

# Financial system reform proposals from first principles

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## 1. Introduction

In this paper I highlight some fundamental characteristics of the recent financial crisis and identify ways to make the financial system stronger. The financial system has evolved technologically, with an ever wider use of securities and derivative contracts, and geographically, with the worldwide spread of the capitalist model of financial intermediation. I start with a description of the effects of these developments and show that, fundamentally, the key weak points in the business of financial intermediation have remained the same.

The recent crisis has brought to the forefront a number of pitfalls in financial markets including, prominently, weak systems to protect retail investors as well as retail borrowers. This paper does not address these issues, which are important and, in some countries, may have been a factor in the build-up of excessive risk positions. By contrast, the paper focuses exclusively on the problem of markets instabilities, and on reforms to make the system less vulnerable to crises.

**...the combination of asymmetric information and illiquidity gives rise to the possibility of a financial crisis...**

When addressing the question of improving systemic stability, it is useful to take very few things as given. I use a minimalist, functional perspective and only assume that a financial system is a network of agreements (typically contractual) and rules, and that a financial system, in order to channel economic resources to productive uses, manages information. My approach is to start from what I consider the best description of systemic fragility in financial intermediation (a model in economics). Then, I describe the salient characteristic of the recent crisis, and in particular aspects of it that are the result of recent evolutions of the financial system. I argue that the basic mechanics of

financial crises still applies, but requires certain key extensions.

The analysis yields implications for reform. The fundamental approach in my analysis of reform is the comparison of financial markets functions with financial markets institutions.

Section 2 illustrates the model of financial crises that I use throughout the paper. Section 3 describes the major lessons from the events of 2007-2008. Section 4 presents the argument for proper equilibrium between functions and institutions in financial market. Section 5 draws the implications for financial market reform. Section 6 contains a few concluding remarks.

## 2. What is a financial crisis?

*'Any sudden event which creates a great demand for actual cash may cause, and will tend to cause, a panic in a country where cash is much economised, and where debts payable on demand are large. In such a country an immense credit rests on a small cash reserve, and an unexpected and large diminution of that reserve may easily break up and shatter very much, if not the whole, of that credit. Such accidental events are of the most various nature: [...], the sudden failure of a great firm which everybody trusted, and many similar events, have all caused a sudden demand for cash.'*

Bagehot (1873), p. 122.

More than 130 years later, the nature of financial crises has not changed, and that is because the basic features of financial intermediation - asymmetric information and liquidity transformation - have not changed. In an intermediated financial system, one where institutions raise capital resources from investors, the asymmetric information between investors and intermediaries can cause withdrawals of capital even in the presence of good investments. In the case where investments are relatively illiquid, as in the classic banking business, where banks finance long-term loans with short-term deposits, investors (depositors) not only worry about the way a bank uses the resources they lend to it, but they also worry about the possibility of not getting their money back in the case where the withdrawal of

<sup>1</sup> I thank Vitor Gaspar, Garry Schinasi and Luigi Spaventa for comments and suggestions.

deposits is widespread.

But what justifies a business of liquidity transformation, where resources are gathered from actors who want to gain easy access to them in case of need, to employ them in a durable way? Consider the classic banking business model. When banks borrow short term and lend long term they carry out a socially productive function (See Diamond and Dybvig 1983). They allow easier access to their funds by savers and at the same time they allow users of capital to take on long-term, more productive plans. Liquidity transformation is a socially productive, hence desirable, function. But the combination of asymmetric information and illiquidity gives rise to the possibility of a financial crisis, a situation whereby all depositors want their cash back - and this can happen simply out of suspicion, with a perfectly healthy loan portfolio.

Because there is a possibility of equilibria that are socially inferior (when a financial crisis occurs, liquidity transformation breaks down, thus leading resources away from higher yielding investments), these are market failures and therefore there is an economically sound argument for a role of public institutions and regulation.

### The most notable feature of the world financial system on the eve of the recent crisis is the tremendous development of securities and derivatives.

Armed with the justification that market failures are possible, the regulatory tools to avoid financial crises are of two kinds: permanent, ex-ante mechanisms and emergency, ad hoc, devices. The ex-ante mechanisms are banking supervision, deposit insurance and regulatory constraints on the management of the banking business. The emergency devices include various liquidity provisions, typically managed by central banks.

With supervision, authorities are given the power to pierce the veil of asymmetric information, which in principle they can do very well since they are not conflicted entities. By assessing banks' investment portfolios they can determine whether such portfolios are too risky, thus making it more likely that depositors withdraw their funds. In some cases, authorities have the power or the persuasion to force banks to close out risky positions. Deposit insurance provides safety to individual depositors, and erases the risk that any one depositor becomes a victim of a justified - or unjustified - run on a bank (typically, only small deposits are covered by insurance). Regulations, of which the so-called Basle capital requirements are the prime example, provide risk limits to banks, expressed as ratios of capital and liquid resources to assets.

Of course, these time-honoured devices to prevent financial crises have all been in place during the recent crisis. But, in the current crisis, as well as in past episodes, they were clearly insufficient. In the next section I explore potential causes of this failure.

## 3. Contemporary Financial Crises

The 2007-2008 financial crisis, similar to previous episodes, more vividly highlighted the profound changes in the financial system, and drew the attention of public opinion and authorities on the mechanisms and weaknesses of the financial system. I will argue that the events have shown three important facts:

- That a securities based financial system has crises that are, fundamentally, identical to those of the traditional bank-based system, with some features that possibly exacerbate their disruptive impact;
- That the counterparty risk problem is key in a securities based financial system;
- That the authorities had developed an unsustainable information deficit relative to the markets they were supposed to supervise and safeguard.

The financial system has changed dramatically in the past 20 years. The last decade of the second millennium was the decade of fastest development of communication and computation technologies, both of which are used intensely to make securities and derivatives markets work. This phenomenon, coupled with a generalised embrace of market capitalism by essentially all large economies in the world, fully explains the evolution of the financial system up to 2007.

The most notable feature of the world financial system on the eve of the recent crisis is the tremendous development of securities and derivatives.<sup>2</sup> In 2004 the DTCC settled 10<sup>15</sup> dollars worth of transaction (\$1 quadrillion). Two years later the number was already 50% higher! What stands behind such huge volumes?

