

# Changing Business Models in Banking and Systemic Risk<sup>1</sup>

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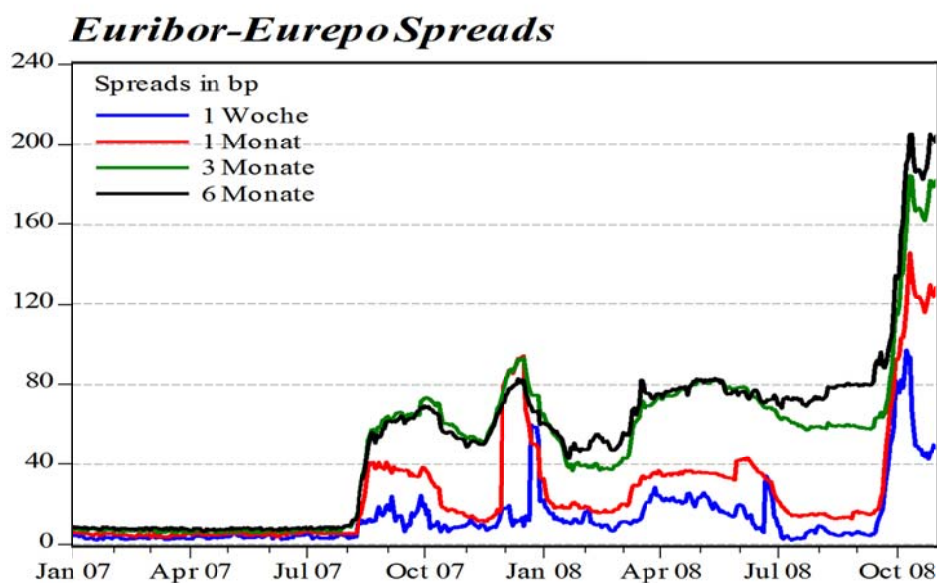
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## 1. Introduction

The failure of the former rising star Northern Rock marks the end of an unsustainable business model built on exploiting regulatory loopholes and inertia. When markets realized the systemic character of the liquidity problems caused by Northern Rock they instantaneously dried out.<sup>2</sup> Overnight interbank money markets drastically changed their character and function. Even specialized financial intermediaries started distrusting each other so much that they withdrew massive amounts of short term liquidity. For the first time in the postwar economy the nerve of the banking sector's daily liquidity management, the interbank market came to a complete standstill. Central banks had to intervene at large scale and substitute for decentralized trading in order to provide liquidity to the banking sector. And in fact, interbank markets have never fully recovered since August 2008.



Source: Data provided by Hans-Helmut Kotz, Deutsche Bundesbank, 2009.

Figure 1: Euribor-Eurepo Spreads

Figure 1 shows that up to the Northern Rock debacle the spread between the unsecured Euribor lending rate and the secured Eurepo rate for the same maturity tended to be in the order of just a few basis points. This spread is a measure of the price for the risk of lending on the interbank market. Hence, prior to August 2008 the price for risk was almost negligible for any short term maturity up to 6 months reflecting an enormous, if not excessive amount of trust of banks in their peers and a complete absence of concerns about counterparty risk. This picture changed dramatically after the announcement of liquidity problems of Northern Rock with money market spreads between secured and unsecured deposits reaching almost 80 basis points. The failure of Lehman Brothers added another round of acceleration with pushing even the one-month spreads above 100 basis points. At that point the heart of the

<sup>2</sup> More precisely, in this context "drying out" is meant to imply proper pricing of counterparty risk, which apparently and paradoxically did not happen prior to August 2007. Relatedly see Afonso, Kovner, Schoar (2011) on stressed fed fund markets after the Lehman insolvency.

financial system essentially stopped operating and was put on life support by massive liquidity injections supplied by central banks. As evidenced by the rising risk premia the major participants in the interbank market had massively lost trust in engaging in trading relationships with their peers, and the market has never completely recovered from this episode. Still worldwide central banks are substituting for much of decentralized trading among banks.

How could such a massive loss of trust have been triggered in the financial crisis of 2007/8? What went wrong with banks' business models, if at all? Has the crisis just been an accident with considerable collateral damage, or have we been witnessing the consequences of a systemic market failure? Can we still trust in a decentralized banking system or should we call for public banks and governmental support? Is it enough to amend national prudential regulation by taking into account the international nature of business relations or is it necessary to develop a (completely) new regulatory framework for prudential regulation of the global market? What can banks do on their own to avoid future such systemic crises?

