Rethinking the future of financial services: A structural and evolutionary perspective on regulation

Michael G. Jacobides* - Sir Donald Gordon Chair of Entrepreneurship and Innovation and Associate Professor of Strategy and Entrepreneurship, London Business School

Michael Drexler - Senior Director and Head of Investor Industries, World Economic Forum

Jason R. Rico - Senior Project Manager, World Economic Forum


Abstract

Given the immutable pathologies of human nature, the fundamental reasons why financial crises occur have changed little over time. Nevertheless, the structure of the financial system has undergone a dramatic transformation to a complex, interconnected, immediate, global sector mediated by capital markets. In this paper, we explain why this transformation went largely unnoticed by academics and regulators, and argue that an outdated view of the financial system that looks at “one piece at a time” and ignores the institutional context may do more harm than good. We articulate an alternative view, showing how a systemic analysis, focused on the structure of the sector and its evolution, can lead to a fresh set of proposals. We illustrate our evolutionary structural view with an account of the 2008 financial crisis and preceding events, and assess the fault-lines that currently remain in our financial system. We conclude with a set of concrete proposals that could improve the stability and performance of the financial sector, and help to reframe both analysis and regulation.

*: Address correspondence to mjacobides@london.edu
Evolution of the Financial System

Why do we need a structural and evolutionary perspective?

In the immediate aftermath of the financial crisis, a group comprising of some of the most respected economists in the U.S., noted that “…the crisis revealed both gaps in regulation and unanticipated interconnections among different types of financial institutions and markets. Yet no one was charged with understanding these interconnections, looking for gaps, detecting early signs of systemic threats and acting to mitigate them.” [(Pew Charitable Trust, Financial Reform Project Task Force (2009)]. Five years later, one would have hoped that both analysis (in terms of economics and finance) and policy might have taken stock of what happened, accepted the lessons, and changed accordingly. Yet relatively little appears to have changed in the way that we understand the financial system and its regulation, whether on the academic or the policy front (Colander et al, 2011). This paper aspires to offer a complement to the mainstream analysis, and identify a set of concrete recommendations for action which, if implemented, might have averted the previous crisis, or might avert the next crisis, which could already be in the making.

We start by offering a systemic view of the financial sector and of the nature of risk. We then move to an analysis of the drivers of the sector’s evolution, focusing in particular on its “industry architecture”, the set of rules and roles that pertain to the division of labour, and which circumscribe the business models in place. We then explore the systemic interactions, before summarizing the current regulatory response and challenges. We conclude with our analysis of the challenges of the regulatory framework, and offer concrete recommendations on how to solve some of these challenges, based on our evolutionary structural approach.

A systemic view of the financial sector

For better or worse, the global financial system pervades nearly all aspects of economic activity. From ledger- and credit-based origins in Mesopotamia and very likely even earlier human societies [Graeber (2011)], through the development of coinage and ever more sophisticated financial instruments to the present day, the financial system has tracked economic development and wealth creation. Independent of its sophistication, three major functions describe its purpose to society: (1) facilitation of economic transactions (e.g., via payments systems); (2) allocation of capital (in particular from savers to borrowers) over time and space; (3) transfer of risk between economic actors. Of those, the first is often referred to as the system’s “plumbing” and covers a vast majority of money flows every day. It is of obvious importance to a well-functioning global economy. However, this paper focuses on the latter two – not only are they more complicated, but they also involve the majority of systemic issues of the financial system that came to light in the recent crisis.

At a macro-level, it is very easy to describe the global financial system, as Figure 1 illustrates. This familiar picture serves to emphasize two points. First, that the financial system is a complex dynamic system with feedback loops between actors. Second, that intermediaries (whether regulated or not) pool capital flows and design products that best suit the needs of other actors – final users of capital, intermediaries, and their own. Intermediaries’ positions both mirror the needs of the users and suppliers of capital, but also arguably shape these needs – for example, through the creation of money and the provision of credit for particular activities.

Understanding the nature of these intermediaries, and devising policies and frameworks to deal effectively with them, is central to effective regulation. So far, the practice of regulation has tended to look at “one type of intermediary at a time”, especially in the large economies where the majority of the financial assets reside – namely, the U.S., the U.K., and the E.U. In the U.S. in particular, there has been a remarkable extent of “regulatory balkanization” (see, e.g., Figure 22), whereby each participant has been supervised by a different regulator, with little regard for their systemic interaction. Likewise, despite the increasingly global dimension of the financial services world,
regulation has tended to be balkanized by countries – each trying to preserve assets in their own jurisdiction, leading to an often incoherent medley of regulatory policies. Yet before we move in greater detail on what are the shortcomings of this balkanization, it may be worth outlining the arguments in favor for separate analyses of different parts of the sector – especially between the strongly and weakly regulated ones.