A securities-based financial system has some very attractive attributes. The non-proximity between issuers and investors is one. It broadens the potential market for any issuer enormously. An additional attractive attribute of securities is that they, typically, have a secondary market, where their stock changes hands among investors. If you are not compelled to keep a security in your investment portfolio until maturity (or forever) you may be more willing to buy it if you believe it is worthwhile - the result is a wider potential set of investors. This is the value of liquidity in securities markets; just like a bank aggregates diverse depositors with diversifiable short-term liquidity needs to commit long-term resources to higher-yielding and productive investments, the securities market aggregates diverse investors with diversifiable short-term liquidity needs to provide long-term resources (debt and equity capital in the form of bonds and stocks) for productive purposes. Therefore, liquid secondary markets represent a fundamentally productive resource in an economy, in that they allow greater access to financial resources for productive use.

For securities markets to function properly, potential buyers and sellers need to obtain accurate information about the prices of the securities they are interested in, and actual buyers and sellers need to find willing counterparties and need to complete their transactions

<sup>2</sup> This is not to say that securities are a development of the last 20 years. Just that securities trading has mushroomed in recent years.

smoothly and with minimum risk. Therefore a securities-based financial system necessitates intermediaries, whose functions are to service issuers on one side and investors on the other, but also to support the price-setting process as well as the settlement of transactions.

The second notable development of the financial system in the past 20 years has been the spreading of derivatives. Derivatives are a natural by-product of the boom in securities which has made available a plethora of prices in an equal number of markets, each representing different risks or combinations of risks. These prices provide references for derivative contracts, which themselves allow buyers and sellers to gain exposure to, or eliminate exposure from, those different risks. The development of derivative contracts has multiplied hedging and risk-taking opportunities to all actors.

A key implication of the development of the securities and derivatives businesses is the proliferation of transactions and counterparties. The "production" of derivative contracts requires high-frequency trading (in theory it requires a trade every instant): it is easy to conceive the piling up of bilateral credits and debits in a market with widespread use of derivatives and the attendant intense and continuous trading activity. In general, high-frequency trading allows more efficient hedging, and therefore, for any given risk level, it minimises capital usage, with the effect of making capital more abundant.

The important lesson from the recent crisis to outside observers, public opinion, and political leaders, is the central role played by securities in the present-day global financial system. In particular, the experience of 2007-08 (as well as earlier cases) has dramatically shown that the standard financial crisis described in section 2 occurs with the same characteristics in securities markets, with distinct properties.

In general, as the market for securities stops working, it stops providing the liquidity services described above. People become unwilling to trade and subsequently prices no longer convey information about the value of the securities. This happens either when market participants themselves become unable to value the securities traded, or when participants lose confidence in other market participants' capability to settle their obligations in the market. At the peak of the financial crisis in 2008 a long list of markets almost ground to a halt, including the markets for mortgage bonds, the markets for corporate bonds and the interbank deposit market (in this case, however, loss of confidence towards counterparties coincides with loss of confidence on the underlying asset: deposits are not securities). This produced massive damage in other securities markets, in particular for the stock markets.

How is does the standard "bank" crisis manifest itself in securities markets? Practically all financial intermediaries, banks and non-banks alike, hold securities in their balance sheet. A number of them hold securities that are more vulnerable to the problems described in the previous paragraph - securities which are normally called less-liquid because they have markets with fewer willing counterparties than, say, US Treasury securities. A liquidity mismatch between securities in the assets

versus the liabilities side of the balance sheet has the same business justification of the traditional banking business: providing liquidity in the loans and deposit markets is a risky activity, since liquidity demand fluctuates randomly, and as such it carries a risk premium, or return. Providing liquidity in securities markets by buying relatively illiquid securities and selling more liquid securities is the same risky activity and also carries a return. As I pointed out above, it is also a socially desirable activity because, by making securities markets work better, it facilitates the fundamental function of finance, channelling economic resources to worthwhile productive activities.

Just as in banking crises, and as in the 1873 description of Bagehot, a security crisis is associated with an increase in demand for liquidity, or more liquid securities. This puts strain on the balance sheets of those intermediaries who provide liquidity in securities markets: their assets fall in value, their liabilities increase in value. To restore their own financial equilibrium, those intermediaries have to sell their assets, in a situation where buyers are relatively fewer. This is evidently an unstable situation, well described by, for example, Brunnermeier and Pedersen (2008) and Geanakoplos (2009).

A distinct property of liquidity crises in securities markets is the way they spread, the so-called contagion phenomenon. Those actors that find themselves in a bind, unable to sell securities that do not have very liquid markets, because their attempts would produce too steep falls in their value, are forced to sell securities that are more liquid. The result is that the fall in value in illiquid securities spreads to the more liquid securities: this is why, for example, stock markets experienced collapsing quotations across the board during the worst weeks of the crisis. (The reasoning in the previous paragraphs applies to derivative markets as well.)

The most telling example of a securities-driven crisis in 2008 is that of US money market mutual funds. On 15 September, Lehman Brothers filed for bankruptcy. The following day Reserve Primary Fund, a US money market mutual fund, "broke the buck" because it held Lehman debt. This triggered a run on money market mutual funds: investors feared for the quality of their assets. Three days later, to avoid contagion, the US Treasury announced a guarantee program for the US money market mutual funds while the Federal Reserve announced it would extend non-recourse loans to banks to finance purchases of asset-backed commercial paper from money market mutual funds. Money market mutual funds were major holders of asset-backed commercial paper, highly rated and short term; however, the market for asset-backed commercial paper froze because much of it had been issued to finance investment vehicles into mortgage debt, including subprime mortgages. The last public initiative was the Money Market Investor Funding Facility created by the Federal Reserve on October 21. (See Acharya and Richardson 2009)

Money market mutual funds were viewed as the tamest financial entities offering maximum liquidity to their unit holders and were meant to be close substi-

**Table 1** Morgan Stanley's balance sheet

ASSETS	US\$ million	LIABILITIES	US\$ million
Cash and cash equivalents	16,636	Commercial paper and other short-term borrowings	33,829
Cash and securities deposited with clearing organisations	35,739	Deposits	37,313
Financial instruments owned	407,754	Financial instruments sold, not yet purchased	157,807
Securities received as collateral	82,684	Obligation to return securities received as collateral	82,684
Collateralised agreements	469,131	Collateralised financings	502,105
Receivables	138,262	Payables	146,473
Office facilities and equipment	4,313	Other liabilities	24,063
Goodwill	3,131	Long-term borrowings	159,833
Intangibles and other assets	24,411	Equity	37,954
	1,182,061		1,182,061

Source: Securities and Exchange Commission Form 10-Q, February 28, 2007

tutes for cash. Yet, in 2008 they experienced a run, just like banks, and needed to be bailed out, just like banks.