In this contribution I will argue that the Financial Crisis of 2007/8 triggered by the liquidity problems of Northern Rock was a natural consequence of widespread changes in banks' business models. As such it was essentially foreseeable. Both, the international regulatory process, as well as globalization and the internationalization of banking contributed to changes in business strategies that ultimately left banks void of any resiliency and badly prepared for the liquidity problems triggered by completely anticipated and foreseen rises in interest rates in the year 2007. Essentially, banks freed up their balance sheets from risk bearing capital and, essentially, transferred all business risk, including interest risk to depositors, and arguably to the public sector. Thus, in order to minimize systemic crises, effectively, the tax payer has assumed the role of the "risk-taker of last resort" (Kotz, 2009).

The next chapter briefly discusses the evolution of banking business models over the past two decades. The subsequent chapters discuss potential public reactions as well as the scope of private remedies to restore resiliency in banking.<sup>3</sup>

## **2. From Banking to Trading**

After the oil price shocks of the 1980s and after the experience of stagflation in that period, monetary conditions seem to have loosened, and still are rather accommodating, both in the U.S. and in Europe. Figure 2 documents a sustained decline in interest rates in the U.S. from about 20 percent in 1980 to about 5 percent for 30-year bonds in the U.S. In parallel also short-term rates, i.e. the Fed-Fund rate, declined to almost zero percent currently.

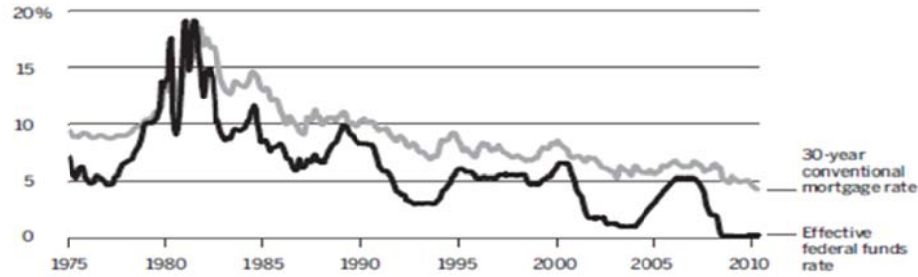
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<sup>3</sup> This essay borrows from Gehrig (2013), which concentrates on the evolution of the Basle regulatory process and its unintended consequences. In contrast, this essay focusses on the private sector and the banks' strategies plus their business models.

**Bank Borrowing and Mortgage Interest Rates**

*Rates for both banks and homeowners have been low in recent years.*

IN PERCENT



SOURCE: Federal Reserve Bank of St. Louis, Federal Reserve Economic Database

Figure 6.1

Source: Financial Crisis Inquiry Commission, 2011

Figure 2: Developments in US-Banking

Likewise there has been a prolonged convergence and decline in interest rates of long term European sovereign bonds in Europe before and after the creation of the Euro in 2002 until 2008.<sup>4</sup>

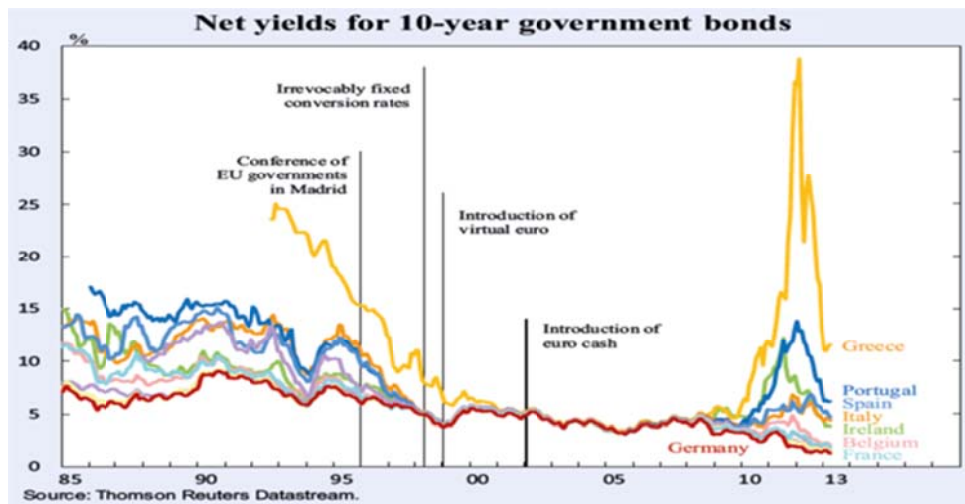


Figure 3: Yields of 10-year European Sovereign Bonds.