The principle for regulation of particular sets of actors appears, on the surface, to be straightforward. For those intermediaries that pool assets, engage in maturity transformation and use leverage, regulatory requirements are high, since society needs to protect those that provide capital but do not wish to take on risk (e.g., retail depositors) from suffering losses on the capital provided. Other intermediaries that are not subject to the regulatory purview are often referred to as shadow finance or shadow banking (the latter when they fulfill bank-like functions such as maturity transformation between assets and liabilities). Central in this distinction is the presumed willingness of the state to intervene, supporting financial institutions when in trouble, and the protection of retail depositors’ funds.

In this context, the ongoing discussion on separating the wholesale and retail activities of banks appears to make sense. Wholesale banks (including those that provide services and possibly capital and leverage to businesses and to financial services firms) have been broadly considered to be more prone to excessive risk-taking (being dubbed “casino capitalists”, on the basis of their using their funds to take proprietary positions, for example) and as such a growing sentiment in the U.S., the U.K. and the E.U. has pushed for severing their links with retail, deposit-taking banks, as evidenced by the Volker, IBC and Liikanen reports. The idea is that this would deprive a potentially scrupulous intermediary from their incentives to be excessively risky, since on the retail side they would be strictly regulated, and on the wholesale side they would know that the state would not come to their rescue. Potentially integrated banks, the argument goes, could leverage the implicit guarantees by the state to wager in quest of higher returns (and bonuses to their employees).

In reality, though, this approach seems to ignore the systemic nature of the sector which we just outlined. The last crisis provides a perfect illustration. For all the rhetoric of the risks of integrated banks, the recipients of state support in the U.S. were all non-depository institutions, some of them not even parts of the banking system: Bear Sterns, Fannie Mae, Freddie Mac and AIG were all specialized intermediaries, whose interconnected nature led the Federal government (and the FED) to intervene to support them so as to preserve the viability of the system. Even the collapse of Lehman brothers was a collapse of a strictly focused wholesale bank, with strong bonus claw-back policies, and no links to retail customers. This suggests that in past crises, and most probably in future crises, it is the systemic nature of the sector’s constantly evolving structure that may lead to instabilities. In turn, regulations must also continuously evolve, lest regulators be left to focus narrowly on a small part of the sector and lose the forest for the trees, as we argue happened in the last crisis. Both regulations and regulators’ skills must keep pace with the changes in the financial sector.

**Risks from a systemic perspective**

Moving from a critical approach to a positive set of recommendations, we consider that financial service disruptions should be considered, at the level of the entire ecosystem, on the basis of risk-
inducing shocks. As in any complex system, shocks can occur, and they normally have one or more of the following causes: (1) loss of confidence in a significant share of capital sources (e.g., threat of currency devaluation), destinations (e.g., corporate credit quality) or intermediaries (e.g., banking crisis); with the latter being the most frequent and systemically catastrophic due to the higher concentration of the intermediary landscape; (2) sustained imbalances in capital flows, particularly across different time horizons (contingent claims); and (3) inability of intermediaries to appropriately channel capital flows.

Fundamentally, the system’s top-level intricacy lies in four major issues (several more issues arise at more granular levels):

- A mapping of actors – some institutions can be both sources and destinations of capital, and sometimes engage in intermediary functions also, as shown above.
- Highly adaptive and intelligent (from a perspective of maximizing own returns) actors who often have better human capital than regulatory bodies. In addition, the number of actors is vast – e.g., 7,000 banks in the U.S. alone – which makes for a highly interconnected and complicated system at a more granular level.
- Rapid feedback loops in a system that can enter self-reinforcing negative cycles (aka procyclicality).
- Inter-temporal nature of capital flows and therefore intermediation (introducing time-related risk, such as from ‘warehousing’ mortgage-backed securities).

In order to be able to respond to these challenges, regulators must be able to have a clear and sophisticated understanding both of the institutional structure of the intermediaries sector (i.e., who does what in the financial services ecosystem), and of their interactions (i.e., how failure in one part of the sector affects the other, or indeed how regulation in one part of the sector affects another).

