



WALL ST

*Understanding the
financial crisis:*

INVESTMENT, **RISK** AND GOVERNANCE

Steen Thomsen, Caspar Rose and Ole Risager (eds.)

Understanding the financial crisis:
investment, risk and governance

Understanding the financial crisis:
investment, risk and governance

**Understanding the financial crisis:
investment, risk and governance**

First edition 2009

Copyright © SimCorp StrategyLab and the authors 2009

All rights reserved. No parts of this publication may be reproduced, stored in a retrieval system, or transmitted in any form and by any means – electronic, mechanical, photocopying, recording or otherwise – without the prior written permission of the publisher.

ISBN 978-87-993151-0-9

Printed in Denmark by Nofoprint as

SimCorp StrategyLab

This volume is a result of the research programme of SimCorp StrategyLab, an independent research institution founded and managed by SimCorp.

The research work of SimCorp StrategyLab focuses on identifying, understanding and suggesting solutions to issues pertaining to mitigating risk, reducing cost and enabling growth in the investment management industry.

The contributions to this anthology do not necessarily reflect the views of SimCorp StrategyLab. SimCorp StrategyLab has used all reasonable endeavours to ensure the accuracy of the information, however, SimCorp StrategyLab does not guarantee or warrant the accuracy or completeness, factual correctness or reliability of any information in this volume and does not accept any liability for any errors or omissions including any inaccuracies or typographical errors.

SimCorp StrategyLab
c/o SimCorp A/S
Weidekampsgade 16
2300 Copenhagen S
Denmark

www.simcorpstrategylab.com

Steen Thomsen, Caspar Rose
and Ole Risager (eds.)

*Understanding
the financial crisis:*
investment, risk and
governance

Contents

List of figures and tables	6
Foreword <i>by Lars Bjørn Falkenberg</i>	7
<hr/>	
INTRODUCTION	8
1 Macroeconomic perspectives on the financial crisis: an overview <i>by Ole Risager</i>	
 Regulation and risk management	
<hr/>	
OVERVIEW	22
2 Regulation and risk governance <i>by Caspar Rose</i>	
<hr/>	
3 The credit crisis of 2007 and its implications for risk management <i>by John Hull</i>	36
<hr/>	
4 Some thoughts on the role of mathematical models in light of the crisis <i>by David Lando</i>	52
<hr/>	
5 Enterprise architectures for investment managers from a risk management perspective <i>by Marc Schröter</i>	70

Regulation and governance

OVERVIEW	6 Corporate governance and the financial crisis <i>by Steen Thomsen</i>	98
	7 Avoiding international financial crises: an incomplete reform agenda <i>by Jean Dermine</i>	110
	8 Reputational risk and the financial crisis <i>by Ingo Walter</i>	132
	9 Governance and the financial crisis <i>by Renée Adams</i>	156
	10 Governance, risk and compliance in the financial sector: an IT perspective in light of the recent financial crisis <i>by Kjell Johan Nordgard</i>	176

In practice

	11 Three executive interviews: evidence from the front line of investment management <i>by Caspar Rose</i>	220
--	---	------------