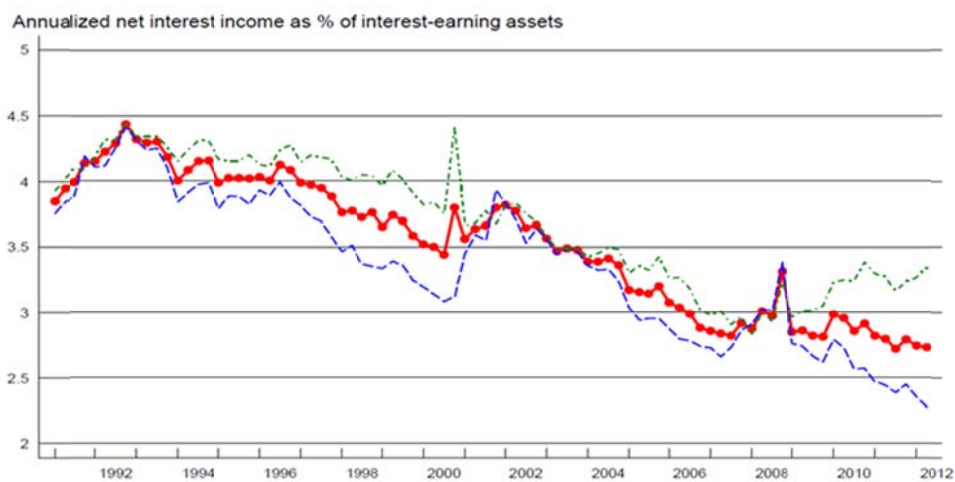
Since interest income is positively correlated with interest rates, the sustained decline in interest rates also exerted substantial pressure on net interest margins. These dropped in the U.S. from 4.5 percent in 1992 to about 2.5 percent in 2012. At the same time

<sup>4</sup> The financial crisis of 2007/8 re-introduced heterogeneity in European sovereign bonds.

globalization and integration of European banking markets exerted extra pressure on banks' lending margins.

At the same time the international regulatory debate about capital rules focused attention on the harmonization and the regulation of bank capital.<sup>5</sup> The debate about the proper level of capital highlighted the potential costs of capital relative to deposits. The Basel II regulation even resulted in allowing banks to assess their own level of capital on the basis of quantitative models. While the idea was that banks should be given incentives to improve their risk management, the incentive consisted in the possibility to reduce their burden on (costly) capital. While the debate about the (excessive) costs of capital is clearly lobby-driven (e.g. Admati, Hellwig, 2013, Gehrig, 2013), it did effect banks business strategies profoundly as we will see.

### Net Interest Margin



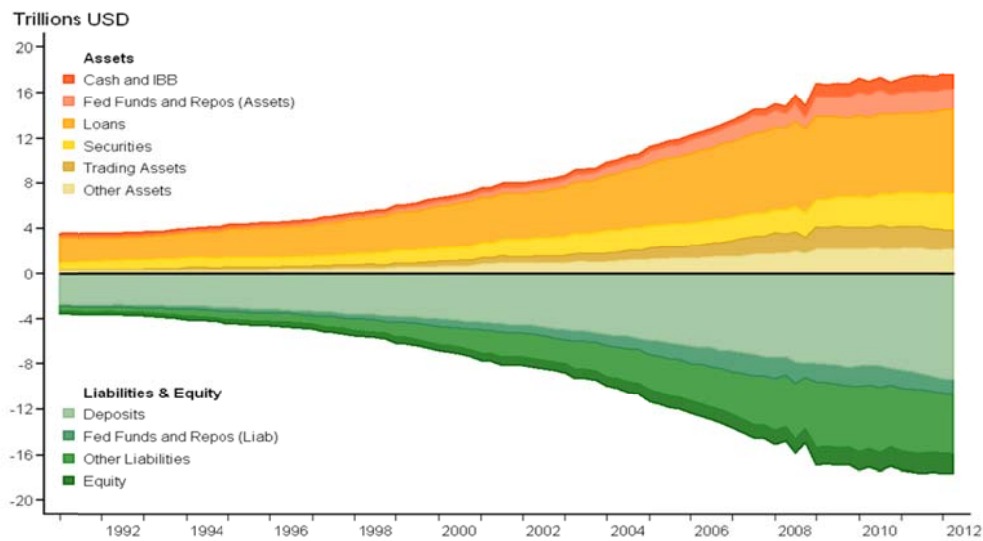
Source: Fed. Reserve Bank NY: Quarterly Trends for Consolidated U.S. Banking Organizations, 2.Q. 2012

Figure 4: Net Interest Margin U.S., 1980-2012.