The challenge has been that, to date, we seem to be very far from either of these two goals. As for a grounded understanding of the nature of industry participants, the first official mapping exercise happened a full two years after the crisis - the architecture of the different players and how they map onto each other [(Pozsar et al. (2010)] only gained currency recently, and coincidentally [Jacobides (2013)]. As for the side-effects of regulation, it is even clearer that little was understood ex-ante. For instance, the push for a “Tobin tax” (i.e. a tax on market transactions) ignored the fact that this was not only detrimental to trading activities, but would also impose huge costs to the banks funding themselves from the wholesale market, and was only shelved when the systemic implications became painfully evident, just prior to its potential implementation.

On the basis of these observations, then, it does appear that a more fine-grained understanding of business models in the world of intermediaries and of the evolutionary dynamics and of the feedback loops in the sector might be of use. In the next section, we will endeavor to provide a bit of both, drawing on the evolution of the financial system over the last few decades. Our focus will be the changing business models and dynamics; and we will explain how these led to the financial crisis.

**Drivers shaping the evolution of the financial system**

Beginning in the 1970s, the very nature of the financial system underpinning the global economy began to materially change, giving rise to new structures as well as instruments. No single factor proved decisive. Rather, a confluence of factors such as macro trends in the global economy, regulatory changes across the world, technological innovation, and theoretical breakthroughs in academia began to coalesce. The result was the gradual transition from the historically simple loop connecting savers and borrowers to the highly complex, interdependent, interconnected, and dynamic system that we see today. The new system fundamentally altered the landscape and gave rise to a new set of actors, many frequently misunderstood.
Breakthroughs in academia played a key role in changing the nature of finance and enabled the creation of a wide range of new financial instruments. Financial theoreticians would lay the foundations, with their peers in computer science providing the means to apply the theories in financial markets. Two financial formulas, in the form of the Black-Scholes option pricing model and the copula theorems, would give rise to rapid growth in derivatives [Bernstein (1992)] and structured products [Jones (2009) and Salmon (2009)], respectively. Supported by rapid increase in computational power, the two formulas enabled the financial industry to create new products intended to better carve up and distribute risk amongst various actors.

Macro-economy driven demands played a key role deepening and expanding the demand for these new instruments – for example, the use of commodity driven derivatives would increase dramatically during the 1970s in response to price volatility of critical industrial inputs. In turn, the early 1980s with its inflationary interest rate volatility saw the emergence at scale of interest rate swaps. The use of credit default swaps would grow rapidly after the dotcom crash and related record corporate default rates. Investment banks played a key role in developing these products in a quest to earn fees in an ever more competitive landscape. Those innovations coordinated hitherto disparate economic actors, creating increasingly interconnected, homogeneous and sizeable markets [Tett (2009)].

Legislative and regulatory actions taken by governments around the world would also prove critical in reshaping the structure of the financial sector. Regulation Q, for instance, enabled the growth of money market funds, which would quickly become a systemic player in the financial system. The collapse of the Bretton Woods system and the subsequent growth of the Eurobond market in the 1980’s, coupled with increasing globalization, favored Universal Banks, a model that started in Europe, and then moved to Japan and finally to the U.S., with the 1999 repeal of the 1933 Glass-Steagall Act by the Financial Modernization Bill (Gramm-Leach-Bliley Act). The law, which was in response to the belief that US banks were losing their competitiveness relative to the European and Japanese peers, enabled the creation of hybrid financial institutions that could combine retail banking, wholesale banking, insurance, and asset management. Critically, it did not require that each line of business be overseen by the regulator historically affiliated with the space. The effect was that wholesale banks in the U.S. could expand into the traditional retail banking space without also having to remain accountable to the FDIC or the Federal Reserve. An era of deregulation in the 1990’s and 2000’s led to substantial innovation, and to an aversion of looking into the dynamics of financial markets. It also led to a sector which wasn’t only too big to fail but, as some are increasingly arguing, just “too big” (Acharya et al, 2013).

The growth of derivatives and structured investment vehicles can also be related to government action. The 1999 Financial Modernization Bill exempted derivatives from being regulated, which enabled them to grow largely unchecked by regulatory authorities. Basel regulations also gave a large reduction to capital reserves against securitized assets, when compared with the identical full loans on a banks’ balance sheet, and thus banks found it beneficial to seek greater securitization – which was all too happily provided by the alternative investment or wholesale bank actors active in the booming market [Jacobides (2013)]. Underneath these changes in the financial market, lie

<table>
<thead>
<tr>
<th>Year</th>
<th>US Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>100</td>
</tr>
<tr>
<td>1999</td>
<td>200</td>
</tr>
<tr>
<td>2000</td>
<td>300</td>
</tr>
<tr>
<td>2001</td>
<td>400</td>
</tr>
<tr>
<td>2002</td>
<td>500</td>
</tr>
<tr>
<td>2003</td>
<td>600</td>
</tr>
<tr>
<td>2004</td>
<td>700</td>
</tr>
</tbody>
</table>

Figure 2: Notional principal value of outstanding derivatives contracts

Recorded at year end and including FX, interest rates, equities, commodities and credit derivatives.