List of figures and tables

- 1 Macroeconomic perspectives on the financial crisis: an overview**
 - US house prices and savings rate, 11
 - Delinquency rate of US residential mortgage loans in percent, 11
 - IMF estimates of financial sector potential write-downs, 2007–10 by geographic origin of assets as of April 2009 insurers, 14
 - GDP forecasts, 15
- 3 The credit crisis of 2007 and its implications for risk management**
 - S&P/Case-Shiller Composite-10 Index of US Residential Real Estate, 1987 to February 2009, 39
 - An asset backed security, 41
 - An ABS CDO, 43
 - Losses to AAA tranches of ABS CDO in fig. 3, 44
 - A more realistic example of the structures created from mortgages, 45
- 4 Some thoughts on the role of mathematical models in light of the crisis**
 - CDX premiums for non-equity tranches, 65
- 5 Enterprise architectures for investment managers in a risk management perspective**
 - The link between business driver, strategic challenge and IT solution, 74
 - Three major business drivers in the current financial market conditions, 76
 - Strategic challenges to comply with the three major business drivers, 84
 - The relationship between operating model, enterprise architecture and IT engagement model, 86
 - High-level view of value chain for investment managers, 87
 - Typical best-of-breed architecture, 88
 - Typical integrated enterprise architecture, 89
 - Enterprise architecture with core and add-on best-of-breed systems, 90
- 7 Avoiding international financial crises: an incomplete reform agenda**
 - A world without banks, 112
 - Real estate shock in a world without banks, 113
 - A world with banks, 113
 - Securitisation and credit default swaps (CDS), 114
- 8 Reputational risk and the financial crisis**
 - A hierarchy of risks confronting financial intermediaries, 138
 - Reputational risk and the external control web, 140
 - Performance gaps, competition and conflict, 142
 - Reputation-sensitive events in a simple going-concern valuation framework, 143
 - Reputational risk exposure – JPMorgan and Banco Español de Crédito 1993, 145
 - Cumulative Abnormal Returns (CARs) for banks and insurers in a large-sample study of operational and reputational events (three-factor models), 147
 - Operational losses by event type, 148
 - Operational losses by business line, 148
 - Reputational Impact and Share Prices. Pilot Study – 49 Events, 1998–2005 (unweighted mean CARs), 149
 - Relative CARs – reputational loss pilot study, 150
 - Absolute CARs – reputational loss pilot study, 150
 - Decomposing CARs related to earnings restatements, 151
 - Declines in market capitalisation of major banks, 2007–09, 153
- 9 Governance and the financial crisis**
 - Comparison of selected governance characteristics of banks to non-financial firms, 164
 - Comparison of selected governance characteristics of non-bank financial firms to non-financial firms, 166
 - Comparison of selected governance characteristics for sample banks receiving bailout money to surviving sample banks that did not, 170
- 10 Governance, risk and compliance in the financial sector**
 - Internal and external factors to be covered by corporate governance, 183
 - The Trust-Confidence hypothesis, 184
 - PHLX KBW Bank Sector Index, Sep 08–May 09, 185
 - The Risk and Control Framework Model, 186
 - The five pillars of IT Governance, 188
 - The process of establishing a business-driven IT infrastructure, 189
 - The value impact of IT infrastructure, 191
 - The ITIL service lifecycle, 193
 - Areas planned for increased investments in risk management, 201
 - Keys to improve risk management in the future, 201
 - The price-to-rent ratio 1987–2009, 206
 - The price-to-household income ratio 1987–2009, 207
 - The liquidity spiral in financial markets, 211

Foreword

The world has witnessed a global, financial pandemic; the worst financial crisis since the Great Depression. Many financial institutions that were commonly perceived as too big to fail did exactly that. The high levels of risk taking combined with what in some cases looked like greed appears to be driven by harmful social constructivism, to a large degree unchallenged by regulators, governance, risk management functions, systems and models. As a result, many people worldwide have lost their homes, their jobs, their savings and not least their confidence in the financial sector and the laws and entities regulating it.

This volume is the first in a series of three, published by SimCorp StrategyLab, resulting from its research programmes within the investment management industry, focusing on mitigating risk, reducing cost and enabling growth. The book gives suggestions as to why the financial crisis happened. It presents thoughts, proposals and recommendations on how to avoid similar, future meltdowns in the financial sector and the financial markets and discusses the severity of the resulting negative impact on the real economy which the world has been seeing.

The book is an anthology. It reflects experience, research and thought leadership from experts and specialists in various disciplines: finance, economics, mathematics, risk, governance, compliance, IT and regulation among others, serving as a contribution to the work-in-progress aimed at building a new, sustainable financial system. The authors are for the most part senior scholars of respected research institutions; including INSEAD; Stern School of Business, New York University; University of Toronto; UQ Business School, University of Queensland and Copenhagen Business School.

At the same time this work is being accompanied by thoughts and recommendations from highly experienced executives at major firms in the financial sector, such as Deutsche Bank, ATP and Allianz SE. Last, but not least, the crisis in the financial industry and its implications for individual institutions are viewed from a strategic IT architectural perspective by specialists in financial IT architecture at SimCorp.

On behalf of SimCorp StrategyLab, I would like to thank all the contributors for the efforts they have made to the making of this book.

Throughout this volume it has been our aim to contribute to the identification and explanation of the drivers behind the crisis in the financial industry. Moreover, it has also been our intention to present thoughts on how to move forward. The book is written with management of the global investment management industry in mind. Yet, policy-makers, legislators, financial journalists, students, and everyone else who has a stake or interest in the global financial industry *per se* will find the contents highly relevant for their understanding of the past as well as for the decisions they will have to take in the future.

