintain a level playing field by imposing an appropriate, but not necessarily similar, CAR on all credit-expanding leveraged financial intermediaries.

On liquidity my list would involve

(L1) sufficient owned liquid assets to give time for a severe liquidity squeeze to be resolved in an orderly fashion; and

(L2) increasing penalties or sanctions placed on intermediaries as their proportion of short-term wholesale funding rises.

(v) The score card on capital ratios

Against this background, how do the current Basel II and Dodd–Frank Act requirements match up?

Let us take capital first:

On C1 the proposed Basel Committee–FSB proposals get an A-. The regulators have realised the key importance of increasing the proportion of TCE, and the minimum ratio that would be acceptable is likely to rise by a factor of about three or four times. The grade is not better than A- because there have been so few academic and/or empirical studies to try to work out what the optimal value or ratio of core equity to total, or risk-weighted, assets ought to be (see Hellwig 2010; Barrell et al. 2009 is an exception); so the choice of ratio, though much higher, is still largely a stab in the dark.

On C2 the Basel Committee proposals get a B. The regulators there have now understood the basic argument and are willing to consider the imposition of a sanction, in the form of a prohibition on dividend payments, should the CAR fall too far, that is, below 7 per cent. *However*, the prohibition of *any* payment of dividends is not only quite severe, but would also cause reputational damage. What was needed, instead, was a much more finely calibrated ladder of sanctions, with the initial sanctions being mild enough, so that banks and commentators would not have been very concerned when they were breached, for example, start with a prohibition on any *increase* in dividends and then continue with a mild cut in dividend pay-outs and so forth before reaching the stage of prohibition. Moreover, in addition to sanctions on dividends, there could have been sanctions on mergers and expansion abroad, on advertising and on (average per employee) compensation (relative to the past). Partly because there is so little certainty about the optimal quantum of capital, it makes it all the more important to place *much*

more emphasis on the design of a gradual ladder of sanctions. Against their prior tradition of refusing to touch this nettle, of designing sanctions, at all, the Basel Committee–FSB have made a start, but it is only a very tentative first step.

On C3 the Basel Committee did outline some sensible draft proposals in a working paper, but I understand that they have subsequently rejected this as "too difficult". Instead, I believe that the use of countercyclical variations in CARs will be allowed, in principle even encouraged, but left entirely to the *discretion* of each area's systemic regulator. This is a replication of the discretionary Pillar 2 of Basel II. Such Pillar 2 competences were rarely, if ever, used. The reason for this is simple. Asset-price and credit expansion booms are popular with politicians and both lenders and borrowers, and *ex ante* can only rarely be clearly seen as unsustainable (if they were so seen, market prices would go down on their own). So, a central banker or systemic regulator would have to be supremely brash and self-confident, and impervious to widespread abuse to raise CARs at such a time. Regulators have missed an opportunity to make a countercyclical mechanism quasi-automatic. They get an A- for effort, but an F (fail) for outcome; so, overall, a C- grade.

On C4 the regulators have been, rightly, chastened by their inability to spot the risks in the financial system in advance of the crisis. While there has been too much prior investment in the concept of risk weighting to abandon it altogether as a failed approach, I believe that the regulators will now supplement the RWA approach with a simpler overall leverage ratio, belt and braces. But as before with the RWA approach, the more difficult question is what the fully satisfactory level should be, and on designing a gradual ladder of sanctions as actual ratios increasingly diverge from desired ratios; overall another A-.

The worst outcome, perhaps, is C5 were I award a score of C--. There has been too little awareness that the basic problem has been one of excessive credit and leverage cycles; indeed, some would blame both the authorities' monetary and regulatory policies for actually exacerbating such cycles. *Per contra*, there has been over-much emphasis on the "bad behaviour" of bankers and a belief that "bashing bankers" is the correct response to the crisis. In so far as this view is indeed correct, the question then is how far each financial intermediary contributes to such credit and leverage cycles, combined with a capital ratio control that should prevent them from doing so unduly. Again, risk is hard to assess, though regulators need to be

concerned about risk concentrations (AIG, monoline insurers?) and crowded trades. Some form of simple leverage ratio with a size minimum and adapted to each kind of business might probably be a good starting point. However, that starting point has not even been reached, because the way of thinking about what is the real problem has been deficient.

(vi) The score card on liquidity ratios

For too long the financial crisis starting in August 2007 was seen as purely, or predominantly or primarily, a liquidity crisis. It could never have been so, or else the wholesale interbank and repo markets would not have become so dysfunctional. The authorities, both central banks, financial supervisory authorities (FSAs) and ministries of finance, ought to have done much more planning in advance on how to deal with the looming solvency crisis, rather than reacting in a great hurry off the cuff to each crisis event as it occurred. Be that as it may, the earlier symptoms of the crisis (up to the failure of Lehman Brothers, or perhaps even earlier with Bear Stearns, or even with Northern Rock, where the authorities had the brass neck to claim that the asset book was in good shape at the time of the rescue in September 2007) were primarily in the guise of liquidity difficulties. Hence the authorities came to rue their prior blind eye both to the run-down of asset liquidity and to their passive acceptance of a build-up, in too many cases, of banks' reliance on short-dated wholesale funding, especially overnight repos in the US.

Somewhat belatedly, since the wholesale horses have already stampeded away, the Basel Committee–FSB are moving to rectify such omissions.

On L1 the authorities are going to require each bank to have sufficient owned liquid assets to be able to withstand an occasion of acute stress, during which time unsecured wholesale markets will be shut to them, for four weeks (a month). Serendipitously, this will require banks to purchase more short-dated government bonds just when governments have large deficits to finance. Moreover, banks have already amassed huge reserves, beyond requirements, at central banks, thus a normalisation of balance sheets would allow central bank balance sheets to decline, matched by a commensurate shift of commercial banks out of deposits at the central bank and into government debt. There is, of course, a danger that the liquid asset requirements on banks could be used merely as a protective device for securing a captive market for financing government deficits. To prevent this, it is highly desirable that such requirements are set by independent

systemic regulators and on the basis of clear criteria that take no account of the financing needs of government. In both respects the current Basel Committee–FSB proposals seem to me to score well.

Perhaps even more than in the case of capital, imposed liquidity ratio controls, must *not* become treated as minima. A stock of assets that must be held *at all times* is by definition *not* liquid. The regulators, once again, do not seem to have grasped this fully. As with capital ratios, the need is to define a sufficiently high ratio as fully satisfactory and then design a gradual ladder of increasing sanctions as the ratio falls below the "fully satisfactory", so gradual that some, or even most, banks or intermediaries will choose to position themselves below the "fully satisfactory" level for much of time. It is important to avoid any sense of stigma in response to a bank's decision to trench upon liquid asset holdings. Because this key aspect has not been fully incorporated into the proposals, I would only give L1 a B++ rating.

On L2 there have been more problems. The Basel Committee–FSB developed the concept of the 'net stable funding ratio' (NSFR), which represented, in effect, the proportion of assets backed by equity, longer maturity debt and retail deposits. The remainder, not included on the NSFR, was relatively short-term wholesale borrowing. The idea was to require banks to move quite quickly to an acceptable NSFR. The main problem was that the banking system had become so massively dependent on short-term wholesale funding, that achieving the NSFR over any short time period (say two or three years) would either have required issues of new equity and/or long-term capital that appeared well beyond the capacity of these markets to absorb and/or a sharp reduction in bank lending to the private sector. As a result, largely of representations to this effect made by the banks, the prospective transitional period has been extended until 2018 or even 2019, and the NSFR concept itself is being reassessed.

(vii) Transitional arrangements

This latter point brings one quite neatly to the question of transitional arrangements. Although the banks have been portrayed as lobbying ferociously against tougher ratio controls, most bankers do accept the need for higher equity holding, and reinforced ratio controls on both capital and liquidity, though they are not as convinced as academic economists that the market will happily trade a lower RoE for less risk and volatility. After all the markets thought, prior to 2007, that banking risk and volatility were already low!

To a relatively large extent, the debate has been a dialogue of the deaf, with the regulators and academics claiming that in a comparison of one equilibrium state, with the banks holding a significantly larger proportion of capital, with another, with much less bank capital, there need be relatively little effect on bank spreads, or on the availability of credit to the private sector. In contrast, the banks have focused much more on the transitional period in the immediate future, where the need to move with any rapidity to a significantly higher level of equity and/or NSFR would likely place credit expansion under even greater pressure.

One might claim that both sides will largely have won the argument on which they have focused most. With the possible exception of revisions to the NFSR, the regulators have mostly stood their ground on the ultimate destination, whereas the transitional period of adjustment has been, in several cases, considerably extended; perhaps now extended too far, and thereby possibly increasing uncertainty. There has been too little discussion of the comparative merits of ending the transition in, say, 2016 as contrasted with 2018.

B. Taxes

Most of the focus in the Basel Committee–FSB work has been on reforming and refashioning ratio controls. As already noted, one of the main deficiencies in this general approach has been an inability to design a gradual ladder of sanctions, or even to recognise the need for this. But there is an entirely alternative way to approach this same subject. This involves the application of (Pigouvian) taxes to behaviour that is likely to cause adverse externalities.

Take capital ratios: they either impose *limits* on asset expansion relative to capital at some point, and/or introduce increasing *sanctions* as the CAR falls below some desired level. Both can be viewed analogously as a form of tax; the limit can be viewed as a tax above 100 per cent, and the increasing sanctions as step changes in tax rates. Doing the exercise specifically in the guise of taxes rather than of other sanctions or absolute limits has a number of advantages. First, it provides fiscal support to the authorities, *and* the taxes could, at least in principle, be roughly calibrated relative to the social cost, the externalities, that the undesired behaviour (e.g., too-little capital or liquidity) might bring upon the wider economy. Second, the use of taxation, rather than specific limits or sanctions, could make the imposition of a *gradual* ladder of deterrence to anti-social behaviour considerably easier to achieve.

Over the years, at least prior to 2010, proposals in official, regulatory circles (as contrasted with academia) to use taxation for regulatory purposes have been rare, almost conspicuous by their absence. Why? What are the arguments against? A first argument is that the imposition of a tax requires national political legislation. Not only might it become a political football, but it was, self-evidently, outside the remit of the Basel Committee. Such an international body (i.e., Basel Committee and FSB) felt it could not touch the subject, while national legislatures were individually constrained by the "level-playing-field" argument.

Second, there have always been doubts on anyone's ability to measure "systemic externalities". In the absence of such measurement, the tendency has been to impose a flat-rate tax, in relation to size. Since it is so hard to measure the probability of another financial crisis arriving, such a flat-rate tax is usually inversely related to the length of time since the previous crisis, that is, procyclically high in the immediate aftermath of a crisis and reaching its lowest point just before the next, thereby damaging the weakened survivors of a crisis and failing to deter excessive expansion before the next disaster.

Third, most non-economists think that if some form of behaviour is socially bad, such as drugs, prostitution or proprietary trading on the back of depositor funds, then it should be prohibited rather than allowed, whereas most economists believe that such strongly individually desired social "bads" should be allowed, but taxed sufficiently not only to limit its incidence, but also to fund measures to offset its social effects (subsidising groups of "rogue traders anonymous"?). Most economists differ and prefer (calibrated) taxation to prohibition, but a selection of proponents of prohibition will be introduced in the next section of this paper.

The arguments against considering the use of taxation for regulatory purposes have weakened. In particular, the proposal by US President Obama, at the beginning of 2010, to levy a tax on banks (above some minimum size on an *ex post* basis, based broadly on wholesale short-term funding) broke the flood barrier. In view of the straitened fiscal circumstances of so many countries and the patent unpopularity of bankers, the widespread adoption of bank taxation has become almost inevitable. But such taxation has not been properly designed to help constrain the social externalities of excessive leverage cycles. Most such tax proposals have been *ex post*, that is, they relate to the structure of a bank's portfolio at some past time, rather than to its current structure, and thus cannot be avoided by a bank

adjusting its portfolio towards a "better", safer structure. Indeed, such taxes are often purposefully levied to repay past outlays in supporting the banking system, rather than to try to prevent the need for *future* taxpayer support. Thus, they are imposed on the survivors, rather than those who failed and thereby stoked the disaster and at a cyclical moment when the survivors are cyclically weakened. Perhaps because bank taxes are seen as a fiscal measure, and thereby as a matter for the legislature, central banks and bank regulators have hesitated to comment on the general issue of bank taxation. They should overcome such undue reticence.

The subject of (bank) taxation has a wider aspect. Much of the fragility of the financial system arises from excessive leverage, too high a ratio of debt to equity. This occurs because bankers (financial intermediaries) see debt as cheaper than equity. A major reason for this is the tax allowance (tax wedge) on interest payments. If this allowance were scrapped (for all financial intermediaries) or tapered (so that the higher the leverage, the lower the tax allowance on debt, even with a tax penalty perhaps after some point) much of the problem of financial fragility would be lessened, might even disappear. The reduction in this tax allowance would greatly benefit the exchequer. There would certainly be international competitive cross-border implications. Even so, it is surprising that so little attention or discussion has been given to using fiscal measures for lessening financial fragility. Humankind will surely find ways to indulge in manias and financial excesses whatever the tax system, but fiscal measures can be adopted to mitigate the credit boom or bust cycle.

By contrast, proposals to ban the use of debt contracts altogether in financial intermediation, as in Islamic banking or Kotlikoff's mutual fund banking (2010) go far too far. The advantage of debt contracts, over equity-based contracts, is that the former economise on information (Dang, Gorton and Holmström 2009). For a prospective lender on a debt contract the relevant information is limited to the interest rate and the probability of default. By contrast, a potential equity investor needs a much wider set of data. In a world where asymmetric information is the norm, debt contracts have many advantages.

I have no doubt that the inability to measure systemic externalities, even approximately, is the most serious constraint on the use of taxation to deter such behaviour. But even so, the sanctions and/or prohibitions on certain behaviour that *are* imposed can be regarded as equivalent to implicit tax rates. If seen in this light, the implicit tax rates often do not seem very sensible. Thus the prohibition on banks becoming larger than a certain size, or issuing

debt, or undertaking proprietary trading and so forth, is the equivalent of a 100 per cent tax on such activities. Often such a stringent tax is to be imposed on one set of intermediaries, but not on others, perhaps those abroad. This naturally leads to border problems, whereby the penalised activity is shifted from the taxed to the untaxed segment, with results that may even exacerbate the fragility of the ultimate outcome.

This line of argument leads naturally on to the next subheading.

C. Direct constraints on allowable financial practices

(i) Size

"If a bank is too big to fail, it is too big." But why might a bank be "too big to fail"? I can think of at least three, often overlapping, reasons. The first is the size of the bank relative to the community in which it operates. If the bank had a preponderant share of the banking business in any community, then the community would be devastated by the failure of that bank and that devastation could be socially unacceptable. But what is the community concerned? If it is the world, then no bank is too big. If it is the local town, then a small unit bank might be regarded as "too big to fail". In practice those countries that fared best in the recent crisis (i.e., Australia, Canada and Sweden) had somewhat cartelised protected domestic banking markets, with a handful (i.e., four or five) of oligopolistic banks that served all communities. It is frequently forgotten that the conclusions reached by those who studied the banking collapse in the US in 1929–1933 at the time was that it had been caused by *too much* competition. Such competition drove a search for yield and acceptance of higher risk in the pursuit of return on equity. In this context the greater consolidation of the banking system, caused by the encouraged mergers of weaker into stronger banks, is not a bad thing, at least from the point of view of financial stability, so long as there remain some four or five large banks in each country.

If the decision is made to tax or constrain banks on the basis of size, one would have to answer the question of relative to what? Standard Chartered, for example, is a large bank on an overall, international basis, but a smallish bank in most of the countries in which it operates, not least a relatively small bank domestically in the UK where it has its headquarters. Are subsidiaries to be consolidated? How about non-banking (e.g., insurance) subsidiaries? What about minority interests? And cross-border issues? The mind boggles. Yet much of the discussion on regulatory reform, even CARs, has them

being varied according to size. The definitional problems will be massive. The (legal) structure of financial intermediaries will be bound to respond so as to minimise the resulting (tax, penalty) exposure. Such consequential structural adjustments may themselves lead to unintended consequences.

The next meaning of "too big to fail" is actually the opposite, namely that a bank may be "too big to save". The argument here is that certain cross-border banks were allowed to become so large relative to their home economies and governments that the latter could not easily support the former in a crisis; examples are as follows: all the Icelandic banks, two huge Swiss banks, the Royal Bank of Scotland (RBS) and HSBC in the UK, and Anglo Irish Bank in Ireland. Is the implication that the allowable size of a bank should be a function of the size of its home economy? Are the US, China and Japan to be allowed huge banks, middle-sized countries (e.g., France, Italy and the UK) to be allowed middling banks and small countries little banks? What should then happen if a big bank establishes its headquarters in a small country, say HSBC in Hong Kong? Should the authorities in some other financial centre refuse to accept an HSBC subsidiary, or branch, into their own market because the Hong Kong government or economy was too small to support HSBC on its own if it got into trouble? European directives make no mention of the size in the home country. Is not the fundamental question in any case how a cross-border crisis may be resolved (discussed in Section 2D of this paper) rather than size as such?

The third meaning of "too big" is not size as such, but interconnectedness, so that the failure of the institution has widespread external effects on other financial markets and/or intermediaries. This need not be related to size as such. For example, the Bank of New York Mellon is not one of the very biggest US banks, but its current role as one of the two banks operating the tri-party repo market makes it too strategic to fail. Other examples of small, but strategic, institutions are those that run networks or payment systems, centralised counterparties and so forth. While one can roughly see which institutions are likely to be more or less interconnected, this is extraordinarily difficult to measure accurately. What one can measure, after a fashion, is how much the market prices (e.g., equity, CDS) of institution X responds to a (pricing) shock to institution Y, but not all financial institutions have such market prices and markets are far from perfect (their failure to foresee the 2007/8 financial crisis being as abject as that of the regulators). Either trying to impose direct constraints, or taxes, on interconnection is, for the time being at least, beyond our technical capacity and competence.

My conclusion is thus that the case for direct constraints on size has yet to be properly made and the technical problems of how this might be done have not been properly addressed.

(ii) Asset holdings

The next proposition is that banks invested in assets that were too risky to be compatible either with financial stability in general or with their role as guardians of everybody's liquid assets (retail deposits) and of the payment system in particular. So, it is suggested that they should be stopped from doing so by direct constraints on their asset structure.

But this runs into several problems. First, there is a measurement problem. If one assumes, for the purpose of argument, that the measure (the incremental systemic) risk of an asset in a bank's book can be measured, why not impose a risk weight on the CAR or a tax that more accurately reflects that risk, rather than a blanket prohibition? If, however, one should assume that risk cannot be measured at all well, how can one specify which assets the bank should hold and which not? A bank, even a Greek bank, whose assets consisted primarily of Greek government bonds would hardly be considered "safe". Mortgage lending, such as undertaken by Northern Rock, is sometimes done safely, sometimes not so. Super senior tranches of collateralised pools of mortgages were thought to be extremely safe.

Perhaps the model that those who would impose direct constraints on banks' asset holdings have in their minds is one in which bank insiders have a quite different, and perhaps better, perception of risk than outsiders, including markets and regulators. Banks then consciously and opaquely assume extra risk in pursuit of higher RoE, confident in the knowledge that this will not be observed by regulators or markets (beta dressed up as alpha) *and* that they (or their creditors) may get bailed out by taxpayers. Because, so the story would then go, regulators, creditors, markets and other outsiders *cannot* observe or measure risk, as well as the bankers, one cannot penalise such practices commensurately. The best that can be done is to ban the worst practices altogether and hope that those allowed are mostly safe.

That is not a story that I find plausible. In my view, assessment of risk is mostly common among banks, regulators, credit-rating agencies, markets and commentators. The problem is that we, all of us, tend to get it wrong,

simultaneously, as a herd. A risk is underestimated in the boom by bankers, markets and regulators, and overestimated in the bust. If so, direct constraints on asset holdings by the regulated institutions, and no constraints on unregulated institutions will tend to exacerbate the credit cycle, which I have claimed to be the main externality that needs to be kept under control.

Consider the call for narrow banking, whereby such banks can only hold a limited set of low-yielding assets, but intermediaries outside the narrow banks can hold any assets, without regulation and without any protection. Being riskier, they will offer a higher yield. In normal times, when the possibility of the default of such risky intermediaries seems remote, most people will shift funds to the riskier, but better-yielding, intermediaries. Since they are unregulated, there would be no check on their leverage multiples, or their credit expansion. Once a crisis ensues, the run back to the protected sector would exacerbate the decline in credit, and the rising yield spread between safe and risky assets. The adoption of narrow banking would therefore be a retrograde and damaging step, seriously worsening the financial boom-or-bust cycle.

Based on this view, even the much more limited set of prohibitions under the Volcker rules, prohibitions on any connection to hedge funds or on proprietary trading seem to be dependent on an assumption that, through such operations, the banks can purposefully and opaquely raise their riskiness by more than outsiders and regulators can observe. If this is not so, the diversion of such riskier business to (unregulated) hedge funds might tend to exacerbate the credit cycle. One reason why this has probably not been so in the last cycle has been that hedge funds have generally had a lower leverage ratio than banks. But the leverage ratios of banks need to come down sharply. If hedge funds receive a competitive advantage vis-à-vis banks in such proprietary trading activities *and* remain unregulated, irrespective of size, leverage and business policy, then the blanket prohibition under the Volcker rules could in future worsen the risk, credit and asset-price cycle, rather than lessen it, by encouraging a greater shift of funds to the hedge funds in the boom and an increased flow-back in the bust.

If one takes, as I do, the contrary view, that the main problem has been the common misperception of risk, shared by almost everyone, then the main need is to impose greater contracyclical limitations on leverage and credit expansion in a boom on all agents involved. In so far as banks have greater systemic riskiness, their regulation needs to be tougher, but the regulation should, as far as possible, be calibrated to the incremental risk involved, *not* carried out via blanket prohibitions.

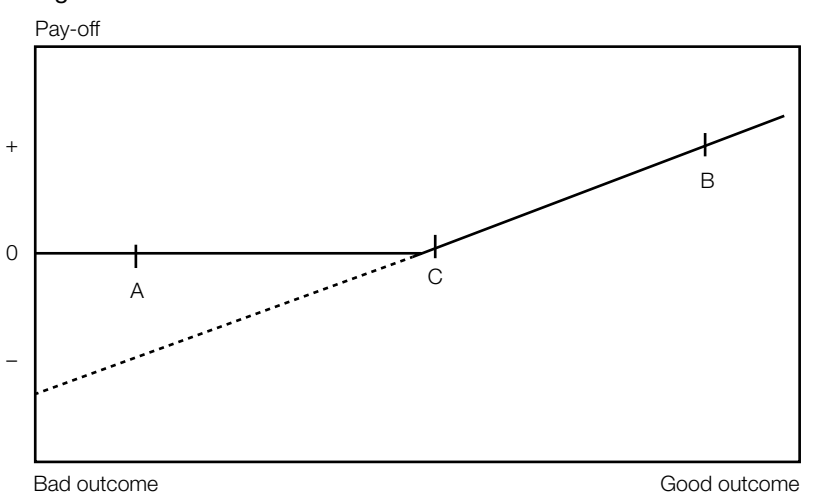
Nevertheless, the view that bankers use superior (asymmetric) information to assume more risk than was appreciated by outsiders is widely held. It is difficult to assess its validity. One reason that this view is so widely held is that senior bankers' remuneration arrangements would appear to make such behaviour rational. I next turn to proposals for reforming remuneration.

D. Remuneration and its reform

The remuneration arrangements for investment bankers were devised when these institutions were still partnerships. The partners shared both in the good times and then in the losses in the bad times. But such compensation arrangements were not appropriately adjusted when such investment houses became limited liability companies. Under these new circumstances their remuneration or compensation (comp) became aligned with that of equity shareholders, that is, sharing in success but with a strictly limited downside in the case of failure.

While there once was an academic principle that the rewards of management should be aligned with that of shareholders, this is unwise and dangerous in the case of highly levered industries such as finance, as Bebchuk and various co-authors (2009, 2010) have shown. The problem is that the pay-off to a limited liability shareholder has the characteristics of a call option (see Figure 1).

Figure 1: Return as a function of outcome



As can be seen from Figure 1, a risky prospect that has a 50 per cent chance of getting a return A and a 50 per cent chance of return B does better for shareholders than a certain prospect of C (because the fixed interest creditors or the taxpayer pick up the rest of the loss). Shareholders will therefore rationally egg management on to take on risk, and management will have their own incentive to accede to such pressure.

There have been several suggestions for remedying this incentive to assume excessive risk. Both involve trying to increase the sensitivity of comp to downside loss. One way of doing so would be to require that part of any bonus was paid in subordinated debt. Another way would be to make any bonus payment subject to claw-back in the event of a bad outcome, for example, by making such bonus payments subject to unlimited liability (Record 2010). While the claw-back approach has had some general academic support (Squam Lake Working Group 2009, Chapter 6) the technical details might be tricky.

Moreover, any significant change to remuneration that could reduce managerial rewards significantly in a downturn would be subject to problems with co-ordination. No individual bank, or single government, could introduce them unilaterally without being at danger of losing staff, or whole parts of institutions, either immediately or when a downturn looms. Moreover, interference in the structure of pay and rewards is not something that governments, either individually and even less in G meetings together, feel comfortable in doing.

The likelihood is therefore that beyond some gestures when a chief executive officer publicly cuts his or her own remuneration from the obscene to the merely bloated, nothing at all will get done on this front. Perhaps the most likely reform to pass the political hurdle would be a requirement that at least X per cent of any bonus be paid in subordinated debt.

E. Reforms of market structures

Most organised financial systems and markets continued to operate smoothly and efficiently throughout the crisis. No settlement or payment system failed. Most organised markets worked efficiently, though the factors responsible for the “flash crash” in US equity markets in May 2010 remain obscure.

Where there were problems was mostly to be found in the bilateral, OTC, markets, including interbank markets. There were several shortcomings:

first, by their nature they were largely opaque, with insufficient information available to regulators, or to any other outsiders, on positions and risk concentrations. Second, they led to a build-up of interconnectedness and, hence, to potential systemic fragility among the major participants in these markets, primarily a small number of huge investment houses and universal banks. Third, since they were largely based on bilateral repetition and trust, they could often, under normal circumstances, operate on an unsecured basis but when suspicions of solvency worries in certain counterparties emerged, especially in crisis conditions, such markets could rapidly close to some, perhaps most, or even all participants.

By exactly the same token, such disadvantages, from a systemic viewpoint, had certain major advantages for the individual participating bank intermediaries. The opacity allowed those central players, with inside information, to discriminate in pricing, to hide their own positions and increase margins on average. The interconnectedness of such markets generally made the main participating intermediaries too systemic to be allowed to fail. Lehman Brothers was the exception that proved the rule. The reliance on repetition and trust allowed the participants largely to dispense with expensive collateral and tiresome operational detail. Thus, such OTC markets could, under normal conditions, operate relatively cheaply, even for those more occasional (non-financial) end-users, against whom the insiders were discriminating in pricing.

There were considerable advantages to the main participants in keeping the OTC status of such markets, even when the form of the financial contract became commonly used and largely standardised. But these markets operated best in fair weather, and their disadvantages became both more pronounced and more obvious in the recent crisis. As a result, there has been regulatory pressure to put all such standardised bilateral deals through a CCP, where each deal will become novated with the CCP so that each party to the transaction then faces the central clearing house as its counterparty. In turn, the CCP is itself protected by initial margins, collateral calls on the party out-of-the-money, and specified loss-sharing arrangements (plus the taxpayer as ultimate backup). The information accruing to the CCP could then be passed to the appropriate regulator(s), improving their ability to assess risk. Counterparty risk and interconnectedness (too much to fail) would diminish substantially. Such markets would be much less likely to become dysfunctional in a crisis.

Nevertheless, the transfer of such standardised actions to a CCP would leave the negotiation of their terms bilateral and opaque (except to the CCP and to the regulators). Thus, in the interest of greater transparency and greater economic efficiency, many have proposed that such transactions not only be put through a CCP, but also be undertaken in a public marketplace, exhibiting bids, offers and market prices to inspection. Most participants are resigned to the need to put standardised transactions through a CCP, but are still arguing against the need for the second step towards a public market. Which sets of transactions will now operate through a CCP, and which will move beyond that to a public exchange, has yet to be determined, and will probably be decided in future negotiations between the regulators and the large banks.

An emerging problem in this respect is that such financial systems, CCPs and markets exhibit strong network economies of scale, whereas there are many regulators. Each regulator wants the CCP (or market) established in its own country. Assume, for example, that there are some six main financial participants operating in some five main bilateral markets in seven countries. With bilateral markets, the six main participants can net their positions over all these five markets with each of the other participants. If the regulators in all seven countries should then each demand separate stand-alone CCPs (markets) in all five markets on their own individual territories, the economies of scale, the ability to offset, the ease of operation and even the reduction in risk would dissipate. This problem was noted by Duffie and Zhu (2010). It yet remains to be seen whether the regulatory authorities in various countries or regions can co-operate well enough to overcome the danger of establishing too many such separate markets. At the moment it looks doubtful whether it would be possible to operate with fewer than two (European and North American) or even three (plus Asian) sets of markets. How these will interlink also remains to be determined.

F. Other regulatory proposals

(i) Credit-rating agencies

There are a variety of perennial themes in the field of financial regulation, such as the importance of incentives, of measurement in a world of both limited and asymmetric information, and of leverage. The capitalist system has sought to handle several of the problems with information by delegating

responsibility for the provision of information on credit risk to certain CRAs. It is now common knowledge that they did not perform well in that role in the run-up to the crisis.

My own interpretation is that the CRAs inevitably suffer from a chicken-and-egg dilemma. This is that no new financial market can easily develop unless the CRAs are prepared to rate the product. So they are under enormous pressure to do so. But since the market is new and untried, they cannot, by definition, have much experience of how it will operate in a severe market downturn. They are thus being asked to do the impossible, and reliance on complex quantified models simply disguises the fundamental fact that the future is uncertain, and not an ergodic, carbon copy of the past.

But perhaps I am being too charitable (though I note that having lambasted the CRAs for being useless, the authorities still agonise about CRA judgements about sovereign risk). One criticism is that the CRAs are not sufficiently competitive (i.e., Moody's, Standard & Poor's (S&P) and Fitch); a more important criticism is that they were not sufficiently independent of the corporate institutions whose (structured) debt they were rating. This valid emphasis on independence implies that proposals to enhance government-sponsored CRAs should be a non-starter (though one such has now been established in China and a European CRA has been mooted in Brussels).

A means of dealing with the issues of independence, and possibly also competitiveness, has been raised in the Franken proposed amendment to the Dodd–Frank Bill, a proposal that I understand emanated from some New York University academics. This is that the regulatory authorities should require all issuers of debts to be rated to accept (and treat on equal terms) one CRA which is to be chosen by the *regulatory authorities* and not by the debt issuer (the issuers could, and would, also themselves appoint other CRAs). The authorities could choose smaller, up-and-coming CRAs, thus lessening the problem of insufficient competition. Next, having been appointed by the authorities and not by the issuer, this CRA should be even more independent. This proposal did not get into the final Dodd–Frank Act, but the regulatory authorities have now been asked to come up with proposals, within a specified time frame (one year) either to adopt the Franken proposal or come up with equivalent or better mechanisms for reform of the CRAs. This remains to be seen.

(ii) Leverage among end-users

In this section I have focused primarily on credit and leverage cycles among financial intermediaries. The credit they extend in the boom period is equivalently the debt of other borrowers, notably of households, corporate and governments. Fortunately, the corporate sector in most countries did not become over-extended, prior to 2007, and has remained financially quite strong. The issue of government, public-sector, indebtedness has now come to the forefront, but is far too large a subject to be tackled here. That leaves the question of whether, and what, measures might be taken to lessen the build-up of household indebtedness during the expansionary phase of the credit cycle.

Most of this debt has taken the form of mortgage debt. In the expansionary phase of the credit cycle loan-to-value ratios are increased (i.e., down payments are reduced), spreads of mortgage rates over official rates come down, and all requirements on borrower requirements (e.g., Fair Isaac Corporation (FICO) scores in the US) are downplayed, all in the interest of competition over market share. This is often encouraged by politicians keen to expand owner occupation, especially among disadvantaged groups. Then, of course, it all goes into reverse in the eventual bust. There have been no fewer than three such major cycles in the UK since the 1970s.

Financial regulation is better adapted to checking the expansion (than reversing the bust, when the constraints will come from market pressures). This can be done. Maximum loan-to-value (LTV) ratios, and perhaps loan-to-income ratios, can be required and enforced by making any loans to the borrower beyond the LTV maximum not securable by law against the property. This has been done in countries such as Estonia, Hong Kong and more recently in Sweden. Such measures need to be adopted more widely.

Once again, a problem is that this will not be popular, taking away the punch bowl just when the party is starting, and will be condemned as unnecessary. A policy of leaving such countercyclical measures to the discretion of the central bank, regulatory authority, will thus tend to mean that they are not used. A much better approach is to examine the empirical regularities of housing (and also commercial property) bubbles, and then use such results to design triggers that require the central bank or systemic regulator either to comply, for example, in requiring lower maximum LTVs, or to explain in public why this will not be done on this occasion.

3. Crisis resolution

A. Some current problems in resolving financial crises

Whatever reforms and enhanced regulations are applied to the financial system, there will always be financial crises. There are three main reasons for this, somewhat pessimistic, viewpoint. First, it is human nature to respond to the unknown and unknowable future by cycles of optimism and pessimism, greed and fear. The concept of man, let alone woman, as a bloodless calculator, using rational expectations to decide how to respond to a future in which the probabilities of all future events can be accurately inferred from past history (an ergodic system) is, for better or worse, a fantasy. Second, any system, such as fractional reserve banking, which combines debt and leverage with maturity mismatch, is quite largely dependent on confidence for survival. The first argument states that confidence will be subject to fluctuations. The second argument indicates that collapses in confidence can instigate crises. Third, the advantages of debt, and fractional reserve banking, are so great that attempts to constrain the extent of leverage by the imposition of regulation will lead to a potentially massive emigration of financial business from the regulated to the non-regulated sectors. This is the border, or boundary, problem (see Goodhart and Lastra 2010, Brunnermeier et al. 2009).

The assumption must be that, whatever additional crisis prevention measures are to be put in place, financial crises will recur, so long as the capitalist system remains.[1] The next major problem in this area is that the mechanisms for such crisis resolution have been severely deficient. This was partly due to the unfortunate intellectual legacy of the Bagehot ([1873] 1999) doctrine. This was held to entail the following three propositions:

i. That problems of liquidity shortage and insolvency could be identified separately
ii. That pure liquidity problems should be met by central bank lender-of-last-resort action, but at a penal rate
iii. That insolvent banks should be closed and liquidated.