Source: Haldane (2011)
individuals and companies intent to re-shape the way money was made - shaping new business models to profit themselves, and thus (often unwittingly) re-shaping the architecture of the financial system.

![Figure 3: Historical model of the banking system](source: World Economic Forum)

In terms of regulatory approach, individually, each new action appeared to make sense, but the growing complexity of the financial system increasingly often resulted in secondary effects far beyond the original intention of policymakers [Pew Charitable Trust, Financial Reform Project Task Force (2009), and Rajan (2011)]. Over time, the gap between how regulators were positioned to govern the system and how the system was actually structured grew, resulting in a significant erosion of the oversight capacity of regulators. This point is illustrated by the growth of alternative (shadow) finance, which until recently had seen almost no direct regulation and was thus becoming of potentially systemic relevance as evidenced in the 1998 Long Term Capital Management episode.

**The systemic shift in the financial ecosystem’s architecture**

The regulatory, academic and technological shifts fundamentally altered the structure of the financial system, dramatically increasing its complexity and interconnectedness. Historically, the banking system was relatively linear and easy to understand. It consisted of retail and investment banks connecting individual and institutional savers to their matching borrowers. The major role of intermediaries was to monitor the capability of borrowers to pay back their liabilities and reserve adequately for defaults.

However with the changes outlined in the previous section, as Mehrling et al (2013) find, the system itself has evolved from one focused on funding liquidity to one centered on market liquidity and one from premised on a “promise to pay” to a “promise to buy”. The resulting credit intermediation process has also grown to include more steps and players, as shown in Figure.

![Figure 4: High level view of the shadow credit intermediation process](source: Pozsar et al. (2010))
The result has been a dramatic increase in the complexity and interconnectedness of the financial system and the steady rise of a vast and largely unregulated shadow banking system that it is interwoven into the fabric of the financial ecosystem [Pozsar et al. (2010)]. Figure 5 provides a stylized view of the new ecosystem’s complexity; it may be worth noting its original (more legible) size is a 3 by 5 feet. Clearly, the endogenous dynamics of industry change, and the cumulative set of regulatory responses have created an ecosystem of remarkable complexity, albeit not one that is as safe as we would want it to be.

Figure 5: Detailed conceptual map of the shadow banking system

Source: Pozsar et al. (2010)

The decrease in the traditional forms of intermediation and commensurate rise of alternative forms of financing can be seen clearly in figure 5. More important yet, much of the growth of shadow finance was not as separate as once thought. As a 2012 special issue of the NY FED bulletin suggests, much of the growth in the shadow banking sector has been fed by banks. Banks have originated loans and then used shadow banks to help them optimize their balance sheet [Bord & Santos (2012)], and bank holding companies have seen the majority of the value of their assets be dedicated to activities outside their traditional core [Cetorelli and Goldberg (2012)] - while in the 1990’s the vast majority of bank revenues were reflected on their book assets, fee income (and adjusted assets) made up for most of their profitability. Within bank holding companies in particular, the growth came primarily through an explosion of activities in their non-bank subsidiaries, which are evident in the growth of the assets they held. As shown in Figure 7, revenues were reported to be even more skewed towards these new activities. Yet while universal banks changed their business model and the credit intermediation
process evolved dramatically, many regulators maintained frameworks that were anchored in a traditional view of banking. And, ironically, regulation intended to create a safer and more insular financial system often unwittingly increased the role of intermediation - both in the regulated financial sector participants and by helping spur the growth of the shadow banking and alternative investment ecosystem [Olson (2012)].

So while the underlying societal needs for finance have remained largely unchanged, the ecosystem addressing those needs has evolved significantly in recent decades. The fact that these changes have also led to a remarkable growth of total indebtedness (i.e., public sector plus individual plus corporate debt) in the countries with the most developed financial systems, is not a coincidence – and suggests that the innovations in intermediation have enabled, in a secular fashion, both the extent of credit (and money supply) available, and the way this is distributed across actors and in time.