The second issue that became clear in 2007-08 was the importance of counterparty risk.<sup>3</sup> The discussion above has explained why functioning securities and derivative markets produce very large numbers of transactions, the DTCC volume of business confirms that observation. Each security or derivative transaction exposes the parties to counterparty risk: the default of the counterparty in a trade creates an imbalance of the other counterparty's financial position, which needs to be hedged.

To illustrate the size of counterparty risk in a typical large financial intermediary, consider Morgan Stanley's balance sheet, reported in Table 1. Most assets and liabilities are in the form of securities, or securities lending or borrowing. In addition, the off-balance sheet gross total of derivative contracts at the same date was \$3,728,464 million, i.e. almost \$4 trillion.

It is evident, despite the alarmist statements of many observers, that the stock of derivative contracts is, largely, inert from a financial perspective; it is assets and liabilities that almost perfectly match each other (it could not be otherwise with a size of almost \$4 trillion!). But those very large debits and credits become open positions if Morgan Stanley were to become insolvent. They would become extra risk thrown into the financial system. In other words, a very large financial intermediary like Morgan Stanley is a counterparty to a myriad of different actors in the market, and, if it were to become insolvent, the total risk in the financial system would shoot up by the size of un-hedged positions of all of Morgan Stanley's counterparties. It would be like the insolvency of a clearing house.

This is exactly what happened when Lehman Brothers declared bankruptcy; the balance sheet of Lehman, of the same order of magnitude as that of Stanley, was thrown open, multiplying the risk in the system and provoking a near collapse of world finance.

The final issue that the crisis laid bare is the information deficit of authorities, including financial supervisors, on the actual risks present in financial markets. And this is despite the logic of financial supervision

<sup>3</sup> Counterparty risk has attracted policy-makers' attention since the setup of the Counterparty Risk Management Policy Group, chaired by Gerald Corrigan, in 1999. Since then the Group, in three incarnations, has produced an equal number of reports, the last in 2009.

described in section 2 which would require supervisors to have full knowledge of risks present in the system in order to be able to anticipate problems. As an illustration, I report excerpts of a speech by the President and Chief Executive Officer of the Federal Reserve Bank of New York at the end of 2006:

*'The resiliency we have observed over the past decade or so is not just good luck. It is the consequence of efforts by regulatory, supervisory and private financial institutions to address previous sources of systemic instability. Risk management has improved significantly, and the major firms have made substantial progress toward more sophisticated measurement and control of concentration to specific risk factors. What seems to have been most critical in preventing financial market turmoil from translating into a significant reduction in credit provision by banks and other financial institutions were the steps taken by regulatory authorities and financial institutions alike to strengthen capital in the core of the financial system, and to measure and manage risk. These efforts have most notably manifested themselves in increased levels of risk adjusted capital in the core of the system relative to what prevailed in the early 1990s. In the United States, for example, tier-one risk-based capital ratios have stabilised near 8.5 percent, considerably higher than the estimated levels around 6.5 percent for the early 1990s. This is based on a relatively crude measure of risk, but the direction of the improvement is right and the magnitude of the change is significant. Relative to the conditions that prevailed in the early 1990s, the higher levels of capital in the core now provide a larger buffer against shocks and enhance the ability of the banking industry to act as a critical stabiliser in times of stress by providing liquidity to the corporate sector. When financial markets dry up, firms turn to banks and their unused loan commitments and lines of credit. Banks are in a position to fund this liquidity because transaction deposits tend to flow into the banking sector. In times of crisis, it appears that U.S. investors now run to banks, not away from them.'*

Geithner (2007).



The speech provides aggregate data on regulatory capital requirements for US banks. It concludes with a guardedly optimistic note, indicating that increasing regulatory capital levels at banks, "the core of the system", implies decreasing systemic risks. With the benefit of hindsight, systemic risk was probably at an all-time high at the time of this speech. Just a few months later, US banks went collectively nearly bankrupt due to having taken on risks that were large multiples of their capital base, often by arbitraging regulations. In April 2009 the IMF (2009) estimated \$2.7 trillion of loans and securities losses by US banks, and concluded that the new equity capital needed by US banks to bring leverage down to 17 times (17 times!) would be about \$500 billion. Without government intervention, all major US banks may well have gone bankrupt. The information-deficit problem was in no way limited to the US. In Europe - in particular in the UK - authorities were all surprised by the events that unfolded in 2007 and 2008.

**The boom in the securities business has changed the structure of financial intermediaries and has generated imbalances that may be at the root of the instabilities we have been experiencing.**

Thus far, I have shown that major financial markets developments have changed the way financial crises unfold, though the fundamental mechanisms at work have not changed. I have also shown that a securities based financial system has changed the global risk map, and that authorities in charge of supervision seemed unable to evaluate how much systemic risk there was in financial markets on the eve of the crisis. Why were the standard tools to limit systemic risk insufficient? In the next section I argue that the boom in the securities business has changed the structure of financial intermediaries and has generated imbalances that may be at the root of the instabilities we have been experiencing. The changes in the financial industry will require a change in the tools and functions of financial regulators.

#### **4. The boundary problem**

Organisations in financial markets are entities defined by a set of governance rules, contractual arrangements with counterparties and, typically, a regulatory framework - the finance industry is one of the most regulated. Thus, financial markets institutions define individual organisations.

In this section I follow the method suggested by Merton and Bodie (2005) and treat functions (i.e. businesses) as the conceptual anchors. Merton and Bodie also offer a theory on how institutions endogenously evolve. By their very nature, institutions evolve more slowly than functions/businesses. The evolution of institutions requires a complex coordination exercise, with different roles played by authorities and private market

participants. Functions, i.e. business opportunities, evolve because of technological progress, because of innovations by the industry, and in response to changes in needs of final users.