Lars Bjørn Falkenberg
Assistant Director of SimCorp StrategyLab

INTRODUCTION

1 Macroeconomic perspectives on the financial crisis: an overview

by Ole Risager



Ole Risager, Ph.D, is a professor at Copenhagen Business School. He has published extensively on foreign exchange markets, stock markets, and macroeconomics. His work has appeared in international journals as well as in publications of the International Monetary Fund (IMF) and the World Bank. He has previously served as a senior economist to the IMF in Washington and as a consultant to the World Bank. He has also been Vice President and Chief Economist at the Danish shipping and oil company A.P. Moller – Maersk.

Ole Risager is currently chairman for Core German Residential II, a real estate investment company, supervisory board member of LD Invest, a mutual investment fund, and supervisory board member of H+H, a Danish manufacturing company.

Contact: or.int@cbs.dk

This chapter deals with the macroeconomic roots of the financial crisis. We argue that there are several important macroeconomic factors that together with excessive risk-taking in the financial sector, reflecting poor corporate governance and to some extent also inadequate regulation and enforcement, led to the current crisis. Once the crisis had hit the system, high leverage is the key to understanding why the crisis turned into the worst financial crisis since the Great Depression.

At the end of the chapter, we discuss whether we can avoid crises in the future through improvements in policy-making. We argue that crises are inevitable and that we can never fully avoid them. That said, it should be noted that there has been progress in crisis prevention. The best example of this is that the world avoided a new depression due to timely and effective global policy intervention led by the US Federal Reserve and the Treasury. Had policy-makers not intervened and undertaken the necessary fire fighting the financial crisis could very well have led the world into a very deep and prolonged recession reflecting that world industrial production, trade, and stock markets were diving faster from April 2008 to early spring 2009 than during 1929–30, see Eichengreen and O'Rourke (2009).¹

As a result of these interventions, the US government had to take over some of the

¹ April 2008 marks the peak of world industrial production.

world's largest financial institutions. Similarly, the financial sector has also to some extent become state-owned in other countries.² The price of this insurance against a meltdown of leading financial institutions and the world economy is accelerating public sector deficits in all advanced economies. Taxpayers will have to carry this enormous burden in the coming years.³

From a business point of view the lesson is once again that it pays to have a strong focus on risk management including macroeconomic surveillance. Companies that are forward looking and know that the economic cycle is a fundamental characteristic of the world we live in can better hedge and take advantage of the cycle than companies that disregard macroeconomic realities, see Risager (2009).

Macroeconomic roots of the financial crisis

The roots of the financial crisis go back to the preceding long period of low interest rates, high growth, excessive optimism and risk willingness, and high leverage spurred by both the boom itself and by the creation of extensive shadow banking and new financial products. These meant that the financial sector's capital reserves were inadequate in a crisis situation. Below we discuss the different macroeconomic factors that played a role in the build-up of the crisis. We also discuss estimates of likely losses and write-downs due to the IMF (2009a). If these estimates prove to be correct we should also expect large losses going forward. Moreover, the latest round of capital injections into the US banking sector in May 2009, following the US Treasury's stress tests of major US financial institutions, may prove to be inadequate.

Low interest rates and the boom-bust global housing cycle

In response to the 2001 recession, caused by the bursting of the stock market bubble and the sharp cutback in firms' capital spending, the US Federal Reserve reduced the Fed funds rate to 1 percent, down from a peak at 5.5 percent prior to the recession. The Fed's aggressive interest rate policy led a global monetary policy easing trend reflecting that other countries were also hit by the downturn in the US. Moreover, as the world economy operated with subdued inflation pressure, reflecting the integration of China and other low-cost producers into the global supply chain and reflecting reduced trade union bargaining power, central banks could maintain this low inter-

-
- 2 The US government now owns the world's largest mortgage companies Fannie Mae and Freddy Mac, the world's largest insurance company AIG, and is an important shareholder of major US banks. Similarly, the UK government is now a majority shareholder of some of the largest financial institutions in the UK, including RBS and Lloyds TSB; only Barclays Bank and HSBC managed to run their own affairs.
 - 3 The public deficits are right now absorbed by central banks but they cannot in the long-term finance the deficits assuming that they will not violate their inflation targets. That said, one can of course not rule out that the crisis in the medium-to-long term will lead to higher inflation and to a breakdown of inflation targeting regimes.