A focus on this changing distribution of “rules and roles” in the sector, in the “stable but evolving rules that pertain to the division of labor” that was dubbed “industry architecture” by Jacobides, et al.
(2006), merits our attention. This was a case of a dynamic system evolving as a result of endogenous pressures, with the forces of change coming from within. Innovators, seeking profit and margins, drove change; regulators, motivated by politics and political or academic beliefs (that “the market” is superior) allowed for unsupervised innovation; and new structures took hold. Traditional actors adjusted their business models, new sets of actors and related products emerged, all actively seeking to maximize their returns within (or around) the regulatory guidelines in place. Not surprisingly, there has been a commensurate increase in the number and complexity of interconnections within the financial ecosystem.

This brings us to the changing structure of the world of non-traditional finance and alternative investments – in 1980, the channel barely existed, but 30 years later it is has grown to provide more than U.S.$6 trillion worth of capital. In order to understand those changes, not only do we have to consider the incentives and evolutionary trajectory of the regulated part of financial services, which we reviewed earlier, but to also consider the global macro-economic shifts that have shaped the financial sector, which explain the appetite for products traded through the global capital markets.

Political and institutional changes enabled many non-OECD countries to enter the global economy for the first time, leading to a dramatic increase in the world’s effective labor supply. Export oriented strategies and off-shoring were the natural result, with goods produced in emerging markets being predominantly sold to citizens in OECD nations. Also, as the West was reducing its savings rates, the newly developed East (especially China) was accumulating capital in search of investment options outside the country. The resultant savings and trade imbalances left emerging markets with large amounts of U.S.$ and Euro, which were subsequently loaned back into the OECD through sovereign debt and other vehicles. The cycle was self-reinforcing, as each turn pushed interest rates lower and encouraged the further accumulation of debt, much of which was used to purchase more imported goods from emerging nations. On the financial side, this facilitated the vertical dis-integration of financial institutions and the reliance of banks on wholesale funding. New instruments, new markets, and new business models, both within and outside the regulated part of financial services resulted. The regulatory, academic, and technological changes within the financial sector reinforced the trend. Total indebtedness in Western countries grew, and nobody wanted to spoil the party.

The banking, asset management and insurance sectors were impacted significantly. Universal banks sought to provide a global one-stop shop to their clients, whilst benefiting from diversification and funding benefits that were believed to come with this scale. And, as the alternative investment sector grew, banks sought to emulate compensation practices to retain talent, increasing pay and making
incentives stronger than they had been before, potentially changing the behavior within the regulated parts of the financial services sector [Jacobides (2013)].

These changes also were visible in the transformation of asset management, long a high margin and high service business, which came under immense pressure due to the innovation in the space. The launch of new competitors utilizing passive investment techniques, index funds and later ETFs put tremendous pressure on margins. Asset management and alternative investment boundaries would soon become blurred, with alternative fund managers expanding into the space left by traditional asset managers.

Finally, the emergence of new products related to the tranching and redistribution of risk attracted the interest of players in the insurance industry who viewed this space as a core competency. Examples for this are the now infamous AIG Financial Products division, but also the monoline insurers who branched out from their origins in municipal bonds to cover many forms of asset-backed structured products.

The macroeconomic forces acting upon the financial sector not only transformed the traditional space, but led to the creation of the modern day alternative investment ecosystem. The result was the rise of a previously obscure investment space led by family offices into the U.S.$6 trillion alternative investment industry that exists today. The drivers of this growth can be traced to changes in investment laws as well as regulation aimed at the traditional financing space. In particular, the clarification of the prudent man rule, a part of the 1974 Employee Retirement Income Security Act, made it possible for pension funds to invest in privately held securities. This allowed alternative fund managers such as private equity firms to re-orient their businesses from family offices and high-net-worth individuals to institutional investors – a trend that still continues.

The attractiveness of equity was subsequently enhanced by the 1981 Economic Recovery Tax Act, which reduced capital gains tax rates. In addition to making returns for institutional investors more attractive, this allowed alternative fund managers to improve their own economics by structuring investment vehicles to be taxed as capital gains and not as income. This gave the industry an edge in attracting high quality and innovative talent from other parts of the economy. Perhaps an even more significant driver of change, carried interest structures, conceived to address the principal-agent issue for long term investment from passive (limited) principals to active (general) partners was used to boost returns under beneficial tax treatment.

The confluence of vastly improved technology, liquid capital markets and retreat of traditional active fund management lowered barriers to entry for new, technology-driven asset managers. Together with an appetite for yield by institutional investors and family offices, this enabled the rapid growth of the hedge fund industry to its current size of some U.S.$2.5 trillion. For a long time, universal and investment banks with their “proprietary trading” units served as a training ground for hedge fund managers that would eventually start their own operations.