Most of these propositions are not in Bagehot's original book and none are fully justified in practice. In Bagehot's time the BoE could not inspect other banks' books. Liquidity depended solely on the quality of the assets that the prospective borrower could supply as collateral for loans; the BoE could

not itself differentiate between the overall liquidity and solvency of another bank. Nowadays, so long as wholesale markets are functioning normally in the absence of an operational problem, a liquidity shortage in any bank almost implies by definition that other banks and wholesale lenders have some concerns about that bank's solvency.

Second, both the stigma effect of being seen to go to the central bank for last-resort lending, and the "penalty rates"[2] then charged, have the implication that banks will not approach the central bank until they have already pledged all their better assets to obtain secured loans in wholesale markets. As a result, banks in trouble tend to approach the central bank far too late, often too late for help to be effective in securing survival. In the recent crisis, when wholesale markets shut and liquidity shortages became systemic, central banks not only jettisoned the concept of "penal" rates, but also refashioned their techniques to avoid any potential stigma effect.[3]

Third, and for our purposes here most important, the closure of banks that become incapable of meeting their current obligations and/or are assessed as insolvent can cause, under present legal arrangements, severe widespread adverse economic and social effects, that is, externalities. One major reason for such negative externalities is that the normal insolvency process, which was all that was available in most countries, *lex generalis*, was most unsuitable for banks. In particular, normal insolvency procedures take a long time to complete (years rather than months), whereas both the liabilities and assets of banks are frequently of a very short tenor, and can represent hedges against fast-moving assets and/or the liquid asset reserves needed for day-to-day management.[4]

Indeed, the problems for certain financial markets, such as OTC derivative markets, should a significant participant in such a market go bankrupt and have all its deals frozen, have been regarded as so severe, that there has been a world-wide agreement to allow a "carve-out" from normal bankruptcy arrangements for handling such qualifying assets and liabilities. These can be settled in full, including those where the insolvent bank is a net debtor (and/or novated completely to some other bank) before the rest of the creditors to the bankrupt bank get a chance to make their claim. While the argument that certain markets might collapse, in response to the bankruptcy of a major participant, unless such a "carve-out" was put in place, has obvious force, it does also introduce distortions and discrimination between markets and

creditors, which can have their own adverse consequences. The arguments, pro and con, having such a dividing line, and where it might be drawn, are arcane and not easy for a layman to follow.

Moreover, many of the mechanisms that economise on costs and collateral in normal times make outcomes worse when bankruptcy looms. Rehypothecation, whereby the prime broker (usually an investment house) can use the collateral placed with it by its (hedge fund) clients as if it were its own (i.e., *not* held in segregated form) reduces all-round costs in normal times, but causes huge problems should bankruptcy occur, as in the case of Lehman Brothers in London. Even when lending is secured, as in the repo market, *and* control of the collateral passes to the lender, the collateralised asset involved may be of a kind that the lender may not be legally allowed to hold directly and/or which the lender fears could drop sharply in price in the event of a bankruptcy and resultant forced (fire-sale) liquidation. Borrowers, when suspected of potential future bankruptcy, may then find even secured markets shut against them, or imposing sharply higher margins, despite holding what might seem to be a sufficiency of usable (collaterisable) assets.[5]

For a variety of reasons, the normal application of standard insolvency procedures, *lex generalis*, was and would be relatively disastrous in the case of banks and of other systemic financial intermediaries. Yet, in most countries there was no alternative, except for government recapitalisation through one route or another, or of official encouragement of merging the "bad" bank into a stronger bank; (or both these latter two together, as in the case of Lloyds and HBOS, and as was proposed for Lloyds and Northern Rock). Such encouraged mergers often have the effect of weakening the better bank severely and almost by definition increase concentration in the industry, with potentially adverse effects on competition.

Moreover, the cleanest method for official recapitalisation of failing banks, as undertaken in the Nordic countries in their crises in the early 1990s, would be for the authorities to take over the bank, eliminate the shareholders and the current senior management, and, if necessary, imposing a haircut on existing subordinate debt holders (new debt issues being naturally government guaranteed). The idea would be to sell the bank back to the private sector once the crisis was over and the bank's business re-established. The proceeds would go first to any fixed-interest creditors who had suffered a haircut and thereafter to the prior shareholders.

Thus "nationalisation" was always perceived as a temporary exercise. Nevertheless, the phrase "nationalisation" carried such ideological and political baggage, and the process seemed so alien to the capitalist regime that it was hardly ever undertaken in this latest crisis, even by the UK Labour government. Furthermore, there may have been a fear that the market response with respect to the equity and bond prices of those banks *not* initially nationalised could have been so severe that the government would have to end up nationalising most, or all, of the country's banking system, as was done in the Nordic crisis of the early 1990s. Whether this fear is justified, or not, one simply cannot tell.

Be that as it may, full nationalisation was rejected in favour of equity injection, thereby diluting the equity of existing shareholders, leaving existing management in charge and guaranteeing for a time new bond issues. This was seen, correctly, as being soft on management (and on shareholders and senior creditors) who had allowed their banks to get into such straits. In some cases, as with Fred Goodwin's (RBS) leaving (pension) package, the authorities would have liked to be tougher, but found that such packages were part of a legal contract. But the process was also seen, to some large extent incorrectly, as being extremely expensive to taxpayers. The reason why I state that this is *incorrect* is that the economic and social costs of the only-then-available alternative, that is, allowing the standard insolvency procedure to take place, would have been, as it was in the case of Lehman Brothers, far worse. Furthermore, it is likely that in most cases the capital injections will be sold off at a profit in future and that the guarantees, for which a fee is charged, will never need to be used. There are some counter-examples, notably the government-sponsored enterprises (GSEs) and, perhaps, AIG in the US, Allied Irish Bank and the Icelandic banks; but these were either outside the remit of the (banking) regulator, and/or extreme examples of prior regulatory failure.

Nevertheless, the perception that Main Street bailed out Wall Street, not only at enormous cost to the taxpayer, but also allowing the "fat cat" bankers off the hook has taken a deep hold. Indeed, for most observers the main requirement is to put an end to "too big (or too interconnected or systemic) to fail". Given, as asserted at the outset of this section, that financial crises *will* continue to occur, this implies that ways must be found of trying to lessen the costs, and externalities of relying on the current insolvency process. One way of so doing is to move towards a special resolution regime (SRR) for banks, from a *lex generalis* to a *lex specialis*.

Before getting into the detail of what such an SRR might look like, a caution is necessary. The US had already introduced such an SRR under the guise of the Federal Deposit Insurance Corporation (FDIC) Improvement Act of 1991. Under this Act, the FDIC was meant to shut down any bank whose equity capitalisation fell below 2 per cent of total assets (and could not quickly recapitalise itself). Such prompt corrective action (PCA) was meant to insure that banks would be closed well before they became insolvent so that all creditors could be paid out in full without any recourse to the taxpayer. Patently, PCA failed to protect the US taxpayer.

A main reason for this was that the epicentre of the crisis in the US lay outside the banks subject to the FDIC Improvement Act of 1991, in the broker/dealer investment houses and GSEs. So, Dodd–Frank and most Acts introducing SRRs elsewhere will now require all SIFIs to be brought within the ambit of the main prudential regulator. But how does one measure systemic importance? And what should a regulator do about intermediaries that are individually below the SIFI threshold, wherever that may be, but have systemic importance as a group, or herd?

Another reason for the failure of PCA in the US was that it was based on accounting measures, which involve lengthy lags whereas markets move fast, and which accounting measures are capable of manipulation (Repo 105). Indeed, the capital ratios, at the last estimate, of failing banks often seemed better than those of banks that survived (IMF 2009). Whereas the objectives of PCA were admirable, the mechanics appeared to have been flawed. Perhaps the numbers should have been much higher (say 5 per cent for TCE) and/or based on market, rather than accounting, valuations. One of the greatest dangers in the current regulatory framework, and apparent in Dodd–Frank, is that the power to close a SIFI *before* it enters insolvency will be left to the *discretion* of the macroprudential authorities, rather than be subject to presumptive *rules*. The reason why this is a danger is that such discretion will hardly ever be exercised, at least not before it will already be too late. The *ex ante* uncertainty will be such, and the likelihood of legal suit so strong, that the macroprudential authority is bound to hesitate.

B. Shift resolution costs from taxpayers to banks and their creditors?

Not only will crises recur, but one cannot rely on the regulators to shut down failing SIFIs before a loss is incurred, which burden needs to be borne somewhere. So who is the candidate for bearing such a loss? The obvious answer is the banking system itself.

One line of attack, along the lines of PCA, is to try to force the bank(s) in difficulty to refinance themselves before they fail and a loss crystallises. The leading proposal in this genre is to encourage (or force) banks to issue conditional contingent bonds that transmute automatically into equity when some trigger (of weakness) is passed. Unfortunately, the likely outcome depends sensitively both on the trigger mechanism and on the terms on which the transformation to equity is made. Under many possible versions the effect would actually be adverse. Even in those cases when the effect might be beneficial, for example, by inducing shareholders to make new rights issues early rather than be diluted into insignificance, it would be a complex exercise, and it is far from clear that it would have any net social benefits relative to a simpler regulatory requirement for more equity capital. (I have written on this at greater length, and this earlier paper (Goodhart 2010c) is included as Appendix A to this paper.)

A common failing of this genre of proposal, namely to make the bank(s) bear the burden, is to ignore the effect on the other banks in the system, beyond the bank in difficulties. Let me take three examples. First, consider the Hart–Zingales (2009) scheme to force any bank whose CDS risk spread rises above a certain level either to raise new equity, or liquidate. For the initial bank coming under this requirement, this would be fine; and so it would also be if shocks to the banking system were idiosyncratic. But what would happen in the case of a systemic shock? All banks would tend to be under pressure. The requirement on the first bank to enter this process to raise new equity would sharply lower its own equity valuation. That fall, in the equity price, would spread rapidly to other banks and also drive their CDS risk spreads up; in other words, the requirement would spread contagiously to other banks. The new issue market for bank equity could not cope and would dry up. Faced with the prospects of a large proportion of its banking system failing simultaneously, the government (taxpayer) would have to step in once again.

Second, in the case of the bail-in of bank bond holders, proposed, for example, by the Association for Financial Markets in Europe (2010) and several others, suppose a SIFI fails, with losses that go beyond wiping out shareholders and a haircut is imposed on other creditors, from the most junior up, sufficient not only to meet losses, but also to recapitalise the SIFI and maintain it as an ongoing institution, this would again be fine for the initial bank (ignoring technical legal problems) and also if the shock is idiosyncratic; but what about a systemic shock? Once again, the process is likely to bring about a sharp weakening in bond prices not only in that bank, but in all of the many similar banks. The likelihood is that the market for new bank bond

issues would either close, or only absorb new issues at extremely high rates. Most large banks have continual regular maturing debt issues that need rolling over. The bail-in process would make such rollovers, let alone new funds, difficult if not impossible.

In practice the authorities have, entirely correctly, gone in exactly the opposite direction to the "bail-in" proposal by guaranteeing (for a fee) the future repayment of new bonds for all banks. It would be possible, on the first occasion, to combine a bail-in on all *old* unguaranteed bonds, together with a blanket guarantee (for all banks and SIFIs) on all *new* bonds. Whether, and when, such guarantees could then be dropped would be unsure. A two-tier market for guaranteed and unguaranteed bonds would develop. Whether governments would want to continue such guarantees and whether the unguaranteed market on its own would be broad enough both to meet banks' funding needs and the potential bail-in requirements would remain to be seen.

The final example is the *ex post* tax on surviving banks contained in the Dodd–Frank Act. The idea is that an orderly liquidation authority (OLA) takes over a failing SIFI, and together with the Systemic Oversight Regulatory Committee, decides on the most efficient way to deal with that SIFI. In the short run it can tap government funds by borrowing, but in the medium to longer term it recoups all its expenses by imposing a tax or levy on surviving banks and SIFIs pro rata to assets beyond a certain threshold (to benefit politically powerful small banks). This has several obvious flaws. It taxes the good guys, not the bad; just at the moment when the taxed are least able to bear the burden, that is, it is most procyclical. Being an *ex post* tax, it cannot shift bankers' behaviour in a preferred direction.

Perhaps the main objection to an *ex ante* tax was "moral hazard"; that having paid towards a bail-out, it would increase the probability of such a bail-out being delivered. Like most moral hazard arguments, it is often grossly overstated, being akin to preventing burial clubs because they might encourage suicide. Perhaps a stronger argument is that the quantum of any *ex ante* tax necessary to meet the cost of crisis resolution is unknowable in advance. If the *ex ante* tax was too low, it would need to be topped up with an *ex post* supplement and, if too high, would be a net burden on channels of bank intermediation.

Ideally, the extra marginal cost of an *ex ante* tax should equal the marginal social benefit in reducing the incidence and intensity of financial crises. But no one can assess where that optimum may be. This harks back to the

discussion of bank taxation in Section 2B "Crisis prevention" in this paper. Perhaps the best that could be done, under both headings, "Prevention and resolution", would be to have a *much* higher, fully satisfactory, core equity ratio, perhaps as high as 20 per cent of total assets, and say 12 per cent of RWAs, with a progressive scale of tax requirements as capital fell below that level, and a similar scheme for liquidity.

The message is that attempts to make the banking system bear the burden after the event of a crisis are largely self-defeating. Often they will make the systemic problem worse, not better. Moreover, the idea that the burden will fall on a few fat cat bankers is wrong. The cost will, once again, fall primarily on society, including taxpayers, in the shape of increased spreads and reduced credit expansion in the downturn following the crisis. Instead, the way to proceed is to increase core equity requirements very sharply, preferably in a countercyclical manner, and impose a progressive tax on short-falls from that level. Getting from here to there, the transitional problem, will require time, but, if it is known where the end-destination should be, a sensible compromise could be worked out.

Perhaps the common mind-set has been wrong. Regulation is too often perceived as helping to mop up after a crisis. However, in practice regulation is largely ineffectual, or sometimes downright damaging, in the bust. Instead, the market provides the constraint at that time. The purpose and objective of regulation should be to constrain the boom, in contrast and in opposition to the market, not an easy exercise, and one that will *not* be done effectively if it rests on the discretion of the regulatory authorities.

C. Special resolution regimes and "living wills"

The *lex generalis* of standard insolvency procedures do not meet the urgent requirements of a financial crisis. Instead, an SRR to handle such an event needs to be devised. Clearly there are two requirements for such an SRR: (i) proper coverage and (ii) speed of response. Proper coverage should require that all SIFIs are included. The Dodd–Frank Act scores well in that respect; the British Banking Act of 2009 less well (see Lastra 2009). There obviously remains an acute problem for both the regulators and for academics, which is how to assess and measure what is systemic. At present the only techniques for so doing depend on the use of market prices; thus if a market price (equity or CDS usually) of Bank I, or set of all institutions, move by X per cent, what is the likely effect on Bank J, or the set of all other banks? While one can get some way by so doing, much more data on interconnectedness,

crowded trades, concentration of risk and so forth are needed. The shift of derivative trading into CCPs should help. Nevertheless, in the run-up to the last crisis, the massive increase in leverage and credit and debt, its focus in many countries on housing, property and construction, and the reliance of the housing market on there not being a sharp downward break in prices were hardly obscured from sight by data limitations.

Nor, if we are to be honest with ourselves, were regulatory instruments to counteract the boom entirely lacking, though they were certainly insufficient. Mervyn King's (2009) claim that all the BoE could do was "to compose sermons and to conduct burials", is a lovely quote, but a slight exaggeration. Under Basel II each country's regulatory authority could, at its own discretion, under Pillar II raise the CAR of its own banks. Certainly in the UK the FSA, not the Bank, had the responsibility for activating Pillar II, but the Bank could have requested that it do so, and could have made that request public knowledge. Moreover, the Bank could have proposed the application of maximum LTV ratios in the housing market, steps already taken in Estonia and Hong Kong, and recently (2010) in Sweden, and/or measures similar to the Spanish dynamic pre-provisioning requirements. While additional macroprudential measures to limit credit expansion and asset (housing) price bubbles would be desirable, the real problem has been the mind-set of the regulators and their determination to operate a discretionary system, rather than one constrained by presumptive rules. What is needed is an equivalent Taylor rule for macroprudential policy.

Crises tend to occur suddenly. When problems develop, all those involved tend to state, in order to bolster such confidence as remains, that everything will be all right, until suddenly it is not. So, usually, there will be little forewarning of insolvencies. How then can proceedings be put in place rapidly, as is necessary, to deal with a sudden, unforeseen collapse. In this respect one of the best ideas to come out of the latest crisis is the requirement for all SIFIs to prepare a "living will" or "funeral plans" in advance. The idea emerged, so I believe, from Tony Lomas of PricewaterhouseCoopers (PwC) as a direct result of his personal experience of being pitched into becoming the liquidator of Lehman Brothers, London. There had been no prior planning for this bankruptcy and the initial conditions were chaotic. If crises are going to recur, as they will, and if the treatment of such failures is not going to involve potentially massive social and economic costs (externalities), there has to be some preplanning for such a potential failure, in any SIFI. This is where "living wills" come in.

The current plan is that "living wills" should have two parts (Huertas 2010). The first part is a recovery plan. If the reputation and/or the perceived solvency of the SIFI becomes severely damaged, say by presumed losses of asset values, a rogue trader, or fraud, what immediate steps could it take to shore up its position, for example, by selling non-core assets and businesses, drawing on pre-arranged credits and so forth? The second part involves a review of procedures to be followed, should the SIFI transmit from being a "going concern" to a "gone concern", and become unsalvageable. Above all else, this must involve information – a data room – on legal structures; location of assets and liabilities; and on who within the institution has the relevant knowledge and responsibilities. As a generality, the resolution of a SIFI will be less traumatic if key parts of it can be wound down gradually in an orderly fashion, rather than everything just stopped cold at a specific moment. How can one identify in advance how this can be done and what the nature of the operational structure that will allow this to be done is? For example, without functioning computers (information technology (IT)) everything will come to an immediate halt physically. Does that mean that the IT section of any SIFI, or subsidiary of a SIFI, needs to be legally structured so that it is legally immune from the bankruptcy of its parent?

Basically, the conduct of this part of a "living will" or "funeral plan" is akin to a "war game" in which those involved play-act the demise of the SIFI, assess how to minimise the adverse effects of such a failure and require its liquidation to be carried out more smoothly. There must be hope that some of the early exercises of this approach will lead to the adoption of some general principles, since doing such an exercise is likely to be hideously labour-intensive, and the idea that this be done quarterly for all SIFIs in each country would seem unrealistic; though each SIFI would have to maintain its core data room on a regular, ongoing basis.

As the Roman saying goes: "If you want peace, prepare for war." If you want to avoid a systemic financial crisis, prepare to handle the collapse of any SIFI, however large and complex. This is a valuable precept. However, it is difficult to know in advance quite how useful and valuable such an exercise will be, since this collapse has yet to happen.

Perhaps the main problem, both with crisis resolution and the conduct of "living wills" is that a SIFI is almost always at the same time a cross-border, international institution. In the global financial system, such SIFIs are "international in life, but national in death." When a cross-border SIFI fails, its various national subsidiaries immediately become subject to national

insolvency laws, and such laws are different and inconsistent with one another. This takes one to the final part of this section of this paper.

D. Cross-border resolution mechanisms

Of course, if a cross-border SIFI never becomes insolvent, there is no problem. The purpose of the increased CARs, described in Section 1, along with the proposals for transforming contingent convertibles (CoCos) into new equity capital, and/or bail-ins, is precisely to ensure that all SIFIs remain going concerns. But the lesson of history is that financial crises are endemic in the capitalist system, and that (overregulation in one corner of the financial system (e.g., narrow banks) will lead inexorably to, just as severe, financial crises popping up (unexpectedly) elsewhere. It would be wishful thinking to assume that crisis prevention mechanisms have become so effective that problems in (cross-border) crisis resolution mechanisms can be ignored.

Some countries, such as Sweden, have not yet introduced any SRRs for their SIFIs and still operate under a, *lex generalis*, insolvency regime. There is, however, now pressure, both within the European Union (EU) and more widely, for all major countries to introduce a *lex specialis*, an SRR, for their own banks, and I expect such pressure to be effective.

The remaining problem, however, is that each such SRR, *lex specialis*, is set up under national law, and these national laws, given different histories and traditions, are not consistent, indeed they often conflict. In particular there are differences between the universal principle of the treatment of creditors in bankruptcy, whereby all are treated alike irrespective of location, and the territorial principle, wherein national creditors have their claims satisfied first from available assets, as practised by the US and Australia. But this is far from the only example of legal differences, though probably the most important. Thus the question of what assets and liabilities can be offset against each other (netted) in bankruptcy proceedings often differs from country to country.

With Emilios Avgouleas and Dirk Schoenmaker (2010) I have been proposing that the present trend towards getting all countries to introduce an SRR might be extended to getting them all to establish an *exactly common* legal basis for their SRRs, so that the insolvency process for SIFIs would become universal. The purpose is to try to prevent national haggling over who bears the burden of failure, national asset grabs, and slow and incoherent national responses to failures, or potential failures, of cross-border SIFIs, such as

disfigured the insolvency process in almost all cases in the recent crisis, with Lehman Brothers, the Icelandic banks, Fortis, Dexia and so forth being notorious examples.

The objective of trying to obtain an international legal basis for a global financial system is not outlandish. In order to allow the global market system for derivatives to function smoothly, international acceptance of International Swaps and Derivatives Association (ISDA) master agreements were obtained. In a non-financial context, the law of the sea has been commonly agreed.

But I am not optimistic. Getting global agreement on a common legal basis for handling the insolvency of SIFIs would involve too many large countries, with veto powers, accepting conditions for the insolvency of such SIFIs that would run contrary to their own national legal traditions. It would be likely to be blocked.

If one cannot move towards a common (legal) basis for managing cross-border crises, arising from a failure of a cross-border SIFI(s) the obvious logical alternative would be to give much more crisis management powers, both for crisis prevention and crisis resolution, to the local host country, for example, giving the host country the right to require all foreign-headquartered SIFIs with a large local presence to make these into subsidiaries (rather than branches) and to apply local, host country, CARs and liquidity requirements. The effect would be to introduce frictions into the global financial system. This would be most unpopular in the EU, which is trying to introduce the single European financial area (SEFA) and to most, though not all, cross-border universal banks who see economic advantages in centralised management. This will not happen.

So, there will not be any general mechanism for handling cross-border financial crisis resolution. Instead, we shall have to move forward on a rather messier, case-by-case basis, in which each cross-border SIFI is examined by a college of supervisors, probably as a key aspect of the “living will” process. In each case the idea would be to handle each insolvency in as universal a method as possible, a form of “modified universalism”, in which agreements not only on procedures, but on methodologies for burden sharing are agreed in advance, wherever possible. The proposals for doing so among Scandinavian countries (see Riksbank 2010) are a good example of what might be done.

There are not an enormous number of such crucial SIFIs; probably less than 50. With any luck, it might be possible to carry out the "living will" exercise for each of them, and use that to agree in advance on how any such cross-border failure would be prevented, and then handled if prevention were unsuccessful, before the next financial crisis hits.

4. The administrative structure for implementing the new financial architecture

The new financial architecture will incorporate several new instruments, both for crisis prevention and crisis resolution. Their purpose is to maintain systemic financial stability and they are generally described as macroprudential in form. What institution(s) should then wield these?

In his paper on "How central should the central bank be?" Alan Blinder (2010, 123–133) concludes that "the central bank should monitor and regulate systemic risk because preserving financial stability is (a) closely aligned with the standard objectives of monetary policy and (b) likely to require lender of last resort powers". Indeed, the provision and control of liquidity in the system is central to the functions of the central bank in maintaining both price and financial stability (Goodhart 2010a). Moreover, most central banks have been charged with some generalised responsibility for the maintenance of overall financial stability, even when they have at the same time lacked any instruments, beyond issuing public warnings in financial stability reviews, for achieving this.

There are, at least, two further arguments that support the case for allocating the responsibility for systemic risk control to the central bank. The first is professional expertise. Systemic risk arises from market interconnections, the province of economists. The macroprudential management needs to be monitored and managed by economists. Consumer protection, conduct of business and, to some extent, micro-prudential oversight of individual institutions, are undertaken more by lawyers and accountants. Among micro-prudential supervisory institutions, such as FSAs, the bulk of the work tends to fall into the field of consumer protection, and the institution tends to become dominated by lawyers and accountants, whereas nowadays the central bank's staff are dominated by economists.

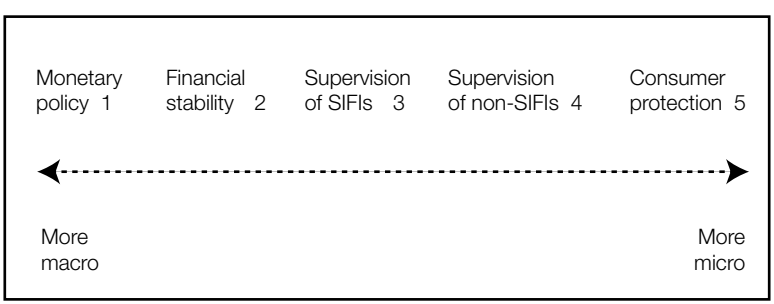
The second argument concerns independence. The central bank tends to be better resourced, usually from seignorage, than an FSA, and is thus less

subject to budgetary pressures, either from politicians or from the banking industry. Moreover, the application of countercyclical macroprudential measures, "taking away the punch bowl just when the party gets going", for example, toughening LTV requirements in a housing boom, tends to be very unpopular, both with politicians and the industry. So, the proper conduct of such a mechanism requires a high degree of independence. Central banks have developed a tradition of such independence, more so than any other supervisory institution; their financing, their historical roles and the academic support for central bank independence give them better protection, against outside interference, for the conduct of macroprudential measures than any other institution in the field.

In practice these arguments have won the day. Even where the reputation of the central bank has suffered most, in the recent crisis, as in the US,[6] Congress there still allocated responsibility for macroprudential systemic risk to the Federal Reserve (subject to an oversight committee) in the Dodd–Frank Act. In the EU the newly established European Systemic Risk Board (ESRB) is managed by the European Central Bank (ECB) and the voting power dominated by central banks. In the UK the incoming Coalition Government has handed all the macroprudential powers, and most of the micro-prudential oversight, back to the BoE.

A consensus is now developing that responsibility for monitoring and managing financial stability should indeed rest with the central bank. But, beyond that, there remains a great deal of doubt about how extensive the role of the central bank should be. I have slightly extended Figure 1 in Alan Blinder's paper (2010, 129).

Figure 2: The spectrum of central bank responsibilities



Thus it is now widely agreed that the central bank should do 1 and 2, and most would reckon that it needs direct supervisory (on-site) access to 3 as well in order to carry out its policy functions effectively, though that need not imply that a specialist FSA should not also supervise all SIFIs. The additional use of resources from an overlap of two supervisory bodies dealing with each SIFI would be small, and the countervailing benefits of having two sets of eyes with differing perspectives and priors could be large.

Furthermore, the implementation of any countercyclical macroprudential measure, as proposed by the central bank, could be left to the FSA for implementation. Almost all macroprudential measures have detailed technical and legal micro-prudential implications, of which the central bank economists may be unaware. The central bank could issue a (public?) instruction to the FSA to comply with the adoption of some proposed macroprudential measure, or to explain (in public?) why this was not feasible.

A template for this kind of approach is represented by the ESRB. It has no executive powers of its own, but can issue instructions to member states to comply in taking steps to counter some perceived systemic fragilities, or to explain why this was not possible or needed. So, at one end of the spectrum, a structure with an entirely separate FSA could be retained. All that would be needed to be added would be a reaffirmation of the right of a central bank to direct access to SIFIs, plus new powers to require FSAs to comply with the introduction of some proposed new macroprudential measures, or to explain why not. Nevertheless, if such separation was to be maintained, someone must be in charge. What if the FSA and central bank disagreed, or if the FSA just delayed? In that case there would seem no alternative but to seek a final ruling from the government.

At the other extreme the central bank could do *all* the financial supervision work in-house (1 through 5) abolishing all other FSAs. That would have the virtues of simplicity and clarity. But it would also have several disadvantages. It would extend the scale, scope and power of the central bank so far as to

1. raise concerns about democratic legitimacy;
2. raise concerns about the ability of the governor and board to manage such a huge and diverse body;
3. take the work of the central bank beyond its traditional focus and expertise into areas such as insurance regulation, consumer protection and conduct of business, thereby changing its ethos;

4. represent extreme "mission creep" and potentially extend the central bank's "safety net" too far; and
5. increase reputational risk and, with that, threats to its continued independence.

In the case of some small countries there are efficiency arguments (e.g., few skilled economists and regulators) for doing all financial supervision in the central bank, and it has been done (Masciandaro et al. 2007, 2008, 2009). But as a generality this has not been the preferred route. Examples and experience, including current experience, show that most countries leave supervision of non-SIFIs and non-banks to specialist supervisory bodies; and also leave consumer protection or conduct of business either to yet another specialist institution or to the specialist micro-prudential supervisory body. There is no consensus, or agreed best practice, on exactly where to draw such lines.

Perhaps, though this is advanced tentatively, the best approach might be a supervisory body connected with the central bank, but physically separate with a different remuneration scale, with an overlapping Board or policy committee, both chaired by the governor, and with some, but not all, common members. In addition, there could be a separate consumer protection body, preferably entirely separate from the central bank, and perhaps yet another body to regulate or supervise the insurance industry. This might be described as the Finnish or French model, towards which recent reforms have also taken the UK and Germany.

The above discussion has focused on the relationship between the central bank and separate specialist supervisory bodies in the context of crisis prevention. Exactly the same debate can be undertaken in the field of crisis resolution. Again, it is possible to consider the extremes. At a minimum, the central bank could put some general proposals to a specialised resolution authority on a comply-or-explain basis, and would have full access to the "living wills" of all SIFIs, but otherwise would leave everything to a specialist resolution authority, such as the FDIC in the US or National Debt Office (NDO) in Sweden. The maximum would involve the central bank doing everything in-house.

In the case of crisis resolution the case for greater separation seems stronger than in the case of crisis prevention. There are three reasons for this. First, crisis resolution can require fiscal assistance, in the shape of capital injections, debt guarantees and so forth. The government is much more likely to need to be involved. Central bank independence is then less at risk if the

government is primarily interacting with a separate resolution body. Second, under the proposed new architecture, the regulators will likely intervene much more into property rights, for example, in the conduct of bail-ins and CoCos. The potential for reputational risk and extended legal battles could rise sharply. A central bank might be well advised to out-source such risks to a separate body. Third, but overlapping with the previous arguments, both the preparation for crisis, notably in establishing "living wills" for cross-border SIFIs in a context of "modified universalism", and in the actual resolution of crises are going to require specialist legal and accounting expertise, which central banks normally do not fully possess.

A counterargument is that crises, fortunately, occur rarely. Most of the time a specialist resolution authority would have nothing to do. So it could find it difficult to attract, motivate or retain staff, whereas a central bank could switch staff between roles as required. While there is some force in this argument, there are also responses to it. First, if the preparation of "living wills" becomes the responsibility of the resolution authority, as would seem sensible, this would give it ongoing regular duties. Second, staff could, if necessary, be temporarily seconded from the central bank to the resolution authority in a crisis as required.

To conclude, it has become clear that the central bank will be given responsibility for monitoring and managing systemic risk, and will be allocated powers to adjust some new instruments for that purpose. By contrast, the question of where the dividing lines may be drawn between the central bank and specialist supervisory agencies, both for crisis prevention and crisis resolution, remains unresolved.

Appendix A: Are CoCos from Cloud Cuckoo-Land?

There are a number of reforms to financial regulation that enjoy almost universal endorsement, at least from the great and the good in the academic fraternity. These include

i. routing most derivative deals through CCPs;
ii. requiring all SIFIs to write "living wills";
iii. imposing tougher capital regulations on assets held in bank trading books;
iv. giving incentives to banks to hold a larger proportion of liquid assets; and
v. requiring banks to hold a form of debt that is "quasi-automatically" transformed into equity when the bank gets into trouble. These latter are the contingent convertibles, or CoCos, of the title.

While I have supported (i) to (iv) above, I am a sceptic on CoCos. So pervasive, however, is the range and eminence of its supporters that I feel bound to set out the reasons for my reservations. The intentions and objectives of the proponents of CoCos are excellent, indeed beyond reproach. The main purported benefits are, first, that in the event of an insolvency, they allow loss to be spread more widely among bank creditors, rather than assumed by taxpayers and, second, that they enhance stability by providing additional capital in bad times and, if appropriately designed (on which more later), providing incentives to raise new equity in good times. It is rather the mechanics of their operation and market implications that may be subject to doubt.

Let me start by recalling that this is the third version of a quasi-automatic market mechanism for limiting bank losses and facilitating bank resolution that has been proposed in the US. The first two both failed. The first, which had some considerable success for many decades up until the 1930s, was the imposition of double liability on shareholders. Quite why this was rejected in the 1930s, and why academics have not proposed its reintroduction (rather than the more complex CoCo scheme) are not entirely clear.[7] The second, and more recent proposal, was that for PCA contained in the FDIC Improvement Act of 1991. This too patently failed in 2008. The main reason appears to be that it was based on accounting, rather than market, values of equity capital. Such accounting values adjust far too slowly and are subject to accounting gimmicks (Repo 105). Indeed, the IMF has shown that the banks that went under in 2008 were, beforehand, generally supposedly better capitalised than those that did not! The implication is that CoCo convertibility must be triggered by falls in the market, not in accounting, valuations; this brings with it concerns about market dynamics, of which more later. Accounting triggers, such as have been included in certain recent issues, for example by Lloyds, are deficient.

A main purpose of CoCos is to allow loss in the event of insolvency to be spread more widely among bank creditors, rather than assumed by taxpayers. While this is a laudable objective, it would be even better to have a recovery rather than insolvency. On this last-mentioned front CoCos do not score well. When a bank, or SIFI, gets into real trouble, what it needs most urgently is lots of cash up-front. The only benefit the conversion of CoCos brings on this front is the cessation of their interest payments. A much stronger and simpler mechanism would be to require the authorities to ban (or to explain why they choose not to do so) all dividend payments, and perhaps all increases in the compensation and earnings ratios, for all banks

and SIFIs once the market value of an index of, say, the equities of the ten largest banks or SIFIs had fallen more than X per cent from their previous peaks. This could conserve far more cash than triggering CoCos. Admittedly the prospect of a cessation of dividends could further depress bank equity valuations in a crisis, but the likelihood of success, and the attractions to banks, of raising new equity at such junctures are fairly minimal then anyhow.