The progressive spreading of securities and derivatives has led to a multiplication of business opportunities, and a transformation of financial intermediaries. The securities business has moved from specialised broker-dealers and investment managers to the whole of the financial system, including all kinds of banking organisations as well as insurance companies. But the evolution of businesses (or, to use a term more familiar to regulators and academics, functions) has not been in synch with the evolution of institutions. To be more precise, certain private-market contracts have necessarily developed with the booming securities- and derivatives-based system. Consider for example standardised contracts, tri-party agreements, netting provisions, daily symmetric mark to market, and so on. Other aspects of institutions, and in particular regulatory frameworks, appear to have dismissed the notion that there should be a satisfactory correspondence between functions (businesses) and the organisations that run them.<sup>4</sup>

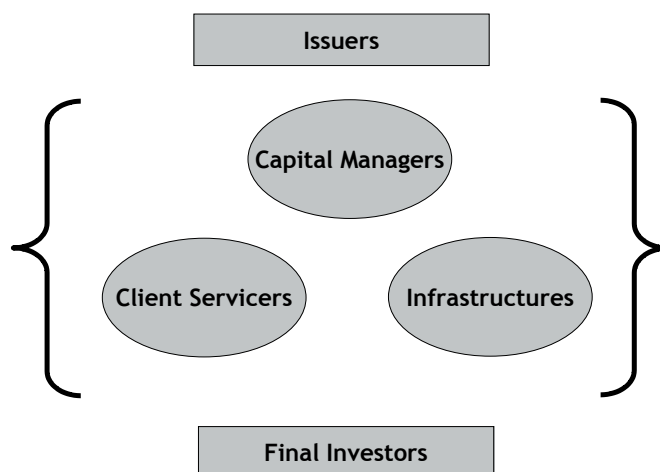
Without doubt, such lack of correspondence is largely due to a very basic fact; institutions are static; businesses (functions) are dynamic.

As much as this logic is hardly disputable, institutions have two roles to play in the financial system:

- Institutions provide constraints in business conduct; such constraints should be efficient, that is, appropriate for the nature and the riskiness of the businesses they carry out, as for example by eliminating incentives to excessive risk taking or other distortions like abuse of dominant market position,
- Since finance is pervaded with asymmetric information, knowledge that a given entity is a member of a given organisational class should help estimate its riskiness; institutions should be reliable signalling devices.

I define the boundary problem as follows: "Do institutions provide efficient boundaries for the different functions in the financial market?" Efficient boundaries are those that perform the functions 1) and 2) above; they provide the appropriate constraints and incentives to those that run the businesses and they are reliable signals to all market participants about the riskiness of each individual institution. To answer this question I need to first identify the basic functions performed in the financial system. Then I will review the way different financial organisations perform these functions and discuss whether the boundaries are efficient.

<sup>4</sup> The abandonment of financial institutions as the starting point of an efficient regulatory framework is illustrated, for example, by the Financial Services Authority's (FSA) emphasis on functional regulation. Such emphasis de-facto dismisses the notion that a satisfactory correspondence between institutions (by which I mean entities with uniform regulation) and functions or businesses should be an appropriate objective for a financial regulatory framework.

**Figure 1** Functions in securities markets

#### 4.1 Functions of a financial system

The primary functions of a financial system are to provide clearing and settlement of payments, to provide resource pooling, to transfer economic resources through time and space, to manage risk, to provide price information and to deal with incentive problems (see Merton and Bodie 1995). These primary functions are bundled in a number of different businesses. I choose to order the different financial businesses in three classes that are very well known to market participants, and correspond to three broad functions. These functions are depicted in Figure 1.

In the Figure, I portray exclusively functions performed by private market participants. The picture would be completed by a number of public functions, such as supervision, public liquidity provision, etc., which I cover below.

The business of client services is one that is defined by a large overlap between market counterparties and clients, who are the core of the franchise value of the business. A client servicer lends money or securities to clients, it produces contingent payoffs (OTC derivative contracts) that clients need for the purpose of managing their own risk, it arranges capital market transactions for clients (debt or equity issues), and performs a number of ancillary services, such as research and advisory. The overriding objective of client services is to maximise profits through the enlargement of the client franchise, more clients and more transactions with each client. Client servicers gain their profitability from exposure to, and efficient management of, two types of financial risk: credit (or counterparty) risk and liquidity risk. That client business is a means of achieving exposure to counterparty risk is self-evident. That exposure to liquidity risk is also a key characteristic of the client business can be explained intuitively; typical services to clients include liquidity provision, in all of its forms like, e.g., long-term loans and broker-dealer services. In general, clients seek from their intermediary easy (and therefore liquid) access to securities markets; client servicers are the principal suppliers of liquidity services (buyers of liquidity risk) in securities markets.

Capital management is the second important function (business) in the securities market. It is, essentially,

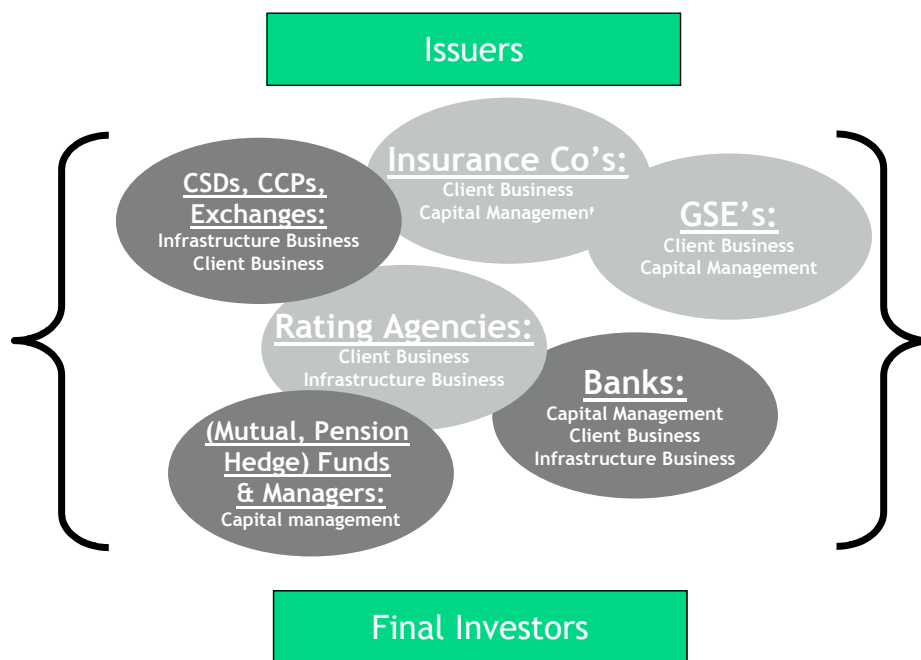
the business of investing (from now on, I use capital management and investment management interchangeably). Capital management consists in creating and managing exposure to all kinds of financial risks accessible in securities markets, with a view of producing attractive returns. The balance sheet of a capital manager may have securities both in the asset and in the liabilities side (exposure to certain kinds of risk requires going short certain securities). A capital manager may use either debt or equity, and all the variations thereof. The fundamental distinction between capital management and client servicing is that, in the former, market counterparties are not clients. The clients of a capital manager are the shareholders. A capital manager's objective is to maximise shareholders' returns without regard to market counterparties.