A (partial and incomplete) list of changing rules and roles in the financial services ecosystem

To illustrate the way in which the “rules and roles” in the financial services ecosystem changed, changing the architecture of the sector, it is worth identifying some of the actors which changed - often beyond recognition in the recent period. We focus on those that have become systemically relevant or that are new classes of actors.

Money market funds were created to overcome regulatory driven barriers that artificially constrained the deployment of short-term capital by the private sector. They have since become a critical node in the financial system, as many other players such as investment banks and hedge funds are heavily reliant on the short-term capital they provide.
Universal banks saw their structure and business model changed, with multiple sources of funding now being pooled, greatly complicating the historically linear picture of banks directly connecting savers and investors. The new model, with strong distribution networks already in place, supported the creation of a vast range of new financial products which served to further complicate the links between sources and destinations of capital. Increased derivatives volumes and use caused a marked increase in universal banks’ leverage and scale. The economies of scale allowed the largest universal banks to dramatically increase their share of the sector balance sheet, as can be seen in Error! Reference source not found.; it also allowed investment banks to increase their scale and scope of activities and instruments. The highly leveraged nature of the newfound scale, the dearth of regulation governing much of the growth, and increasing levels of interconnectedness within the financial system, led to the point where “too big and connected to fail” became an issue. More importantly, the source of income changed drastically, as the analysis of bank holding companies suggests [Cetorelli et al (2012)]: revenue increasingly shifted from traditional (interest) income to fee-based and non-traditional income, and the number of activities, scale and complexity of these banks grew to unprecedented levels.

Rating Agencies, arguably the most nodal and least effective part of the system, have found it remarkably difficult to be accurate, let alone far-sighted in their foray in the world of structured finance, which vastly expanded their volumes. Their serious shortcomings, and their inability to foresee the major financial catastrophes in the sector have been noted – a number of the financial services firms that were later forced to merge with other institutions or even went bankrupt were solid investment grade days before their bankruptcies. Their assessment of risk in tranches of CDOs was even worse, yet they have become systemically more important as regulation (especially through the Basel and Solvency frameworks) has turned them into de facto regulators. Governments recognized them as the official benchmark of risk on record and regulation required many large institutional investors to utilize the benchmarks when selecting assets, restricting their ability to invest in ratings below a threshold. Well-intentioned, codifying the role of rating agencies into the financial system as these ideas might have been, they indelibly altered incentive mechanisms for asset managers, rating agencies, and wholesale banks. And given that the payment system was changed by the U.S. Congress in the early 1970’s, making issuers and not investors pay for their services (while restricting competition to the small set of Nationally Recognized CRA), the rating agencies themselves had good reason to give in to the pressures to inflate ratings. In practice, agencies had little incentive to increase the quality of their ratings, but a large incentive to increase their volume; predictably, a huge increase
in their business increased, and the revenue per employee shot up by multiples of three and above [Jacobides (2013)]. Furthermore, banks found it cost-efficient to reduce some of their own risk-assessment inasmuch as ratings could be substituted, with the net result being that far fewer people, with far less direct knowledge, were involved in real credit and risk analysis. The fact that rating agencies were aiming for increasing volumes of risk assessment in ever more opaque and complicated structure while cutting costs should have been a red flag. Yet the fact that ratings agencies were all for-profit, profit maximizing public firms, or occasionally the cash-cows of corporate parents eager for results, did not seem to worry the regulators, at least not to the point of identifying an alternative. And despite recent legal action, their role in the center of modern finance has not been challenged.

Sovereign wealth funds (SWFs) have emerged as an important new source of alternative financing. The concentration of vast amounts of wealth by a finite set of actors, their foreign national identity, and the source of wealth (primarily oil and trade) have all helped to create the image of omnipotent foreign actors with the power to overwhelm domestic markets. The reality, in the context of the global financial system, is quite different. The assets managed by SWFs, whilst significant in absolute terms, are actually quite small relative to other actors such as pension funds, insurance companies, or private wealth managed by traditional asset managers. In addition to this point, Error! Reference source not found. also notes that SWFs play no intermediary role, further reducing their systemic relevance.

Alternative investors, are comprised in particular of private equity and hedge funds. Similar to sovereign wealth funds, they have outsized influence at the individual actor level, but as a whole the industry has not proven systemically relevant in the recent crisis. However, their rapid growth has made them an important actor and source of financing. Similarly, the industry simultaneously supports and relies heavily on the new financial ecosystem. Hedge funds often utilize money markets and wholesale banks for a material amount of their short-term funding, serve as counterparties on large amounts of derivatives, and provide tremendous amounts of liquidity throughout the system. In turn, private equity and infrastructure funds make ample use of structured products in support of their capital structures.