At least tying CoCos to equity market valuations should simplify somewhat the vexed question of triggers for the conversion. One concern of some proponents of CoCos has been that the quasi-automatic rebuilding of equity from the conversion might encourage some bank executives to adopt riskier strategies; so the suggestion was that conversion should only be allowed if both the individual bank and the whole banking or financial system were in a state of crisis. But if that required a pronouncement, say by the central bank governor, of the existence of such a crisis state, would not the pressure be to delay making such a (market-damaging) pronouncement? Instead, if the trigger were a system-wide decline in equity prices, this would be a transparent, objective basis. Of course, that leaves open the question of what happens when one gets a, possibly technical, market collapse, as in 20 October 1987 or 6 May 2010, and of the possibility of market manipulation. Both those concerns can be partially alleviated by relating triggers to average market valuations, over say 20 working days, but this could still leave final-day problems or volatility, let alone concern about the uncertainty, and hence additional volatility, throughout the potential averaging period.

Much depends on the precise terms of the conversion, namely, what share of the enhanced equity would go to the CoCo holders. I should confess that originally I assumed that triggering such a conversion would lead to a, possibly sharp, fall in the value of such CoCos. If so, several consequentials arise. First, all other banks, and SIFIs, would have to be banned from holding such CoCos, as triggering them would just spread contagion within the financial system. Indeed the pay-off function of CoCos, namely incurring a large loss just when all other assets were also doing badly, would be most unattractive. So they could only be sold to a small clientele at a high yield, that is, very expensive. Moreover, the triggering of a CoCo for Bank A would very likely cause a contagious market reaction in the value of CoCos in many other banks, leading to value destruction, though the extent and likelihood of such contagion can be questioned. Finally, CoCo holders would hedge against the possibility of loss from activation of the trigger by shorting the equity of the bank in which they held the asset, leading potentially to the amplification of systemic downward spirals in the prices both of bank equity

and of CoCos in the system as a whole. One of the weaknesses of some of the analyses of CoCos is that it concentrates on the effect on a particular troubled bank, rather than also exploring the effects on the market dynamics of the financial system as a whole (one of the key inherent weaknesses of the previous regulatory system).

Indeed, were the conversion terms of CoCos such as to be likely to impose a significant loss on the holders of CoCos, I would be inclined to claim that they were a bad idea and leave it at that. But the conversion terms can be adjusted so that the CoCo holders get such a large proportion of the resulting enlarged equity base that they even gain at the expense of the pre-existing equity holders, whose position gets diluted into insignificance. This gets us back towards imposing a sudden large loss on original equity holders, if an above-zero trigger is reached (rather akin to the prior double liability arrangement). This is a much better idea. The suggestion is that equity holders will be incentivised to issue new additional equity early, in order to protect themselves against being wiped out by dilution, and from any manipulation to activate the trigger by CoCo holders hoping to benefit. Indeed, some of the proponents hope that the incentives to raise new issues in good times will be such as to make banks continuously well capitalised and to prevent CoCos being triggered, except very rarely (and by the miscalculation of existing equity holders).

This is where I have my doubts. Markets can move rapidly from complacency, in which protective action seems unnecessary, to such fear, that new issues become non-viable, in quite a short period of time. Consider what happened to the assessment of sovereign risk in 2010, or of equities in 2008. To avoid widespread triggering of CoCos at a time when the alternative of new equity issues would be difficult or impossible, the trigger would have to be set to go off well before a serious systemic crisis was upon us. Thus one way, or another, the existence of CoCos with such conversion terms would face the bank equity holder with a much higher probability that the valuation of the holding would be significantly diluted well in advance of insolvency. This would make equity holding in banks or SIFIs less attractive and would raise the required return that would need to be met (and at present the return that banks may be able to offer is also under threat from other regulations and taxes).

And if such a CoCo were triggered by miscalculation or misadventure, the adverse effect on equity holders could lead to contagious effects on other bank equity valuations, possibly leading to a domino effect triggering one CoCo after another. If so, it would become impossible to recapitalise banks via new equity issues for some long period. Indeed, all bank equity enhancement might then have to come for some time by way of CoCos converting, not a happy state of affairs. *Per contra*, supporters of CoCos

suggest that under such circumstances the conversion of CoCos would indeed be the only way to recapitalise banking systems, but if they were required to be large enough, they could suffice. But how large would this have to be, for example, perhaps 10 per cent of total bank liabilities, and what then would be the effect on overall bank costs and profitability, especially in the transition period?

Would it not just be simpler and easier to raise equity capital requirements directly, rather than go through this more complicated rigmarole? Here the argument of the proponents of CoCos is that it allows the banks to enjoy the tax shield, that the interest payment (while not triggered) can be offset against tax, so that CoCos plus equity will be somewhat cheaper than just more equity. But this depends on a whole host of other factors as well, such as the liquidity of the CoCo market, the exact terms of each CoCo and the likely market for such instruments and so forth. Against their issuance being possibly marginally cheaper for banks than additional required equity, their (required) usage would make the system more complex, potentially lead to problematical market dynamic, and tend to be oversold as a magic bullet.

So, overall, I am yet to be persuaded that CoCos represent any improvement on a reformed system of, somewhat higher, countercyclical requirements.

Notes

[1] There have been few financial crises under communism or other authoritarian regimes. Their financial problems are different. Similarly, there were hardly any banking crises between 1935 and 1970, but this owed much to the prevalence of state control and direction of financial intermediation in most countries in those years.

[2] Bagehot never used the phrase “penalty rate”; instead he talked about “high rates”, but the context implies “high relative to rates in normal market conditions”, which could be lower than market rates in the midst of a panic.

[3] When normal (peace-time) conditions become re-established, central banks may need to think again about how to defuse the problem of “stigma”.

[4] It is frequently forgotten that many bank customers rely on their unused or undrawn credit (overdraft) facilities for managing their future financing needs. Once a bank becomes insolvent, these are immediately frozen. It is not just existing creditors or depositors who suffer an immediate liquidity loss. Indeed, since deposits are insured, and unused overdrafts are not, net borrowers can be worse hit.

[5] Some large part of the argument about the US authorities’ actions with respect to AIG, Bear Stearns and Lehman Brothers comes down to the question of the quality of the assets that the United States Federal Reserve System (US Fed) could take from them as security against loans to them.

[6] Blinder (2010, fn 13) gives two examples: "First, the thirty votes against Ben Bernanke in January 2010 were the most in history, by a wide margin. Second, a July 2009 Gallup poll found that the public judges the Fed to have done the worst job among nine federal agencies tested – a list that included Homeland Security, the CIA, and the IRS!"

[7] Under this system all bank shareholders could be legally required, in the event of distress, for a further payment equal to the initial par value of the shares. So long as most banks only had a few wealthy owners, the system worked well; but once shareholding became widely distributed, both the quantum and timing of such extra funding became doubtful.

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New architecture of financial regulation: Systemic risk measurement and integrating risk exposures into macroprudential and monetary policies

*Dale Gray**

The financial crisis that began in 2007 has its roots in excessive leverage and maturity transformation in the shadow banking system, which grew outside the regulated banking system. Sub-prime loan losses propagating through this system led to a "run on the shadow banking system", a systemic crisis and, ultimately, large-scale risk transfer to the sovereign. Inadequate regulation was part of the cause. But also one reason for not seeing the potential seriousness of the crisis lies in the shortcoming of supervision and of macroeconomic analysis which does not include default, macro-risk exposures or risk transmission propagation through the economy.

Going forward in the design of new financial regulations to address systemic risk it is important to include risk exposures and risk-adjusted balance sheets that provide the foundation for improved systemic risk analysis. Including risk exposure measures in the macroprudential policy framework enhances policy analysis on ways to mitigate financial-sector risk or crisis. The risk-based approach allows financial policies, monetary polices, and government contingent liabilities and sovereign risk to be integrated. This short paper describes the benefits of using risk-adjusted balance sheets; provides an overview of systemic risk models and how they fit together; describes the benefits of the systemic contingent claims analysis (systemic CCA) framework; and how to include risk exposures in macroprudential, fiscal and monetary policy models in an integrated framework.

* Much of this work was done jointly with Andreas Jobst of the International Monetary Fund. This paper complements and extends several aspects of the presentation and paper presented by Charles Goodhart: "The emerging new architecture of financial regulation".

Risk-adjusted balance sheets

Basel I was designed to try to get global consensus and create a level playing field. Basel II tried to address the increasing complexity in balance sheets. Basel I, II and III place great emphasis on capital buffers. What has been missing is that one must take into account and quantify financial institution expected losses and systemic expected losses. Basel is about preventing failure of individual institutions and not aggregate systemic risk – Basel fails to adequately take into account externalities from one bank to another.

Furthermore, Basel rules are adequate when one has activities that have reasonably well-behaved or symmetric payoffs (e.g., loans to individuals), but not with complex option-type assets where a small change in the value of key macro-parameters (e.g., the risk-free rate, or a corporate spread) can cause large changes in the value of the contract. The largest banks are the furthest away from this type of well-behaved asset distribution – this applies mostly to small local banks and not the large cross-border ones. In designing the new architecture for financial regulation it is very useful to focus on the combination of policies and regulations that mitigate systemic losses, which entails reducing the probability and severity of the systemic losses.

What is needed is to extend financial institution risk analysis to understand the relationship between assets, equity capital, debt and *expected losses*. Assets are uncertain and over a horizon period the assets may be larger than promised payments on debt or may be lower, leading to distress and default. Risk exposures measure expected losses due to default or distress and expected upside value (i.e., equity) over a specific horizon period and are components of the risk-adjusted balance sheet. The risk-adjusted balance-sheet concept can be summarised as follows:

Assets = Expected value of equity capital
plus PV of debt promised payments
minus expected loss due to default.

The last two items are the value of risky debt.

When assets decline, the changes on the liability side are spread over both equity (which declines) and expected losses (which go up), assuming that the

PV of debt payments (also called a 'default barrier') stays constant. However, the relationship between equity capital, and assets and expected losses is non-linear. As assets decline, the equity declines and the expected losses increase. Risky debt goes down in value (since risky debt is the default barrier minus the expected losses). The slope, that is, sensitivity, is change in equity capital or change in assets. If this sensitivity factor for equity is examined: the change in assets * sensitivity factor for equity = change in equity capital. This sensitivity factor has a parallel in the Basel accounting world, *it is analogous to the aggregate risk-weighted asset adjustment factor*. Risk-weighted assets are calculated by taking book assets and adjusting them down using specified risk characteristics, aggregating and then analysing the change in bank capital as a *one-to-one change* in risk-weighted assets.

The sensitivity factor for equity and expected losses changes from a non-distress to a distress situation. In the non-distress state assets are high relative to the default barrier and there is substantial equity value. In the non-distress case of very good capitalisation for a 1 per cent decline in assets, the equity capital decreases by 0,7 to 0,9 per cent and the expected losses increase by 0,1 to 0,3 per cent versus the distress state where expected losses are higher and equity value is very small. In the distress state, a 1 per cent decline in assets leads to a decrease in equity capital of 0,1 to 0,3 per cent, but an increase in expected losses of 0,7 to 0,9 per cent. These results are obtained using a simple Merton model where the asset distribution does not reflect true distress situations. In the case of a distressed probability distribution, that is, where there are "large fat-tails", the change in expected losses for a decline in assets is much steeper. In this case a 1 per cent decline in assets can lead to a 2 to 5 per cent increase in expected losses!

From a systemic point of view, a key indicator is the simultaneous joint losses of all the institutions in the system. In a systemic crisis, the correlation is high and joint losses can be incredibly large.

Systemic risk models

The goal of financial systemic risk measures is to determine the contribution of individual financial institutions to systemic risk, including capturing contagion between institutions. The ultimate objective is to assess how systemic risk could be mitigated through special taxes, risk-based premiums, capital surcharges and/or insurance premiums.

Many new systemic risk models have been proposed in the past few years. Figure 1 shows how various systemic risk models are related. Some models use only equity information or only credit default swap (CDS) information, but many combine sources of information. CCA models use equity and balance-sheet information. Distress insurance premium (DIP) uses equity and CDS information. The systemic CCA uses equity, CDS and balance-sheet information. Four of the main systemic risk models proposed are (i) CoVaR (the value at risk (VaR) of the financial system conditional on institutions being in distress), (ii) systemic expected shortfall (SES), (iii) DIP and (iv) the systemic CCA. A short description of each is given in Box 1.

Box 1: Summary of the four main systemic risk models

CoVaR (Adrian and Brunnermeier, 2008): The CoVaR quantifies how financial difficulties of one institution can increase the tail risk of others. CoVaR for a certain institution is defined as the VaR of the whole sector conditional on a particular institution being in distress.

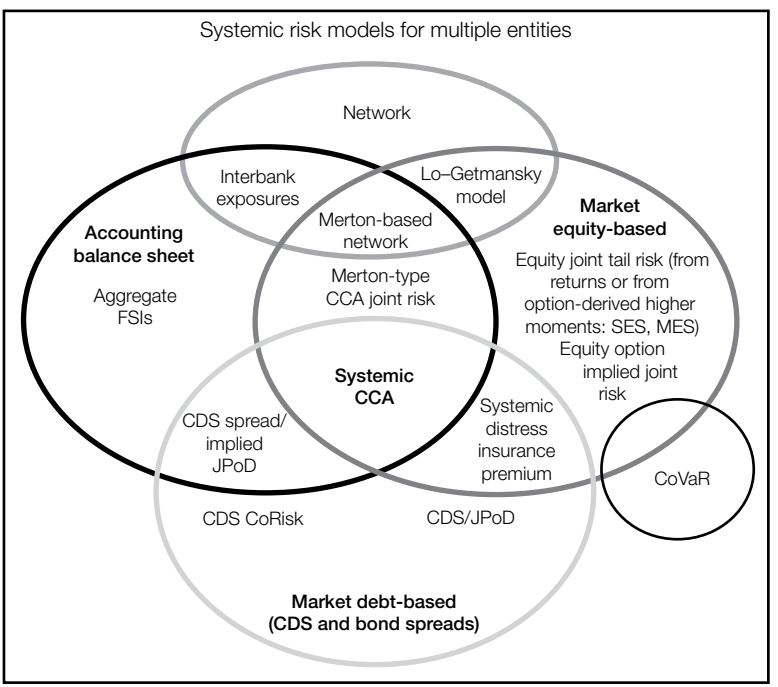
Systemic expected shortfall (SES) (Acharya et al. 2009): The marginal expected shortfall (MES) specifies historical expected losses, conditional on having breached some high systemic risk threshold. Adjusting MES by the degree of firm-specific leverage and capitalisation yields the SES. MES measures only the average, linear, bivariate dependence. It does not consider interaction between subsets of banks.

Distress insurance premium (DIP) (Huang et al. 2010): This approach to measuring and stress testing the systemic risk combines estimates of default risk backed out of CDS spreads with correlation backed out of bank equity returns.

Systemic contingent claims analysis (systemic CCA) (Gray and Jobst 2010 and forthcoming; IMF 2010): CCA is based on a Merton-type model where equity prices and volatility, along with debt default barriers from accounting data, are used to estimate expected losses (i.e., implicit put options in the Merton-type model, see Merton 1973, 1974, 1977; and Gray, Merton and Bodie 2007, 2008). This framework combines financial market data and accounting information to infer the risk-adjusted balance sheets of financial institutions and the dependence between them in order to estimate the joint market-implied expected losses and contingent liabilities. Information from equity and CDS markets is used to calculate individual contingent liabilities to generate a conditional, non-linear metric of systemic contingent liabilities.

The systemic CCA framework provides three distinct benefits: (i) by applying a multivariate density estimation, it helps quantify the marginal contribution of an individual firm to the magnitude of potential risk transfer to the government, while accounting for rapidly changing market valuations of balance-sheet structures; (ii) it can be used to value systemic risk charges, guarantees or insurance within a consistent framework for estimating potential losses based on current market conditions rather than on historical experience; and (iii) it is more comprehensive and flexible than CoVaR or MES, which can be seen as different subsets of the systemic CCA. (See Gray and Malone 2008; Gray and Jobst 2009, 2010.)

Figure 1: Taxonomy of systemic risk models



The expected shortfall (ES) metric in the SES model is an improvement on VaR using CoVaR, since ES is a "coherent risk measure". However, conditioning ES on the most severe outcomes for the entire sample of banks ignores a wide range of underlying asset values below the ES threshold. Similar to CoVaR, the parametric specification of SES/MES conditional on quarterly estimated data (e.g., the necessity to estimate a leverage ratio from quarterly

available data) is insensitive to rapidly changing market valuations of balance-sheet structures, and requires re-estimation with the potential of parameter uncertainty. DIP has similarities to SES in the sense that correlations from equity market returns are used, but default probabilities are backed out of credit CDS spreads and are distorted because the price of CDSs is affected by government liability guarantees. Systemic CCA, however, measures total risk and splits it into the share due to government contingent liabilities and banks' retained risk. The dependence structure in systemic CCA captures risk in a more sophisticated way than the simple correlation used in the other models.

Example of systemic contingent claims analysis applied to the United States financial system

An example of systemic CCA applied to the United States (US) financial sectors delivers useful insights into the magnitude of potential public-sector costs from market-implied expected losses (IMF 2010). Particularly the ability to assess contributions of individual institutions to systemic tail risk and analyse the risk retained in the financial system in relation to the risk taken on by the government via large contingent liabilities makes the systemic CCA framework a useful methodology to analyse potential (non-linear) destabilising feedback processes between the financial sector and the sovereign balance sheet. The systemic risk from contingent liabilities was considerable during the credit crisis. For the whole period from 1 April 2007 to 29 January 2010, the contingent liabilities at the 95th percentile levels amounted to 10 per cent of gross domestic product (GDP) just after the Bear Stearns rescue and 20 per cent of GDP just after Lehman Brothers had failed (See Figure 2). This means that there was a 5 per cent chance of government contingent liabilities being 20 per cent of GDP (over a one-year horizon) in October 2008! Institutions that failed the Supervisory Capital Assessment Program (SCAP) stress tests and the government-sponsored enterprises (GSEs) contributed the largest share to these contingent liabilities.

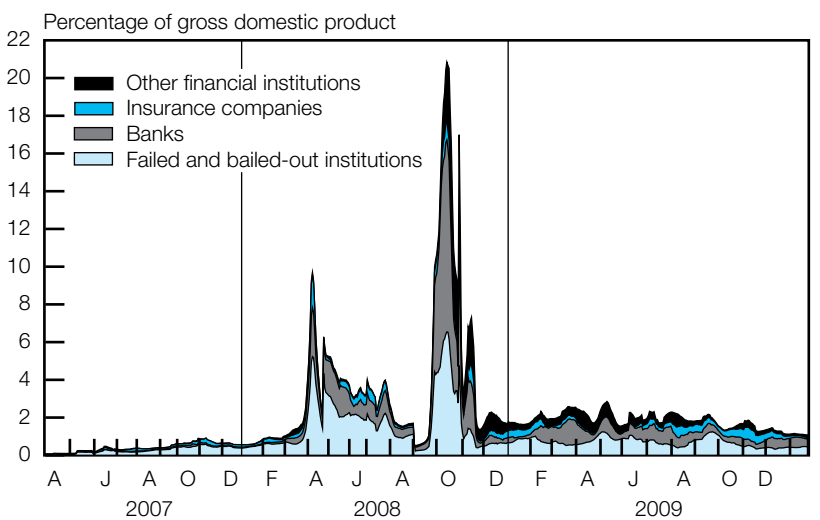
Macroprudential policies, including risk exposures and risk mitigation policies

Macroprudential policy is aimed at reducing systemic risk and focuses on the interactions between financial institutions, markets, infrastructure and the wider economy. Its two main and non-exclusive objectives are to strengthen the financial system's resilience to economic downturns and

other shocks, and to limit the build-up of financial risks by "leaning against the financial cycle".

It is helpful to review the generalised risk management guidelines shown in Table 1. If loss frequency is low and severity low, then retain the risk. If the loss frequency is high but severity is low, then retain the risk but use risk mitigation tools. If the frequency of loss is low but severity is high, then it is most appropriate to use risk transfer tools – called 'loss financing' which includes insurance, guarantees and hedging. If both frequency and severity are high, avoid the activity (from a regulatory point of view it means banning the activity).

Figure 2: United States financial sector: Decomposition of average daily expected shortfall (95th percentile) based on multivariate density of contingent liabilities[1]



[1] Sample period: 3 January 2007 – 29 January 2010 (743 obs.) of individual put option values (i.e., expected losses) conditional on the endogenous alpha factor of implicit guarantees of 36 sample banks, insurance companies, and other financial institutions. The multivariate density is generated from univariate marginals, which conform to the generalised extreme value distribution (GEV) and a non-parametrically identified time-varying dependence structure. The marginal severity and dependence are estimated over a window of 60 and 250 working days (with daily updating) via the linear ratio of spacings (LRS) method and the iterative logistic model procedure respectively.

There are two broad ways to mitigate risk: (i) on direct change in the balance sheet (e.g., increasing capital or equity, reducing debt) and (ii) risk transfer. Risk transfer instruments include (i) pre-loss financing (e.g., contingent

Table 1: Generalised risk management guidelines

Frequency of loss	Severity of loss	Guideline
Low	Low	Retention
Low	High	Loss financing (e.g., insurance, guarantees, hedging)
High	Low	Retention with risk mitigation
High	High	Avoid the activity

equity, loss equity puts, reverse convertible debt (hybrid/CoCos) and contingent debt); and (ii) insurance (contingent asset protection, insurance against extreme losses), guarantees (from government or third parties), and (iii) diversification and hedging.

A recent Bank for International Settlements (BIS) Committee on the Global Financial System (CGFS) (2010) paper addresses issues central banks face as macroprudential frameworks are developed and applied. The CGFS survey of central bank practices indicates that macroprudential policy frameworks remain at the groundwork stage. Conceptions of macroprudential policy objectives are "fuzzy". In most cases central banks have relied on adjustments or add-ons to existing micro-prudential and liquidity management policies, based on judgement rather than rules. The most widely used instruments have been constraints on bank credit supply to specific sectors that are seen as prone to excessive credit growth. Measures targeting the size and structure of financial institutions' balance sheets (e.g., dynamic capital and reserve requirements, capital surcharges, loan to deposit and leverage ratios) are also increasingly considered in the light of the crisis.

The analysis in the CGFS report is tilted towards static accounting indicators of vulnerability and policies that are geared to affect balance-sheet components directly. The narrow approach in the CGFS paper excludes a richer risk-orientated framework. Policies to mitigate risk include those that mitigate risk retained on the balance sheet *and policies that transfer risk via insurance, guarantees, hedging or diversification*. Table 2 shows (dynamic) risk exposures on the vertical axis and a redefining of the columns to make a distinction between retained risk and transferred risk. This framework can help analyse the role and calculation of systemic capital charges or levies and direct restrictions on size, as well as how sovereign risk interacts with banking vulnerabilities and how this fits into macroprudential regulation.

Of these, macrofinancial risk linkages are crucial to understanding the tail risk in institutions coming from shadow banking and excessive derivatives

Table 2: Macroprudential and related instruments by vulnerability or risk and system component[1]

	Instrument	Financial system component				
		Bank or deposit taker			Non-deposit-taking institutions	Markets
		Balance-sheet adjustment to reduce risk		Transferred risk exposure (to government or non-government)	Transferred risk exposure (to government or non-government)	
		Direct balance-sheet adjustments	Lending criteria related			
Vulnerability	**Credit risk** Probability of default (PoD) and expected loss due to default (EL)	– Capital ratio – Risk weights – Provisioning – Profit distribution restrictions – Credit growth cap	– LTV cap – Debt service-to-income cap – Maturity cap	– Deposit insurance – Liability guarantee surcharge – Contingent capital – Contingent debt	– *Liability guarantee surcharge*	– Margin/ Haircut limit
	Liquidity risk Probability of liquidity distress (PoLD) and expected cost of liquidity distress (ECLD)	– Reserve requirements – Foreign-exchange lending restriction – Currency mismatch limit – Open foreign-exchange position limit	– Valuation rules (e.g., money-market mutual funds)	– *Implicit, explicit short-term liquidity support*	– *Exceptional central bank liquidity support*	
	Systemic liquidity and credit risk	– Concentration limits – Subsidiarisation		– Systemic capital surcharge – Systemic risk insurance/guarantee – Financial sector tax (e.g., FAT tax, or surcharge)	– *Systemic capital surcharge* – *Financial-sector tax (e.g., FAT tax, or surcharge)*	– *Central clearing*

[1] New potential macroprudential policies to help mitigate risk are shown in italic

Source: International Monetary Fund

risk concentration — things that are banks' hidden or contingent liabilities. This can give guidance for banning the activity.

Interaction and feedback between the sovereign contingent claims analysis balance sheet and the financial sector: Potential destabilisation processes

The CCA framework can be used to measure sovereign risk-adjusted balance sheets and be integrated into banking-sector balance sheets in a simple but illustrative framework to show the interaction and potential destabilisation of values of spreads and risks in both the sovereign and banking sectors. In the absence of measureable equity and equity volatility, such as in the case of a developed country sovereign, including where their assets and debt are all in the same currency, the term structure of sovereign spreads can be used to estimate implied sovereign assets and asset volatility, and calibrate market-implied sovereign risk-adjusted balance sheets.

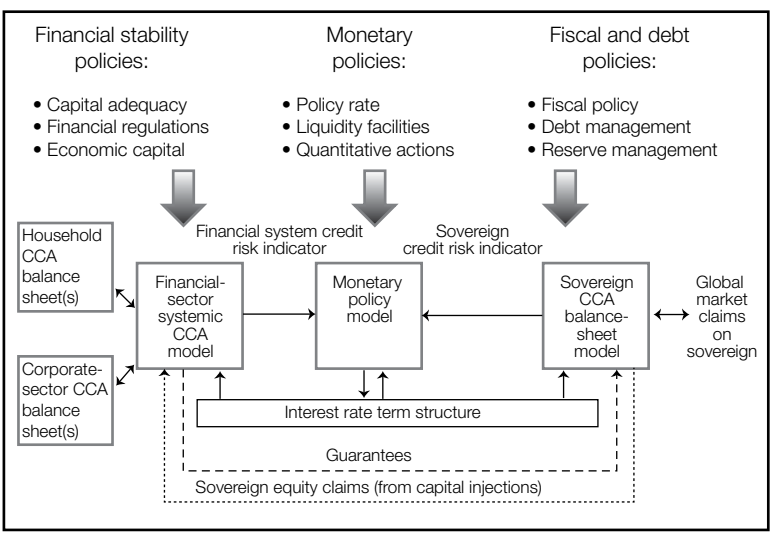
Using an estimate of the sovereign default barrier from debt data, and using the full-term structure of the sovereign CDS (CDS for years 1, 3, 5, 7 and 10), an estimate of implied sovereign assets and implied sovereign asset volatility can be calculated.[1] This simple model shows the ways in which sovereign and bank spreads can interact and potentially lead to a destabilisation process. If sovereign spreads increase, this can lead to an increase in bank spreads because (i) the credibility of sovereign guarantees decreases; (ii) the implicit bank put option could increase as the value of the bank's holdings of government debt decreases; and (iii) the bank default barrier may increase due to higher borrowing costs as the premium increases (and if banks cannot roll over debt). Prospects of a much more fragile banking system can feed back on sovereign spreads via several possible channels, such as an increasing large bank guarantee or bailout costs that may overwhelm the budget, reduced ability of sovereigns to borrow from banks and potential crowding-out effects.

Unified framework for financial, monetary and fiscal policy

Once credit risk exposures and systemic risk indicators are calculated for the financial sector and the sovereign, a rich framework can be developed

which allows financial, monetary and fiscal policies to be linked and integrated. Recent research has shown that systemic risk indicators have an important impact on GDP and the output gap, and can be used in monetary policy models (Garcia et al. 2008). Furthermore, the use of CCA for the financial-sector risk allows the measurement and analysis of risk transfer to the government (i.e., government contingent liabilities) which can lead to serious sovereign risk problems and higher borrowing costs (see Gray 2009). An integrated framework is described in Figure 3. The primary targets are output and inflation, along with subsidiary targets of maximum levels of financial-sector systemic risk and sovereign risk. It allows for the integration and impact of financial or macroprudential policies with fiscal and monetary policies.

Figure 3: Unified macrofinance framework targets: Inflation, gross domestic product, financial system credit risk and sovereign credit risk



Note

[1] See Dale Gray and Arthur Jobst's chapter, "Modeling systemic and sovereign risks", in *Lessons from the financial crisis* edited by Arthur Berd, 2010.

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The emerging new architecture of financial regulation: A response to Charles Goodhart

*Yvette Singh**

1. Introduction

The concepts raised in the paper presented by Prof. Goodhart titled "The emerging new architecture of financial regulation" are certainly interesting and thought-provoking, and would certainly be taken to heart from a South African perspective as we always attempt to enhance our existing regulatory and supervisory framework. Reform and change in general are ongoing events, but they should also be suitable for individual countries, South Africa included, and their appropriateness and potential impact should be taken into account, given their national circumstances. Reforms and changes, no matter how well intended, might also lead to some unintended negative consequences.

South Africa's current regulatory and supervisory framework stood it in good stead during the past global financial crisis, evident in the fact that not only did none of the South African banks fail, but not one of them needed any form of liquidity support, neither from the central bank nor from government.

Of course, this does not mean that we should become complacent. In fact, we still remain vigilant as always and will take the appropriate action as and when required to ensure a sound and safe banking sector. We therefore continually monitor international regulatory and supervisory frameworks, but in doing so, also attempt not to "fix something that is not broken", as not all international regulatory reforms and changes are necessarily appropriate to local circumstances.

* Paper prepared by Riaan Hattingh, South African Reserve Bank College.

2. Architecture of financial regulation and supervision in South Africa

In South Africa the South African Reserve Bank (the Bank), through its Bank Supervision Department (BSD), is responsible for banking regulation and supervision (also referred to as 'micro-prudential supervision') and for financial stability (macroprudential supervision). The mission of the BSD is "to promote the soundness of the banking system and to minimise systemic risk through the effective and efficient application of international regulatory and supervisory standards". A key outflow of the successful achievement of this mission is "depositor protection".

Conversely, the Financial Services Board, an independent statutory body accountable to the Minister of Finance, is responsible for the regulation and supervision of all non-bank financial institutions. The Financial Services Board also takes responsibility for investor protection in the markets it supervises, which include short- and long-term insurers, retirement funds, securities markets, financial services providers and collective investment schemes.

The framework for regulation and supervision of the South African consumer credit market is undertaken by the National Credit Regulator (NCR). The NCR, an independent statutory body, is primarily focused on consumer protection, and intends to promote a credit market that is fair, transparent, accessible, competitive and sustainable.

2.1 Preventative supervisory actions

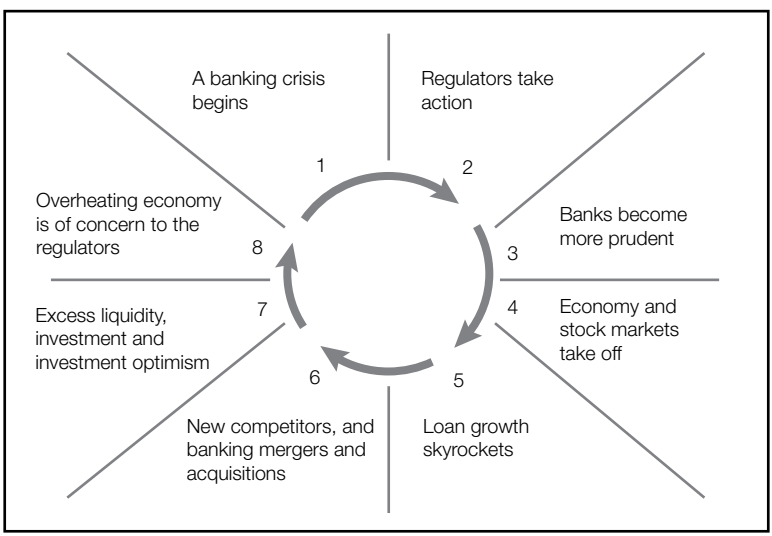
South African banks have mostly been isolated from the turmoil in international markets. Because the South African banking sector has had no direct exposure to the sub-prime mortgage market, the impact has been minimal. Therefore, while there has been no need for drastic enforcement of any changes to the local regulatory infrastructure as a result of the crisis, the banking sector continues to operate in a very challenging environment, demanding continued and increasingly intensive supervisory actions.

2.1.1 Stages of the banking cycle

As is commonly known and understood, banking and banks progress through various stages of a cycle. It is those banks that proactively plan during the good times for the hard times that survive.

From Figure 1, one can easily identify the corresponding events in South Africa. The country experienced a banking crisis (Stage 1) during the period from late 1999 to 2002, resulting in many regulatory actions being taken and implemented during Stage 2. As a result of these actions, normality returned to the banking sector. Banks became more prudent and remained very much aware of those events, leading to down- or rightsizing of business; curtailment and critical evaluation of cost structures; disposal of previously acquired non-core and non-performing assets and investments; evaluation of the required staff complements; reconstitution of management and board structures; and an overhaul of risk management practices. Stock markets and the South African economy took off (Stage 4), resulting in all macroeconomic indicators moving into positive territory. The all-share index touched an all-time high, loan growth increased (Stage 5) and demand for credit surged to a 13-month high in early 2005, while consumer spending remained strong.

Figure 1: Stages of a banking cycle



Signs of Stages 6 and 7 started emerging by 2005, causing the banking regulator to encourage banks to take proactive steps and actions in preparation for the leaner periods that might follow. With hindsight, the

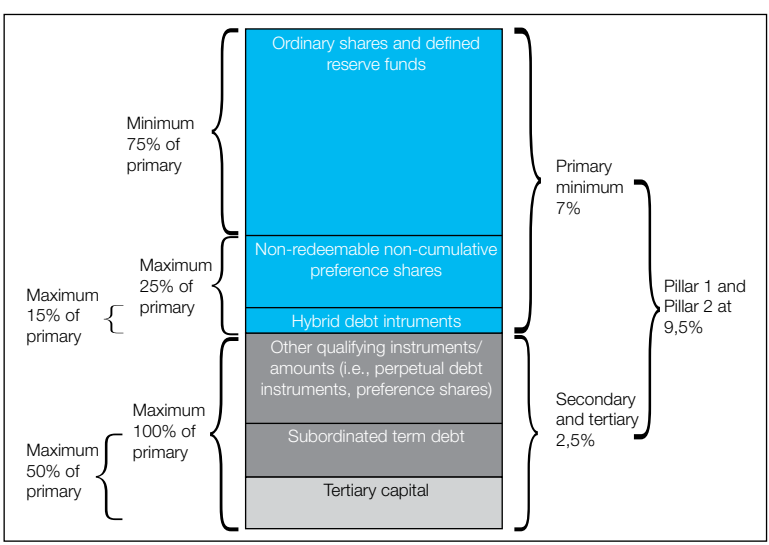
warning, unrelated to international events, came just in time for the crisis that was soon to follow.