est rate policy over an extended period. This also mirrored the dominant view at the time that central banks should only worry about inflation of the prices of goods and services. Central banks should not be concerned about asset price inflation including the booming housing sector. It is easier to clean up after a bubble has run its course than to identify and prick a bubble as the Fed Chairman Alan Greenspan put it. This view was not shared by all economists. Roubini (2008) warned against a financial pandemic and there were also others who saw a financial crisis in the horizon.^{4,5}

There is little doubt that this long period of cheap global credit is an important explanation of the sharp run up in house prices we have seen in almost all advanced economies with the exception of Japan and Germany, see also Buiter (2008).⁶ On top of this, mortgage institutions and banks on a global scale undertook a number of innovations that essentially made it possible to buy real estate with very little down payment, if any at all. The problems with some of the innovations in mortgage financing became particular obvious in the US sub-prime market in late 2006 and early 2007, see Shiller (2008). The sub-prime loans were often made in anticipation that house prices would continue to rise. In many cases sub-prime mortgage loans were so-called 'teaser loans' with low repayments, if any, at the beginning and with low variable interest rates taking advantage of the low rates at the short end of the interest rate yield curve. The idea was basically that even though many of the new homeowners could not afford a house, rising real estate prices would eventually solve that problem. However, when house prices flattened out in autumn 2006 and later nosedived, the problems with this high risk model cascaded and this marked the beginning of the global credit crisis. At that time sub-prime had become an important source of mortgage financing accounting for more than 20 percent of annual mortgage financing in the US.

Declining house prices and higher mortgage rates, reflecting that the boom had lasted several years, in combination with irresponsible credit scoring eventually triggered a sharp increase in delinquency rates.⁷ In some cases they rose significantly above 20 percent, see figure 2. Investors who had purchased these mortgage loans, often securitised, that is, sliced and packaged together with other credit instruments,

4 When reading Roubini's paper, one is struck by the similarities of his predictions and what has actually happened. That said, one of the problems with some of these warnings was the timing, that is, the warnings were issued at a very early date and years before the crisis materialised.

5 Amongst theoretical economists, Minsky was the one who most frequently wrote about financial crises, see Minsky (1977). His view is basically that investors in good times take on too much debt to finance aggressive asset expansions. Eventually, investors reach a point in time where the cash generated by their assets is insufficient to service the mountains of debt. This forces investors to sell assets, which leads to plummeting asset prices, which in turn leads to even more demand for cash, and therefore to a further decline in asset prices, and so forth. When the economy has arrived at this point, we are at the so-called Minsky moment.

6 All econometric studies of house prices point to a large role of (nominal) interest rates as houses in many cases are purchased with an eye on current after-tax nominal mortgage costs.