Each major asset class seeks to generate value in a distinct manner, with possible positive effects on societal economic productivity. Early-stage private equity (venture capital) seeks to identify and support companies that develop and deploy innovative technologies and academic research finds that its impact on the economy has been far reaching [Lerner (2002), and Kaplan and Lerner (2009)]. Private equity seeks to enhance the productivity of companies by optimizing the operations, governance and capital structure of existing companies (Mozes and Fiore (2012)). A subset of private equity funds focuses on infrastructure and other physical assets. While their intrinsic value creation approach has changed little over the last decades, various adjustments to their business model are
worth noting. As the industry matured, this segment became more institutionalized: while its roots were with high-net-worth individuals and family offices, today’s funds orient themselves towards institutional sources of capital such as pension funds and SWFs. Furthermore, the emergence of high-yield (junk) bond in the late 1980s dramatically increased the potential for private equity players to apply leverage to their deals and aim for ever bigger buyouts – a phenomenon that has seen several cyclical peaks since then. The ability to pursue large targets has also been enhanced by opportunistically collaborative behavior among buyout funds, which will regularly form consortia to increase their firepower. This strategic proclivity is not confined to acquisitions – an increasing number of private equity exits are made to another fund (so-called ‘secondary buyouts’), rather than into public markets. Finally, the increasing availability of structured products and financial innovation has allowed private equity players to create value through financial engineering – a trend that has somewhat abated since the 2008 crisis, but is nevertheless still relevant.

Hedge funds, which invest in existing assets, have been shown to increase market liquidity, encourage financial innovation, improve the governance of companies, and reduce the transaction costs associated with distressed debt [Blundell-Wignall (2007), Muhtaseb (2012), Fichtner (2011)]. Starting from small origins, the sector has become a major force in capital markets – the 1998 LTCM episode being a case in point. This has been enabled by the changes in academic finance theory and technology discussed earlier, which have lowered both barriers to entry and barriers to scale. As a consequence, individual hedge funds can now account for a major share of daily trading volume on stock exchanges. Their size has enabled them to become market makers in addition to traders, and some funds run ‘dark pools’ to that effect [Farrell (2013)]. In addition, hedge funds have broadened their business model from origins in ‘stock picking’ to cover the whole range of financial assets – major funds are now active in commodities, credit, foreign exchange, and all other asset classes. Hedge funds have also been at the forefront of the recent expansion of algorithmic and high-frequency trading, which both capitalizes on and increases the connectivity of global markets.

Central banks have long been key players in the financial system, but only in the recent crisis have they become “actively systemic” again. They have moved beyond their traditional, narrow mandate (manage economic stability, with inflation and possibly employment in mind; manage money supply and exchange rate; and acting as a lender of last resort during times of crisis). They have shifted from their role of a “lender of last resort” (promise to pay) to “liquidity provider and market backstop of last resort” (promise to buy) that ultimately elevated central banks to their preeminent position they occupy today. Their transformation can be seen through the changes in the balance sheet - especially of the Federal Board of Reserve [(Mehrling et al. (2013)].

The 2008 financial crisis as an illustration of systemic interactions

Having seen the changes in the finances services ecosystem, we can turn to the examination of how these interact, using the recent crisis as a canvas.

The seeds of the most recent crisis can be traced to a fragmentation of the regulatory climate in the US surrounding mortgages and a secular decline in the mortgage lending standards that regulators allowed. Nobody in the regulatory context viewed their role as a guarantor of the upkeep of sensible lending standards at the retail end. Even discussions of control over predatory lending (which had very real social implications) were met with hostility, leading to fairly ineffective regulations. But, fundamentally, the elementary questions of “who gets loans, and should they? And who bears the risk if they default?” were not addressed head-on. The fragmented nature of lending regulations in the US made it possible for many of the leading mortgage originators to avoid Federal oversight. At the same time, the Office of Thrift Supervision was subject to regulatory capture by the firms that it was tasked with overseeing, including Countrywide, Washington Mutual, IndyMac, and AIG. And while it was poor loan originations in the US that created the crisis, investors in such loans were globally diverse. Major investors- such as German banks, were not only poorly supervised, but also incentivized to maximize their returns subject to the risk assessment of the ratings agencies. So weak supervision of depository institutions in other geographies would eventually fuel the demand of loans of declining
standards. Sadly, nobody was looking at the system as a whole- or at the entities they supervised with a systemic mindset.