Thus, client business is all about counterparties whereas an investment manager does not care about counterparties. Indeed, much of the profitability of a capital manager may come at a loss to counterparties; a capital manager cares about counterparty risk, of course, but not about the satisfaction of his/her counterparties in the trades he/she does with them. Suppose that, after appropriate research, an investment manager decides that a given security (say, a stock) is undervalued. The right course of action is to buy the security in the most inconspicuous way, hoping that the buying activity does not attract the attention of other market participant. By contrast, in the client business, if research suggests the attractiveness of a certain security, this research will be immediately shown to clients, in order to give them the chance to take advantage of a good opportunity.

Another inconsistency between client business and capital management relates to the so-called problem of "front running". Client business often carries with it valuable information about supply/demand imbalances in the market (consider the market impact of large transactions); if capital management could access such information it would use it to its own advantage. By necessity the actions of a capital manager, taken as a result of knowledge of client transactions, will negatively affect the cost of such transactions to clients.

The last business in the classification is that of infra-

Figure 2 Organisations in securities markets



structure. Infrastructures facilitate the functioning of securities markets. The salient characteristic of infrastructures is that they are information-processing platforms, with no human intervention; hence, they approximate natural monopolies. Take, for example, the case of post-trading; the business of clearing and settlement of securities transactions. In today's securities markets the technology to provide such services is entirely automated. It is, for all intents and purposes, a zero-marginal-cost business. As such, it achieves maximum cost efficiency when it reaches maximum scale, that is, the size of the entire market.

#### 4.2 Institutions

Where are the functions described above performed? I illustrate some salient cases in Figure 2. The figure reports some organisations and their businesses in securities markets. As mentioned above, an organisation is defined by a set of institutional arrangements; laws, regulations governance rules, private contracts and market conventions. The aim of the figure is to highlight the most interesting cases, not to provide an exhaustive list. In the Figure 1 list, for each class of organisations the different businesses (functions) performed. The shaded organisations are not discussed, but are in the picture to indicate the many varieties of organisations active in financial markets.

I now turn to the boundary question, that is, whether institutional boundaries are appropriate for the businesses run by the different organisations.

I start with fund managers. As a whole, the community of fund managers seems to be specialising in only one business and, perhaps because of the specialisation in just one function, the private contractual framework to which they are subject is already rather robust. However, there are some boundaries that need to be

considered. For example, hedge funds, one sub-class of money managers, have been the fastest growing segment of the investment management industry. Hedge funds are also universally regarded as major actors in financial markets. Most hedge funds are corporations based in offshore centres. This stands in contrast to the rest of the investment management industry, which operates through onshore organisations, with specific regulatory status. Thus, the size and significance of the hedge fund industry suggests the presence of a sort of institutional imbalance; the fact that most hedge funds are to a large extent outside the realm of standard advanced financial regulatory frameworks is clearly an embarrassment for the latter (the advanced financial regulatory frameworks) and, in my opinion, also an embarrassment for hedge fund themselves.<sup>5</sup>

In addition, while the crisis has exposed potentially devastating liquidity risks even in the money market mutual funds, i.e. supposedly the least risky of all managed funds, it is self evident that a significant number of hedge funds are involved in liquidity transformation in the securities space and therefore are, just like banks, vulnerable to liquidity crises.<sup>6</sup> However, in the current institutional setup, authorities have little or no visibility on the extent to which offshore hedge funds are involved in liquidity transformation. Authorities, in their role as systemic risk managers, would certainly be helped by having full access to information on hedge funds' risks and trades.

Consider now the financial market infrastructure

5 They are routinely defined in the press as secretive schemes choosing offshore status to escape regulation and controls.  
 6 Hedge funds have dealt with sudden liquidity demands using tools at their disposal, restrictions of equity reimbursements in the forms of gates and side pockets, which are part of their contractual agreement with investors.

providers. Central securities depositories (CSD), central counterparties (CCP) and exchanges CSDs are the entities that hold the dematerialised securities, and perform the function of assuring, at every point in time, that the stock of securities issued equals the stock of securities held. This implies that every transaction involving a security in a CSD is duly recorded. CSDs provide, therefore, settlement services in securities transactions. CCPs, instead, perform in a centralised fashion the clearing business - they become the counterparty of every transaction (e.g. instead of A selling a security to B, the CCP buys the security from A and sells it to B) - i.e. the business of determining credits and debits in all securities transactions. This way, CCPs facilitate risk reduction by pooling counterparty risk. Centralised trading, clearing and settlement are typical infrastructural businesses; they are high volume, near-zero-marginal cost. But they are also closely linked to client businesses through lending and asset servicing. It is evident that bundling infrastructural services with banking services is an attractive business opportunity, and this is what has been done by several providers of infrastructural services (see Giovannini, forthcoming). While originally infrastructural service providers were either government-owned entities or mutual companies, throughout the 1990's many have progressively transformed themselves into common stock companies. Thus, companies that offer mainly infrastructural services are moving towards client servicing and businesses are often dubbed as banks because they offer lending.<sup>7</sup> These critics also suggest that such initiatives are being "subsidised" by the near-monopoly, standard infrastructural business. Should there be an institutional boundary (governance, regulatory, private contractual) between the natural monopoly functions and the client service functions? This has been discussed at length in Europe and has led to proposals to re-introduce user-ownership of infrastructure business, to avoid vertical integration of trading and post-trading and to setup regulations restricting natural monopolies in market infrastructures from exploiting their dominant position (see Giovannini forthcoming).