How did these developments affect banks' business models? The evolution of banks' aggregated balance sheets provides first hints. As can be seen in Fig. 5 for the U.S., the role of non-traditional assets and liabilities, marked as trading asset or "other assets" or "other liabilities" and Fed-funds respectively, increased substantially. Also bank capital almost seems to have disappeared at 2007 and re-emerged after 2009. Overall, monetary conditions prior to the financial crisis are reflected in hugely expanding aggregate balance sheets.

<sup>5</sup> See Goodhart (2011) for a description of the early stages of the Basle Committee.

### Balance Sheet Composition



Source: Fed. Reserve Bank NY: Quarterly Trends for Consolidated U.S. Banking Organizations, 2.Q. 2012

Figure 5: Trends in US-Banking from 1990-2012

Fig. 6 reveals that a large part of that increase in assets consists to asset-backed securities. These are securitized loans intended for sale or resale but not to be kept on banks' balance sheets for longer periods. Apparently, long-term lending relations were substituted by short-term loan origination with the purpose of selling securitized loans on the market to other long-term investors.

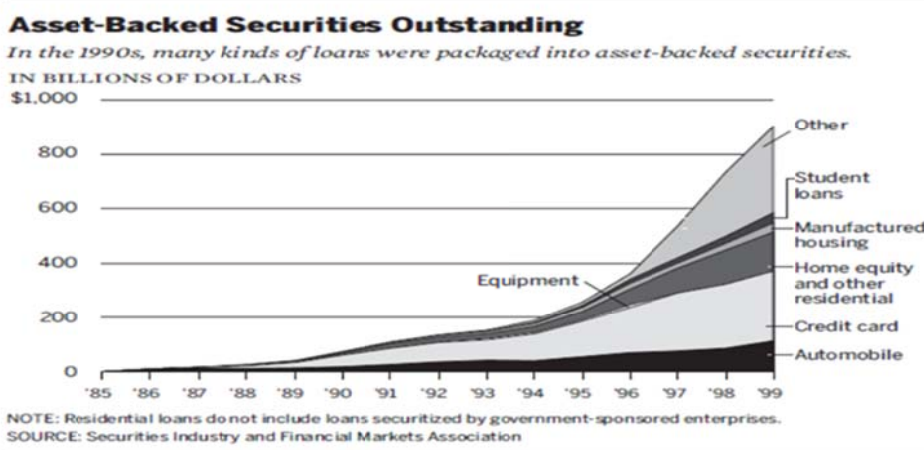


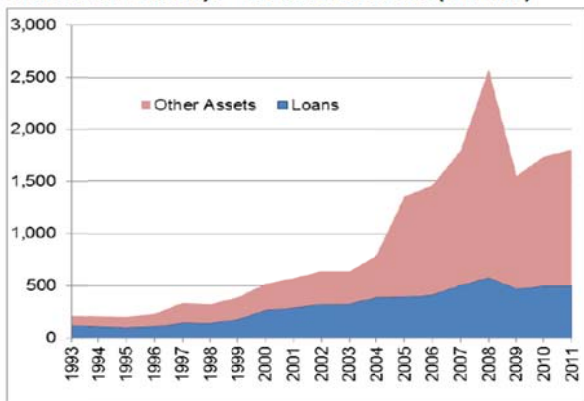
Figure 3.1

Source: Financial Crisis Inquiry Commission, 2011

Figure 6: Development of asset-backed assets.

A similar development can be identified in Europe. Fig. 7 provides two representative examples, Barclays Bank and Deutsche Bank, as reported in the Liikanen report. Also in those cases, derivatives trading starts dominating the balance sheets at about 2004. Moreover, these examples reveal the effective disappearance of bank equity on the liability side. Even after the financial crisis the build-up of bank equity seems relatively feeble.

Chart 3.4.11: Barclays – Evolution of assets (€ billion)



Source: Data from published accounts.

Chart 3.4.12: Deutsche Bank – Evolution of assets (€ billion)