2.1.2 Appropriate level of capital for the risk being undertaken

Banks in South Africa are required to maintain, at all times, overall financial resources that are adequate in respect of both amount and quality. It is generally recognised that, as a minimum, the capital and reserve funds of a bank serve not only as a basis for the bank's future growth, but also as a cushion against any unexpected losses, especially during economic downturns.

Often, banks choose to maintain capital levels substantially higher than the minimum requirements prescribed by regulators, since banks prefer to be highly rated by recognised rating agencies, in order to reduce their cost of funding. The overall objective of Basel II is to promote the adequate capitalisation of banks commensurate with the risk undertaken and to encourage improvements in banks' risk management processes. South Africa complied with the minimum capital requirement for banks at 8 per cent (as proposed by the Basel Committee on Banking Supervision (the Basel Committee)), but added a further

Figure 2: The revised capital framework implemented in South Africa with effect from January 2008



1,5 per cent for systemic risk. The Pillar 1 capital requirement for South African banks is therefore 9,5 per cent, effective 1 January 2008 when Basel II was officially implemented in South Africa.

Requirements regarding the composition of capital are that primary capital should constitute at least 7 per cent of total capital, 5,25 per cent of which should consist of Tier 1 core capital. Compared to the current proposals of Basel III as they relate to core capital, South Africa's largest banks, therefore, already adhere to these minimum requirements (Table 1).

In addition to the 9,5 per cent capital, a further capital charge has been imposed on the individual banks, depending on the idiosyncratic risk of the individual institution.

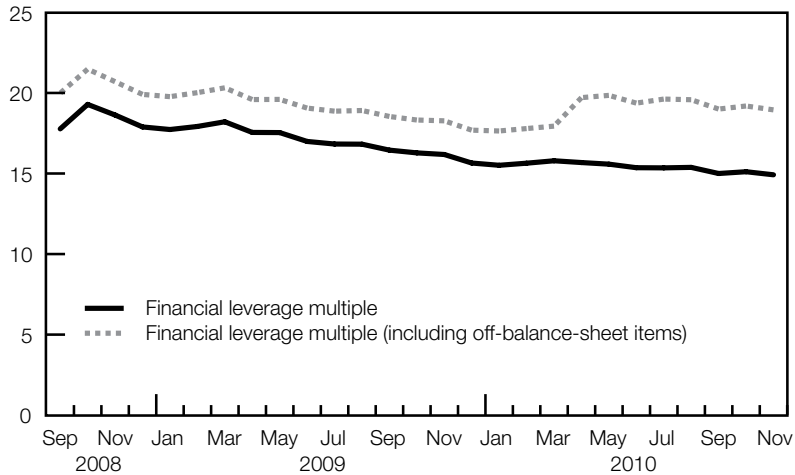
Table 1: Capital position of South African banks

Per cent

	The Standard Bank of South Africa	Absa	Nedbank	First-Rand Bank	South Africa: Current regulation	Final implementation Basel III: 1 Jan 2019
Core Tier 1	11,00	10,70	9,90	10,70	5,25	4,50
Tier 1 capital ratio	11,80	12,00	11,50	11,70	7,00	6,00
Total capital ratio.....	14,60	14,90	14,80	14,00	9,75	8,00
Basel conservation buffer						2,50
Basel countercyclical buffer maximum.....						2,50
Minimum total capital *plus* both buffers.....	14,60	14,90	14,80	14,00	9,75	13,00

Furthermore, Basel III proposals include introducing a non-risk-based leverage ratio as an additional prudential tool to limit excessive leverage in a banking system. For the past few years, as part of its supervisory framework, the BSD has calculated and monitored banks' leverage multiples in order to monitor the build-up of risk. South African banks are, however, in general not highly leveraged (Figure 3).

Figure 3: Financial leverage times of South African banks



2.1.3 Specific supervisory actions

The robustness of the South African banking sector has been accomplished through a strict adherence to international best practices and intensive supervisory action over many years. Some of the actions undertaken by the BSD that undoubtedly assisted in maintaining a safe and sound banking system include the following:

- Participation in the Financial Sector Contingency Forum since 2002
- The revision of corporate governance processes in 2002 (codified in law in 2008)
- Simulation exercises conducted within banking groups as part of their contingency planning and liquidity risk management during 2006
- The adoption of a voluntary code for responsible lending by banks during 2007
- The implementation of the revised Core Principles for Effective Banking Supervision (the Core Principles)
- The appointment of an external audit firm in 2007 to conduct an independent assessment of all securitisation exposures of South African banks and to provide detailed information of its assessment whereby the banks had to establish their position vis-à-vis any potential contagion (or other) risks[1]
- The successful implementation of Basel II in 2008
- The introduction of biannual stress testing since 2008
- Specific focus on internal capital-adequacy assessment processes (ICAAPs) since 2008
- A review of banks' compliance with the Principles for Sound Liquidity

- Risk Management and Supervision
- The corporate governance benchmarking by banks in 2009
- Local banks' self-assessment on compensation practices.

From the findings it became clear that local banks had no direct exposure to the sub-prime mortgage market, while the banks' international franchises had only limited exposure. One of the banks that did have exposure to the sub-prime mortgage market (although to a limited extent) through its separate off-shore-listed operations had to make a negative mark-to-market adjustment to its portfolio.

2.2 Latest pronouncements from the Basel Committee

As is already well known, the Basel Committee developed a reform programme (now generally referred to as 'Basel III') in response to the global financial crisis. The reform package consists of the following building blocks:

- Raising the quality of capital in order to be more loss absorbent
- Strengthening the risk coverage of the capital framework
- Introducing a leverage ratio
- Introducing measures to promote the build-up of capital buffers that can be drawn on in periods of stress
- Introducing a global minimum liquidity standard.

Raising the quality and minimum level of capital entails an increase for all banks in common equity Tier 1 capital from 2 per cent to 4,5 per cent, with a total minimum common equity Tier 1 capital of 7 per cent. Furthermore, the Tier 1 or primary capital requirement, which includes common equity and other qualifying financial instruments based on stricter criteria, is to be raised from 4 per cent to 6 per cent. The total Pillar 1 capital, however, remains at 8 per cent. Banks are also required to establish a capital conservation buffer of 2,5 per cent above the specified regulatory minimum requirement, to be met with common equity; the purpose of which is to ensure that banks maintain a buffer of capital that can be used to absorb losses during periods of financial and economic stress. A countercyclical buffer within a range of 0 to 2,5 per cent of common equity or other fully loss-absorbing capital is proposed; the implementation of which is subject to national circumstances.

Additional work being conducted by the Basel Committee includes a fundamental review of the trading book; the use of external rating agencies;

policy responses to systemically important banks; a review of the Core Principles; and stronger collaboration among banks through the establishment of supervisory colleges.

The BSD has already commenced with its formal processes to amend its regulatory framework in accordance with the latest internationally agreed regulatory and supervisory standards.

2.3 Concluding remarks

The increase in capital quality and level as required by the Basel Committee and Group of Twenty (G-20) reform packages should not impact on South African banks that much, as local banks already comply with most of these proposals. It will, however, affect the level of capital that will be available to banks for future growth. Substantial work needs to be done in order to ensure compliance with the liquidity standards. In this regard, the National Treasury has established, and is driving, various workstreams in which the BSD and commercial banks participate.

The BSD will continue to monitor and assess international developments to ensure that the South African banking sector remains resilient. For South Africa, it is therefore rather a matter of "fine tuning" the existing regulatory and supervisory architecture than developing a new one.

Note

[1] Detailed information on securitisation practices and foreign funding were scrutinised. South African banks had no direct exposure to the sub-prime mortgage market, while their international franchises had only limited exposure. One of the banks that did have exposure to the sub-prime mortgage market (although to a limited extent) through its separate off-shore-listed operations had to make a negative mark-to-market adjustment to its portfolio.

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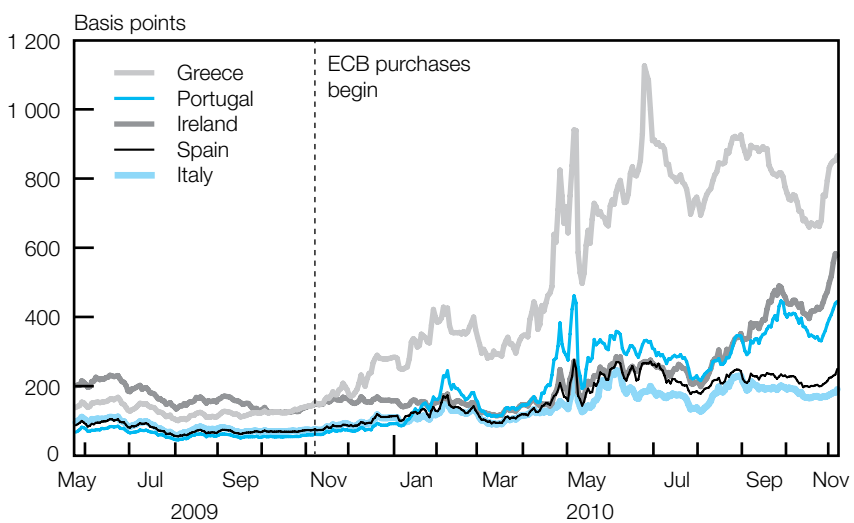
The unravelling of the euro and the South African economy*

Desmond Lachman

Among the more important developments in the global economy in 2010 was the outbreak of a sovereign debt crisis in the eurozone's peripheral economies. Sadly, there is every indication that the eurozone's sovereign debt crisis will only intensify in the year ahead as markets increasingly focus on the intractable solvency and competitiveness issues confronting the Portuguese, Italian, Irish, Greek and Spanish (PIIGS) economies. It is all too likely that any such intensification will severely impact Europe's already troubled banking system in a manner that will seriously threaten the global economic recovery.

South Africa, along with other open commodity-dependent emerging-market economies, would appear to be particularly vulnerable to any renewed global economic downturn and to any renewed increase in global risk aversion.

Figure 1: Five-year credit-default swap spreads



Source: Bloomberg

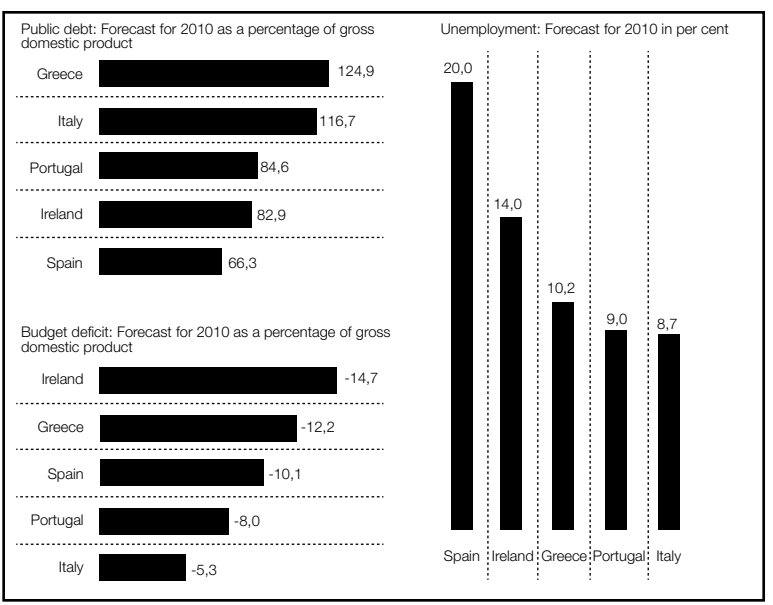
* This paper formed part of the monograph published by the Legatum Institute titled "Can the euro survive?" (2010).

In anticipation of such an eventuality, there would seem to be little room for outsized wage increases and for unduly high public-sector borrowing requirements in the South African economy. It would also appear to be an opportune time for the South African Reserve Bank (the Bank) to rethink its policy of non-intervention in the foreign-exchange market, which threatens to continue contributing to the undue volatility of the South African currency.

A fundamentally flawed idea

In January 1999, at the time of the launch of the euro, Milton Friedman famously warned that the euro would not survive Europe's first major economic recession. He based his grave misgivings on his assessment that Europe was not an optimal currency area in the sense that the United States (US) was. In particular, he noted the fact that Europe lacked the required degree of wage flexibility and of labour market mobility that are the necessary conditions for a successfully functioning monetary union. He also noted that Europe lacked a system of federal fiscal transfers that a currency union such as the US enjoyed, whereby federal funds were routinely transferred from the stronger to the weaker states.

Figure 2: The eurozone's problem children

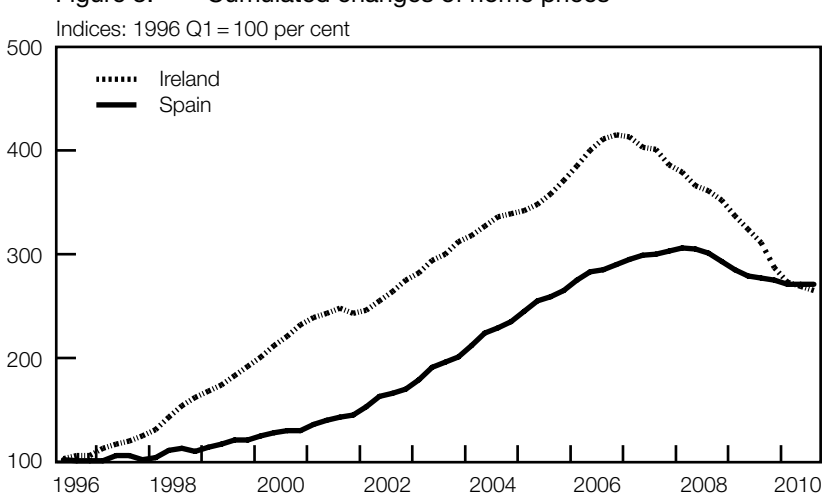


Source: European Commission

Aware of the intrinsic structural weaknesses to which Friedman alluded, European leaders realised that strict budget and public debt limits were fundamental to the successful functioning of the euro. They also recognised the dangers of different rates of inflation among member countries. To that end, the eurozone's members agreed on enshrining the Maastricht criteria to qualify for eurozone membership into an Economic Growth and Stability Pact (the pact). This pact required member countries to keep their budget deficits below 3 per cent of gross domestic product (GDP) and to limit their public debt to no more than 60 per cent of GDP.

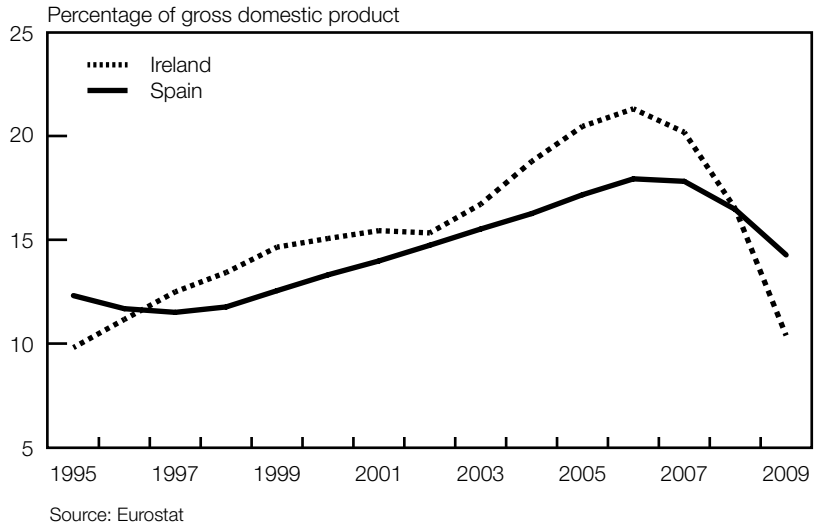
In his darkest moments, Milton Friedman could not possibly have imagined the degree to which imbalances would build up in countries such as Portugal, Ireland, Greece and Spain. These imbalances built up as markets readily provided the necessary financing and as the eurozone lacked the instruments to enforce the limits of the pact. Budget deficits for these peripheral countries have all ballooned to double-digit levels as a percentage of GDP, which is placing these countries' public debt levels on a path that would soon well exceed 100 per cent of GDP. At the same time, these countries have generally lost in excess of 20 per cent in international competitiveness, which has been a principal reason for double-digit current-account deficits as a percentage of GDP in these countries. Further complicating matters has been inappropriately low European Central Bank (ECB) interest rates for Europe's periphery which, together with unduly easy credit conditions, spawned outsized housing market bubbles in Ireland and Spain.

Figure 3: Cumulated changes of home prices



Sources: ESRI, Ministerio de Viviendas

Figure 4: Construction investment



Source: Eurostat

The essence of the eurozone periphery's present economic predicament is that the countries in that periphery have all run up very large internal and external imbalances that will be extraordinarily difficult to correct without the benefit of having separate domestic currencies. Stuck within the eurozone, these countries cannot resort to currency devaluation to restore the very sizeable losses that they have registered in international competitiveness. Nor can they devalue their currencies to boost exports as a cushion to offset the highly negative impact on their economies from the major fiscal retrenchment that the International Monetary Fund (IMF) and the European Union (EU) are requiring as a condition for their financial support. Attempting to adjust under these conditions must be expected to entail many years of painful deflationary and recessionary conditions for these countries, which will only compound their problems of indebtedness.[1]

Greece's road to default

The Greek case, where the economic imbalances are the greatest, illustrates most vividly the futility of trying to adhere to the IMF's prescription of painful budget adjustment without resort to either currency devaluation or debt restructuring. Greece's two basic problems are (i) its extraordinarily bad public finances and (ii) its large loss in international competitiveness. As already mentioned above, despite the strictures of the pact, Greece's budget

deficit has ballooned to 14 per cent of GDP, while over the past decade it has managed to lose over 20 per cent in wage and price competitiveness.

Not wishing to countenance the idea of either debt restructuring or euro exit as part of its May 2010 US$140 billion support package for Greece, the IMF and the EU are currently prescribing draconian fiscal retrenchment as a cure-all to Greece's many economic ills. Indeed, they are requiring Greece to cut its budget deficit by no less than 11 per cent of GDP over the next three years, with half of that adjustment to occur in the first year of the programme. Recognising that fiscal retrenchment will entail a significant recession that will erode Greece's tax base, the IMF is insisting that Greece implement tax hikes and public spending cuts that total as much as 10 full percentage points of GDP in 2010. Adjustment of this order of magnitude, and in so short a space of time, goes considerably beyond what the IMF has ever prescribed before for any other of its major economic clients.

By now one would have thought that the IMF would have learnt that undertaking a Herculean-sized budget adjustment, without the benefit of a currency depreciation to boost exports, would plunge the Greek economy into a major economic recession that would sap Greece's political willingness to endure many years of painful austerity. One would also have thought that this would be particularly the case at a time when Greece's borrowing costs had soared, its banks were losing deposits and labour disturbances had become the order of the day. It is difficult to understand how the IMF could seriously be thinking that the Greek economy could possibly avoid the deepest of economic recessions. After all, its economy was being subjected to 10 full percentage points of fiscal tightening at the very same time that the markets had, in effect, brutally tightened monetary policy for Greece by raising borrowing costs since the beginning of the year by around 8 percentage points.

If one had any doubt on this score, all one needed do was look at the sorry experience of Argentina under the IMF's tutelage in the late 1990s.[2] In the late 1990s Argentina, like Greece today, found itself in deep economic and financial trouble, though not nearly to the extent that Greece has today.[3] Like Greece today, it did so by profligate public spending within the context of an "immutable" currency peg to the US dollar. Yet, although very much smaller might Argentina's economic imbalances have been than those in Greece today, it subsequently found that attempting to address those imbalances

through IMF-style fiscal austerity, while maintaining its currency peg, was an exercise in futility. Since, without the benefit of a currency depreciation to boost exports, fiscal austerity produced a deep economic recession that undermined its political willingness to stick with austerity policies. The ensuing domestic financial crisis plunged the economy into an economic depression that saw Argentina's GDP decline by 25 per cent in the early 2000s.

Closer to home, one would have thought that before embarking on an IMF hair-shirt-style adjustment programme, Greece might have wanted to take a close look at the more recent adjustment experience in Latvia and Ireland, since, over the past two years, output has collapsed by over 20 and 10 per cent in Latvia and Ireland respectively. It has done so precisely as a result of IMF-style budget-deficit reduction on a very much lesser scale than that now being proposed for Greece in the context of a fixed exchange rate system. Given the very much larger fiscal adjustment being required of Greece than was the case in Ireland and Latvia, extrapolating from the Irish and Latvian experience, one must expect that Greece's economy could very well contract by 15 per cent over the next two years. Such a contraction would be more than double the 6 per cent in the Greek economy that the IMF is targeting, which would almost certainly put the IMF stand-by programme for Greece off track.

At the same time that the IMF is proposing a draconian budget adjustment for Greece, it is also urging Greece to restore the 20 per cent that it has lost in international competitiveness over the past decade through an "internal devaluation". Given the limitations on Greece's ability to increase labour productivity through structural reform, the IMF would like to see wages and prices fall in Greece over a prolonged period of time so as to restore its loss in competitiveness.

The basic flaw in the IMF-sponsored programme is that if successfully implemented, it will have the unwanted effect of substantially increasing rather than reducing Greece's public debt-to-GDP ratio. Since if Greece's nominal GDP were to decline over the next few years by 20 per cent, as a result of a deep recession and price deflation, Greece's public debt-to-GDP ratio would arithmetically rise from its present level of around 120 per cent towards 175 per cent.[4] It is calculations of this sort that have recently led Standard & Poor's (S&P) to warn Greek bond holders that they might eventually retrieve only 30 to 50 cents on the dollar on their bond holdings.

It is also calculations of this sort that is inducing markets to assign a 75 per cent probability to a Greek sovereign restructuring within the next five years, despite the massive IMF–EU Greek bailout package.

It is difficult to understand why the Greek government is allowing the IMF to lead it down a path that failed so spectacularly in Argentina. This is all the more so the case when one considers the very much larger fiscal adjustment that the IMF is requiring of Greece than it did of Argentina. If Argentina's experience is any guide, over the next few years Greece's economy will be put through the severest of wringers as the brutal IMF fiscal adjustment takes fuller effect in the context of very high domestic interest rates. At the same time, the country will be saddled with a mountain of IMF and EU debt as official financing replaces private financing, thereby making Greece's debt all the more difficult to restructure. Yet, in the end, it is all too probable that Greece will be forced to default on its sovereign debt and to exit the euro as a means to improve its competitive position.

What makes Greece's economic outlook all the more tragic is that the Greek government does have viable policy options, which inexplicably it is choosing not to exercise. Principal among these is Greece's option to restructure its US$420 billion sovereign debt in an orderly way as a means of reducing the fiscal adjustment required to restore fiscal policy sustainability. For, unlike the 2001 Argentina case, where almost the entirety of Argentina's debt was covered by American or English law, around 90 per cent of Greece's debt is covered by Greek law.[5] By changing its domestic law, Greece can restructure the overwhelming majority of its sovereign debt without fear of having to pay Argentina's price for irresponsible public-sector borrowing.

That is not to say that there would not be a large cost for a Greek default. Rather, it is to say that the cost of such a default would be shifted by Greece mainly to the European banks, the largest holder of those bonds. Ultimately, that burden would be shifted to the European taxpayer who, in all probability, would be needed to bail out the European banks. To be sure, having the IMF kick the Greek can forward through large-scale official financing might be in the immediate interest of the European banks. However, it remains difficult to understand why Greece is allowing the IMF to put the Greek economy through the severest recessions when the most that is being achieved is the delay of an inevitable debt restructuring and of an all-too-likely euro exit.

Ireland's hangover

In a number of important respects, after Greece, Ireland appears to be the eurozone member country most likely to default on its sovereign debt. As was the case in Greece, Ireland's budget deficit increased sharply to 14 per cent of GDP by 2009. Despite the early adoption of bold fiscal measures to address the country's public finance imbalances, the Irish budget deficit is expected to remain at an unsustainably high 12 per cent of GDP in 2010, or at the highest level in the eurozone. However, unlike the Greek case, Ireland's public finance problems were not the result of budget profligacy. Rather, they have been the product of a hangover from an uncontrolled credit binge.

In the early part of this decade, an orgy of Irish bank lending both helped to fuel the Celtic Tiger's economic miracle and gave rise to one of the world's most pronounced property speculative bubbles.[6] In the two years since that bubble burst in early 2008, the Irish economy had contracted by a cumulative 13 per cent and unemployment had risen to 13 per cent. Meanwhile, the country's public finances deteriorated sharply as the government's property-based tax revenues collapsed and as income tax collections were severely impacted by rising unemployment and by declining incomes.

More ominously yet for Ireland's future public finance outlook, at the end of September 2008 the government announced a blanket guarantee on all of the liabilities of the main Irish-controlled banks. It did so in response to the inability of Anglo Irish Bank, a major Irish bank, to roll over its debt and to fears of a contagious reaction onto the other banks. Subsequent revelations of balance-sheet window-dressing at Anglo Irish Bank and some dubious transactions related to share purchases contributed to the government's decision to take full ownership control of Anglo Irish in early 2009. Since the gross bank liabilities guaranteed by the government amounted to well over twice Ireland's GDP, the open-ended nature of the possible bank losses constitute a very large potential charge on the Irish government's finances. That blanket guarantee is now proving to have been a very costly policy mistake and is raising serious political questions as to why the government agreed to guarantee all creditors, including unsecured creditors, as opposed to only depositors in the Irish banking system.

Until very recently, markets turned a blind eye to Ireland's highly compromised public finances and to the massive potential cost to the Irish exchequer of the blanket liability guarantee programme. Instead, markets lavished praise

on the Irish government for the bold and timely fiscal measures that it took in an effort to correct its rapidly eroding public finances. Markets were particularly impressed with the deep public spending cuts, especially in the area of wage and benefit cuts, as well as with the government's capacity to withstand considerable economic pain. Ireland was amply rewarded for its efforts by the market as was reflected in the relatively low interest rates that the market demanded for purchasing Irish government bonds as compared with the corresponding rates demanded for other countries in the eurozone's periphery.

In August 2010 there was an abrupt turnaround in market sentiment towards Ireland as doubts began to surface as to whether Ireland was any more solvent than was Greece. These doubts were reflected in a widening in the spreads on Irish bonds relative to those on German bunds to as wide as 400 basis points or to their widest levels since Ireland had joined the euro. The factor triggering the sea change in the market's attitude was a further downgrading of Ireland by the rating agency S&P. The market was particularly taken aback by S&P's estimate that Ireland's blanket bank liability guarantee could in the end cost the Irish government between a staggering €80 billion and €90 billion, or the equivalent of between 50 and 58 per cent of Ireland's GDP. The market was also shocked by S&P's estimate that Ireland's banking-sector problem could raise the country's public debt level to 110 per cent of GDP by 2012, or to a level not very different from that currently prevailing in Greece.

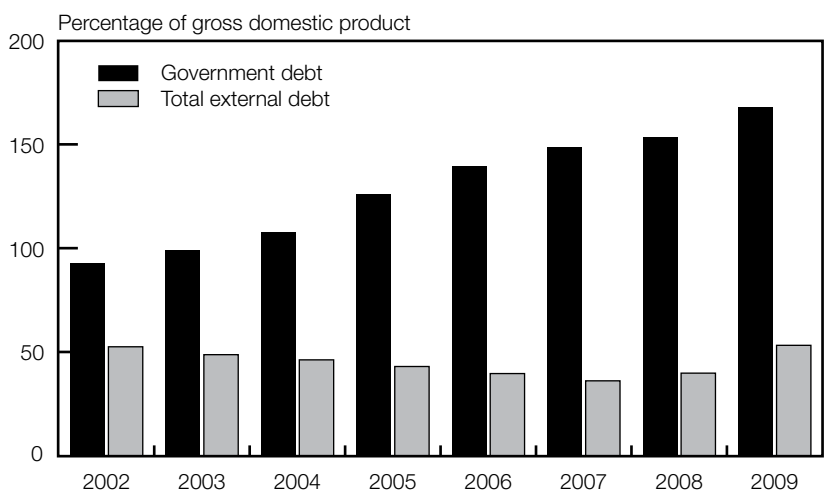
The Irish government is hoping that Ireland will somehow grow its way out of its public finance and public debt problems after having seen its GDP contract so sharply over the past two years. However, such hopes would seem to be fanciful in the light of both the substantial amount of budget-deficit cutting that lies ahead, as well as of the large effective monetary policy tightening being forced on Ireland by the mounting financial market scepticism about Ireland's longer-run solvency. The IMF estimates that Ireland needs further fiscal tightening of at least 6½ percentage points of GDP over the next two years if the country is to hope to regain fiscal policy sustainability. At the same time, since the start of 2010 Irish interest rates have increased by more than 250 basis points, while credit has become considerably more difficult to obtain. Since Ireland is stuck within the euro straightjacket and is unable to boost export growth by currency devaluation, one has to expect further declines in Irish GDP in the year ahead as the Irish economy is subjected to further fiscal policy tightening and higher market interest rates.

Spain's balance-of-payments problem

Spain poses a much greater threat to the long-term survival of the eurozone in its present form than does Greece. After all, its economy is five time the size of that of Greece, while at over US$1 trillion its sovereign debt exceeds that of Greece by a factor of three. In addition, the Spanish economy is burdened by an excessively high external indebtedness level, which makes the Spanish economy particularly vulnerable to the whims of the international capital market. While at less than 60 per cent of GDP Spain's public debt level is rather comfortable at 135 per cent of GDP, Spain has among the highest gross external debt levels in the eurozone. An important component of Spain's overall external indebtedness is the very high level of Spanish corporate and financial-sector foreign borrowing that was used to finance Spain's housing market bubble.

Unlike in the Greek case, the parlous state of the Spanish economy is not the result of years of government profligacy. Rather, similar to the Irish case, Spain's financial and economic problems have mainly been the result of the bursting of a massive housing bubble. Over the past decade, Spain saw a trebling in home prices and an increase in its construction sector to a staggering 18 per cent of the Spanish economy, which all made the parallel US housing market bubble pale. A further factor that has highly compromised

Figure 5: Spain: Public debt and gross external debt



Sources: World Bank, World Development Indicators, Spanish National Bank, and the Joint External Debt Hub (JEDH)

the Spanish economic outlook has been a loss of 20 percentage points in international competitiveness that has been associated with the overheating of the Spanish economy. That loss in competitiveness contributed to a ballooning in Spain's external current-account deficit and led to an increase in Spain's gross external debt to around 135 per cent of GDP.[7]

Since September 2008, the bursting of the Spanish housing bubble, together with the onset of a deep domestic economic recession, has revealed the weak underbelly of the Spanish economy. As housing-related tax revenue collections plummeted, and as a weakening in output and employment growth further impacted income tax collections, Spain's budget position dramatically swung from a small surplus to an 11½ per cent of GDP deficit by 2009. At the same time, in large measure due to structural rigidities in the labour market, unemployment surged from less than 10 per cent prior to the crisis to over 20 per cent at present.

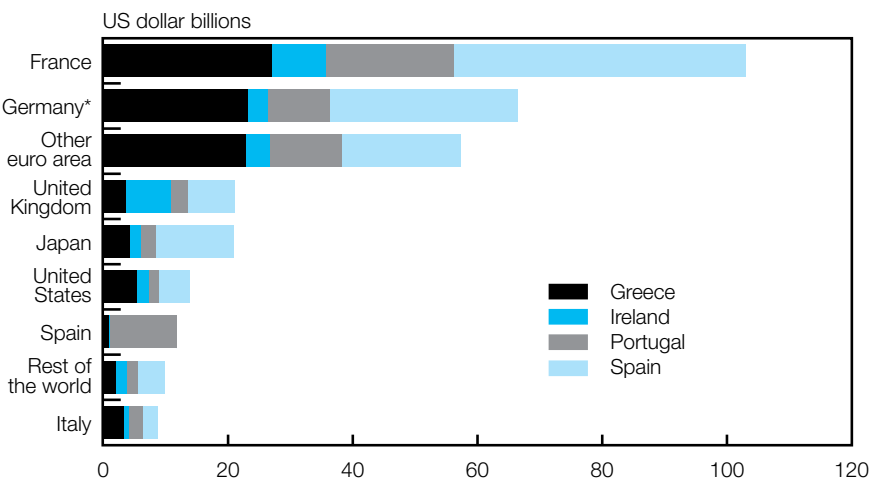
More disturbing still, the incipient housing market crisis has drawn the market's attention to the fact that the Spanish banks in general, and its savings and loan banks (the *cajas*) in particular, are overly exposed to Spain's crumbling housing sector. Construction loans made by the Spanish banking system are estimated to be the equivalent of 45 per cent of the country's GDP, which would suggest that these loans could in the end result in a significant increase in Spain's public debt once the Spanish banking sector has to be bailed out. By the summer of 2010, unsettled by this large exposure, foreign banks virtually stopped lending to Spanish banks and corporations. This has forced the ECB to have to rediscount around €125 billion in Spanish bank loans to forestall a full-blown Spanish funding crisis.

Conceptually, Spain now finds itself in a very similar predicament to that faced by Greece. It is forced to engage in severe budget cutting to bring its budget deficit down to a more sustainable level without the benefit of a cheaper currency to boost exports so as cushion the economic blow of budget retrenchment. Similarly, Spain is forced to go down the painful path of price deflation to restore international competitiveness, even though that path will compound the country's public and private debt problems. Further complicating Spain's policy challenges is the fact that Spain will have to engage in serious budget tightening at a time when unemployment is already around 20 per cent and when the domestic housing crisis still has a long way to go. After having run up threefold, Spanish home prices have only declined by around 15 per cent to date.

Kicking the can forward

Europe's policy-makers fully understand that a default in any peripheral eurozone member country would likely trigger contagion to the other peripheral members. They also understand full well that a series of defaults in the eurozone's periphery would have devastating consequences for the European banking system. After all, the combined sovereign debt of Portugal, Ireland, Greece and Spain, is around US$2 trillion and a major part of that debt sits on the European banks' balance sheets. The Bank for International Settlements (BIS) estimates that the French banks are particularly exposed to the troubles in the so-called Club Med countries, since they have lent the equivalent of 37 per cent of France's GDP to those countries.

Figure 6: Bank exposure to PIGS by nationality in 2010 Q1



* Statistics for Germany are on an immediate risk basis, while the others are on an ultimate risk basis

Realising the potential threat to Europe's banking system, European policy-makers have put in place a US$1 trillion financial support system for the eurozone's periphery. They have done so in an attempt to convince markets that there is little imminent risk of a sovereign debt default since the financial needs of the periphery's public sector are being fully backstopped for the next three years. The main pillar of that support system is the European Stabilisation Fund (ESF), which is to raise €440 billion in the market on the basis of loan guarantees from the 16 eurozone governments. Lending by the ESF will be undertaken in conjunction with the IMF, which will set the

conditions of any such lending and will provide up to €250 billion of its own resources to the European financial support effort.