I now turn to banks, where the boundary problem is most critical. In recent years the institutional setup of banks has converged. For example, the vast majority of banks are now common stock companies (and this convergence has accelerated during the financial crisis). Meanwhile, the partnership structure, which was a distinctive characteristic of investment banks, has disappeared from large institutions. In addition, investment banks have all but disappeared; they were born in the US in the 1930s, when Glass-Steagall legislation separated commercial and investment banking, but they were de-facto reabsorbed into commercial banks with the Gramm-Leach-Bliley Act, which ended the separation of securities business and lending and deposit busi-

<sup>7</sup> Indeed, the debate on financial market infrastructure reform in the EU witnessed a debate between an impromptu association called "Fair and Clear" and Euroclear, the banking group with access to all of the main EU CSDs. The "Fair and Clear" group were banks concerned with the fact that Euroclear, in their view, was using the advantage it had as a manager of the "notary function" to bundle banking services together with settlement services.

ness. Finally, in the immediate aftermath of the recent crisis, some of the most prominent investment banks have transformed themselves into commercial banks. The basic regulatory framework of banks - capital requirements - allow for leverage equal to 12.5 to 1; banks can hold (risk-weighted) assets 12.5 times their capital. In addition, banks have access to liquidity facilities provided by central banks. They are also subject to supervision.

The significant trend in banks business has been the increase in securities and derivatives dealing, relative to traditional lending and deposit taking activities. As I argued above, this simply reflects technical progress in financial intermediation. However, banks have also mixed their client business and investment (or capital management) business.

Indeed, recent years can be characterised as a period during which investment business has slowly taken over client business in many banking organisations. Starting from the very large losses suffered by banks in the recent financial crisis, it is straightforward, almost tautological, to conclude that the size of the losses can be justified only by very large risk positions which could only be undertaken in a (rather reckless) investment business, and could not possibly arise from client business. While there has been a dramatic fall in liquidity, and liquidity risk, this is inherent in client business and I would expect those losses to account for a limited fraction of total losses. This view is shared by many observers. Indeed, it has been claimed that the financial crisis was, essentially, caused by excessive risk taking of banks involved in investment or capital management business:

*"We believe that, although the originate-to-distribute model of securitisation and the rating agencies were clearly important factors, the financial crisis occurred because financial institutions did not follow the business model of securitisation. Rather than acting as intermediaries by transferring risk from mortgage lenders to capital market investors, these institutions themselves took on this investment role. But unlike a typical pension fund, fixed income mutual fund, or sovereign wealth fund, financial firms are highly levered institutions".*

Richardson (2009)

The mixture of capital management and client business has three implications:

- It exposes banks' balance sheets to an array of risks other than liquidity and counterparty risks, which characterise client business;
- It uses banks' leverage potential in a way that may be inappropriate for the kinds of risks in a capital management business - in other words, 12.5 to 1 leverage is to be considered very high, and rather unusual, in a straightforward capital management business, like for example that of a hedge fund. Such a high leverage ratio may be more appropriate for a client business, where the greatest majority of financial risks are hedged out;



- It exposes banks to those conflicts of interest described above.

One of the most evident implications of the management of investment businesses within banks is that banks and investment managers operate the same business with very different constraints. I illustrate as an example some of the different constraints on the investment business of banks and hedge funds. To start, take Figure 3.

**Figure 3** Balance sheets

Bank		Hedge Fund	
1250 MBS	1150 Debt 100 Capital	200 MBS	100 Debt 100 Capital

The figure reports the size of investments in a certain security with 100% risk weighting (I use MBS, but it could be any other security with that feature) that can be implemented by a bank and by a hedge fund. It should be stressed that the constraints in figure 3 are not of the same kind; in the case of a bank I report the regulatory capital requirement, in the case of a hedge fund, I report the typical financing constraint of a hedge fund (this is pre-crisis; right now there is no debt financing available for mortgage backed securities). The Figure shows that under bank regulation a capital of 100 in a bank can be deployed to invest in 1250 of Mortgage Backed Securities. The same capital in a hedge fund can finance at most 200 of MBS. Thus banks can, in principle, take on far more risk than standard investment management businesses in the same capital management activities.

**...banks and investment managers operate the same business with very different constraints.**

An additional asymmetry between banks and fund managers that manage the same investment business regards accounting rules. Banks have exercised discretion in the accounting treatment of assets that were most affected by the crisis, as Huizinga and Laeven (2009), and Ross Sorkin (2009, pp. 102-104) have shown. Indeed, Huizinga and Laeven claim:

*“Overall, accounting discretion enable the banks to soften the impact of the crisis on the book valuation of assets during the present financial crisis. [...] In the present crisis, the financial statements of banks appear to overstate the book value of assets to the point of becoming misleading guides to investors and regulators alike.”*

The discretion available to fund managers is much more limited; their balance sheet is generally marked-to-mar-

ket by external entities (administrators, custodians). Offshore hedge funds, though they are not subject to specific regulations, have market-imposed valuation practices which are typically the standard ones (that is, mark-to-market valuation). Due to a lack of a uniform regulatory framework, however, exceptions are to be observed here as well.