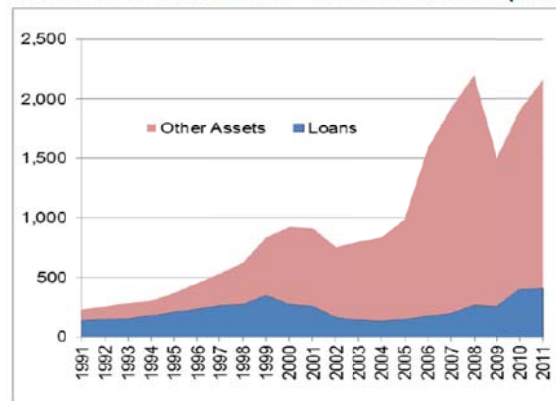
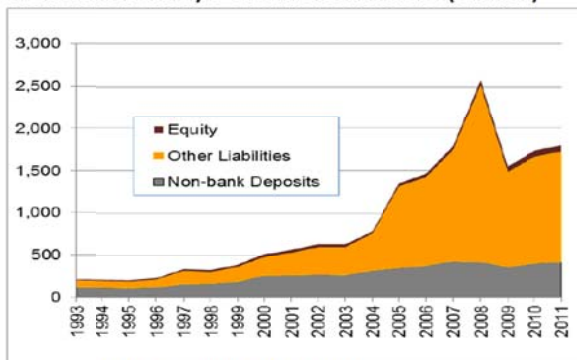
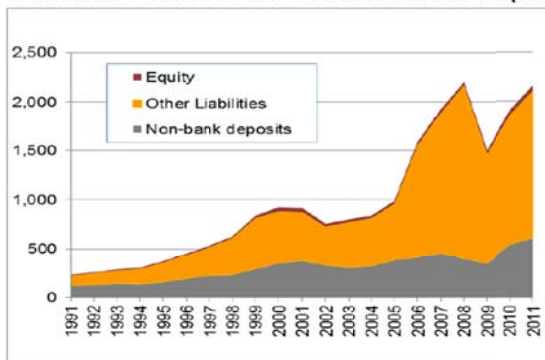


Chart 3.4.18: Barclays – Evolution of liabilities (€ billion)



Source: Data from published accounts.

Chart 3.4.19: Deutsche Bank – Evolution of liabilities (€ billion)



Source: Liikanen Report (2012)

Figure 7: Graphic Representation of the Balance Sheets of Barclays Bank and Deutsche Bank

The change in balance sheet composition reflects a change in earnings. According to Fig. 78 non-interest income has risen to major if not source of bank income in the 1990s essentially across all size groups. With the exception of the crisis years 2007 and 2008 noninterest income has leveled at about 50 percent on average for all institutions at about 2000, while it attains about 60 percent for large banks and 40 percent of the smaller banks. This structure of income shares has been interrupted, but effectively not changed by the financial crisis.

Apparently, noninterest income started dominating interest income around the turn of the millennium. This development correlates with the rise of securitization and the change of business models from origination towards trading. While banks started to concentrate on their core-business of information production and loan origination they freed up balance sheets by selling long-term

assets to long-term investors. Thus investment banking started dominating commercial banking, or simply, traditional banking. This process seems to have started in the U.S. at around 1995 and, hence, well after the implementation of the Basel I accord.

### Noninterest Income Share



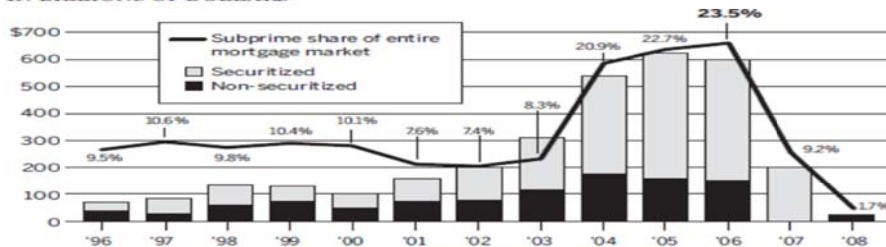
Source: Fed. Reserve Bank NY: Quarterly Trends for Consolidated U.S. Banking Organizations, 2.Q. 2012  
 Figure 8: Trends in US-Banking from 1990-2012

One possibly unintended consequence of this development has been a shift in focus and management horizon. While traditional banking was much more relationship oriented and as such long-term in focus, the trading model was geared towards short-term profitability. While relationships typically require initial investments into a lending relationship by the lender with the prospect of earning fees in the future, the trading model tends to anticipate and cash-in on potential future cash-flows by selling the assets immediately after origination. Thus, the trading model in its very nature is far more short-term than a relationship model of banking.

### Subprime Mortgage Originations

In 2006, \$600 billion of subprime loans were originated, most of which were securitized. That year, subprime lending accounted for 23.5% of all mortgage originations.