Table 1: Consolidated foreign claims of reporting banks, end of 2009 Q4 (percentage of GDP)

	Lending to					
	Greece	Portugal	Spain	Ireland	Italy	Total PIIGS
Lending from banks in						
Austria	1,3	0,8	2,5	2,4	7,2	14
Belgium	0,8	0,7	5,0	14,1	6,9	28
Denmark	0,1	0,1	0,8	7,3	0,2	8
France	3,1	1,8	8,9	2,5	20,8	37
Germany	1,5	1,5	6,2	6,0	6,2	21
Greece	0,0	0,0	0,1	0,3	0,2	1
Ireland	4,0	2,6	14,5	0,0	22,1	43
Italy	0,4	0,3	1,6	0,9	0,0	3
Netherlands	1,6	1,7	16,4	4,2	9,4	33
Portugal	4,7	0,0	13,4	10,3	2,5	31
Spain	0,1	6,4	0,0	1,2	3,5	11
Sweden	0,2	0,1	1,6	1,3	0,7	4
Switzerland	0,8	0,9	4,0	3,6	3,6	13
United Kingdom	0,8	1,2	5,7	9,4	3,8	21
European banks	1,3	1,7	6,0	4,5	7,3	21

Note that the numbers must be interpreted with caution as there are large changes in the figures from quarter to quarter in some countries (e.g., Switzerland from Q3 to Q4).

Sources: Bank for International Settlements and Danske Markets

The ECB is also playing a major role in Europe's efforts to forestall a full-blown sovereign debt crisis. Since May 2010, the ECB has been buying the eurozone peripheral countries' bonds in the secondary market. Much more importantly still, the ECB has been substantially expanding its balance sheet through the rediscounting of bonds of the eurozone periphery banks. Spain has been a particular beneficiary of the ECB's largesse as indicated by the ECB having €125 billion outstanding to the Spanish banks. As a result, as much as 37 per cent of the ECB's vastly expanded loan book is made up of loans to Portugal, Ireland, Greece and Spain.

Emerging markets and the 2008–9 crisis

A striking feature of the emerging-market economies during the Great Global Recession of 2008–9 is how much better they performed than in previous

crisis episodes. Although the emerging-market economies did suffer a sharp economic slowdown in 2008–9, the slowdown that they experienced was no more pronounced than that in the industrialised countries. Similarly, although emerging-market bonds suffered considerable spread widening in 2008–9, that widening was markedly less pronounced than in previous crisis episodes.

A recent IMF study examined the relative performance of the different major emerging-market economies during the 2008–9 economic crisis.[8] It found that those countries that had improved policy fundamentals and reduced external vulnerabilities in the pre-crisis period reaped the benefits of those reforms during the crisis. In particular, the IMF study arrived at the following conclusions:

i. Countries that had better pre-crisis economic fundamentals and stronger vulnerability indicators than the average emerging-market economy experienced less severe output contractions and less widening of sovereign credit spreads.

ii. Higher international reserve holdings helped buffer the impact of the crisis on the emerging-market economies by reducing their external vulnerability.

iii. Countries that entered the crisis with better public finances and with less binding financing constraints were able to react successfully to the crisis with more aggressive fiscal and monetary policy stimuli.

iv. Those countries that had better pre-crisis fundamentals and those that were able to sustain public-spending growth recovered more quickly from the crisis than did the average emerging-market economy.

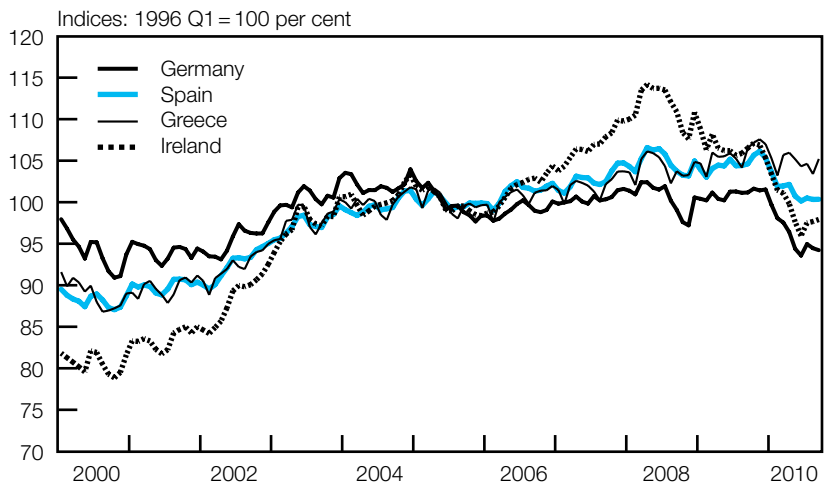
The three areas of improved economic fundamentals that would seem to have been the most important in helping the emerging-market economies to have weathered the storm better this time around than in previous crises are the following:

i. The emerging-market economies entered 2008–9 with substantially strengthened public finances than in earlier episodes. These better public finances increased their market credibility and substantially reduced their dependence on international capital flows. In this respect, it is striking how much better the emerging market's public finances are today than those of the industrialised countries. Whereas in industrialised countries public debt-to-GDP ratios appear to be heading to 100 per cent, in

emerging-market economies these ratios are generally being held to below 40 per cent.

ii. Chastened by their experience during the late 1990s, most emerging-market economies moved to much more flexible exchange rate regimes than before. Rather than attempting to defend overvalued exchange rates as they had done in the past, during the 2008–9 crisis emerging-market economies used their exchange rates as useful shock absorbers to the crisis.

Figure 7: Real effective exchange rates (Base = 2005)



Source: Bank for International Settlements, http://www.bis.org/statistics/eer/index.htm

iii. In sharp contrast to the 1990s, most Latin American and Asian economies entered the 2008–9 crisis with a substantial arsenal of international reserves. Those reserves helped insulate these countries from the dangers of speculative attacks.

Implications for South Africa

If there is one thing that South African policy-makers should have learnt from the 2008–9 economic crisis it is how interconnected the global economy has become and how important it is to go into a global crisis with a sound economic position. Were Europe indeed to experience a full-blown sovereign debt crisis down the road, one must expect that the South African economy

would be severely impacted. For not only would a European banking crisis lead to an abrupt slowing of the European economy – South Africa's main trade partner – and to a decline in global commodity prices. It would also lead to a heightening in global risk aversion and to a drying-up in capital flows to emerging-market economies in general and to South Africa in particular.

On the eve of a possible European economic slowdown, one has to be concerned about South Africa's large public-sector borrowing requirement and about the renewed opening up of a sizeable external current-account deficit in South Africa at a time when international commodity prices remain high. One also has to be concerned about the acceleration in domestic wage settlements that go beyond levels that the country can afford. These developments would appear to make the country particularly vulnerable to any sudden stop in international capital flows.

In anticipation of the real possibility ahead of renewed international financial market turbulence, one has to question the appropriateness of the Bank's stubborn adherence to a policy of non-intervention in the foreign-exchange market. One would have thought that by now the Bank would have seen the benefits that almost every other major emerging-market economy derives from preventing their currencies from getting too strong in the good times and from preventing their currencies from becoming a one-way-bet and from becoming excessively depreciated in the bad times.

At present there is a massive financial effort by the EU, the IMF and the ECB to keep Europe's peripheral economies afloat. However, judging by the German public's growing opposition to indefinite bail-outs and by the peripheral countries' serious solvency issues, South African policy-makers would be making a serious mistake by counting on this financial support lasting indefinitely. It would seem that they would do well to take advantage of the narrow window that this financial support offers to prepare the country better for the onset of an all-too-probable full-blown eurozone crisis.

Notes

[1] There are a number of important countries such as Canada, New Zealand and Sweden that have all successfully made very large public finance adjustments in the past two decades without experiencing unduly painful domestic economic recessions. However, all of these countries operated under floating exchange rate systems that facilitated large exchange rate depreciations. They were also helped by very much more favourable international economic environments than currently confronts the so-called Club Med countries.

[2] For an excellent account of the IMF's involvement in Argentina, refer to the *Report on the evaluation of the role of the IMF in Argentina*, *1991–2001* by the IMF's Independent Evaluation Office, July 2004.

[3] At its peak, Argentina's domestic imbalance was around half that of Greece today. Argentina's budget deficit did not exceed 6 per cent of GDP, while its public debt-to-GDP ratio did not exceed 65 per cent.

[4] It might be noted that with all of its optimistic assumptions about economic growth and budget adjustment in Greece, the IMF's stand-by arrangement for Greece concedes that by 2012 Greece's public debt-to-GDP ratio will have risen in the vicinity of 150 per cent of GDP.

[5] For an interesting discussion of how very much more amenable Greece's sovereign debt is to restructure than was the case in Argentina, see "How to restructure Greek debt" by Lee Buchheit and Mitu Gulati, 7 May 2010.

[6] Between 2000 and 2007, Irish bank credit grew at an average annual rate of 25 per cent. This rapid credit growth fed a housing price bubble which, in turn, fed back into more credit growth and resulted in a more than 300 per cent increase in house prices. This led to a disproportionately large contribution by both the construction and the financial sectors to the Irish economy, and consequently to real Irish GDP growth rates well above the country's potential.

[7] At its peak in 2008, Spain's external current-account deficit at US$150 billion was second only to that of the US in absolute terms. At 9 per cent of GDP, Spain's external current-account deficit that year was more than twice the corresponding US level.

[8] "How did emerging markets cope in the crisis?", International Monetary Fund, 15 June 2010.

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Reuters.

The euro's unravelling and the South African economy: A response to Desmond Lachman

*Ipumbu Shiimi**

In response to Desmond Lachman's dispensation on the economic developments in the eurozone, I should like to draw on the experience of the Southern African Development Community (SADC) and make specific reference to the fact that SADC could learn key lessons from the experience of the European Union (EU).

SADC envisages a common monetary area by 2018, largely based on the model of the Common Monetary Area (CMA). The CMA consists of South Africa, Lesotho, Namibia and Swaziland, and the South African rand is used as the common currency in the CMA. Although the other countries issue their own currencies, they cannot be used in the jurisdiction of the CMA. The EU monetary union had been established over a period of 50 years and the EU still experiences problems in the current financial crisis. Lachman stated that the euro was flawed from the start and Milton Friedman warned that the euro would not survive a recession because of inflexibilities in the European financial and real markets.

There are six key lessons that SADC can learn from Lachman's paper. The first lesson SADC can learn from the EU is on the question of economic union versus political union. SADC also has monetary and fiscal convergence criteria, which member countries should implement by 2018 to establish a monetary union. The harmonisation of these convergence criteria is a difficult task and it is in this field where SADC can learn from the processes established by the EU. The EU has full monetary union, but less political union, and during the current financial crisis this aspect posed a problem, since the EU could not make political decisions expeditiously to assist countries in distress. In the end the process remained a political one. Therefore, members of SADC must decide if they want a political union first, or should it be an economic and monetary union first. A fine balance between the two would further enhance the effectiveness of the envisaged SADC CMA.

* Paper prepared by Johan Delport, Research Department, South African Reserve Bank.

The second lesson SADC can take from the EU is the enforcement of fiscal rules. How is the non-compliance of fiscal rules going to be sanctioned? Again, the experience of the EU would be invaluable to SADC members. The process of sanctions in the case of non-compliance in the EU is clear, but it is not implemented uniformly.

The third lesson is the setting up of a compensatory fund. In the EU the International Monetary Fund (IMF)/European Financial Stability Facility (EFSF) made loans for rescue packages available to those countries facing problems with liquidity or solvency. In the case of SADC the question is where and how such a fund is going to be established, and who is going to manage it.

The fourth lesson relates to common business cycles or the absence thereof for SADC. Labour mobility and wage flexibility are issues that should be dealt with if SADC is to have a common business cycle. The fact that SADC member states are sovereign nations is going to complicate the establishment of labour mobility and greater wage flexibility within the region. Some member states are very rigid in this regard. However, the process of establishing a union in SADC is important.

The fifth lesson is the specific challenges related to SADC. Member countries should look at their competitiveness and policy choices to enhance their competitiveness. Once a monetary union or economic union has been established, it becomes difficult to use exchange rate policies to manipulate a specific outcome. In addition, although SADC currently has a project in terms of which member states are harmonising their statistics, the reliability of statistics and the frequency of publication of such statistics remain a problem.

The final lesson for SADC in establishing an economic union is the harmonisation of financial-sector regulation. The co-ordination of banking regulation at the regional level remains a challenge. The Committee of Central Bank Governors of SADC has established a subcommittee for bank supervisors and regulators in SADC. This subcommittee is tasked with co-ordinating banking regulation in the region. The establishment of an early warning system on a region-wide basis is an important task of this sub-committee, so too is the establishment of mechanisms to deal with various bubbles.

In conclusion, there are two issues from Lachman's paper that warrant further interrogation. First, that of whether or not to intervene in the foreign-exchange market needs to be debated further. The question is whether or not the South African Reserve Bank should intervene in the foreign-exchange market and if it does, when should it do so. Important for this discussion is that everyone has his or her own opinion, depending on whether he or she is an importer or exporter. The cost of intervention is an important aspect and it should be weighed against the potential benefits. The long-run answer, however, lies in the improvement of competitiveness and labour productivity to enable South Africa to compete with other countries in the international market.

Second, the question that begs further debate is whether indeed the cost and implication of the debt writedowns of Portugal, Italy, Greece and Spain (PIGS) are more desirable than the cost and implication of the IMF rescue packages. The IMF estimated that the writedowns caused by the sub-prime crisis amounted to US$2,28 trillion. At present the Bank for International Settlements (BIS) estimates total global bank exposure to PIGS debt at US$2,57 trillion, already more than the loss caused by the sub-prime crisis. A writedown of about 90 per cent of the PIGS exposure will reach the same impact as the sub-prime crisis. However, here would always be costs involved in IMF rescue packages. Therefore, a decision should always be taken to use rescue packages that are less harmful to the country and the financial sector.

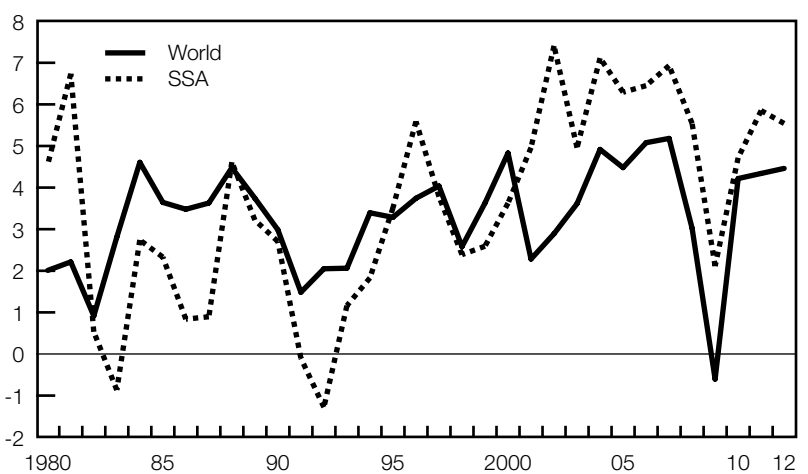
Resources for growth

Razia Khan

Economic outlook

Fears that the global economic crisis would result in a structural setback for sub-Saharan Africa (SSA) have largely dissipated. Real gross domestic product (GDP) growth has recovered from the weak, but mostly positive, levels recorded in 2009, with rising expectations that 2011 may see a return to trend GDP growth across most sub-Saharan African economies. This stands in marked contrast to earlier episodes of economic slowdown in Africa, when weakness in the global economy (Figure 1) had a marked lagged effect on African economies. African economies entered this downturn with strong growth momentum. Perhaps as a result of this, recovery from the crisis appears to have been more rapid as well.

Figure 1: Global and sub-Saharan African GDP growth

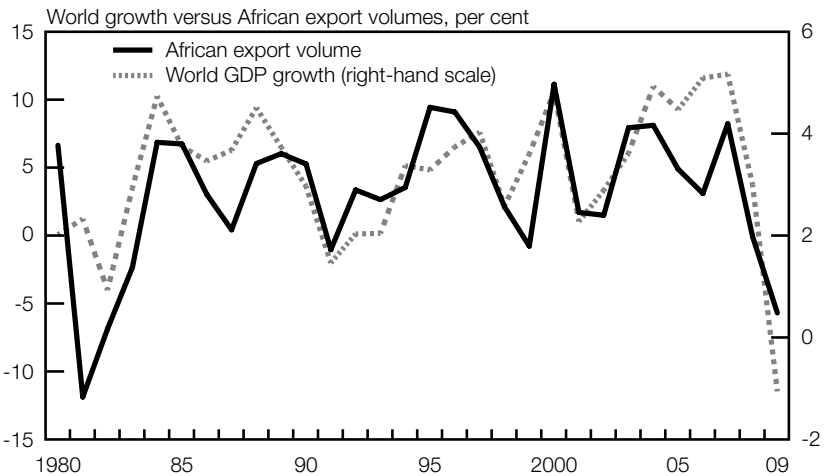


Sources: IMF *World Economic Outlook*, April 2010 and Standard Chartered Research

Nonetheless, headwinds associated with continued global uncertainty persist. Africa is not immune to the slowdown. With intraregional trade estimated to be as little as 11 per cent of total trade (poor infrastructure

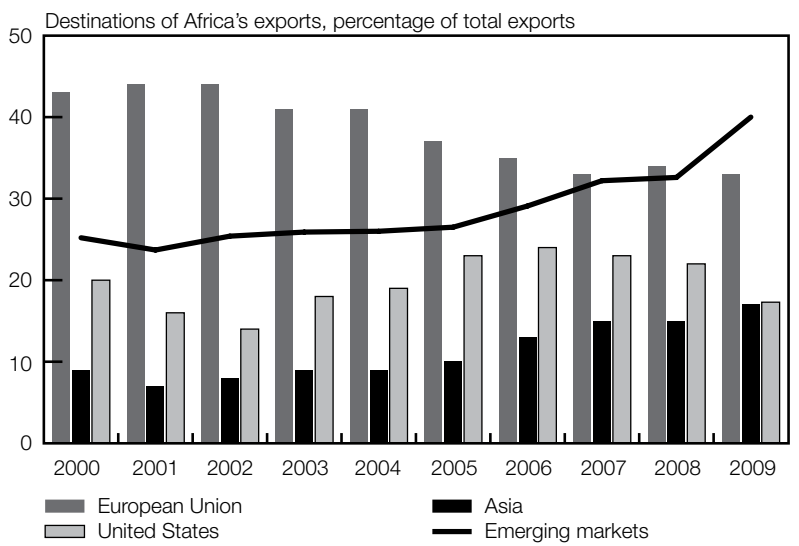
is largely to blame), Africa's export growth remains highly correlated with world growth (see Figure 2). Rising South–South trade (Figure 3) has helped to buffer African economies from the full brunt of the global slowdown.

Figure 2: Global outlook still matters



Sources: IMF and Standard Chartered Research

Figure 3: Africa's hopes lie in increased South–South and intra-regional trade



Sources: IMF DoTS (January–October 2009) and Standard Chartered Research

However, more subdued growth in Asia and other emerging regions would pose risks to the African outlook as well.

Africa's more rapid growth recovery relative to previous crises had its roots in several factors:

i. The unprecedented countercyclical policy response put in place in answer to the crisis

ii. Unexpectedly large aid or concessional flows, especially from international financial institutions (IFIs).

iii. Healthy Chinese growth and the support provided to commodity prices, which helped stem more severe deterioration in foreign direct investment (FDI) inflows

iv. The resurgence of risk appetite, which was, in part, responsible for the post-crisis stabilisation in African foreign-exchange rates. In turn, along with lower food and fuel prices, this fed more moderate inflation, helping to create an environment more conducive to monetary easing.

Table 1: Standard Chartered Bank global research forecasts: Africa (sub-Saharan Africa)

	2009	2010	2011	2012
GDP (real percentage year on year)	1,1	4,7	5,7	5,5
IMF	0,6	4,1	5,5	5,4
CPI (percentage year on year)	10,0	8,1	6,7	7,3
IMF	8,5	7,7	6,7	6,6
Current account balance (percentage of GDP)	-1,7	0,2	0,5	1,0
IMF	-1,0	0,2	0,5	1,0

* 2009 US dollar GDP-weighted total based on African economies covered by Standard Chartered Bank

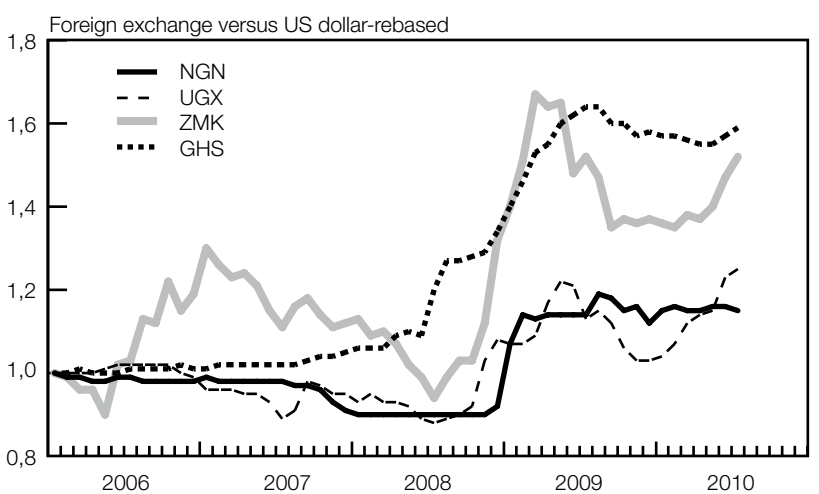
Sources: IMF and Standard Chartered Research

There are risks, however. An initial global consensus on the urgent need for countercyclical policy has now given way to a greater divergence of opinion, as evidenced by the outcome of the latest Group of Twenty (G-20) meeting in June 2010. Following the euro area sovereign crisis, even frontier African economies are being assessed in a different light, with market focus now shifting to the sustainability of fiscal stimulus plans. Before the depths of the financial market crisis in the fourth quarter of 2008, African frontier markets, unlike more established emerging markets, had been largely insulated from bouts of global contagion when risk aversion peaked. This has now

changed. Recent market volatility associated with the euro area crisis has made its mark on smaller African frontier markets as well, with most African foreign-exchange rates weakening in response. Despite most of Africa's trade with Europe being dominated by the core rather than the periphery, market reaction reflects the belief that Africa will be negatively impacted by any renewed downturn in euro area growth prospects. This would be especially the case if other developing regions, with which Africa now sees increased levels of trade, were to slow down as well – with a knock-on impact on commodity prices. Africa's ambitious plans for eurobond issuance in 2010 may also need to be scaled back. Despite generally favourable public debt ratios, most frontier African economies are nonetheless subinvestment grade. Further deterioration in global risk appetite may impact negatively on the cost of borrowing by maiden issuers.

With Africa's development partners now forced to undergo a more rapid fiscal consolidation, markets are wary of the prospect that foreign aid budgets might be susceptible to further cuts. Already, with the recent round of East African budgets in June 2010, there is evidence of reduced donor support to Tanzania and Uganda, although in the case of both countries, the causal factors have more to do with the pace of reform in the recipient economies, rather than the need for more rapid fiscal rebalancing in donor countries. Nonetheless, with increasing talk that previous Gleneagles commitments on

Figure 4: Africa: Foreign-exchange rates succumb to global risk aversion



Sources: Reuters and Standard Chartered Research

foreign assistance may be de-emphasised as a consequence of the global crisis, reductions in the amount of official development assistance remain a threat to the medium-term outlook in Africa. For now, levels of IFI and multilateral development bank lending to Africa continue to be scaled up, led by the African Development Bank in particular.

Commodity price trends will remain an important determinant of the availability of private external financing for Africa (whether FDI or portfolio flows), although the importance of resources in driving actual economic growth in sub-Saharan Africa has traditionally been overplayed. A number of factors suggest that commodities have generally played a limited role in the outperformance of African economies since 2001:

i. A disaggregation of African growth into its component parts reveals that most of the percentage point increase in African growth stemmed from rising levels of private consumption. Especially during the oil boom years, net exports made a negative contribution to sub-Saharan growth as a whole, although commodities were an important contributor to fiscal resources in resource-rich countries.

ii. While there is evidence that Africa's oil exporters achieved higher growth rates than Africa's oil importers, the relationship between terms of trade developments and trend GDP growth, when examined in a region-wide context, is not robust. It is difficult to find a strong correlation. Commodities may have been important, but other factors have been bigger drivers of African growth.

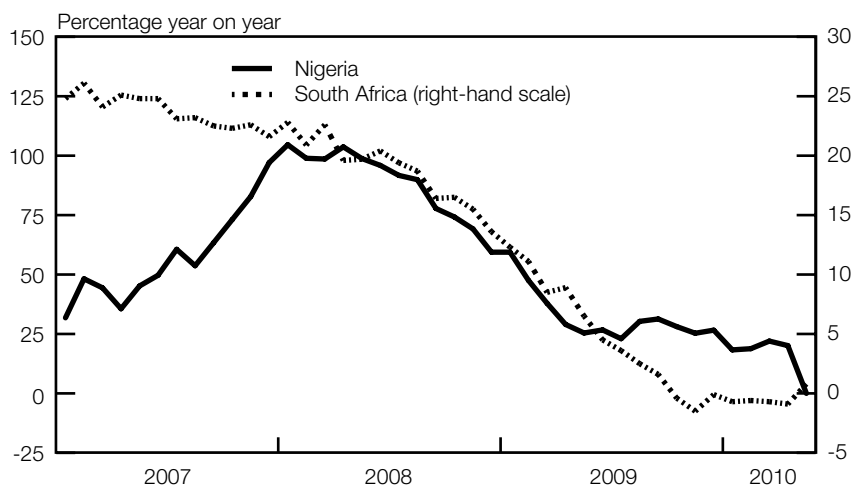
iii. There is evidence that in absolute terms, political change and a gradual move towards systems with greater political accountability – often with the establishment of regular multiparty elections – have had a greater impact on African growth than rising resource prices. The democracy dividend, with consumption booms accompanying political transition in both South Africa and Nigeria (albeit at a different pace) has been marked. Together, the two economies account for over half of sub-Saharan African GDP. Although each economy is resource-rich, democratic transition appears to have had the greater impact on GDP growth.

iv. Recent research has highlighted the success of poverty alleviation efforts in Africa, demonstrating that poverty rates in the region may have been falling faster than previously thought. For most individual African economies, and for the region as a whole, charts outlining rising per capita GDP growth over time appear to be almost the mirror image of falling poverty rates (Pinkovskiy and Sala-i-Martin 2010). Falling poverty levels are typically not associated with commodity-driven growth. The gains of

resource sectors tend not to be widespread and are frequently subject to rents that see a limited number of people benefit the most. Conventional thinking casts doubt on the ability of resource-fuelled growth to drive down poverty levels in Africa, so, recent poverty alleviation success (and GDP growth) must be attributed to other factors.

What does all of this mean in the context of the pressures that African economies face today? While the recent global crisis may have stalled the reduction in poverty levels, growth is back and the impact of the crisis appears to have been more cyclical than structural. Although there are important threats to the external outlook for African economies, much of Africa's growth in recent years appears to have been internally generated. Even faced with external headwinds, Africa's growth recovery should continue – although the health of the global economy may well determine the pace of that recovery.

Figure 5: Private-sector credit in South Africa and Nigeria



Sources: South African Reserve Bank, CBN and Standard Chartered Research

The picture of a gradual improvement in GDP growth is consistent with trends in most of Africa's economies. Two of the economies covered here, namely Botswana and South Africa, saw an outright contraction in growth in 2009. The former was particularly hard hit because of its narrow economic base, with the closure of its diamond mines over a four-month period in 2008/9. Even so, recovery from the crisis has not been dramatic. In South

Africa positive growth is back following a contraction of 1,8 per cent in 2009. However, recovery is mainly led by the external sectors of the economy and is already waning in the case of manufacturing, as restocking momentum subsides. Domestic demand, the key driver of the pre-crisis upswing, is off its lows but still subdued.

Elsewhere, a more mixed picture emerges. Ethiopia, which is not resource-rich, has managed to deliver near double-digit growth, as reforms continue. Kenyan growth had been negatively impacted by both the global crisis and the post-election political fallout which marred recovery prospects. Nonetheless, leading indicators are now improving, with Kenya a key beneficiary of more robust regional growth. Nigerian growth had been encumbered by reduced oil earnings and a domestic banking crisis, but is expected to post a strong recovery with pre-election spending (currently, the financial year 2010 budget envisages a 48 per cent year-on-year increase in spending). However, the real emerging stars over the medium term are expected to be Ghana and Uganda, with a step-change in GDP growth expected in both economies as they become oil producers for the first time. For other countries, more gradual improvement is anticipated. While post-crisis headline rates of growth will still be healthy, the increased casualisation of Africa's formal-sector labour force in mining economies such as Zambia is a concern. Africa's informal sector has also been hit hard by the crisis, and it may be some time before domestic demand recovers fully.

Financial issues

Although Nigeria was the only major African economy to experience a banking crisis, credit growth rates region-wide remain subdued. The reasons vary. Rising non-performing loans associated with public-sector arrears have taken their toll on banks in Ghana, despite the injection of increased capital in line with new regulations. In South Africa highly leveraged households, continued job insecurity and greater caution by lenders have delivered only weakly positive annual credit growth, despite aggressive easing by the South African Reserve Bank. Given the slow response of credit growth to monetary easing in Africa, doubts about the transmission mechanism persist. If anything, this is an argument for policy to remain accommodative for longer.

Policy

A continuation of easy monetary policy is thus forecast. Both Africa's growth and inflation cycle lag that of the rest of the world. Fiscal policy will remain

expansionary, amid efforts to widen the tax base and extract more revenue from the resource sector.

Politics

The economic crisis has in many instances exacerbated fault lines. Of particular interest in the months ahead will be the 4 August 2011 referendum on constitutional change in Kenya, seen as a key litmus test for the holding of peaceful elections in 2012, and pre-election momentum in Nigeria. Elections must be held in 2011, but the issue of whether North–South rotation will be adhered to in the ruling People's Democratic Party remains unresolved.

Table 2: Growth rates in selected African countries

Economy (2009 estimates)	GDP (USD billions)	GDP (PPP)	GDP (PPP) per capita	GDP ranking	GDP (PPP) ranking	GDP (PPP) per capita ranking
South Africa	287,2	505,2	10,244	1	1	5
Nigeria	173,4	341,6	2,249	2	2	8
Angola	68,8	105,9	6,117	3	3	6
Kenya	32,7	62,1	1,730	4	5	11
Ethiopia	32,3	79,0	954	5	4	17
Côte d'Ivoire	22,5	35,8	1,674	6	10	12
Tanzania	22,3	57,4	1,416	7	6	15
Cameroon	22,2	42,8	2,147	8	7	9
Uganda	15,7	39,7	1,196	9	8	16
Ghana	15,5	35,8	1,551	10	9	13
Zambia	13,0	18,5	1,542	11	18	14
Senegal	12,7	22,3	1,743	12	13	10
Equatorial Guinea	12,2	23,7	18,600	13	12	1
Botswana	11,6	25,4	13,992	14	11	3
Democratic Republic of Congo	11,1	21,5	332	15	14	20
Gabon	11,0	21,1	14,318	16	15	2
Mozambique	9,8	19,8	934	17	16	18
Republic of Congo	9,5	15,6	4,146	18	20	7
Mauritius	8,8	16,1	12,527	19	19	4
Madagascar	8,6	19,4	932	20	17	19

GDP = gross domestic product; USD = United States dollar; PPP = purchasing power parity

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On the equivalence of capital adequacy and monetary policy

*Stephen Cecchetti and Marion Kohler**

1. Introduction

The transatlantic financial crisis of 2007–9 has served as a reminder of the importance of financial stability. And, as former Bank for International Settlements (BIS) Economic Adviser William R White observed so presciently in 2006, price stability is not enough.[1] Low, stable inflation does not necessarily deliver financial stability. In order to try to understand how to deliver both, over the past two years many of us have had a crash course in how financial markets and institutions operate, how prudential regulation is structured and what a central bank can do with its balance sheet.[2]

At the same time as policy-makers have been working to resolve the crisis, they have been striving to build a more stable financial system that would make the next one both less likely and less severe.[3] And, as the discussion about appropriate tools, their implementation and the even more difficult task of defining an operational financial stability objective continues, a number of jurisdictions have put in place new frameworks to improve financial stability policies.

Some countries have created new institutions, while others have revamped old ones. For example, the United Kingdom (UK) has created a new Financial Stability Committee parallel to its Monetary Policy Committee, putting both in the same institution, the Bank of England. At the same time, the United States (US), with the Federal Reserve responsible for traditional monetary policy, has created a Financial Stability Oversight Council.

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In the euro area the European Central Bank (ECB) is responsible for monetary stability, while financial stability has been put in the hands of the European Systemic Risk Board. But the differences in framework imply different degrees of co-ordination. Can economic theory help one to understand the degree of co-ordination that is needed? Should one model be preferred over another? The purpose of this paper is to shed some light on these questions.

We start with a brief discussion of the relationship between financial stability and monetary stability. Following this, in section 3 we present a simple macroeconomic model to demonstrate the close relationship between interest rates and capital requirements. This leads us to the following conclusion: while prudential instruments are commonly seen as the tools that will deliver macroprudential policy goals, and interest rates as those that deliver monetary stability, at a macroeconomic level they have quite a bit in common, that is, they can both be used for macroeconomic stabilisation purposes. Section 4 describes how, if both instruments are used to achieve monetary policy and financial stability objectives, a co-ordination problem arises.

2. Monetary stability and financial stability

The ultimate goal of (macro-)economic policies is to increase welfare, providing the foundations for maximum sustainable and stable real growth. This means that monetary stability and financial stability are really complementary – efforts to reduce the amplitude of business cycles and the variability of inflation are of little relevance if financial cycles are both frequent and violent, that is to say, financial stability policy is about avoiding the damaging effect that financial crises will have on the real economy. However, while it may ultimately be impossible to eliminate crises, one can work to reduce both their likelihood and their severity.

Systemic risk – the risk that the entire economic and financial system breaks down catastrophically – affects society as a whole, and no individual can responsibly insure it. Insofar as there is insurance, it must be provided by public authorities. In the pre-crisis world, there was a clear distribution of labour. Regulators and supervisors worried about financial instruments, markets and institutions; monetary policy-makers focused their efforts on price stability, and (possibly) cyclical fluctuations in output and employment; and fiscal authorities concerned themselves with long-run growth and the distribution of output among its final uses (i.e., consumption, investment, government purchases and net exports), next to redistribution of income and the provision of public goods. This division of responsibility has not

survived the crisis. Today, this policy-making triumvirate must work together to answer the question: What can we do about systemic risk?