Finally, the investment business is not highlighted in banks’ financial reports even when, as argued above, such businesses explain most of the volatility of bank profit and loss.. Indeed, bankers do not even admit in public to perform hedge-fund-like activities, that is distinct from, but along with, their client business and within their balance sheet, as illustrated by this description of the business of Goldman Sachs offered by its Chairman and CEO, Lloyd Blankfein, at a congressional hearing in the US (Blankfein, 2010):

*“Our activities are divided into three general areas: Our investment banking business provides strategic corporate services, matching the resources of the firm to specific client needs. This frequently means combining advisory, financing and co-investment capabilities. We help clients access equity and debt capital markets in order to grow their businesses, restructure their balance sheets to improve or to solidify their financial strength and to manage their assets and liabilities. We also assess and facilitate strategic options for M&A, divestitures and corporate defense activities. Through our merchant banking activities, we create and manage investment funds consisting of both our own and our clients’ money in order to invest in growing businesses. Our market making or securities sales and trading business facilitates customer transactions for corporations, financial institutions, governments and individuals through market making and trading of fixed income, equities, currencies, commodities and derivatives products. As a market maker, we provide the necessary liquidity to help ensure that buyers and sellers can complete their transactions and markets can function efficiently. In dislocated markets, we are often required to commit capital to hold client positions over a longer term while a transaction is completed. Our asset management and securities services businesses help public and private pension funds, corporations, non-profit organisations and high net-worth individuals plan, manage and invest their financial assets for the long-term. We also provide these entities as well as mutual funds and hedge funds with prime brokerage, securities lending and financing services.”*

In this description the investment business is mentioned as a separate business in merchant banking transactions and in asset management. However, there is no indication that sales and trading profits originate both client-driven transactions and principal transactions, except for the fact that sometimes capital is committed to hold positions, but just for clients, for the purpose of completing a transaction (this is the typical case of securi-

ties underwriting in capital markets).

The boundary problem of banks seems to be observed elsewhere as well, for example in insurance companies, as Ben Bernanke has vehemently remarked in the aftermath of the AIG crisis (Bloomberg, March 3):

*Federal Reserve Chairman Ben S. Bernanke said American International Group Inc. operated like a hedge fund and having to rescue the insurer made him "more angry" than any other episode during the financial crisis: "If there is a single episode in this entire 18 months that has made me more angry, I can't think of one other than AIG," Bernanke told lawmakers today. "AIG exploited a huge gap in the regulatory system, there was no oversight of the financial-products division, this was a hedge fund basically that was attached to a large and stable insurance company." Thus instead of expressing concern, as some observers have, about "shadow banks", it may seem more appropriate to worry about "shadow hedge funds", both in banks and in insurance companies.*

I do not cover insurance companies in this discussion since my ignorance of them of is even greater than that of banks. I conjecture, however, that the general issues relating to the proper boundaries between the client and investment business are likely to be the same (witness the AIG case).

To summarise the discussion, this section has illustrated the effects of a natural phenomenon, namely the divergences between functions and institutions in the financial system, caused by the differences between the dynamics of businesses and business opportunities and the dynamics of rules and regulations that constrain financial businesses. I have illustrated cases where current institutional boundaries may be inappropriate for the financial businesses subject to them, given the way they are currently run. In particular, one important case has been the growth of risky investment businesses within banking organisations, whose regulatory constraints, relating to leverage and accounting, appear to be designed for client services, and not for an investment business. Indeed, I have also shown that there are noticeable differences in the constraints to investment business as run by banks and that run by investment funds and/or hedge funds.

## 5. Financial Reform

In section 2 I have argued that a financial crisis is a market failure characterised by a generalised and wealth-destructive spike in liquidity demand. Regulatory remedies against financial crises include financial supervision, capital requirements, deposit insurance and liquidity facilities provided by central banks. These tools, with the possible exception of liquidity facilities, have failed in the most recent financial crises. In section 3 and 4 I have attempted to identify reasons why the standard tools have failed. They include:

- The spreading of liquidity and counterparty risk throughout the financial system, caused by the

huge growth of securities issuance and securities and derivatives trading - thus liquidity crises hit where none of the remedies mentioned above was present or effective;

- A progressive inadequacy of existing institutions in providing efficient constraints to financial market organisations in the current securities-based financial system - which led to excessive risk taking (see Rajan (2005) and Lowenstein (2004));
- A deep information deficit of authorities, who have proved unable to effectively identify the key weaknesses and risk concentrations in the financial system and take preventive action, as would be expected of a systemic risk manager;

A strategy for financial market reforms flows naturally from the analysis I have provided. While banks are the first candidates for regulatory reform, I believe that the effort to redesign financial regulation should be efficiently guided by the principles I laid out above in section 4. The overall objective of regulatory reform would be to re-establish a situation whereby the regulatory framework of different actors is appropriate for the business they run.

**The securities-based financial system is characterised by an exponential growth of total counterparty risk, and any mechanism designed to reabsorb counterparty risk is a move in the right direction**

It is immediately apparent, following the method I laid out, that proposals to re-instate Glass Steagall do not seem to be appropriate solutions. Glass-Steagall regulations separated banking businesses from securities businesses. Yet, in my analysis I have argued that the financial system is largely based on the securities business. It is unthinkable to provide financial services to a client separating securities services from cash businesses, since in the financial market cash and securities transactions are very closely linked together. Yet, it makes a lot of sense to separate out client business from investment business, for all the reasons that I have just recalled. The separation of client business from the investment business would confine client servicers -and I believe the name "banks" is appropriate here - to manage credit risk and liquidity risk, just like the old banks used to do, but this time also in securities space.<sup>8</sup>

<sup>8</sup> The typical "practical" exception to a separation of client business from investment business is that to better serve clients banks often have to take securities risks other than credit or liquidity. This objection is true at face value, but not empirically significant. Securities services surely are not only brokerage services, they include dealers' services. These require holding securities inventories for some time. However, such holdings have to be limited in time: if they were not they would be proof of the inability of the bank to intermediate client needs. The typical tool used in banks to separate client business from investment business is a very tight risk budget to the former, and looser risk budget to the latter.

Continuing with the argument, I find proposals to return to narrow banking or so-called utility banks inappropriate, because I still trust, in principle that a system combining liquidity transformation with institutions designed to correct market failures will work.

Along the same lines, it would be very desirable to have a uniform regulatory framework for capital managers bringing hedge funds onshore. Hedge funds are major actors in securities and derivatives markets, yet they are outside mainstream regulatory frameworks and largely invisible to supervisory authorities. Such reform should focus on the exposure of different funds to liquidity risk in the securities space (again, the experience of money market mutual funds in the US has been an eye-opener).

Proper boundaries for infrastructure service providers will certainly complete the buildup of a more robust financial system. The standard for evaluating market infrastructure is risk management, but this should be accompanied by governance structures that are designed to avoid taking inappropriate risks, either to beat competition or to increase profitability by accessing non-infrastructure businesses.