IN BILLIONS OF DOLLARS



NOTE: Percent securitized is defined as subprime securities issued divided by originations in a given year. In 2007, securities issued exceeded originations.  
 SOURCE: Inside Mortgage Finance

Figure 5.2

Source: Financial Crisis Inquiry Commission, 2011  
 Figure 9: Developments in US-Banking

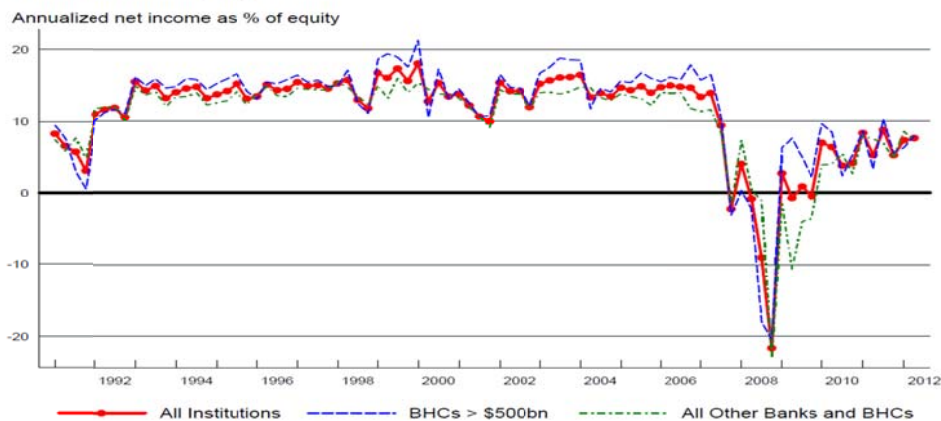


This increasing focus on trading can also be seen in the nature of originations. So the increase in originations of mortgage loans in the new millennium is essentially driven by the prospect of securitization and trading. The share of non-securitized loans, which remain on banks' balance sheets, remains roughly constant since the 1990s.

Apparently, this shift in focus was heralded by shareholders of bank stocks. The new paradigm got associated with the new performance measure of return on equity. Northern Rock's rise to fame was related to its ability to generate formidable rates of return on equity (Shin, 2009). Likewise the success of investment banking units was measured in remarkable rates of return on equity for essentially all the large banks in the U.S. as well as in Europe. Indeed in the 1990 return on equity has become an industry benchmark in the banking industry. Fig. 10 documents surprisingly little variation in that benchmark across bank size classes. Apparently, the benchmark started to reach around 15 percent in 1992, where it remained until 2007. After the financial crisis a benchmark level for the return on equity seems to re-emerge, at a substantially lower level though of about 8 percent.

How is this benchmark level for the return on equity related to banks' business models? It seems that the regulatory debate of the Basel process has contributed to implementing "acceptable levels" of (low) equity for the banking industry. More importantly, the regulatory process has focused management attention on minimizing bank equity as being a scarce and costly source of funding. So it is little surprise that management compensation was made contingent on the short term performance measure of return on equity. Shareholders were asking for a relatively high return on equity and managers were serving their interests.

### Return on Equity



Source: Fed. Reserve Bank NY: Quarterly Trends for Consolidated U.S. Banking Organizations, 2.Q. 2012

Figure 10: Trends in US-Banking from 1990-2012

Tragically, this change of management focus materially contributed towards eliminating the resilience of the Western banking systems by essentially stripping them of required equity. Still this comes at little surprise; return on equity has never been accepted as a standard performance measure in academic research since it can be easily manipulated by management at will. While a high return in good times *ceteris paribus* is reflected in a high return on equity, seemingly

paradoxically, the return on equity can also be enhanced in bad times.<sup>6</sup> For example, a repurchase of stocks in periods with low operating returns reduces bank equity, and, thus, pushes upwards return on equity. In fact, as Fig. 10 demonstrates for Deutsche Bank, there had been widespread stock repurchase programs among the major European and U.S. banks. While stock repurchases are a strategy to stabilize the measured return on equity, they are not useful to stabilize a better performance measure such as return on assets, and, even more importantly, they reduce the banks' loss absorption capacity, and, thus, resilience. Repurchasing stocks in periods of weak operating revenues maintains payout to management and shareholders but increases insolvency risk and leaves banks more vulnerable to shocks in precisely those periods where risk capital is required for survival. The increased insolvency risk is deliberately shifted to depositors and fixed claimholders.



Source: Deutsche Bank (Homepage)

Fig. 11: Share repurchases of Deutsche Bank

Obviously, collectively, bank managers have been willing to accept a high level of insolvency risk and a low level of resiliency for the banks they were entrusted responsibility for.<sup>7</sup> It remains speculation to what extent this risk was purposefully accepted and to what extent there was speculation about government bailouts in case a bank failed despite the bank being in full compliance with the new Basel capital regulation. The sudden drying up of the interbank markets in 2007 (Fig. 1) at least seem to suggest that not all the systemic feedbacks had been taken into account prior to the crisis. But after the crisis had been triggered, bank managers, and investors alike, obviously became quite concerned about the resiliency of their competitors' business models. This market feedback generated a systemic liquidity crisis that required swift reaction by central banks in order to prevent systemic failure.