Ensuring financial stability means addressing externalities – costs that, through its actions, one institution imposes on others but does not bear itself. Two externalities are central to systemic risk. The first is joint failures of institutions resulting from their common exposures and interlinkages at a single point in time – common exposures due to shocks that come from outside the financial system or interlinkages among intermediaries. The shocks may take a variety of forms, including both credit and liquidity shocks and their interaction, while the linkages arise from the complex web of daily transactions. The second externality is what has come to be known as 'procyclicality': the fact that, over time, the dynamics of the financial system and of the real economy reinforce each other, increasing the amplitude of booms and busts, and undermining stability in both the financial sector and the real economy. The basics of the procyclicality problem are straightforward. As the economy booms, lending tends to become cheaper and easier. Banks are flush with funds and capital, borrowers are more creditworthy, and collateral is more valuable. In a downturn, these conditions are reversed. Banks are forced to absorb unexpected losses, which makes them less well capitalised, so they cut back on lending. Borrowers become less creditworthy. And collateral values fall. This is exacerbated by financial institutions' tendency to become less prudent during cyclical upturns and more prudent during downturns.[4]

For many reasons, including governance issues, conflicts of interest between debt holders and equity holders, and moral hazard arising from explicit and implicit government guarantees, financial institutions have a natural tendency to accumulate assets that are too risky and to hold too little capital (both relative to the social optimum). One solution is for authorities both to impose restrictions on asset holdings and require minimum levels of capital. Among policy-makers, there is agreement that the level of capital, for a given balance sheet, has to rise above its pre-crisis level. Moreover, in order to address the procyclicality of the financial system, there is a clear desire on the part of policy-makers to go beyond existing tools and create new policy instruments to ensure that financial institutions adjust their capital (and other tools, such as loan provisioning and liquidity standards) cyclically, building up defensive buffers in good times when capital is relatively plentiful and inexpensive, and drawing them down in bad times when capital is relatively scarce and costly.[5] This could be a rule-based measure, in which the buffer is based on

macroeconomic variables such as credit growth, or banking sector-specific measures such as earnings. Or, it could be done in a discretionary way.

The debate about which tools to use to address financial stability concerns has largely focused on macroprudential tools – instruments typically used in the prudential regulation and supervision of institutions that are then adapted to limit risk in the financial system as a whole.[6] However, one should not forget that fiscal and monetary policies are already designed either to exploit or mitigate the reinforcing feedback between the real economy and the financial system. Through automatic stabilisers and discretionary stimulus, countercyclical fiscal policy works to sustain income and employment, lowering the probability that borrowers will default (as well as increasing the value of what is recovered if they do) and raising the value of assets on financial institutions' balance sheets. Monetary policy, too, acts countercyclically. Seeking to head off a cyclical downturn, policy-makers lower policy rates and, in so doing, improve the state of balance sheets of both financial institutions and borrowers in general. Similarly, central bankers increase policy rates to moderate an upturn, slowing credit growth and leaning against asset-price booms. And through their interest rate-targeting procedures, central banks work to keep financial sector shocks from affecting the real economy. Put another way, by reducing cyclical fluctuations in the real economy, countercyclical fiscal and monetary policies naturally (and intentionally) reduce the procyclicality of financial institutions' capital.

3. Capital adequacy and interest rates: Substitutes?

Discussion about the design of a policy framework for delivering macroeconomic stability sometimes assumes that the two objectives of monetary stability and financial stability can be delivered using two instruments: (i) interest rates and (ii) capital requirements. But, as the discussion in the previous section suggests, monetary (and fiscal) policy can be used to address financial stability concerns. With that in mind, we now construct a small macroeconomic model to show how capital requirements could, in principle, be used to address conventional macroeconomic stability concerns.

3.1 The transmission process of monetary policy and capital requirements

Regardless of the technicalities of implementation, it is interesting to think about the relationship between dynamic capital-adequacy requirements and

traditional measures of monetary policy tools. Our contention is that they are very similar, so we cannot, and should not, think about them separately.

To understand this correspondence, it is useful to review the channels of monetary policy transmission that underpin many macroeconomic models:

- *Interest rates*: Lower interest rates reduce the cost of investment, making more projects profitable.
- *Exchange rates*: Lower interest rates reduce the attractiveness of domestic assets, depressing the value of the currency and increasing net exports.
- *Asset prices*: Lower interest rates lead to higher stock prices and real estate values which, through collateral value and household wealth effects, fuel an increase in both business investment and household consumption.
- *Bank lending*: An easing of monetary policy raises the level of bank reserves and bank deposits, increasing the supply of funds.
- *Firms' balance sheets*: Lower interest rates raise firms' profits, increasing their net worth and reducing the problems of adverse selection and moral hazard.
- *Household net worth*: Lower interest rates raise individuals' net worth, improving their creditworthiness and allowing them to increase their borrowing.

This textbook list may seem varied, but in an important way it is not. Remember, commercial banks are the central bank's point of contact with the financial system. It is by changing banks' ability and willingness to issue deposits and make loans that monetary policy has any impact at all. At a very technical level, the starting point for monetary policy is to change the interest rate on reserve deposits at the central bank. It can do this directly, by announcing the level of remuneration for reserve balances, by controlling the supply of reserves so that the market price is at or near its target, or by some other means. Regardless, by adjusting this riskless short-maturity interest rate, monetary policy-makers influence banks' cost of doing business, which then changes all other interest rates and asset values in the economy. Particularly relevant here is that interest rate changes influence the value of banks' *own* assets and liabilities, affecting the level of bank capital and the bank's risk-taking capacity.

Now consider the impact of changes in capital-adequacy requirements. By changing the amount of capital a bank is required to hold, regulators are again influencing banks' cost of doing business.

Once one starts thinking about the correspondence between interest rate policy and capital-adequacy policy, it is clear that there are a variety of ways to explain it. We will introduce an alternative policy tool into a simple macroeconomic model with bank capital.

But before we do, we note that several years ago Kashyap and Stein (2004) suggested the creation of what they called "capital relief certificates", the idea being that a bank can meet its capital requirement by either holding real capital or through the purchase of the certificates. If, as those authors suggest, there were a market for the certificates, their price would be related to the shadow cost of capital in the banking system. A variety of arguments can be marshalled for and against this proposal. Our interest here is not to debate the efficacy of these certificates, but rather to note that if they existed, the authorities could choose to control their price, thereby providing another channel through which authorities can influence the cost of lending.

With this as a motivation, we now turn to the simplest macroeconomic model that allows integration of capital requirement policy and then a financial stability objective.

3.2 A simple, static, linear model

Following Cecchetti and Li (2008), consider the following aggregate demand-aggregate supply model that includes a banking system, written as log-linear deviations from the steady state. In the manner of Bernanke and Blinder (1988), write aggregate demand y^d as:

$$(1) \qquad y^d = -\alpha\,(\rho - \pi^e) - \beta\,(i - \pi^e) - \delta\pi + \eta; \qquad \alpha, \beta, \delta > 0$$

where i is the short-term nominal interest rate, ρ is the nominal loan rate, π^e is expected inflation, π is inflation, and η is a white noise random variable. The interest rate i is set by policy-makers, while the loan rate ρ is determined by equilibrium in the lending market.

For simplicity, assume that bank lending is constrained by the capital that banks hold.[7] Then, loan supply is given by[8]

$$(2) \qquad L^s = -\kappa \cdot k + \tau \cdot B \qquad \kappa, \tau > 0$$

where k is the capital requirement and B is the level of bank capital. Furthermore, assume that the real value of bank capital rises with the level of real output, so

(3) $B = by;$ $b > 0$

Next, loan demand depends on the level of both the real loan rate and real output, so

(4) $L^d = -\phi\,(\rho - \pi^e) + \omega y$ $\phi, \omega > 0$

And, finally, there is a standard aggregate supply curve in which output supplied, y^s, depends on unexpected inflation plus an additive white noise error ε that is uncorrelated with the demand shock η:

(5) $y^s = \gamma\,(\pi - \pi^e) + \varepsilon;$ $\gamma > 0$

The model is closed with the equilibrium conditions

(6) $y^s = y^d = y$ and $L^s = L^d$.

To solve this simple, linear, static model, first assume that agents have rational expectations, so expected inflation and output can both be normalised to zero. That is, $\pi^e = 0$. Next, using the loan and goods market equilibrium conditions, solve for output and inflation in terms of the two shocks, η and ε, and the policy interest rate i. This yields a solution for output and inflation that is linear in the shocks and the policy instruments:

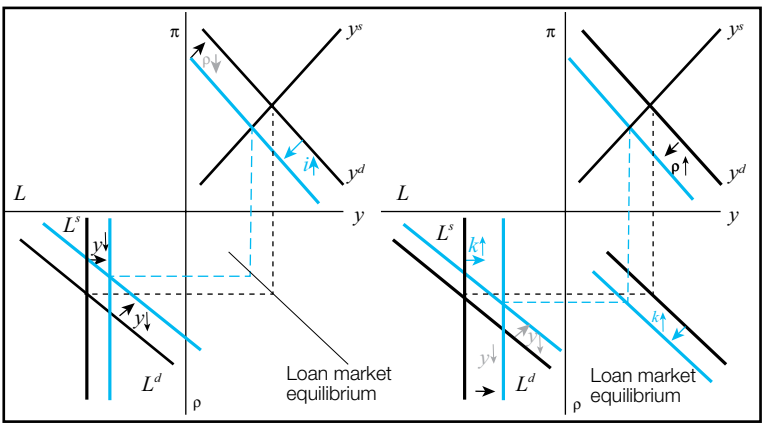
(7) $y^* = A_1 \varepsilon + A_2 \cdot \eta - A_3 \cdot i - A_4 \cdot k$, where $A_1, A_2, A_3, A_4, > 0$

(8) $\pi^* = -B_1 \varepsilon + B_2 \cdot \eta - B_3 \cdot i - B_4 \cdot k$, where $B_1, B_2, B_3, B_4, > 0$

Note that the equilibrium values of output and inflation are also functions of the level of the capital requirement, k. For a higher capital requirement, equilibrium output and inflation are lower.

An increase in interest rates (blue arrow) affects this economy through its effect on goods demand (lowering both consumption and investment) (Figure 1, left-hand side). The result is lower output and lower inflation. Lower output (black arrow) reduces bank lending (loan supply) through its effect on

Figure 1: Comparative statics of an increase in i (left-hand scale) and an increase in k (right-hand scale)



the value of bank capital and it reduces loan demand. If loan demand falls by more than loan supply, the market clearing loan rate will be lower. This, in turn, leads to a second-round increase in goods' demand (grey arrow), reversing some of the initial impact of the fall in output. In the end (blue), interest rates will be higher, output and inflation will be lower, and lending and loan rates will be lower.

An increase in capital requirements (blue arrow) will lead to a reduction in loan supply (Figure 1, right-hand side). Loan rates have to rise to reduce excess demand in the loan market, reducing goods' demand (black arrow). Inflation and output will have to fall to reduce excess output. This in turn will lead to a second round (grey arrow), reducing both loan supply and demand. If loan demand falls by more than loan supply, loan rates fall and output rises (reversing some of the first-round effect). Ultimately (blue), capital requirements will be higher, lending will be lower and loan rates will be higher; output and prices will be lower.

As is standard in monetary policy models, we assume that policy-makers choose the optimal interest rate to minimise the sum of the weighted square loss of the inflation and output gap. Normalising the inflation target and potential output to zero, we write the policy-maker's problem as

(9) $\min_i L_{MP} = \pi^2 + \lambda \cdot y^2$ subject to (7) and (8) , where $\lambda > 0$.

This yields a policy rule

$$(10) \quad i^*(k) = M_1 \cdot \varepsilon + M_2 \cdot \eta - \mathrm{M}_3 \cdot k \qquad \text{, where } M_2,\ M_3,\ > 0.$$

That is, interest rates adjust to both demand and supply shocks. And, interestingly, the optimal interest rate depends on the capital requirement, k, with the response decreasing in k. That is, the higher the capital requirement, the smaller the optimal interest rate adjustment for a given supply shock ε. In other words, the more capital requirements do, the less interest rates need to do. Indeed, looking back at the derivation of the optimal *interest rate* policy rule (10), we can see that everything could have been done in terms of the capital requirement k instead. Solving (10) for k as a function of i, we get:

$$(11) \quad k^*(i) = N_1 \cdot \varepsilon + N_2 \cdot \eta - \mathrm{N}_3 \cdot i, \qquad \text{, where } N_2,\ N_3,\ > 0.$$

The result is an optimal capital requirement policy rule, with k^* responding to η and ε and the coefficient dependent on the level of the interest rate, i. The optimal k is a decreasing function of the level of interest rates. So, the higher the interest rate level, the lower the optimal capital requirement needed to stabilise the economy after a given supply shock, ε, that is, the more interest rates do, the less capital requirements need to do.

Importantly, the equilibrium loss (the value of L_{MP} in equation (9)) is the same regardless of whether we use interest rate or capital requirement policy. This result follows because, in this simple macroeconomic model, interest rate policies and capital-adequacy policies are full substitutes here. As a consequence, it is not possible to improve upon the equilibrium outcome by moving one instrument if the other instrument is already set at its optimal value.

The implication of all this is clear: interest rate policy and capital-adequacy policy are substitutes in a number of cases. For a fixed capital requirement, interest rates can then be used as a stabilising tool, and for a fixed interest rate, the capital requirement can be used to stabilise inflation and output. It is, of course, possible to use both. As we describe above, the more one tool is directed to stabilisation, the less the other needs to be. But, importantly, in reaching the objective of low, stable inflation and high, stable growth, it is essential that interest rate policy and capital-adequacy regulation be co-ordinated.

The simplicity of our model suggests a number of caveats: for example, we assume neither instrument faces a constraint, which is not the case when, for example, the interest rate is at the zero bound; the two instruments have other important channels of transmission such as exchange rates that are not explicitly modelled here; the structure of a national financial systems is likely to matter for the result; and richer modelling of the financial sector (and the addition of dynamics) may introduce a difference between financial cycles and normal business cycles. Nonetheless, other authors – using richer, more complicated models of both the general equilibrium and the partial equilibrium type – have found that there is some degree of substitutability also in those models (Stein 2010; Angelini et al. 2010; Bean et al. 2010). This leads us to conclude that the result from our simple analysis is likely to carry over to larger, more complex macroeconomic models.

4. A broader objective: Monetary and financial stability[9]

While there is consensus that monetary policy objectives can be summarised by the two-part objective function equation (10), there is much less agreement about how to formalise financial stability objectives. One approach, followed by Angelini et al. (2010) is to target or smooth the ratio of credit to GDP. However, in our model, the ratio of credit to GDP is constant, except when policy changes the capital requirement variable k. An alternative approach is to follow Cúrdia and Woodford (2010), and note that purely financial frictions result in welfare-reducing changes in credit spreads.[10] In the same way that nominal frictions give rise to policy that responds to price changes, in the Cúrdia and Woodford setup, optimal policy strives to eliminate the deadweight loss created by the movement in the spread in the presence of financial frictions.

The simplest way to add this financial stability objective into our model is to amend the policy-maker's objective function in equation (10) and then solve the following problem:

$$(12) \qquad \min_{i} L_{joint} = \pi^2 + \lambda \cdot y^2 + \zeta \cdot (\rho - i)^2 \text{ subject to (7) and (8)} \quad \text{, where } \lambda, \zeta > 0.$$

$(\rho - i)$ is the spread between the loan rate and the policy (or funding) rate; ζ is the weight of the financial stability objective in the loss function.

As above, minimising the loss function with respect to either the interest rate or the capital requirement yields an optimal policy reaction identical in form

to (10) and (11). That is, each instrument is a linear function of the demand and supply shocks, as well as the setting of the other instrument.

The losses associated with these optimal policies are higher than in the simple monetary problem, except for the case where both instruments are set at their respective optima.[11] This was not so in the simpler case considered earlier, as the minimum losses could be reached with just one instrument, irrespective of the value of the other instrument.

The intuition for why losses are higher and why the instruments are potentially not substitutes is straightforward. While an increase in either instrument moves the first two objectives – inflation and output variability – in the same direction, the third, new objective creates a conflict. To see this, note that an increase in capital requirements naturally raises the loan rate (ρ), thereby increasing the spread $(\rho - i)$. In contrast, higher interest rates, a rise in i, decrease the loan rate ρ and decrease the spread. Unsurprisingly, adding a term to the policy-maker's objective function that creates a potential conflict like this increases minimum losses in most cases.

All of this brings up a number of questions: If we can use only one instrument, which should we choose? Or, if we can use two instruments, what would happen if we split the objective into two parts?

On the first, unsurprisingly, we can show that the losses for interest rates as the instrument are usually not the same as those for capital requirements as the instrument. This leads us to ask whether one policy instrument is preferable to the other. While we are unable to answer this question definitively, what we can say is that for a large range of parameters the following pattern holds: when demand shocks dominate, losses are lower when interest rates are the policy instrument; while for supply shocks, capital requirements deliver the better outcome in many cases. And, if minimising output variability is important enough (that is, λ is large), interest rates deliver lower losses for both types of shocks.

The intuition for this result is as follows. A positive demand shock increases ρ and, for fixed i, the spread $(\rho - i)$ (see Figure 1). We know from our earlier discussion that, with the standard objective (9), interest rates or capital requirements would need to rise to stabilise the economy. Using capital requirements to do this, however, increases the spread since this increases loan rates further. In contrast, higher interest rates offset the initial widening in the spread in two ways: through higher funding (policy) rates and through

lower lending rates. As a result, in a wide variety of cases interest rates deliver the better outcome.[12]

Turning briefly to the case of two instruments, since the objective is complex, including terms representing both macroeconomic and financial stability, it is natural to examine the independent use of the policy instruments to meet possibly independent objectives.

There are three possibilities. In the first, each policy-maker has his or her own objective, and optimises the instrument available to him or her independently. Regardless of which instrument is assigned to which objective – interest rates or capital requirements to macroeconomic or financial stability – the first-best cannot be achieved.

In the second, each policy-maker has his or her own instrument and objective, but takes the other policy-maker's action into account; in other words, the externalities created by setting one instrument are taken into account when setting the other. In our framework, the second setup is equivalent to joint optimisation of the broader objective. In this case, it is possible to achieve the same minimum losses as in the simple monetary policy problem.

The third setup is one of partial co-ordination in which one policy-maker moves first, ignoring the subsequent reaction of the other. The second policy-maker then sets his or her instrument, taking into account the policy decisions of the first mover. We see this Stackelberg game as particularly interesting, as it mirrors the case in which the capital requirement is set first by one authority (the leader) to achieve a financial stability objective, and then the monetary policy-maker follows, setting the interest rate to minimise the traditional macroeconomic stabilisation objective knowing the outcome of the leader's decision.

Not surprisingly, the loss function for the second mover is at the minimum, the basic trade-off for monetary stability in this case. The outcome for the first policy-maker, however, could be further reduced by internalising the remaining externality. In the cases we consider (i.e., parameters take non-zero values), financial stability losses are higher than in the case of joint optimisation. So, the Stackelberg outcome will always be inferior to the co-operative one. Not only that, but we are also able to show that the losses in this case can be larger than those in the non-co-ordinated one – the first case.

5. Implications for the design of a framework for macroeconomic stability

In this paper, we use a simple macroeconomic model to study the substitutability of interest rates and capital requirements. We find that in our model they are full substitutes for achieving a standard monetary policy objective of output and price stability. If ability to use one is limited, the other can "finish the job". This result stems from the similarity of the transmission mechanism of the two instruments.

Introducing a financial stability objective affects the substitutability of interest rates and capital requirements. However, the fundamental linkages between these two instruments and any associated objectives remain. These relationships create scope for improving macroeconomic (and financial stability) outcomes through co-ordination of the instruments. Once fully co-ordinated, the substitutability reappears differently: it is not important which policy-maker uses which instrument, but that their use be co-ordinated.

We find, however, that the type of co-ordination matters: if financial stability is important enough, a framework of partial co-ordination, where the policy-maker responsible for financial stability moves first, may deliver worse outcomes than one where both policy-makers move simultaneously (as in this case they do not take each other's reaction into account).

While we identify a co-ordination problem, its empirical relevance depends on a number of factors. Even for our simple model, there are parametrisations where the co-ordination gains are small. More importantly, however, our analysis is restricted to a specific type of financial stability: one based on financial frictions that can be measured by an interest rate spread. So, our discussion of financial stability is closer to that associated with the possibility of formulating cyclical capital requirements than it is with work aimed at modifying the structure of the financial system to increase its ability to withstand systemic shocks.

Another aspect of our findings concerns the appropriate choice of instrument for each policy objective. We should be open as to which instrument serves which objective, based on the best possible outcome and not on which system we inherited: interest rates may well be the better instrument to address financial stability, just as prudential instruments could be used for macroeconomic stabilisation.

If we think that financial instability is largely a result of idiosyncratic or sector-specific shocks, then capital requirements may well be the better tool to address it. In contrast, interest rates can reach those parts of financial intermediation that are not bank-based, allowing policy-makers to influence the behaviour of institutions that escape the regulatory perimeter. Building models that integrate more complex financial structures, helping build the policy infrastructure as well as inform policy actions, must be at the top of the research agenda for macroeconomists.

Notes

[1] See White (2006).

[2] For an overview of balance-sheet policies during the crisis, see Borio and Disyatat (2009).

[3] For an overview of the initiatives under way, see BIS (2010) Chapters I and VII.

[4] See Adrian and Shin (2008) on the procyclicality of leverage.

[5] See, for example, Financial Stability Forum (2008) and (2009).

[6] For a discussion, see, for example, BIS (2010), Chapter VII and BIS CGFS (2010).

[7] Without loss of generality, we could make bank lending depend on a combination of the level of capital and the risk-taking capacity. This could be modelled by adding a random element to equation (2).

[8] This is the linearised form of a loan supply function where $L^S = (1/k) \cdot B \cdot$

[9] The technical details of the results summarised in this section can be found in the working paper version of this paper, Cecchetti and Kohler (forthcoming).

[10] They consider two types of friction associated with financial intermediation. First, financial intermediation requires real resources in the process of originating loans. Second, a certain number of borrowers take out loans without repaying them. Both frictions create costs for the financial intermediation process. Allowing these costs to shift over time introduces purely financial disturbances that will be associated with changes in credit spreads.

[11] For i^* there is a unique k for which losses reach a minimum. This minimum is the same as in the simple monetary policy problem. Therefore, for all other k losses are higher.

[12] If interest rates have to move by very much, the spread may widen enough in the other direction to overturn this result.

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On the (non-)equivalence of capital adequacy and monetary policy: A response to Cecchetti and Kohler

Stan du Plessis and Gideon du Rand[*]

1. Introduction

Forty years ago, William Poole published a paper titled "Optimal choice of monetary policy instrument in a simple stochastic macro model" that would later become famous. The paper addressed a controversy of the early 1970s that echoes in 2010: the choice of the appropriate monetary policy instrument or, specifically, the extent to which other instruments in addition to a short-term interest rate are necessary or desirable. Today, the question is no less important in the wake of the international financial crisis, but is perhaps more so.

Cecchetti and Kohler (2010) return to this theme though with a twist and following a financial crisis that has undermined a monetary policy consensus that drew at least partly on Poole's results. We offer a reading of the Cecchetti and Kohler (2010) paper by starting with Poole's and then exploring how the concerns of the day found their way into their paper, before offering minor criticisms of their approach and suggesting some tentative alternatives.

2. The instrument problem in 1970

William Poole wrote his famous paper at a time of considerable uncertainty for monetary economists and central bankers: the Bretton-Woods system was in terminal decline, inflation was rising and the confidence of central bankers was ebbing. Of course, the decade would unfold with what Arthur Burns (1979) called the "anguish of central banking"; the disconcerting realisation that central bankers had both the desire to attain the goals of monetary policy and, apparently, powerful policy tools at their disposal, and yet they failed dramatically to achieve these ends.

* Gideon du Rand is a lecturer in the Department of Economics at Stellenbosch University.

The story of how central bankers overcame their anguish over the subsequent two decades has been told many times, especially by Marvin Goodfriend (e.g., 2007) and others (Svensson 2006; Mishkin 2007). There is no need for a repetition of the story, apart from mentioning that the move towards the systemic policy procedure that characterises the modern approach to monetary policy built in an important way on the formal approach to the instrument problem in papers such as that of Poole (1970).

The question on Poole's table was whether central banks should (i) use money stock, (ii) a short-term interest rate as a policy instrument or (iii) a combination of the two. To build a bridge to Cecchetti and Kohler's (2010) paper, we will translate this as a choice between (i) an interest rate, (ii) a balance-sheet instrument or (iii) a combination of the two. With a balance-sheet instrument, we mean a policy instrument that affects the balance sheets of banks and/or that of the central bank. Compare this with Cecchetti and Kohler's (2010) question about the use of (i) the interest rate or (ii) capital-adequacy ratios or (iii) a combination of the two, which matches the pattern (i) interest rate, (ii) balance-sheet instrument or (iii) a combination of the two.

It is this analogy that upon reading Cecchetti and Kohler (2010) one is reminded of Poole's (1970) paper. Similar to Cecchetti and Kohler (2010), the older paper also opened with an equivalence result: in an investment/saving curve and the liquidity preference/money supply equilibrium curve (ISLM) model similar to that of Cecchetti and Kohler (2010) but without stochastic disturbances, the two monetary policy instruments are equivalent. But that is not the message of Poole's (1970) paper, and we argue that it is not the message of Cecchetti and Kohler (2010) either.

In both cases, the major results are the non-equivalence of the instruments and the potential for their co-ordinated use. This is why we pencilled in the word "non" in front of "equivalence" in the title. It is the non-equivalence of these instruments that challenges monetary authorities: they have to choose between, or co-ordinate the use of, these instruments. Models such as those of Cecchetti and Kohler (2010) help one to understand the choice.

In the earlier paper, the model is a stochastic ISLM model with a quadratic loss function. The important result derived with that model was that the structural parameters of the model (the slopes of the IS and LM curves), and the relative sizes of the stochastic disturbances in the real economy and the asset markets determined the most efficient policy tool. Our view of the

structural characteristics of the economy will accordingly affect our choice of policy instrument. Poole (1970) showed that, in his model, the interest rate was the preferred instrument when shocks to the monetary sector were relatively large compared to shocks to aggregate expenditure. The money stock was preferred when shocks to the monetary sector were relatively smaller.

His next step was to investigate the scope for the co-ordinated use of the interest rate and money stock to improve policy outcomes. This joint optimisation outperformed what could be attained by using either of the two instruments individually, but subject to the monetary authority having knowledge about more structural parameters than is required with the single instrument alternatives. Based on this result, Poole (1970, 209) suspected that "a combination policy based on intuition may be worse than either of the pure policies". The bias against intuition in monetary policy-making has deepened since then, as Alan Blinder (1998, 9) observed almost 30 years later: "You can get your information about the economy from admittedly fallible statistical relationships, or you can ask your uncle. I for one," he continued, "never hesitated over this choice."

3. The instrument problem in 2010

Before the financial crisis, central banks implemented the modern consensus – perhaps the most widely known formulation is Bernanke and Gertler (1999) – that they should not respond *ex ante* to asset market fluctuations over and above the consequences of these fluctuations for the outlook on inflation and real output. Financial stability and price stability are complementary under (explicit or implicit) flexible inflation targeting in this view (Bernanke and Gertler 1999, 18 and 22).

While there were good reasons for not incorporating asset prices as a distinct objective of the interest rate policy of monetary authorities, the severity of the international financial crisis has encouraged a revision of this "mop-up-afterwards" approach to asset bubbles (e.g., Mishkin 2008; Blinder 2008). A finer distinction is now being drawn between types of asset-price bubbles, with the old consensus still believed to be applicable to bubbles on the stock market and where bank credit played a small part ("equity bubbles" in the terminology of Mishkin (2008)), but not for asset bubbles where the provision of cheap credit by banks plays a central role ("credit bubbles" in the terminology of Mishkin (2008)).

In these credit bubbles, neither the knowledge problem nor the instrument problem is thought to be as severe as previously suspected, or so the argument goes. A central bank that also plays the role of bank regulator and supervisor has much better information about bank lending and potentially about the prudence of that lending compared with knowledge about the fundamental support for stock market prices. In addition, central banks have a range of regulatory powers that can be used to reign in credit lending that is supporting an asset bubble; instruments that act directly on the behaviour of banks.

This distinction is sensible and is a lens through which plausible *ex post* readings of cases such as the "Great Crash" of 1929, the Japanese asset-price boom and bust, and the recent financial crisis have been offered by Mishkin (2008). However, to act against credit bubbles requires an *ex ante* analysis of the bubble, and there is not much evidence that the United States Federal Reserve System (US Fed), or other major central banks, were able to do that with respect to the recent crisis. Indeed, former US Fed Deputy Governor Alan Blinder considered the risks to various dimensions of US monetary policy at Jackson Hole in August 2005 (when the credit bubble was well under way) and summarised his results in a risk management matrix. It indicated moderate risks to inflation, employment and aggregate demand, and a high risk of a supply-side shock. Crucially, he identified the level of risk for both the banking sector and credit risk to be low, stable and covered by strong risk management (Blinder and Reis 2005, Table 1).

This demonstrates the need for better monetary policy models so that an observer in Blinder's (2005) position would have identified the emerging credit and banking-sector risks. Without these changes, the distinction between credit and equity bubbles brings central banks no closer to a practical engagement with the risks of asset bubbles. This also provides the motivation for the kind of model proposed by Cecchetti and Kohler.

3.1 Cecchetti and Kohler's (2010) model

The starting point for the Cecchetti and Kohler (2010) paper is the recognition that financial stability is widely recognised as a critical objective for monetary authorities. Indeed, this objective is now, as it has been in the past, a major reason for having a monetary authority at all. This was certainly part of the policy consensus before the crisis, as is reflected in almost any list of prescriptive statements about what central banks should do, for example, the following list from Mishkin (2007):

1. Price stability should be the long-run goal of monetary policy
2. Central banks should adopt an explicit nominal anchor
3. The central banks should be goal-dependent and held accountable to the public
4. However, the central bank should have instrument independence
5. A central bank should be transparent, especially through an extensive communication strategy
6. A central bank should have the goal of financial stability.

Number 6 stands somewhat apart from the first five suggestions and is only implicitly captured by the consensus on inflation targeting. The connection between inflation targeting and financial stability is perhaps closest to explicit in the literature on appropriate responses to asset-price bubbles where, for example, Bernanke and Gertler (1999, 18) connected the "sustained damage to the economy" by an asset-price collapse with a failure by central banks to act against deflationary pressures.

Notwithstanding the aforementioned, the goal of financial stability is widely recognised (Crockett 1997; Goodhart 2005; Svensson 2009) and brings particular modelling challenges. The central bank's role in prudential supervision implies an ability to identify risks to financial stability in a forward-looking manner, and the ability to assess the risks associated with the current and likely future circumstances of the financial sector, conditional on policy actions such as (i) the stance of monetary policy, (ii) the lender-of-last-resort facility and (iii) 'softer' instruments such as financial stability reports by financial firms (Bårdsen et al. 2006).

While all central banks assess these risks, they often do so without the aid of formal models that connect economic developments, policy and financial fragility. Before the crisis, the policy decision with respect to the nominal anchor was often separated from regulatory decisions aimed at financial stability. This "division of responsibility", as Cecchetti and Kohler (2010, 2) rightly observe, "has not survived the crisis". One now has to find a way to co-ordinate these two aspects in a more or less explicit manner.

It is at this point that the Cecchetti and Kohler paper enters the debate: it is an excellent step towards a rigorous inclusion of financial stability in the systematic part of monetary policy. A brief summary of their approach follows.

Instead of an ISLM model, Cecchetti and Kohler start with a log-linearised stochastic aggregated demand (AD)–aggregated supply (AS) model with bank capital, where AD is a function of the short-term real interest rate and the real short-term loan rate at banks. Bank lending in this model is constrained by bank capital, with the capital requirement a policy variable. To capture an aspect of the financial accelerator, bank capital is a positive function of real output. The demand for loans is a function of real output, as well as the real loan rate at banks. Meanwhile, AS is simply a positive function of unexpected inflation. Cecchetti and Kohler (2010) solved the model under rational expectations.

3.2 The equivalence result

Their model is used first to derive an equivalence result between interest rate policy and reserve requirements for a monetary authority that tries to obtain low inflation and stable output around its long-run potential. The optimal policy yields identical outcomes under both policies. The title of the paper derives from this result, but we think the really interesting results follow in subsequent sections, where the equivalence results no longer hold.

3.3 Including financial stability

The next step is to include financial stability in this monetary policy model. This is easier said than done, as there are a number of rival definitions of financial fragility and many of them are not easy to capture in a model.

One important and intuitively appealing tradition in this literature conceptualises financial fragility in institutional terms, with 'stability' defined in terms of (i) the stability and credibility of key institutions and (ii) the stability of key markets, such that prices reflect underlying fundamentals (see, for example, Crockett 1997). In contrast with this emphasis on institutions, Mishkin (1999) and others have conceptualised financial instability as a disruption in the flow of information in financial markets, with shocks – or asset-price bubbles – preventing the markets from allocating resources efficiently. The focus on information, and especially asymmetric information, highlights the risks of moral hazard and adverse selection.

The measure of financial instability used by Cecchetti and Kohler (2010) falls into this broad category, where they follow one of the proposals used by Cúrdia and Woodford (2010) to suggest that changes in the spreads between the interest rates charged to various classes of borrowers might be a useful

barometer of financial instability. The idea in Cecchetti and Kohler (1970) is to include the spread between the loan rate and the short-term policy rate in the loss function for the monetary authorities. We return to the wisdom of this decision later on.

Again, they derive the optimal interest rate and capital-adequacy policy reaction functions. An analogous result to Poole's emerges at this point, namely using both instruments leads to a better overall result than can be achieved with either of the two instruments independently. The reason for this is that both instruments move the traditional first two terms of the loss function in the same direction, while the new third term (the credit spread) is moved in the opposite direction. Using a second instrument to respond to the third term therefore improves the outcome.

Further, the equivalence result between the two polices no longer holds. As with Poole's earlier result, the preferred policies will depend on the structural parameters of the model. If demand shocks are relatively larger, then interest rate policy will be preferred and, conversely, the capital-adequacy ratio will be the preferred policy tool when AS shocks dominate.

3.4 Policy co-ordination

The final question examined in the Cecchetti and Kohler (2010) paper is whether, and if so how, the two policy instruments might best be co-ordinated given the concern for financial stability. They consider the following three alternatives:

1. The two policy instruments are set independently, with the policy-maker in charge of each instrument setting it independently
2. The two policy-makers jointly optimise the setting of their instruments in pursuit of the combined objective
3. A Stackelberg strategy is followed whereby one policy-maker optimises first (ignoring the consequences of that decision for the other policy-maker), after which the second instrument is set taking the setting of the first instrument as given.