Recent initiatives, in the US and in the EU, to incentivise or force the usage of central counterparties for standardised derivative contracts, are a very welcome step in the direction of counterparty risk reduction and counterparty risk control from a system-wide perspective. As I have pointed out above, the securities-based financial system is characterised by an exponential growth of total counterparty risk, and any mechanism designed to reabsorb counterparty risk is a move in the right direction; in the same category should be included rules aimed at regulating orderly resolution of large, systemic financial intermediaries. These initiatives, however, should be accompanied by a careful reassessment of institutional boundaries of infrastructure providers, along the lines I mentioned above.

After the appropriate institutional boundaries for client servicers, market infrastructures and capital managers have been re-established; there will be a need to redesign the role of authorities. I stick with the basic model where one of the main functions of authorities is to perform the role of the systemic risk manager. This starts with gathering and processing information on risk positions from all financial market participants, especially information relevant to assess liquidity risk. This means giving authorities full access to all activities of all relevant actors. While this may appear a gigantic task, it is a requirement if we want to have any hope to build a financial system less prone to systemic crises. To the extent that the information collection preserves the lawful business interests of individual market participants, and there are several ways to maintain confidentiality, starting from the obvious requirement that authorities do not publish data on specific entities but only aggregate data,<sup>9</sup> the implementation of a global

data gathering project is certainly within reach. It requires clear vision by policy-makers who need to understand the importance of endowing financial market authorities with the informational advantage they need to fulfil their role in managing systemic risk.

**A regulatory system based on a number of tools, including reinforced disclosure to authorities, is certainly a more robust system than the current one.**

The proper design of the management of systemic risk presents a vast problem in need of urgent and careful attention. I note here that markets' awareness of authorities' ignorance is a powerful volatility multiplier; anybody who has no view on the systemic risk implications of any major market shock, and knows that authorities do not have a view either, has to react to the shock in the most conservative way, by decreasing risk as much as possible. The events of August 2007 are in my view a good illustration of the fact that markets perceived the authorities' lack of information on the unfolding market events, therefore reacting excessively. As soon as the Fed lowered the discount rate on August 17, there was a swell of relief that only underlined the confusion and concern of the previous weeks. Authorities with sufficient, valuable information on financial markets systemic risks would be in a position to publish such information in an aggregate fashion, and offer useful guidance to individual market participants, who typically have limited, incomplete views on aggregate market developments. The various financial markets stability reports, published by authorities around the world, could be crucial tools for all market participants if they contained data that are not available through Bloomberg or other services, but are produced by a properly designed data gathering system for authorities. Instead, until very recently they have been just another piece of research, often at par or worse than that produced by the financial or academic communities. In addition to provide the valuable externality of informing the market as a whole about aggregate systemic risk, authorities with appropriate information would be in a position to adopt ad-hoc, ex-post measures able to mitigate systemic risk with much greater effectiveness.

Even if the strategic directions for financial reform that I have described in this section were to be agreed upon, it is important to address a few questions related to implementation. The standard criticism to market reform and new regulations, especially in the case of financial markets, revolves around two themes. The first, as Williamson (2000) following Coase (1964), Demesz (1969) and Dixit (1996) highlight, is that governments cannot be expected to deliver flawless rules and supervision. That information to the systemic risk manager is certainly not sufficient to assure that systemic risks will be identified and dealt with effectively. There is no question that this criticism is correct. However, it does

<sup>9</sup> Such information collection could be implemented in an incentive-compatible way, for example by establishing that entities cannot be prosecuted by authorities on the basis of data releases, but only on the basis of specific inspections or external complaints.



not invalidate my argument; a regulatory system based on a number of tools, including reinforced disclosure to authorities, is certainly a more robust system than the current one. This criticism is particularly relevant for focusing on the costs and expected benefits of reform initiatives, which always need detailed and careful assessment – though the cost of failure has proven to be astronomical.

### Individual actors in the financial marketplace have run businesses within institutions that were not conceived for those businesses.

The second criticism, often associated with the work of Merton and Bodie (2005), is that financial regulations can be bypassed by financial innovation. Indeed, these authors argue that financial organisations innovate their way away from the constraints imposed on them by regulations when their business evolves in directions inconsistent with existing rules. While the phenomenon described by Merton and Bodie is certainly present and needs to be taken into account, I do not think (and I believe that I am also interpreting these authors correctly) that this reasoning implies total ineffectiveness of regulatory constraints on financial activities. The characteristic speed, flexibility, and mobility of financial organisation certainly needs to be taken into account when considering regulatory design, but does not justify inactivity on the regulatory front. Once again, this criticism brings the attention on another aspect of implementation, essential in financial reform, which is the requirement of uniform initiatives by all relevant national authorities. Indeed, Initiatives on regulatory reform are being discussed in international fora, such as the Group of 20, the Financial Stability Board, the Bank for International Settlements. The US and European authorities, including the European Commission, have repeatedly highlighted the need to coordination and their efforts to achieve it.

### 6. Concluding remarks

A financial crisis is a market failure which destroys a fundamental function of financial intermediation, the function of liquidity transformation, with substantial social costs. The recognition of the mechanics of financial crises has led to a number of regulatory institutions that were designed to minimise the probability that liquidity transformation breaks down. Such institutions, however, were designed in a world that was different from today. Financial markets are now characterised by a wide diffusion of securities, derivatives and related businesses. These developments have had two effects; they have multiplied exponentially transactions and counterparty risk, and they have led to a progressive divergence between functions and institutions. In other words, individual actors in the financial marketplace have run businesses within institutions that were not conceived for those businesses. These institutions are inefficient in the current financial system. The end

result is that the mechanics of financial crises have changed.

The intended contribution of this paper is to offer an analytical framework to organise a reform strategy. It thus differs from many reform templates that consist of lists of (generally eminently sensible) reform initiatives. The strategy for financial reform that I propose starts from the premise that institutions are very important in financial markets, and have to be appropriate for the businesses they run. I thus propose ways to improve existing institutions, in the interest of more efficient markets. A major aspect of my proposal is a very significant increase in the supervisory responsibilities of financial authorities, necessary for them to regain effectiveness as managers of systemic risk.

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