<sup>6</sup> There are further weaknesses such as inducing myopia due to the focus on short-term periodical revenues. Alternative performance measures such as returns on assets are less critical.

<sup>7</sup> It should be noted though that quite a large number of banks with conservative business models had not changed their strategies dramatically such as large numbers of savings and cooperative banks. Nevertheless, they were also affected by the systemic feedback of the actions of a significant number or large banks.

### 3. Private Strategies Towards a More Resilient Banking System

Is there scope for banks to re-adjust strategies towards more resilient business models?

Historical evidence in periods prior to regulation reveals that indeed banks may have an incentive to maintain more resilient balance sheets if they are rewarded for the higher degree of safety they offer to depositors. Along this line Wheelock and Wilson (1994) find that banks that were not subject to mandatory deposit insurance in Kansas prior to the Great Depression tended to be more strongly capitalized, more profitable and less likely to default.

Also Berger (1995) has analyzed the relation between capital and return on equity for American banks. Indeed he verifies for the US that prior to the Basel 1988 Accord well capitalized banks did generate a higher return on equity. Moreover, well capitalized were less prone to liquidity problems in that period in the US.

Similarly on modern date Berger and Bowman (2011) address this issue on the basis of an international bank data set from 1984-2009, which includes several major banking and financial crises such as the S&L-crisis, the dot-com and the 2007/8 crisis. Their main findings are:

- i. In all Western countries capital increases resiliency in crisis periods. This holds for banks of all size groups.
- ii. In normal times it is especially small banks that profit from capital, and not the larger banks.<sup>8</sup>
- iii. In normal times the relation between capital and return on equity is statistically not significant for large and medium sized banks.
- iv. The positive impact of capital is stronger for US banks than European banks.

These empirical findings seem to stand at odds to the claims of modern banking lobbies which almost regard capital as a necessary evil that needs to be minimized. There are no words about the potential benefits of capital in fostering resiliency, or even strategic advantage in funding markets or more long term oriented relationship banking. Maybe the many political reforms related to the Basel reform process have effectively overturned the original positive relation between capital, profitability and resiliency

The evidence suggests that competitive advantages of capital do not seem to play for large and medium sized banks in normal times. However, capital is important in periods for

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<sup>8</sup> Similarly, Libertucci and Piersante (2012) find that capital is particularly important to improve the resilience of start-up banks in Italy.

crisis for all banks, and even more so in the US relative to Europe. This differential finding seems to hint to the importance of the institutional environment. Capital is important because it strengthens funding ability by reducing potential insolvency concerns. This effect is stronger in countries with i) more effective banking competition and ii) for countries with more pronounced insolvency risk (and hence lower guarantees). Monetary policy and universal guarantees in Europe effectively undermine much of the strategic role of capital. Based on this observation the argumentation of European banking lobbies is well understandable. However, as we can witness in Europe, the increased recourse to state guarantees increases the public interest in generating a more resilient and stable banking system. And ironically this is falling back precisely on those banks that generate the highest social risk, i.e. those banks that like to present themselves as systemically important.<sup>9</sup>

However, will banks be able to lengthen their investment horizon again? Will they be able to move back from a trading bank to a relationship bank? The answer to this question is more difficult. For one reason, securitization has clear benefits and frees up resources for the original banking activity of information production and origination, while leaving long term funding to long term investors (Bester et al. 2012). Moreover, relationship financing seems particularly important in risky start-up phases and in early stages of development. It seems less relevant in low growing and largely satiated environments.

Will banks be able to increasingly service the long-term interests of their depositors and savers? This will largely depend on how much they will succeed to correlate management rewards on trust building long-run performance rather than short-term return on equity. In this regard it seems essential that banks manage well the tradeoff between the interests of short-term and long-term investors. Sound capitalization is a measure of the value of trust in long-term contracts. Low levels of capital clearly compromise long-term contracts to short-term benefits.