In an echo of Poole's result, Cecchetti and Kohler show that the structure of the model, in this case whether AS or AD shocks dominate, affects the relative ranking of these three strategies. While Cecchetti and Kohler (2010) provided analytical results, we simulated the outcomes for the loss function

in their model to demonstrate the results by calibrating their model and calculating the outcomes over various ranges of the parameters in the loss function.[1] These simulations are presented below.

Case 1: Aggregated demand shocks dominate

Figure 1 shows the outcomes for the loss function under the three strategies for a range of relative weights on the credit spread. Unsurprisingly, the co-ordinated strategy is the best, but when demand shocks dominate, the Stakelberg strategy performs least well. Not only is the Stackelberg strategy the worst in this case, the losses pull further apart as the weight on financial stabilisation rises.

Figure 1: Aggregate demand shocks dominate, over a range of weights for the credit spread

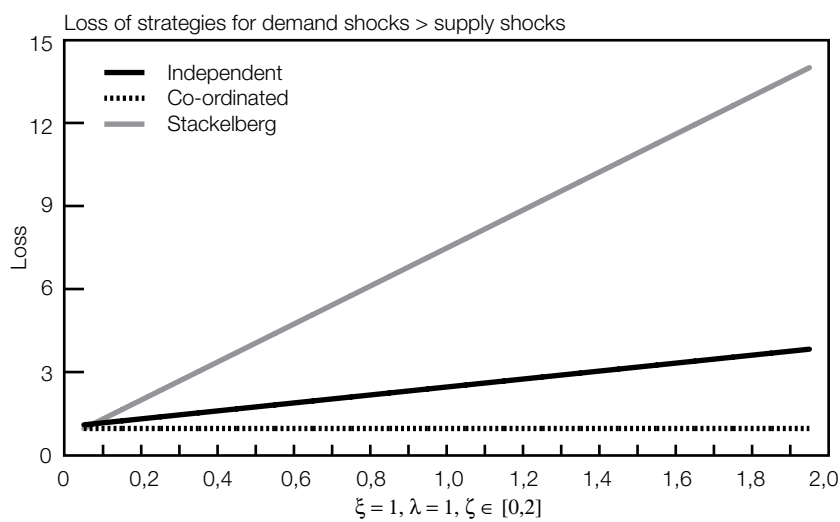
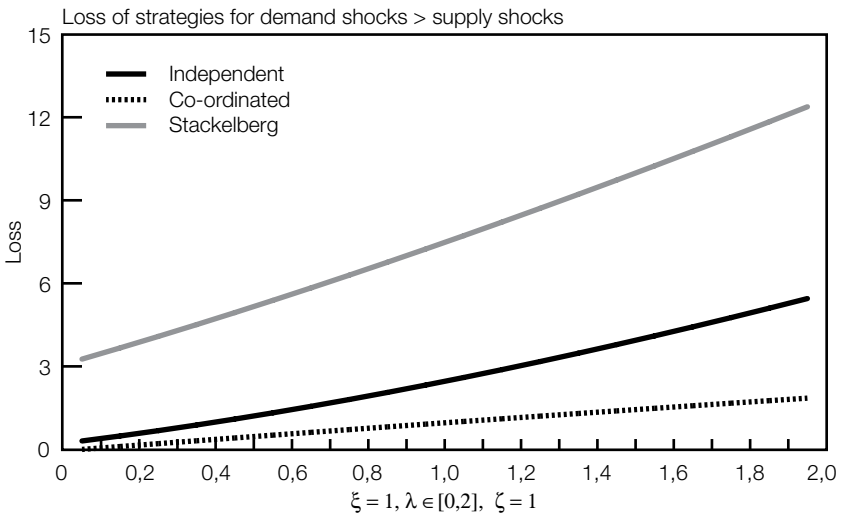


Figure 2 shows the outcomes for the loss function under three strategies for a range of relative weights on output stabilisation.

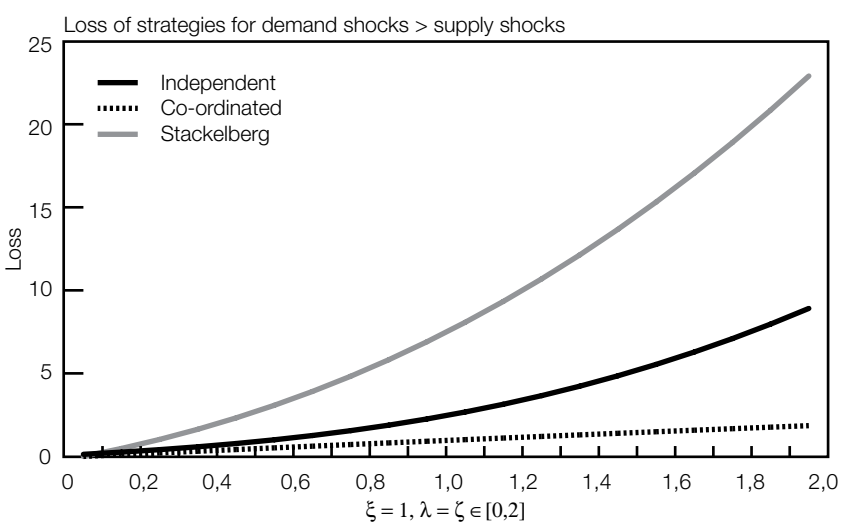
Again, the Stackelberg strategy is the worst, co-ordination is by far the best, and the gap between co-ordination and the other two widens as the weight on output stabilisation rises.

Figure 2: Aggregate demand shocks dominate, over a range of weights for output stabilisation



In Figure 3 we plot the outcomes for the loss function when the weights on output and financial stabilisation vary together.

Figure 3: Aggregate demand shocks dominate, over a range of weights for output and financial stabilisation



Case 2: Aggregated supply shocks dominate

We repeat the simulations above, but under a scenario where AS shocks are dominant. The co-ordinated strategy is clearly preferable but, in contrast with the earlier result, the independent strategy performs least well when AS shocks dominate, as shown in Figure 4. Not only is the independent strategy the worst in this case, but the losses pull further apart as the weight on financial stabilisation rises.

Figure 4: Aggregate supply shocks dominate, over a range of weights for financial stabilisation

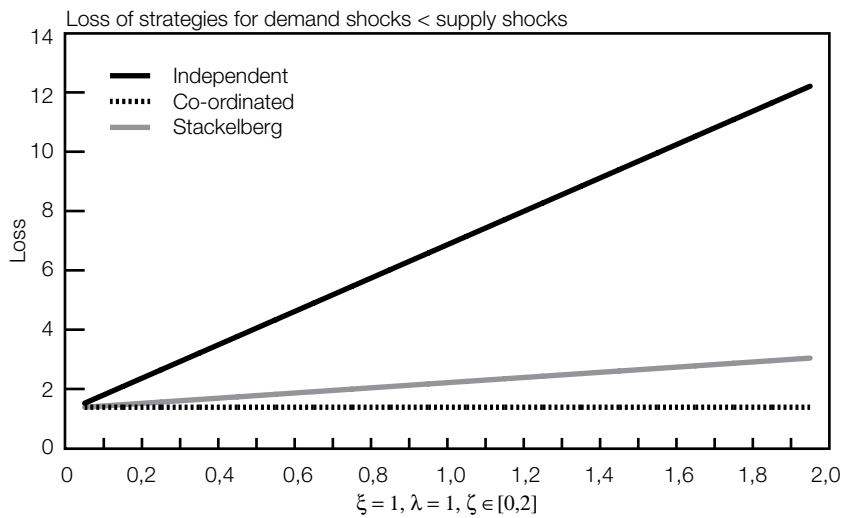


Figure 5 shows the outcomes for the loss function under the three strategies for a range of relative weights on output stabilisation. In this case, the results are more interesting. While the independent strategy is the worst, the gap between the strategies declines as the weight on output rises.

In Figure 6 we plot the outcomes for the loss function when the weights on output and financial stabilisation vary together. The ranking observed in the other AS dominant cases is preserved here.

Figure 5: Aggregate supply shocks dominate, over a range of weights for output stabilisation

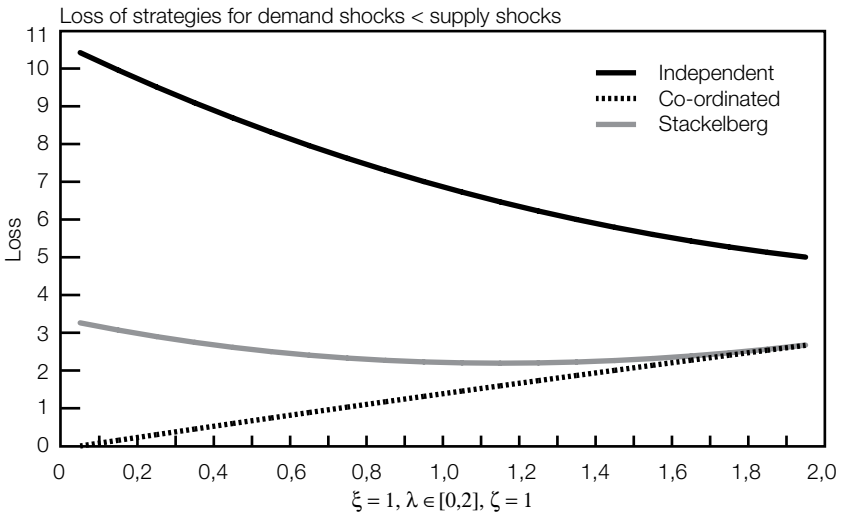
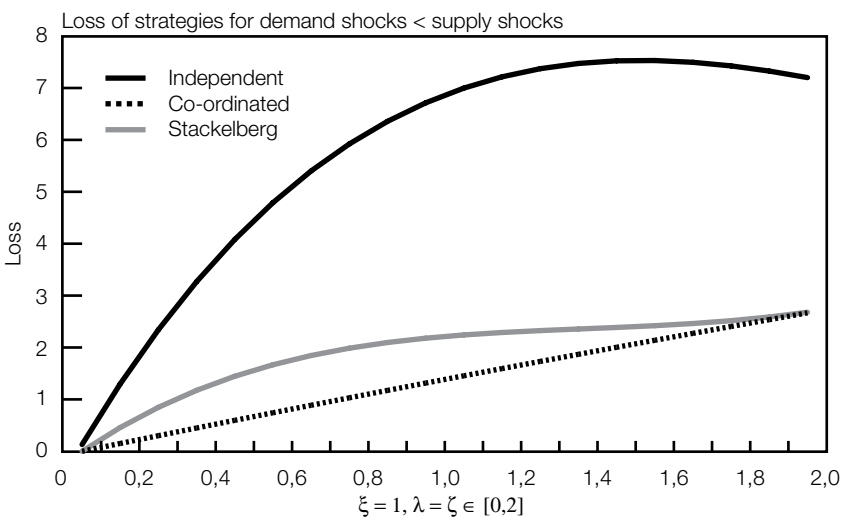


Figure 6: Aggregate demand shocks dominate, over a range of weights for output and financial stabilisation



Case 3: Neither aggregated demand nor aggregated supply shocks dominate

Finally, we consider what happens when neither AD nor AS shocks dominate and were surprised to observe the sensitivity of the outcomes in this case.

Figure 7 shows the outcome when we vary the weight on output stabilisation under conditions where neither of the two macro-shocks dominate. The outcome in this case is comparable to those for the dominant AD shocks, with the Stackelberg strategy clearly being the worst.

Figure 7: No dominant shocks, over a range of weights for financial stabilisation

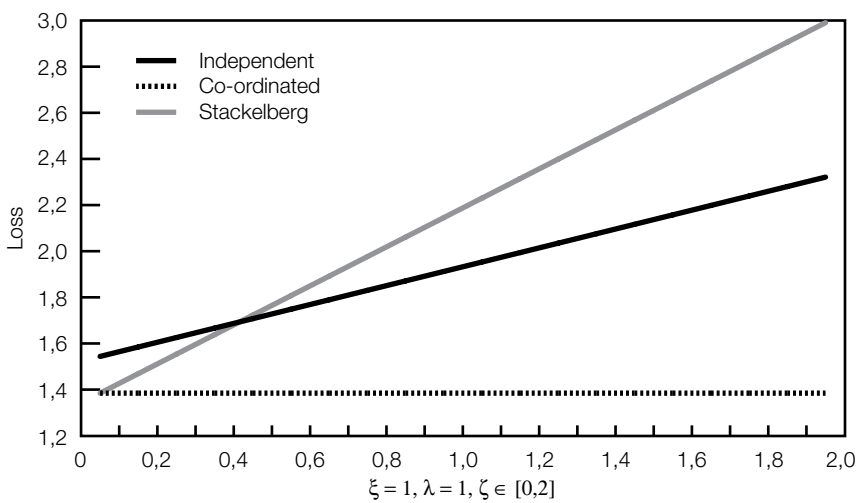


Figure 8 shows the outcomes for the loss function under the three strategies for a range of relative weights on output stabilisation. Here we find a crossover, with the independent strategy being the worst at very low weights on output stabilisation, but better than the Stackelberg strategy at higher weights.

Finally, we plot the outcomes for the loss function when the weights on output and financial stabilisation vary together (Figure 9). In this final scenario, the outcomes are not very different when the weights on output and financial stabilisation are jointly small, but as they rise, a substantial gap between the co-ordinated strategy (best) and Stackelberg strategy (worst) opens up.

Figure 8: No dominant shocks, over a range of weights for output stabilisation

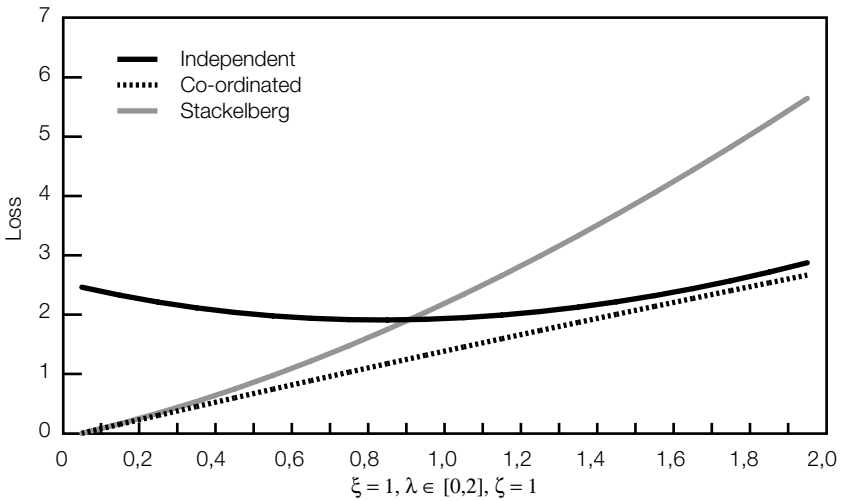
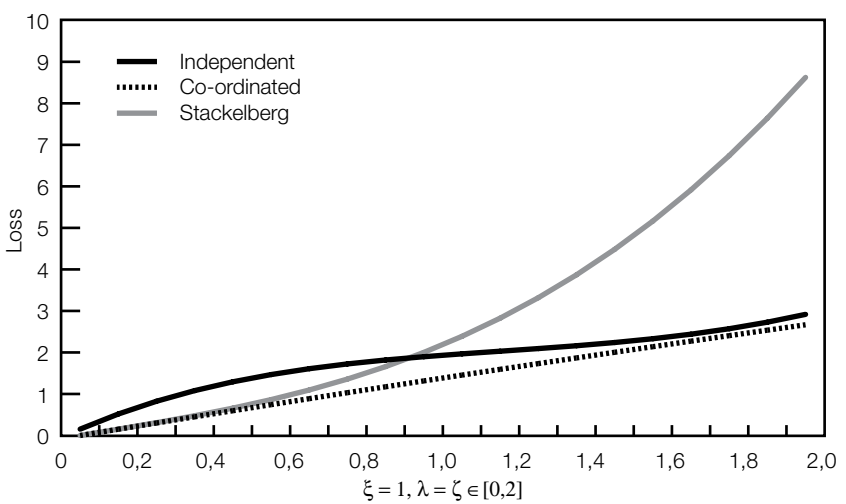


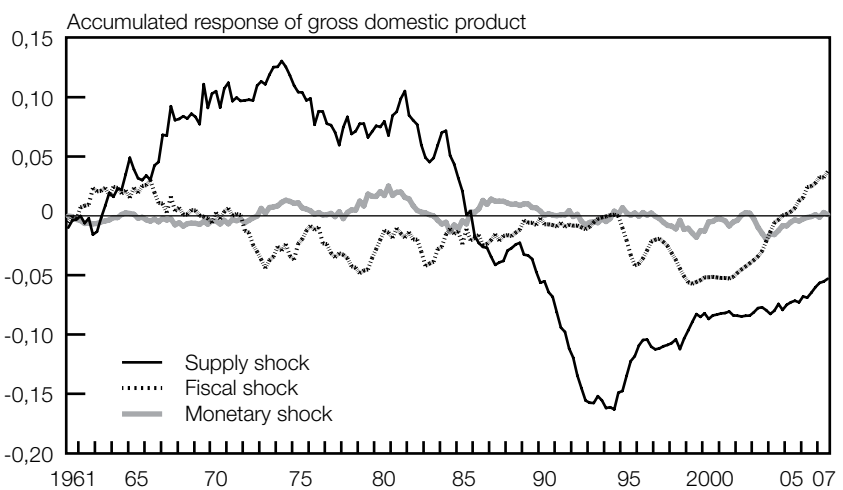
Figure 9: No dominant shocks, over a range of weights for output and financial stabilisation



How do we interpret these graphs? First, a word of caution: these scenarios are dependent on the particular calibration used, and the results should not be over-interpreted. Second, it is clear that our understanding of the economy, as expressed in the relative size of demand-and-supply shocks, has an important implication for the desirable co-ordination of these policies. These results echo Poole's (1970) earlier result.

In the case of South Africa it is perhaps instructive to think of some evidence about the likely relative size of these shocks. In du Plessis, Smit and Sturzenegger (2008), a structural vector autoregression (VAR) was used to identify aggregate demand-and-supply shocks for the South African economy since the early 1960s. Figure 10 shows the cumulative impact on real output for the identified shocks. It is a visual confirmation of the formal result indicating that AS shocks have been somewhat more important in South Africa over this period. Drawing on the Cecchetti and Kohler (2010) results, this suggests that a Stackelberg strategy, whereby the Monetary Policy Committee (MPC) takes into account the prior decision of the financial stability authority, will improve on independence for these two decisions.

Figure 10: The impact of aggregated demand and aggregated supply shocks on real output in South Africa



Source: Du Plessis, Smit and Sturzenegger (2008)

4. Critical reflection

There is no question that Cecchetti and Kohler (2010) offer an important and interesting step towards operationalising the emerging consensus that monetary policy needs to incorporate financial stability much more directly in the systematic part of the policy procedure. To do this, one needs to give tractable content to the concept of 'financial stability' or 'instability'.

Cecchetti and Kohler followed Cúrdia and Woodford's (2010) use of the spread between loan and short-term rates as a proxy for financial instability. There is, of course, good reason for this, as Cúrdia and Woodford (2010, 4) observed: "Among the most obvious indicators of stress in the financial sector since August 2007 have been the unusual increases in (and volatility of) the spreads between the interest rates at which different classes of borrowers are able to fund their activities."

They, in turn, followed earlier suggestions by McCulley and Toloui (2008) and Taylor (2008) to use such a spread to adjust the intercept in the Taylor rule. Cúrdia and Woodford (2010, 32) showed, however, that a simple adjustment of the Taylor rule to include a credit spread would outperform the standard Taylor rule, in their words:

> But flexible inflation targeting, if properly implemented, is superior to even a spread-adjusted rule – at least to simple rules of the kind proposed by Taylor (2008) or McCulley and Toloui (2008). A forecast-targeting central bank will properly take account of many credit spreads rather than just one; it will take account of whether changes in credit spreads indicate disruptions of the financial sector as opposed to endogenous responses to developments elsewhere in the economy, and it will calibrate its response depending on its best guess about the likely persistence of disturbances on a particular occasion.

Cecchetti and Kohler did not simply include the spread in a Taylor rule. Instead, they included it in the loss function, and then solved the optimal policy problem, avoiding some of Woodford's concerns. However, there are a number of potential pitfalls in this approach that require careful attention before using it to rank the optimality of different policy regimes.

First, the use of a quadratic loss function with a linearised economy has a long tradition in monetary economics, as it allows the direct application of familiar and powerful results in a linear quadratic optimal control framework, among other reasons (Woodford 2003, 383). It is, however, important to note that the validity of the answers depends crucially on the structure underlying

the linearised approximation. Woodford (2003, Chapter 6) shows that it is not obvious that optimising with such a loss function will lead to aggregate welfare maximising rules. He shows that a quadratic loss function (in inflation and the output gap) can indeed be derived from a second-order approximation of the expected utility of the representative agent,[2] but that it depends on the point around which the approximation is taken. This result hinges, in turn, on structural features of the specific model concerned, for example, equilibrium distortions due to monopolistic competition, sticky prices and so forth.

Second, while Cúrdia and Woodford's (2010) model is written in linear approximation that appears very similar to that of Cecchetti and Kohler (2010), there are important differences, for example, Cúrdia and Woodford (2010) derive the linear approximation from micro foundations where there are two types of consumers so that in equilibrium there is borrowing and lending. It also yields a Phillips curve that depends on additional terms (e.g., the marginal utility gap between the two types of agent), which is not present in the stylised economy of Cecchetti and Kohler (2010).

Third, even if a simple loss function adjustment could account correctly for the aggregate utility cost of various policies and the linearised model captures enough of the dynamics to be accurate in the setting, the way the spread enters the loss function (as a quadratic term) is itself problematic. We are sceptical of the claim that credit spreads indicate financial instability as strongly as suggested by a squared term. As is stands, it suggests sharply rising concern about financial fragility, even at faulty low credit spreads.

Fourth, Cúrdia and Woodford (2010) show that the optimal response of the policy rate to various shocks is not simple: in response to a financial sector shock that widens the spread, it is optimal to increase the policy rate, while in response to other shocks (say monetary policy) that increase the spread, it is optimal to decrease the interest rate. Clearly, a simple Taylor rule with only a positive or negative coefficient on the spread cannot capture this. While Ceccheti and Kohler derive rules from the loss function rather than imposing them, it is not clear that this will be enough to allow the rule to approximate the optimal policy path that Cúrdia and Woodford derive as a benchmark to measure the performance of rules.

As a final word, we should like to encourage readers to think broadly about the inclusion of financial fragility in the policy procedure. An alternative that we find promising follows the work of Goodhart, Sunirand and Tsomocos

(2006), who have suggested a new definition of financial fragility that is explicitly aimed at modelling the welfare effect of financial instability, which emerges as an equilibrium outcome in the model. At the heart of their concept of financial instability is the combination of (i) high probability of default for banks and (ii) low profitability for banks. This allows for the formulation of a model that is designed to analyse the consequences of risk taking by individual banks, the possible contagious relationship between banks, and a framework for analysing regulatory policy and its effect on financial fragility (Goodhart et al., 2006). Unfortunately though, these models are still so complex that analytical solutions cannot yet be derived.

Notes

[1] The calibration satisfies the necessary conditions given in Cecchetti and Kohler (2010), but was chosen for illustrative purposes and is not rigorously motivated to represent any view on the strength of various interactions.

[2] Which is the axiomatic starting point of the micro foundations of welfare analyses in these types of models

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Post-crisis South Africa: Monetary policy and financial stability; A panelist's response

Ben Smit

Introduction

My brief as a conference delegate is to participate in a panel discussion following the presentation of the formal papers and the associated discussions. To start off the panel discussion, I should like to make the following introductory comments on the conference proceedings:

What the conference was about

The theme of the conference suggests that its focus is on monetary policy and financial stability following the global financial crisis in the second half of 2008 and the associated "Great Recession". This was probably partly motivated by the fact that the financial crisis has not yet been adequately resolved, although the recession seems to be over, and also – and perhaps more importantly – by the ongoing fundamental rethink of financial-sector regulation and its relationship with macroeconomic policies that were triggered by the crisis.

Although financial stability has historically been regarded as an important function of central banks, in recent years the consensus on the conduct of monetary policy has tended to focus on price stability (with the ultimate aim of high stable growth and employment). The financial crisis has, however, proved that price stability does not necessarily ensure financial stability. Financial stability, however, has tended to focus on the stable provision of financial services (i.e., payment services, credit supply and insurance against risk). More ambitiously, it is sometimes defined as avoiding the effects of financial crises on the real economy. The rethink of the interaction between monetary policy and financial stability has resulted in a new focus area, namely the design and use of prudential regulations and other instruments to contain systemic risk – the so-called macroprudential policies.

The papers

Charles Goodhart provided a highly informative and authoritative account of the new architecture of financial regulation, its development and the progress made to date. He distinguishes between crisis prevention, resolution and the administrative arrangements for implementation.

Desmond Lachman offered a scary, very well-argued vision of a pending European financial crisis with pointed lessons for South Africa.

Stephen Cecchetti provided a formal theoretical analysis of the use of capital-adequacy requirements and interest rates as macroeconomic tools.

The role of central banks

A central question from the perspective of the conference theme is whether central banks are responsible for financial stability (macroprudential policy). Goodhart suggests a leading role in monitoring and regulating systematic risk because financial stability is essential for the objectives of monetary policy and may well require lender-of-last-resort powers.

Central banks also have the professional economist expertise for macro-prudential policy independence (from politicians and the banking industry) and are better positioned to "take away the party bowl".

Lessons for South Africa

South Africa is in the fortunate position that its banking sector was not directly involved in the sub-prime crisis, although it certainly did not escape the impact of the "Great Recession". However, the current rethink of financial-sector regulation and its relationship with macroeconomic policies certainly does have implications for the country.

On the responsibility for financial stability and macroprudential policies, South African Reserve Bank (the Bank) Governor Gill Marcus indicated that the Bank would not necessarily take full responsibility, but at least have a shared responsibility and a co-ordinating role.

It also transpired from the earlier discussions that the Bank, through its Bank Supervision Department, was making serious business of the international developments regarding financial regulation.

Finally, as indicated by Lachman, the European financial crisis also has lessons for South Africa; in particular, lessons regarding excessive government wage increases, deficit financing and exchange rate management.

Post-crisis South Africa: Monetary policy and financial stability; A panelist's response

Elna Moolman

Policy evolution

Generally, South Africa will adopt the banking and regulatory policy changes implemented internationally in the aftermath of the crisis and, in particular, the higher and stricter capital requirements discussed in Charles Goodhart's keynote address at the conference. For most countries, the new capital requirements will cause an increase in banks' cost of capital, pushing up the economy-wide cost of credit and, in turn, dampening economic growth (see BIS 2010). However, the large South African banks already comply with the higher proposed capital requirements, so there should be no additional upward pressure on the cost of capital as a result of these changes, according to Yvette Singh's conference presentation. That said, banking regulators and supervisors appear to be somewhat uneasy with the extent of the maturity mismatch between banks' assets and liabilities, and it is likely that some changes in this regard will follow in due course. This would affect all banks and their cost of capital.

The more complex part of the post-crisis policy change is the evolution of monetary policy in the context of the increased focus on financial stability. The long-standing debate around the desirability of a very narrow focus of monetary policy on consumer inflation intensified after the crisis. There is as yet no agreement in the literature about the role of monetary policy in causing the crisis, nor about the appropriate focus of monetary policy post-crisis, although the general drift seems to be towards monetary policy extending its focus to include the prevention of leveraged asset-price booms (see, for example, Mishkin 2009). The South African Reserve Bank's (the Bank) mandate has been expanded explicitly to include financial stability, although it seems to have some flexibility in terms of the instruments to use in pursuing this objective. The National Credit Act (NCA) implemented in South Africa prior to the crisis is an example of an additional tool used in this regard.

The above-mentioned policy changes leave South African policy-makers with some practical challenges. First, the post-crisis re-pricing of credit means that it is no longer appropriate simply to use the prime or repurchase (repo) interest rates as proxy for the cost of credit in, among other things, the Bank's econometric model that is used for policy analysis and forecasting. Instead, it has become critical to quantify and track the actual cost of credit in the economy, and to adapt econometric models to use this measure instead of a prime or interest rate proxy. By extension, changes in lending standards also need to be taken into account (as it should have been prior to the crisis as well). This includes some of the frictions between the real and financial economy discussed in Dale Gray's presentations, as well as the influence of financial sector imbalances on the real economy discussed by Stephen Cecchetti.

Second, insofar as house prices are becoming even more important to policy-makers than before, it has become imperative to develop an accurate house price measure in South Africa. House prices already played an important role in policy-makers' assessment of consumer demand and in their consumer spending forecasts via the wealth effect, but will become even more important given the increased emphasis on financial stability. The three banks that publish house price data in South Africa each base its data on the aggregate price of mortgages that it extended during the period under consideration, rather than the evolution of the price of any specific house (as would, for example, the Case–Schiller United States (US) house price index). As a result, the data are exceptionally sensitive to changes in the price distribution of houses mortgaged in any period. When more expensive (affordable) houses are sold, it artificially boosts (lowers) the average price recorded. This explains why one of the banks reported about 7 per cent year-on-year average house price growth in the third quarter of 2010, but 10,7 to 19,7 per cent year-on-year growth in the four constituent price bands (see Figure 1).

In other words, the 7 per cent house price growth used by analysts and policy-makers in their assessment of the state of the consumer is not representative of the experience of anybody in the economy. It seems as if the recent measured house price contraction reflects comparatively more buoyancy in the more affordable segment of the market rather than falling prices. To add insult to injury, the banks smooth their data to the extent that it distorts the true developments in house prices (Figure 2).

Figure 1: House price growth per price band

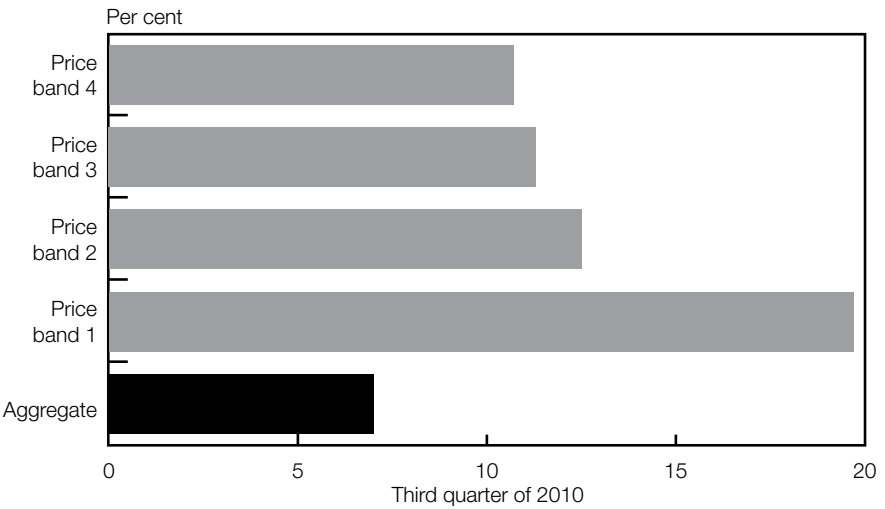
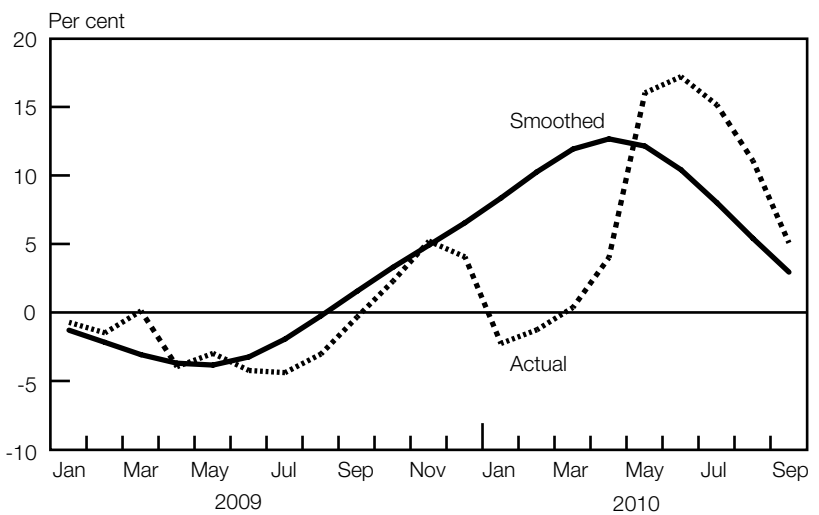


Figure 2: House price growth



Economic impact

Direct impact

The South African economy was partially shielded from the immediate impact of the crisis by exchange controls, prudent bank regulation and supervision, and the NCA. The indirect impact of the post-crisis global recession on South African exports and growth was partially shielded by accommodative monetary and fiscal policy, and a floating exchange rate, but this did not prevent the economy from entering the first recession since the early 1990s in response to lower global demand, plummeting confidence and commodity prices, and tighter and more expensive credit.

Longer-term economic impact

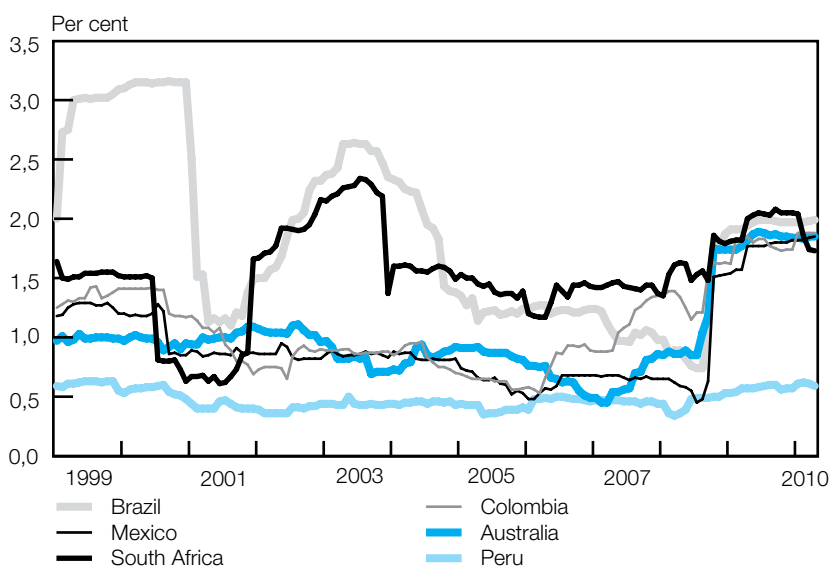
The adverse bearing of the post-crisis global economy on South Africa has faded as economies responded to an unprecedented scale of monetary and fiscal policy stimulus, and the South African economy exited its relatively short-lived (three-quarter) recession in the third quarter of 2009. However, the enormous amount of fiscal consolidation and deleveraging required in most advanced economies after the crisis will keep their growth below potential and fragile for several years following the crisis, with obvious consequences for South African exports and growth. Furthermore, South Africa is one of the developing countries with relatively robust economic growth and relatively low fiscal risks (at least compared to most advanced economies), on the back of which it has seen unprecedented portfolio inflows that would likely endure until economic growth and interest rates in the advanced economies improve meaningfully. Given the structurally superior risk–return profiles of emerging markets generally, these capital inflows are regarded as more structural (i.e., less speculative) in nature than they tended to be historically. As a result, emerging markets will likely have to gear themselves for a sustained period of currency strength.