7 These loans were also known as liars' loans because income statements were often incorrect.

8 These complicated asset backed securities were rated by rating agencies, but apparently with a flawed risk assessment.

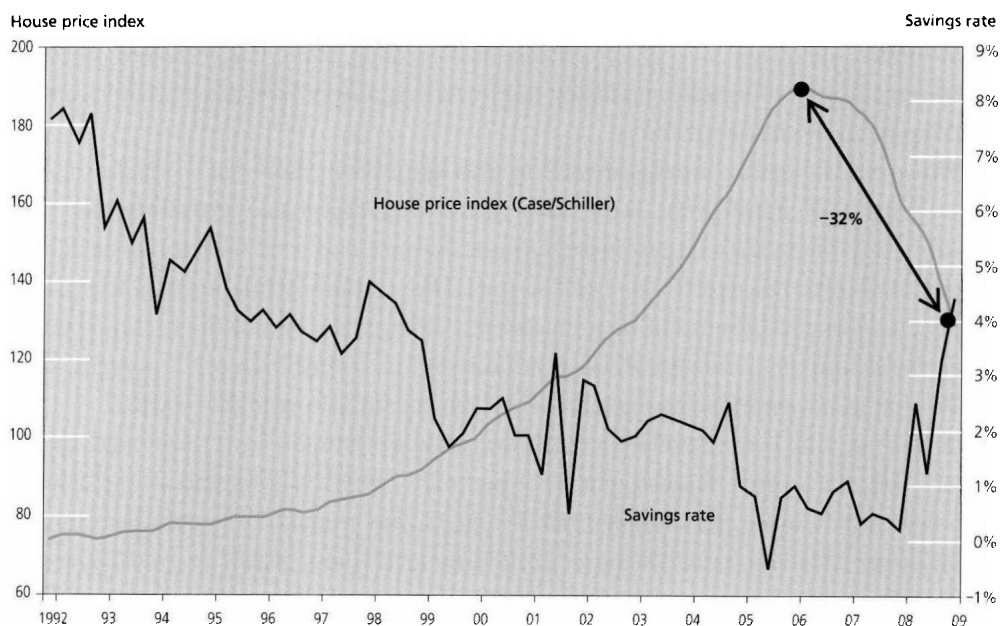


Fig. 1. US house prices and savings rate. Source: Case-Shiller and US Treasury.

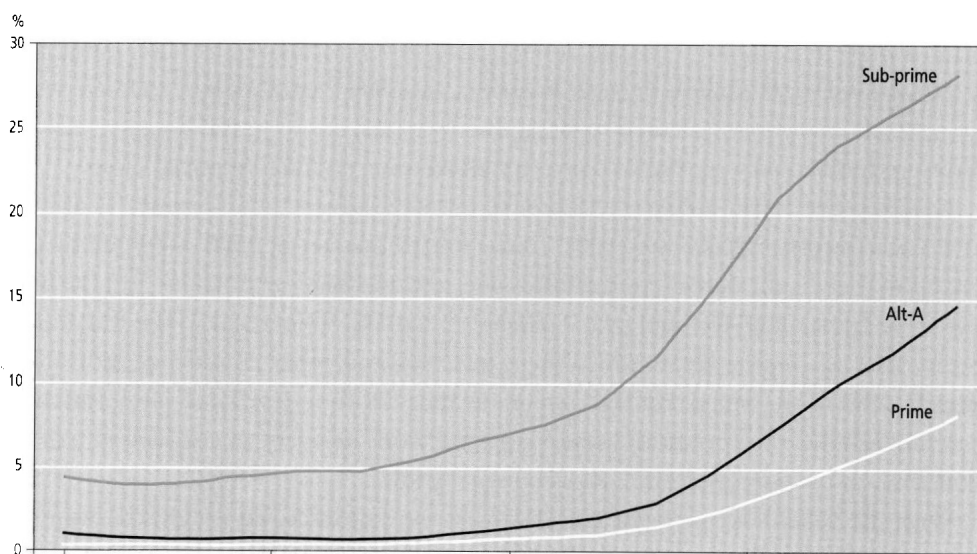


Fig. 2. Delinquency rate of US residential mortgage loans in percent. Source: IMF (2009b).

started to report large losses.⁸ These investors were US and European institutions including investment and retail banks, insurance companies, pension funds, and even local governments and state-owned entities reported large losses.⁹ As a result of the

9 Interestingly, the major sources of the financing of the US trade deficit including China, Japan and OPEC countries were only minor victims.

large losses in the banking sector, credit started to dry up and several top US investment banks, including Merrill Lynch and Bear Stearns, came under severe pressure and were close to collapsing, had they not been taken over by Bank of America and JPMorgan Chase, respectively.¹⁰

However, the prime mortgage market also suffered in response to declining US house prices with Fannie Mae and Freddy Mac taking huge losses on their books. This explains why the world's largest mortgage institutions, endowed with too little equity capital, had to be rescued by the US Treasury. Like the sub-prime market, the prime mortgage market continues to be under stress. Thus, at the end of the first quarter of 2009, the delinquency rate for all US mortgages is at a record high of 9.1 percent. This shows that losses on mortgage assets will be significant also going forward.

It was not only housing related institutions and investment banks that were under water. AIG, the world's largest insurance company, which had extended its business into derivatives and other complex risk products, was rescued in September 2008 to avoid larger, systemic consequences. Large financial sector losses and outright collapses of the world's major financial institutions meant that the interbank market essentially dried up with interbank rates soaring. The decision of the US authorities not to rescue Lehman Brothers and the subsequent collapse in September 2008 was a further blow to markets. The Lehman collapse led to a sharp decline in confidence and to a huge increase in perceived counterparty risks. Moreover, as other countries including the UK, Germany, France, Australia, Sweden, Denmark and so forth, were having their own financial sector crises, due to losses on domestic housing related credits and other risky assets, we had a full blown international financial crisis.