#### **4. Public Strategies Towards a More Resilient Banking System**

As the analysis of the past two decades reveals pressure on lending margins was not only exerted from increasing international competition but also from expansive monetary policy. While competitive forces may be a healthy way of discriminating among alternative business models, financial depression and loose monetary policy tend to weaken the competitive

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<sup>9</sup> This argument could actually be used in order to support subsidizing bank capital because of its positive externality in periods of crisis. Rather than subsidizing risk taking, the tax payer should have an interest in subsidizing solidity and resiliency. Of course, such considerations would require nothing less than a "little revolution" in the think tanks of the treasuries. In the interest of tax payers an effects-based policy might be worth considering.

value of sound balance sheets. In a truly competitive market economy funding costs are related to the strength of balance sheets and competitive advantage. Weaker banks and risky business models have to pay higher risk premiums, and, thus, funding costs reflected in higher costs of capital. Consequently, insolvency rates are higher and they are more likely to market selection. To the extent that monetary policy intervenes in markets, both by subsidizing funding costs at low rates and by accepting lower quality collateral, the advantage of sound balance sheets as well as the forces of market selection are weakened. Moreover, a policy of bailing out any large enough banks completely ridicules the process of market selection. Both, monetary policy and rescue packages undermine the functioning of markets and raise the question about the role of organizing the banking industry around markets or as a central bureau. If markets are the social solution of choice, it will be necessary to allow market forces to operate. An adjustment of the international financial architecture and self-constraint of national policy interference will be unavoidable. The very fact that European banking markets still are highly fragmented is not only a reaction to local informational advantage (Gehrig, 1998) but also reflects strong national political interests that disallow markets to function properly.

Also the question about prudential regulation is highly linked to the proper market framework. History has taught us that successful banks in unregulated markets tended to be more resilient than regulated markets (e.g. Wheelock, Wilson, 1994). To the extent that capital buffers provide a positive externality to others<sup>10</sup>, markets may not be well equipped to provide incentives for optimal capital provision. Even high-quality banks may not have incentives to contribute the socially optimal amount of capital either.<sup>11</sup> As the recent financial crises have shown, the lack of capital is major reason for dwindling trust in the financial sector. Hence, the positive externality of bank capital would seem to constitute a prime reason for public intervention. As done in the Basel III process statutory regulation could mandate minimum levels of capital. Alternatively, policy could provide incentives in a Pigouvian way - e.g. by generating tax incentives - and leave the determination of optimal capital level to the markets. The advantages of the latter approach is a stronger reliance on market knowledge, while the statutory approach easily may fall victim to the "pretence of knowledge" criticism (Hayek, 1974) since it requires lots of information to implement the "optimal" minimal levels of capital. Moreover, in case of distress statutory regulation always allows the excuse that regulatory limits have been obeyed, thus reducing incentives for prior private initiative to avoid distress. In any case, the recent financial crisis has taught the

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<sup>10</sup> This is similar to liquidity reserves (Bhattacharya, Gale, 1987).

<sup>11</sup> The vicious public rhetoric against stricter rules in Basel III regulation is vivid evidence of systemically important banks trying to shy away from accepting social responsibility and providing positive externalities.

lesson that equity to asset ratios of 5 percent and below are clearly deficient to deal with the volatility of modern markets.

Let me add the observation that there has been surprisingly little debate about the public role in subsidizing leverage. The tax exemption of interest payments clearly contributed to the increasing popularity of the performance criterion of return on equity. Bank capital, while contributing to the soundness of balance sheets and resiliency of individual banks as well as collectively to the banking sector was not equally favored, since dividends on bank stocks did not enjoy that tax exemption. Given the fact that bank capital provides a positive externality, typically underprovided in competitive markets, it should be subsidized relative to deposits. So even if the public is not prepared to subsidize bank capital in normal times, at the very least, it should consider to erase the excessive subsidies on bank leverage. This applies to both, tax incentives and to the implicit guarantees for struggling banks. Subsidizing leverage implies subsidizing risk taking and destabilization of the financial system.

Finally, stock repurchases in the banking industry should be viewed as a warning bell by regulators and supervisors. It has been widely forgotten, or neglected, that already the banking crisis of 1931 was triggered by massive stock repurchases (Terberger, Wettberg, 2005). As in the Great Depression, stock repurchases are one way to transfer wealth from depositors to shareholders in critical periods, leaving the banks vulnerable precisely in times when sound balance sheets are required.

Interestingly, many banks that did not resort to such type of strategies did survive the financial crisis very well. For example, the business model of cooperative banks did not require massive bail-outs and proved quite resilient, even without major explicit or implicit government subsidies.

## **5. Conclusion**

Globalization, regulation and monetary policy have contributed to a massive shift in banks' business models from long-term relationship based banking to short-term trading of securitized derivatives around the turn of the 2<sup>nd</sup> millennium. These developments generated an excessively myopic focus and essentially eliminated much of the resiliency of the Western financial systems. Restoring resiliency requires the strengthening of market forces and, especially, market rewards for strategies based on sound balance sheets. Rather than subsidizing bank leverage, Western societies should reward sound and long-term oriented business models. However, even restricting public interventions to proven market failures and relying on market forces otherwise might help to increase management horizon in the banking industry, and, thus, improve resiliency and reduce systemic risk.

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