Some countries responded with restrictions on capital flows or more aggressive intervention in terms of foreign reserves. South Africa's response has mainly been to relax exchange controls and step up the pace of reserve accumulation. With one of the most liquid currencies globally, more than half its currency trades taking place abroad and comparatively low foreign exchange reserves, South Africa has limited options in this regard; particularly given its current-account deficit and large public-sector foreign borrowing requirements.

These developments brought the rand to the forefront of domestic policy debates and calls from manufacturers, exporters and trade unions for policy interventions to weaken the rand. Unfortunately, as Governor Gill Marcus pointed out in her opening remarks to the conference, a weak currency would not be a silver bullet in respect of the country's competitiveness. Historically, (nominal) rand weakness passed through to higher wages and inflation, which eroded the potential real competitive gains. It is critical to consider other relevant elements of competitiveness as well, especially in terms of identifying the most effective policy responses.

It is also critical that policy-makers and businesses accurately identify the portion of South Africa's uncompetitiveness that relates to the rand. If the rand is incorrectly blamed for a lack of competitiveness that in truth relates to other factors, policy interventions will be misguided, and the country's export and growth trajectories will not be lifted to their maximum potential, which is desperately needed to address the country's problems of dire poverty and unemployment. Comparisons of global currencies are always complicated by the differences between their respective economies, but the Brazilian real might be one of the most appropriate currencies with which to compare the rand, given that both economies are in a similar phase of economic development and dominated by commodities. Figure 3 suggests that the

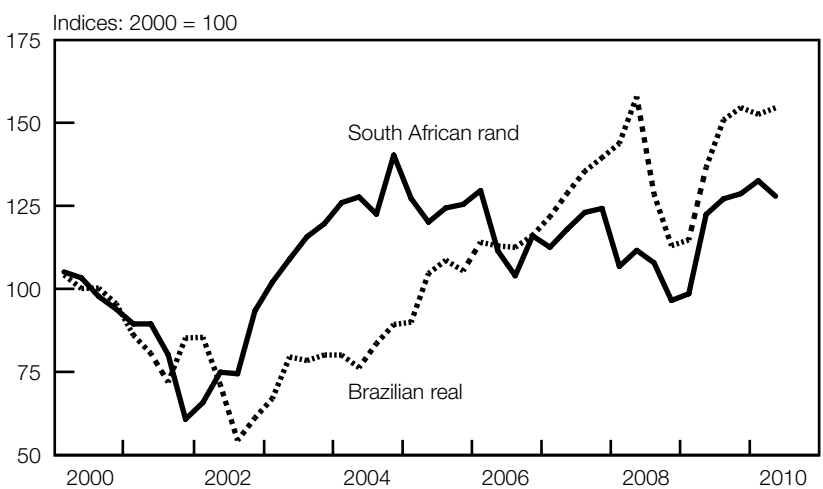
Figure 3: Emerging markets: Currency volatility comparison



nominal effective exchange rate of the rand is generally not particularly volatile when compared with the Brazilian real over a long period (even though both of them are generally more volatile than the other emerging-market currencies (Figure 3)).

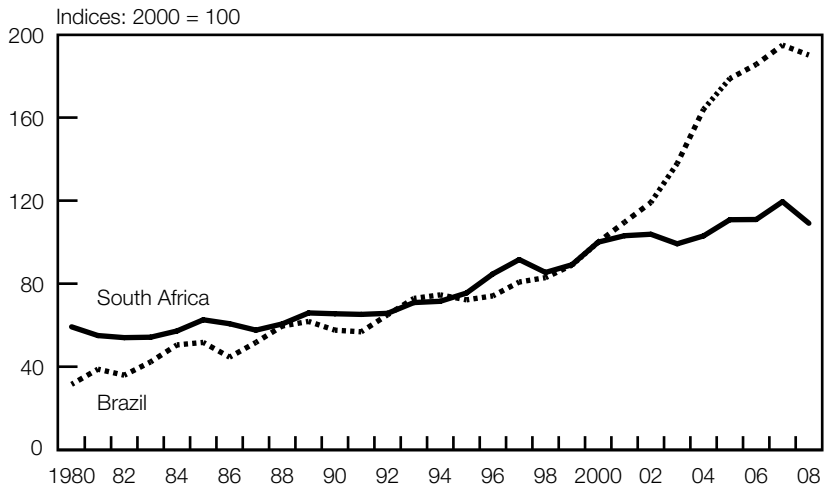
Figure 3 might also be useful in giving very tentative insight into the effectiveness of currency intervention policies applied by some of these countries, such as the taxes on portfolio inflows occasionally applied by Brazil, or the options-based foreign-exchange intervention policies of Colombia, Mexico and Peru. Figure 3 tentatively suggests that the Brazilian real is roughly as volatile as the rand, despite the differences in currency policy between South Africa (where the policy is not to influence the value of the currency) and Brazil (where capital inflow taxes are occasionally applied to discourage portfolio inflows). A comparison between the rand and Brazilian real (in real terms) also suggests that the rand is not strong by comparison (see Figure 4).

Figure 4: South African rand versus Brazilian real



While the analysis above does not reveal any major and sustained differences in the volatility and strength of the rand and real, Figure 5 clearly demonstrates the massive outperformance of Brazilian exports relative to that of South Africa in recent years: since 2000, Brazil's export volumes have outperformed South Africa's by about 80 per cent! Clearly, this underperformance does not relate to the rand and must be attributable to other factors.

Figure 5: South African versus Brazilian export volumes



If Chile is added to the analysis, the earlier observations about the underperformance of South African export volumes remain valid. This is particularly striking in the light of the earlier comparison of currency volatility. The Brazilian real is far more volatile than the Chilean peso, but Brazil outperformed Chile in terms of export volume performance. At the same time, the volatility of the rand is comparable to that of the Brazilian real, while it is generally weaker (in real terms), but the South African export performance is far inferior. Of course, currency strength and volatility are not the only drivers of these relative performances, with, among other things, the respective compositions of exports and export destinations also playing a role. These countries are, however, broadly similar in terms of the importance of commodities in their exports and also in terms of their main export destinations (admittedly, the dominance of copper in Chile's exports distorts any comparison of its export trajectory).

To get a better understanding of the possible reasons for South Africa's export underperformance, its comparison to Brazil is extended to the differences between the two economies as measured by various global surveys including the World Bank's annual Doing Business surveys, the World Economic Forum's annual *Global Competitiveness Report* and data from the Economic Intelligence Unit (EIU). Three of the factors that were highlighted by these comparisons were South Africa's uncompetitiveness in terms of the time that it typically takes to import or export a container, labour costs and certain aspects of macroeconomic policy.

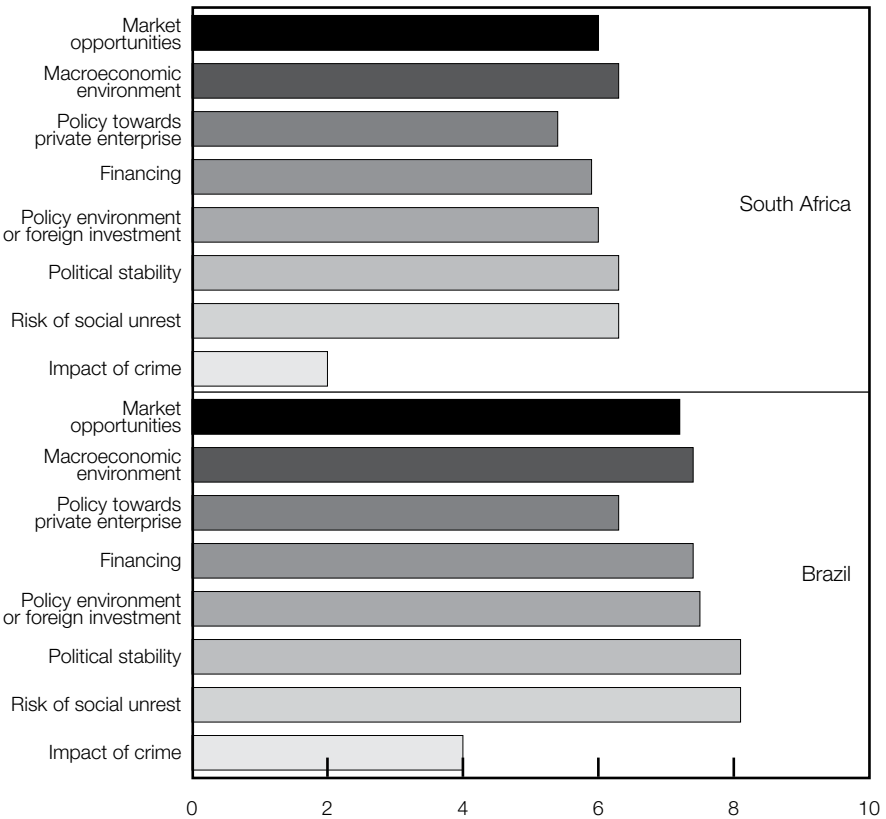
According to these surveys, it typically takes 30 days to export a container from South Africa, compared with only 9 days in Australia, 12 days in Brazil and 21 days in Chile. The cost associated with exporting a container from South Africa is about US$1 531, compared with US$1 060 in Australia and US$745 in Chile. For some of the mines that have been interviewed, the total railway and port costs constitute about two-thirds of total input costs. This means that if these costs can be brought down to match Australian costs, it would have a bigger effect on their competitiveness than a 33 per cent depreciation in the rand. This is without taking into account the pass-through that such currency depreciation would have on input costs, which would dilute the benefit of the currency depreciation.

According to the EIU, the average monthly wage in South Africa, at US$1 190, is materially higher than in Brazil (US$737) and Chile (US$650). The EIU also awarded South Africa worse ratings than Brazil in respect of market opportunities, macroeconomic environment, policy towards private enterprise,[1] financing, policy environment for foreign investment, political stability, the risk of social unrest and the impact of crime (see Figure 6; 10 is the best possible rating). The adverse role of certain aspects of the domestic policy environment was underscored by recent and ongoing events in the domestic mining industry. In terms of the factors in Figure 6, Chile and Australia also rank far better than South Africa in all categories.[2]

To further my argument that the rand is not the alpha and omega of domestic export drivers, Figure 7 on page 158 shows the strong correlation (77 per cent) between the growth in South Africa's export volumes and the weighted average gross domestic product (GDP) growth of its export destinations. My argument is also supported by the relatively low exchange rate elasticity of exports in the Bank's macroeconometric model. According to this model, the long-run exchange rate elasticity of manufacturing goods exports is 0,4, while the elasticity of mineral, commodity and services exports is 0,1; the weighted average elasticity is therefore about 0,2. In sharp contrast, the long-run exchange rate elasticity of non-oil imports in the Bank's model is about 0,8. This means that the growth and trade benefits of a weaker rand are largely to contain imports, rather than to boost exports.

In the light of the costs and risks associated with most of the possible policy interventions to influence the level or volatility of the rand, this analysis suggests that policy-makers should perhaps rather look for ways to (i) boost export performance by addressing the above-mentioned shortcomings and

Figure 6: Export competitiveness

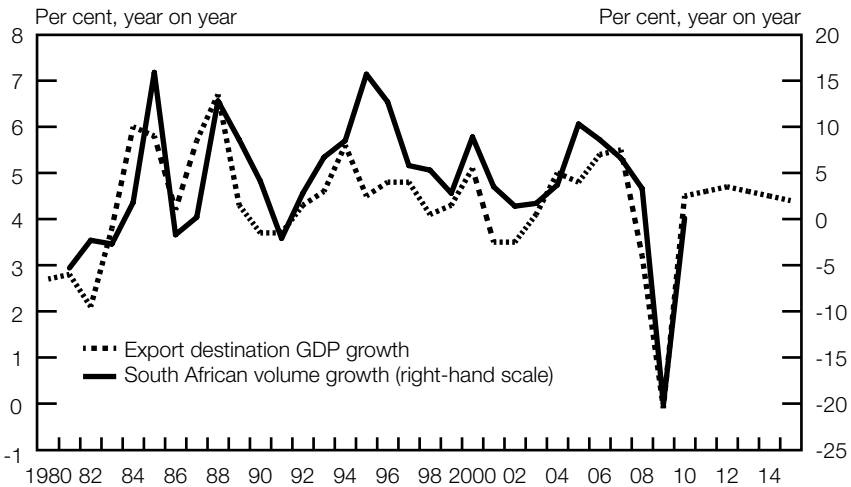


Note: A higher rating indicates a lower risk

(ii) boost domestic demand while steering spending away from imported goods. The latter might include tax incentives for, say, first-time homeowners or more aggressive "buy local" campaigns.

The importance of addressing any uncompetitive characteristics in the economy was clearly highlighted in Desmond Lachman's presentation; the common denominator of the European countries in the direst positions is a loss of competitiveness since joining the common currency. Unfortunately, in the intensifying global "race to the bottom" (of the production cost curve), South Africa is not making sufficient progress in improving its competitiveness, to say the least.

Figure 7: Demand-elastic exports



Notes

[1] While South Africa has established prudent, stable and investor-friendly monetary and fiscal policy frameworks, recent events underscore the remaining uncertainty with respect to the predictability of the macroeconomic policy environment. The impact of poor co-ordination among different policy-makers, such as the contradictory statements made by the Department of Public Enterprises (DPE) and the Department of Mineral Resources (DMR) about the possible cancellation of the Kusile coal power plant in recent weeks, a very important and prominent issue, or the debacle around the Sishen iron ore reserves, should not be underestimated.

[2] I have not focused on Australia in this analysis, given its superior level of development. However, its export composition and export destinations are very similar to those of South Africa, as is its currency trajectory (but not its currency volatility, which is much lower than that of Brazil and of South Africa). Its exports have also outperformed South Africa's by 80 per cent since 2000.

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BIS *see* Bank for International Settlements.

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Speech made at the dinner hosted by the South African Reserve Bank at its biennial conference, "Monetary Policy and Financial Stability in the Post-crisis Era", Pretoria, 4 November 2010

Peter Sinclair

Governors, ladies and gentlemen; Mmusi Marcus, Mmusi Senaoana, Mmusi Shiimi, *metswalle*, *foraneng kaofela*!

It is a great privilege to be here at this gathering, and to have the opportunity to say a few words. I am sure I speak for all of us in saying how grateful we are to the South African Reserve Bank for inviting us and bringing us to this excellent conference. And for me, it is wonderful to be able to escape, for a few days, the rainy, chilly late autumn in Birmingham, where my university is located.

It is said that one day, very long ago in the past, Birmingham hosted a dinner at which the Lord Mayor of Johannesburg said a few words. "Ladies and gentleman," he said, "I bring you greetings from the second city of the Empire."

"Well, you have taught me something," replied the Lord Mayor of Birmingham: "I had always thought that London had that honour."

That visit must have occurred when South Africa and Britain had a common currency and real, as well as nominal, exchange rates were more or less one to one. Today's visitor from South Africa to Birmingham would find the real exchange rate for the rand very high. Is a high real exchange rate beneficial or harmful from the monetary policy maker's standpoint? Presumably, the answer must be, as it is so often, "It all depends." It will depend partly upon what has caused it. If our economy is suffering from excess unemployment, for example, there can be gains as well as losses from a real exchange rate appreciation.

The negative case is brilliantly illustrated by Peter Neary in his famous *QJE* [*Quarterly Journal of Economics*] paper in 1980: starting in full equilibrium,

an exogenous nominal appreciation in a small open economy must raise the real wage rate measured in traded goods, to the detriment of jobs and production in those sectors, and if money wage rates and non-traded goods prices are sticky, Keynesian unemployment must ensue.

By contrast, a more optimistic observer could argue thus: suppose excess demands have emerged for our country's exportables in the rest of the world at the old prices, the terms of trade would improve. Workers buy some importables, which are now cheaper; so the real wage rates are inclined to rise as they perceive them, while (many) employers see real wage rates have dropped in terms of their products. The result is similar to a cut in a tax on the wage bill. We would expect output and jobs to increase. In addition, the prices of imported production input have fallen. This kind of story fits a Layard–Nickell model.

These two views – the consoling view and the worrying view – turn on different definitions of the real exchange rate. I think the Neary view is probably the most apt. But even here there might be a silver lining in the cloud if we look hard enough: sometimes a nominal appreciation is *towards* equilibrium, not away from it; nominal appreciation might bring a welcome temporary drop in measured inflation; a *temporary* real appreciation gives a great opportunity for firms aware of this to import capital goods; and theory reminds us that so long as firms have enough flexibility in what they produce and how they produce it, and no one is too risk-averse, volatility in real exchange rates (like other prices) can actually raise average income. And even if the appreciation is clearly unwelcome, there may be weapons, such as relaxing remaining capital controls or lowering policy rates, that might alleviate it.

The evidence about how real appreciation affects output and jobs is murky. But British and South African monetary history provides one clear case where everyone agrees that its effects were negative, at least in Britain: the return to gold in April 1925, undertaken by Winston Churchill as Chancellor. Afterwards, he regretted the decision and blamed it on having listened to too many bankers and too little to the economy's producers. Churchill did occasionally make errors, but often turned them to advantage. Once he repeated one page of the speech he was giving by accident. Noticing the mistake, he changed his tune and declared, "You may wonder why I am reiterating these points. It is because they are the very pith and kernel of what I have to say."

But why has the rand jumped? To an outsider, there are numerous reasons. First, Asia's growth raises the supply of manufactures and the demand for raw materials; the balance of ensuing relative price changes tends to improve South Africa's terms of trade.

Then, second, there are the forces depressing real interest rates across the world – among them, the boost to saving from responses to increased life expectation, and the gradual retreat from the perception, some 20 years ago, that, after their reinterpretation or rejection of socialism, the global market was acquiring new prospective members (i.e., China, Eastern Europe, India and Russia) which were capital-poor but massively rich in labour; asset prices rise when interest rates slide.

And third, there is quantitative easing. In full equilibrium, except in very special cases such as the Sargent–Wallace Unpleasant Monetarist Arithmetic case, open-market bond purchases should raise all nominal prices. But if some key prices (such as US money wage rates and the renminbi) are sticky, the few prices that can move generally have to jump all the more. These will include oil, since oil in the ground is an asset too; so too metals, foodstuffs, equities, housing and – this is key – other currencies that float cleanly, such as the rand, the real and the Australasian dollars.

But these suggestions pose questions. Markets should look forward. Will China continue to grow so fast? How long will its construction and infrastructure investment share in national income – which boosts the demand for steel and energy so much – stay so exceptionally high? And will real interest rates stay low? Demographic developments (longer lives and fewer births) do point to remorseless upward long-run pressure on the ratio of wage rates to capital rentals, and particularly in Japan now, followed by China, then much of Europe east and west, and eventually North America. And what we see on French streets shows us how hard it is for state rules about retirement age thresholds to keep pace with life expectation! Yet this long-run drift has two intriguing features. One is the lack of synchronisation, which points to quite persistent medium-run payments imbalances between regions of the world at different stages of the ageing curve being perfectly natural and appropriate. The other is the intriguing conflict between the steady state effects (which are clear cut: scarcer labour and more plentiful capital, as the demographic pyramid starts to invert) and the short-run effects. Baby boomers save until their retirement. Once they retire, they sell assets, rather

than buying them, and that depresses asset prices and pushes yields up for a while. And what will gradually falling populations, once we start seeing them or even expecting them later on, mean for house prices? Or will labour-scarce countries react to the pressures by attracting more immigrants, whether with full legal sanction, or perhaps something less than that?

Then there is QE [quantitative easing]. This is essentially a stretch along the maturity spectrum, in lieu of the cut in the (invariably short-term) policy rate which the zero bound is held to forbid. But is the zero bound quite so strong, or might not a tax on banks' reserves, or modernised version of Gesell's ideas of taxing currency explicitly, enable us to cross it a little, now and then? And how does the view that the central bank can push any interest rate where it likes square up against evidence that it can be very hard to move the nominal exchange rate these days in the face of enormous short-term capital flows, or Fisher's view of equilibrium nominal interest rates as the sum of equilibrium real rates and expectations of inflation? And with Friedman's dictum that a high nominal interest rate tells us not that money is tight, but that it has been easy? When should QE stop? How quickly, and under what conditions, should it be reversed? When can we start restoring policy rates to neutral levels and rebuilding the foundations of a sound banking system, which can surely not be strengthened in the long run by destroying the incentive to lodge deposits with it?

Then there is sociology to worry about. Asia appears to retain, for the time being anyway, the family with its strong intragenerational and intergenerational links. Here the family has an effectively infinite horizon and a low rate of discount, and the extended family solves the asymmetric information problems that bedevil formal retail banking, and this tends to make capital markets a bit more complete than they would otherwise be. Some of Europe's families are fragmenting; America started doing so long ago. Will Asia follow? And if it did, would that not turn real interest rates up again?

And, finally, politics. There are many possible interesting developments ahead, of which two stand out. One is ageing. The young do not tend to mind inflation. Positive inflation surprises erode real mortgage debt, for example, and especially so when contracts are at fixed nominal interest rates or interest rates that are adjusted infrequently. Higher or rising inflation may also be associated, temporarily, with improved job prospects. But the old hate inflation, even when their pension income is indexed. The old also vote. Meanwhile, except in Australia where voting in elections is compulsory, younger electors generally turn out less. So the politics of ageing is definitely

anti-inflationary. Tighter inflation targets, whether explicit or implicit, look likely. And during a period when real wage rates will tend to increase, holding the lid on a price index featuring many labour-intensive goods will be a real challenge for tomorrow's central bankers.

The final political issue of importance concerns inequality. In recent years, we have been witnessing a large and most welcome reduction in measures of dispersion of average real incomes across the world, especially when population-weighted. Progress made by Asia's most populous countries has been remarkable, no matter whether real GDP per head (in comparison with other countries) is measured at PPP [purchasing power parity] or current exchange rates. But hand in hand with falling measures of international inequality, defined those ways, has provided disturbing evidence of increasing income inequality within many countries. So we see greater dispersion of incomes inside national borders, but less dispersion in average incomes between them. In parts of Asia the shift from socialism to authoritarian capitalism has made for much bigger pies, less equally divided between citizens. The weakening of welfare states in some OECD [Organisation for Economic Co-operation and Development] countries has had similar, if less dramatic, effects. So will the consequences of globalisation for trade and factor migration for many countries; rich, emerging and poor. And changes in technology and tastes have usually raised the return to brain and reduced it to brawn everywhere, exacerbating intranational inequality in some cases.

What does this mean for central banks? They need to keep stressing that inflation tends to hurt the poor more than the rich, and that financial instability and crises may often do so too. Cogent evidence about to back up this claim needs to be researched and publicised. And fiscal policy experts and economists need to learn more about why international and internal measures of inequality are apparently moving so strongly in opposite directions, and about the benefits and costs of the myriad ways of alleviating it within the nation state. Furthermore, one result of the appalling recent financial crisis, from which we hope we are now at last escaping, has been to throw the spotlight on those poorly understood points of tangency and overlap between fiscal policy and monetary policy. So, in time, central bankers may well need to probe more deeply below the surface of aggregates and national averages to the distributions to which they relate.

Kea leboha haholu! Thank you all very much for listening, and please join me in offering renewed thanks to our hosts.

The participants

Michael Adams
South African Reserve Bank

Bulent Badsha
Absa Capital

Goolam Ballim
Standard Bank

Mshiyeni Belle
South African Reserve Bank

Ann Bernstein
Centre for Development Enterprise

Annabel Bishop
Investec

Elriette Botes
South African Reserve Bank

Ziets Botha
SARB College

Cees Bruggemans
First National Bank

Rashad Cassim
Statistics South Africa

Anton Casteleijn
South African Reserve Bank

Stephen Cecchetti
Bank for International Settlements

Helene Coetzer
South African Reserve Bank

Alan Colburn
SARB College

Alfredo Cuevas
Senior International Monetary Fund
Representative in South Africa

Thea Fourie
IHS Global Insight

Jeff Gable
Absa

Lorraine Greyling
University of Johannesburg

Johann de Jager
South African Reserve Bank

Shaun de Jager
South African Reserve Bank

Johan Delport
South African Reserve Bank

Stan du Plessis
Stellenbosch University

Roelf du Plooy
South African Reserve Bank

Dennis Dykes
Nedcor

Greg Farrell
South African Reserve Bank

Marisa Fassler
National Treasury

Naidene Ford-Hoon
South African Reserve Bank

Colen Garrow
Brait

Stephen Gelb
The Edge Institute

Dennis George
Fedusa

Dion George
Democratic Alliance

George Glynos
Econometrix

Charles Goodhart
London School of Economics

Mr Stephen Goodson
Board Member
South African Reserve Bank

Rudolf Gouws
First Rand/Rand Merchant Bank

Dale Gray
International Monetary Fund

Francois Groepe
Board Member
South African Reserve Bank

Xolile Guma
Senior Deputy Governor
South African Reserve Bank

Nombulelo Gumata
South African Reserve Bank

Adenaan Hardien
Cadiz

Riaan Hattingh
SARB College

Ethel Hazelhurst
Business Report

Brian Hoga
South African Reserve Bank

Callie Hugo
South African Reserve Bank

Mariam Isa
Business Day

Aboobaker Ismail
South African Reserve Bank

Saleem Ismail
South African Reserve Bank

Tertia Jacobs
Investec

Azar Jammine
Econometrix

Jenny Jeftha
South African Reserve Bank

Michael Kafe
Morgan Stanley

Brian Kahn
Adviser to the Governor
South African Reserve Bank

Unathi Kamlana
National Treasury

Arthur Kamp
Sanlam Investment Management

Razia Khan
Standard Chartered Bank

Michael Kock
South African Reserve Bank

Desmond Lachman
Georgetown University and
American Enterprise Institute
for Public Policy Research

Lebo Lehutso-Phooko
South African Reserve Bank

Etienne le Roux
Rand Merchant Bank

Nimrod Lidovho
SARB College

Kevin Lings
Stanlib

Christopher Loewald
National Treasury

Elsabe Loots
North-West University

Sandile Maagde
Investec

Phumza Macanda
Reuters

Catherine Macleod
National Treasury

Masilo Makhetha
Central Bank of Lesotho

Vukani Mamba
South African Reserve Bank

Tendani Mantshimuli
Liberty Life

Noma Maphalala
South African Reserve Bank

Gill Marcus
Governor
South African Reserve Bank

Willie Maree
South African Reserve Bank

Maureen Mashiane
Public Investment Corporation

Danelee Masia
Deutsche Securities

Elias Masilela
Board Member
South African Reserve Bank

Hlengani Mathebula
South African Reserve Bank

Matodzi Mavhunga
SARB College

Zanele MavusoMbatha
South African Reserve Bank

Elijah Mazibuko
South African Reserve Bank

Sibongile Mdluli
Deputy Governor
Central Bank of Swaziland

Jean-Francois Mercier
Citibank

Danie Meyer
South African Reserve Bank

Daniel Mminele
Deputy Governor
South African Reserve Bank

Tsukulu Mokete
South African Reserve Bank

Joel Mokoena
South African Reserve Bank

Thabo Mokoena
South African Reserve Bank

Lumkile Mondi
Industrial Development Corporation

Elna Moolman
Renaissance BJM

Linda Motsumi
South African Reserve Bank

Tersa Murray
South African Reserve Bank

Jonathan Myerson
Cadiz

Evangelina Nailenge
Bank of Namibia

Florette Nakusera
Bank of Namibia

Zelda Naudé
SARB College

Johan Neethling
South African Reserve Bank

Carmen Nel
Rand Merchant Bank

Hendrik Nel
South African Reserve Bank

Kgatlaki Ngoasheng
South African Reserve Bank

Zeph Nhleko
South African Reserve Bank

Molefi Nkhabu
South African Reserve Bank

Zingisa Nkwali
South African Reserve Bank

Humphrey Nobongoza
United Democratic Movement

Siphiwe Nyanda
Parliamentary Counsellor,
The Presidency

Bonginkosi "Blade" Nzimande
Minister of Higher Education
and Training

Ronel Oberholzer
IHS Global Insight

Thandi Orleyn
Board Member
South African Reserve Bank

Sanisha Packirisamy
Rand Merchant Bank
Asset Management

Raymond Parsons
Board Member
South African Reserve Bank

Ebrahim Patel
Minister of Economic Development

Evan Pickworth
I-Net Bridge

Nehru Pillay
Central Bank of Swaziland

Rachelle Potgieter
Econometrix

Michael Power
Investec

Eswar Prasad
Cornell University and Brookings
Institute

Coen Pretorius
South African Reserve Bank

Heidle Rabie
SARB College

Kgotso Radira
Investec

Monale Ratsoma
Thebe Securities

Neren Rau
South African Chamber of
Commerce and Industry

Janice Roberts
SAPA

Simon Roberts
Competition Commission

Jannie Rossouw
South African Reserve Bank

Gina Schoeman
Absa Capital

Francis Selialia
South African Reserve Bank

Moeketsi Senaoana
Governor
Central Bank of Lesotho

Nasreen Seria
Bloomberg

Ipumbu Shiimi
Governor
Bank of Namibia

Peter Sinclair
University of Birmingham

Yvette Singh
South African Reserve Bank

Daleen Smal
South African Reserve Bank

Dries Smal
South African Reserve Bank

Ben Smit
Stellenbosch University

Ike Smit
Metropolitan

Jonathan Stewart
Rand Merchant Bank
Asset Management

John Steytler
Windhoek Bank

Khathu Todani
South African Reserve Bank

Tony Twine
Econometrix

Piet Uys
Freedom Front Plus

Chantal Valentine
Coronation Fund Managers

Johannes van der Merwe
Board Member
South African Reserve Bank

Theo van der Merwe
University of South Africa

Marian van Deventer
South African Reserve Bank

Bertus van Zyl
South African Reserve Bank

Francois van Zyl
South African Reserve Bank

Nicola Viegi
University of Pretoria

Erik Visser
South African Reserve Bank

Wilma Viviers
North-West University

René Vollgraaff
Sunday Times

Harald Wagner
South African Reserve Bank

Stefaans Walters
South African Reserve Bank

Pieter Weideman
South African Reserve Bank

Buks Wessels
University of the Orange Free State

Annamarie Wilke
SARB Conference Centre

Conrad Wood
Rand Merchant Bank
Asset Management

Musa Zondi
Inkatha Freedom Party

South African Reserve Bank
Conference Organising Committee

Phumzile Mbodla
South African Reserve Bank

Sandra Mollentze
SARB College

Logan Rangasamy
South African Reserve Bank

Johan van den Heever
South African Reserve Bank

Gilbert Wesso
SARB College

Abbreviations

AD	aggregate demand
AEI	American Enterprise Institute
AS	aggregate supply
AsgiSA	Accelerated and Shared Growth Initiative for South Africa
BoE	Bank of England
BIS	Bank for International Settlements
BSD	Bank Supervision Department (of the South African Reserve Bank)
CAR	capital-adequacy requirement
CCA	contingent claims analysis
CCP	central clearing party
CDS	credit-default swap
CGFS	Committee on the Global Financial System
CIMDO	consistent information multi-variate density optimisation
CMA	Common Monetary Area
CoCo	contingent convertible
CoVar	value at risk of the financial system conditional on institutions being in distress
CRA	credit-rating agency
DIP	distress insurance premium
DME	Department of Mineral Resources
DPE	Department of Public Enterprises
ECB	European Central Bank
ECLD	expected loss due to default
EFSF	European Financial Stability Facility
EIU	Economic Intelligence Unit
ELA	emergency lending assistance
ES	expected shortfall
ESF	European Stabilisation Fund
ESRB	European Systemic Risk Board
EU	European Union
FDI	foreign direct investment
FDIC	Federal Deposit Insurance Corporation
FICO	Fair Isaac Corporation
FSA	financial supervisory authority
FSAP	Financial Sector Assessment Program
FSB	Financial Stability Board
FSI	financial stability indicator
G-20	Group of Twenty
GDP	gross domestic product
GEAR	Growth, Employment and Redistribution
GEV	generalised extreme value
GHD	Ghanaian cedi

GSE	government-sponsored enterprise
ICAAP	internal capital-adequacy assessment process
IFI	international financial institution
IMF	International Monetary Fund
IS	investment/saving
ISDA	International Swaps and Derivatives Association
ISLM	investment/saving curve and the liquidity preference/ money supply equilibrium curve
IT	information technology
JEDH	Joint External Debt Hub
JPoD	joint probability of distress
LM	liquidity preference/money supply
LRS	linear ratio of spacings
LSE	London School of Economics
LTV	loan to value
MAB	Mexico, Argentina and Brazil
MBL	Master of Business Leadership
MBS	mortgage-backed security
MES	marginal expected shortfall
MPC	Monetary Policy Committee
NCA	National Credit Act
NCR	National Credit Regulator
NDO	National Debt Office
NGN	Nigerian naira
NSFR	net stable funding ratio
OECD	Organisation for Economic Co-operation and Development
OLA	orderly liquidation authority
OTC	over the counter
PCA	prompt corrective action
PIGS	Portugal, Italy, Greece and Spain
PIIGS	Portugal, Italy, Ireland, Greece and Spain
PoD	probability of default
PoLD	probability of loan default
PPP	purchasing power parity
PV	present value
PwC	PricewaterhouseCoopers
QE	quantitative easing
Q	quarter
RBS	Royal Bank of Scotland
RoE	return on equity
RWA	risk-weighted asset
S&P	Standard & Poor's
SADC	Southern African Development Community
SCAP	Supervisory Capital Assessment Program
SEFA	single European financial area

SES	systemic expected shortfall
SIFI	systemically important financial intermediary
SRR	special resolution regime
SSA	Sub-Saharan Africa
TCE	Tier 1 core equity
UGX	Ugandan shilling
UK	United Kingdom
US	United States
VaR	value at risk
VAR	vector autoregression
ZMK	Zambian kwacha

Glossary

comp	compensation
the Bank	South African Reserve Bank
the Basel Committee	Basel Committee on Banking Supervision
the Core Principles	Core Principles for Effective Banking Supervision
US Fed	United States Federal Reserve System