As a result of a near collapse of financial markets, advanced economies went into the deepest recession since the 1930s. In the fourth quarter of 2008, GDP fell by 6.3 percent in the US, 6.2 percent in the Eurozone, and 14.4 percent in Japan.¹¹ In the first quarter of 2009, GDP declined by 5.7 percent in the US, 9.8 percent in the Eurozone, and by 15.2 percent in Japan. Since then, business and other confidence indicators point to a fall in the rate of contraction of advanced economies. Some stabilisation is therefore around the corner and some expect a weak recovery in the second half of 2009, though the degree of visibility is unusually low.

With the benefit of hindsight it is clear that the aggressive and highly accommodative monetary policy and the unhindered development of easier mortgage finance fuelled a new bubble, namely, a bubble in the housing market on a global scale.¹² Moreover, it also seems clear now that central banks should set policy interest rates in view of a broader set of inflation targets including house and equity price inflation; see also IMF (2009a). That said, it should be noted that this is a highly complex issue as there

¹⁰ These deals were orchestrated by the Fed.

¹¹ Annualised rates.

¹² The accommodative monetary policy strategy was frequently coined a 'Greenspan-put' in markets, indicating that if something went wrong in the real economy, Chairman Greenspan would cut rates and hence provide insurance as to how much markets could fall.

is no general recipe for how to conduct monetary policy targeting both goods and asset price inflation. Thus, there is no easy-to-use definition of asset price inflation and there is no formula for how central banks should strike a balance between asset price inflation and goods price inflation.

Excessive optimism and risk taking in other sectors and regions

Excessive optimism and risk taking spurred by the boom itself is also a feature outside the banking and real estate sector. During this cycle the emergence of China and India has in particular spurred optimism. The tremendous outsourcing opportunities and the fundamental change of the world's supply chains have led to massive investments in the global shipping industry in a way that very much resembles the pig-cycle known from agriculture.¹³ As a result of this, container shipping, tank and bulk are all stuck with massive excess capacity and plummeting rates. It is likely that it will take years before capacity is in line with demand and years before these industries again post a reasonable return on assets.

At the regional level this cycle has witnessed a remarkable building boom in Dubai and other oil rich countries driven by a high oil price and the desire to diversify these countries into tourism and banking.¹⁴ As a result of this policy-generated hype, real estate prices skyrocketed but are now down by more than 50 percent, whereas vacancy rates are soaring.

Excessive risk taking is also evident in corporate finance. Many companies have used their cash flows to reduce their share capital, which boosted earnings per share and hence made companies look attractive by conventional price multiples. However, the corporate sector is now globally reversing this process, that is, firms are now raising equity capital to make the balance sheet look more acceptable to banks, and in some cases firms also use the funding to pay back banks and other creditors. Similarly, capital funds, often gearing their investments tremendously relative to historic norms, now also live a more quiet life. Strong balance sheets are fashionable again and 'cash is king'.

IMF's estimates of total losses over the period 2007–10

The International Monetary Fund (IMF) has estimated the likely total losses on assets originating in the US, the Eurozone including the UK, and Japan. A key assumption is that the US will first start a weak recovery in 2010. The Eurozone and the UK will lag one year behind, that is, GDP will also fall in 2010, whilst Japan will track US developments, see IMF (2009b) for further details.

13 High prices trigger large investments of many companies at one and the same time. So what was a smart idea for a single firm turns out to be a disaster for the whole industry since capacity is expanded far beyond what is needed. The result is a sharp decline in prices and bankruptcies of many individual companies. It is through this process the industry eventually reaches equilibrium.

14 In this cycle oil peaked at \$147 per barrel.

IMF estimates of potential write-downs by origin of assets (\$ billion)				
United States		Banks	Insurers	Other*
Loans	1068	601	53	414
Securities	1644	1002	164	477
Total	2712	1604	218	890
Eurozone + UK		Banks	Insurers	Other
Loans	888	551	44	292
Securities	305	186	31	89
Total	1193	737	75	381
Japan		Banks	Insurers	Other
Loans	131	118	7	7
Securities	17	11	2	5
Total	149	129	8	12
Total for all loans and securities		4054		

Table 1. IMF estimates of financial sector potential write-downs, 2007–10 by geographic origin of assets as of April 2009 insurers.

* Include US government-sponsored enterprises, hedge funds, pensions, and other non-bank financial institutions. Source: IMF (2009b).

Under these assumptions, the Fund projects total losses for all loans and securities, such as most of the sub-prime bonds, originated in the US, to be about \$2,712 billion.¹⁵ As of today we have seen less than half of these realised. If these estimates prove to be correct we are not half way through as many commentators believe we are. It is not only on mortgages that we will see large losses going forward. It is also on consumer loans and credit cards reflecting the high and rising unemployment in the US. The corporate sector, outside banking, construction and real estate, which was well capitalised prior to the crisis, will also start to report large losses including bankruptcies as the crisis drags on. These estimates suggest that banks may still be in need of additional equity capital over and above what the recent US Treasury stress tests have suggested, see estimates in IMF (2009b). However, as noted also by the Fund, many governments have effectively through different guarantee provisions allowed for risk sharing between the banking sector and the government. In some cases, this is likely to limit the additional capital required.¹⁶ In addition, if markets maintain the current optimistic view that we are over the worst, this may also help to bolster confidence and reduce the need for equity capital.

Total estimated losses on loans and securities originated in the Eurozone and the UK amount to \$1,193 billion. The magnitude of these numbers shows that the credit crisis is also a European phenomenon. Numbers for Japan show that expected losses

15 This corresponds to 19 percent of US GDP in 2008.

16 IMF's estimates have not prevented equity markets from rallying. Thus, markets including financial stocks have soared from the beginning of March 2009 to the time of writing end May 2009. The above loss estimates raise the question whether the rally will be reversed should some of the projected losses turn out to be realised? During the crisis in the early 1930s, there were 6 bear market rallies, with equity prices increasing by more than 20 percent, which were all reversed, see Christiansen (2009).

on Japanese assets are small relative to the other regions.

How bad it will get depends crucially on the macro economy, which, however, is extremely difficult to forecast because we are in completely new territory with financial markets under stress and global stimulus packages including bailouts, which are hard to quantify in terms of their impact on the real economy. The IMF's outlook is based on the view that it takes long time to overcome a deep financial crisis.¹⁷ The IMF is therefore expecting only a weak US recovery in 2010 with essentially a flat GDP profile relative to 2009. That said, other forecasters including JPMorgan have a more optimistic view on the speed of recovery. For the current year, JPMorgan and the IMF are roughly in line, but JPMorgan is expecting US GDP to grow by 2.7 percent in 2010. If the JPMorgan scenario materialises, losses are likely to be significantly smaller than losses estimated by the IMF.¹⁸

GDP forecasts				
	IMF		JPMorgan	
	2009	2010	2009	2010
USA	-2.8%	0.0%	-2.5%	2.7%
Eurozone	-4.2%	-0.4%	-4.1%	1.2%
Japan	-6.2%	0.5%	-6.8%	2.3%
China	6.5%	7.5%	7.2%	8.5%

Table 2. GDP forecasts. Source: IMF (2009b) and JPMorgan (2009).

High leverage amplifies the downward spiralling of markets and economies – policies can only mitigate this process

Large losses in the banking system have led banks to hoard cash in order to rebuild their balance sheets. This has led to an outright contraction of credits extended to the private sector, in spite of the infusion of public money, which essentially has sent all advanced economies into deep recessions. Thus, firms facing tougher financing conditions in advanced economies scaled back on capital spending and also started to lay off workers at a large scale in autumn 2008, when the credit crisis accelerated. Indebted consumers are also hit hard while they are, at the same time, suffering from sharp declines of their property and stock market wealth. In the US this has led consumers to hold back on spending and raise their savings. The household savings rate is now approaching 5 percent of disposable income, see figure 1. Relative to what is the average long-term prudent savings rate, consumers are about half-way through, but there is a long way to go in terms of rebuilding household wealth. Hedge funds and other highly geared investors have responded to the credit crunch by undertaking massive equity sell-offs, which accelerated the downward spiralling of prices of

17 This is the lesson of previous deep financial crises, see IMF (2009c).

18 In a discussion of this issue, it should also be noted that losses have so far been much higher than forecasted by the IMF.