The transformation of the financial system had altered the structure of the system and with it the distribution mechanism for new products. The new scale and connectedness of universal banks and the links between them, investment banks, and the capital markets provided a global network that could distribute risk around the globe to a degree and at a speed that had previously never been seen. Moreover, inadequate regulatory models allowed them to reach record leverage levels. Large banks in the U.S. saw their leverage reach 25-30x by 2008, whilst their peers in Europe mirrored the change, with leverage ratios even higher at 30-50x in the same period (partly due to different accounting treatment of derivative positions rather than a fundamental business model difference). Figure 11 illustrates the point, while also showing the effect of an assumed government guarantee for certain intermediaries (Government Sponsored Entities, or GSEs).

The arrival of structured products and the (believed) analytical capability to accurately price them led to a dramatic expansion of debt. It really was too good to be true – transforming high risk securities into investment grade securities, with the blessing of ratings agencies, attracted a large pool of investors into low-grade debt. Simultaneously, the belief that those assets were truly lower risk allowed more debt to be issued from a lower capital base. Predictably, the result was a rise in debt issuance for a wide variety of non-investment grade debt, with issuance of ABS, MBS, CLO/CDOs, high-yield bonds, and leveraged loans all increasing dramatically.
Asset prices strayed far from their historical averages, with real estate prices in the U.S. and Europe leading the way, soaring 50-100% from 2002 to 2008.

The stage was then set for the crisis. In the summer of 2007, two hedge funds specializing in mortgage-related securities and run by Bear Stearns suffered tremendous losses when markets began to formally recognize the mispricing of real estate assets. Financial institutions and asset managers across the world marked down related securities, leading to reduced collateral levels, capital calls and ultimately a liquidity crisis. What began with mortgages would lead to a severe shortage of credit, bring new debt issuance to a new halt, and expose the risks associated with off-balance sheet vehicles and SIVs (Bear Stearns had to bail out the hedge funds in question).

Unexpected losses in subprime mortgages led investors to fundamentally reassess their models and assumptions. The value of securitized products fell precipitously (see Figure 14) and spreads on different grades of debt widened dramatically, before returning to historical levels (see Figure 15).
The efficiency of the highly interconnected system began to work in reverse, rapidly transmitting losses and destabilizing the system. The degree of leverage that had hitherto supported return on equity now served to undermine entire institutions, as thin equity cushions were rapidly worn away. The crisis exposed the heavy reliance on short-term funding by wholesale institutions and left them particularly vulnerable to capital flight, as shown in Figure 16.

Bear Stearns provides a perfect example, losing virtually all its liquidity buffer in the course of a single week and being subsequently acquired by JPMorgan as a result (see Figure 17).

AIG turned out to be a hitherto unrecognized “super node” of the financial system. The use of derivatives contracts by an obscure London based unit of the New York based insurance giant (inadequately regulated by the Office of Thrift Supervision, a regulator without extensive derivatives expertise) tied it to a wide range of other financial institutions across the globe. The underlying assets tied to the insurance company to the mortgage industry. Losses in the mortgage industry led to losses on the derivatives contracts, which led to margin calls by AIG’s counterparties. The sudden insolvency of AIG as a result of the losses carried the immense risk of dozens of key financial institutions losing their counterparty. The collapse of such a systemic node would have proven catastrophic to the global financial system, forcing the U.S. government to bail out AIG.

The failure of Lehman Brothers, though not as interconnected as AIG, sparked a wholesale reassessment of counterparty risk, further exposing how complex and interconnected the financial system had become. Virtually overnight, many markets across asset classes ceased to operate entirely. The sudden and unexpected loss of liquidity exposed modern portfolio management theory, the bedrock for the allocation of much of the world’s capital, with its reliance on diversification among uncorrelated assets. Virtually all assets became highly correlated, exacerbating dynamic feedback loops and the severity of the crisis.

Congressional testimony in September 2008 noted that White House and Federal Reserve officials feared the outright collapse of the economic system of the U.S. due to a run on money market funds [Jones (2009)]. Such a scenario would have been possible if losses in mortgage backed securities would be transmitted into what investors had believed was a near zero risk substitute for traditional interest generating time deposits. The FDIC was forced to launch the Temporary Guarantee Program to avert the crisis.

By the fall of 2008 governments around the world began to realize the potential for another Great Depression and quickly took unprecedented actions to head off such an event. Their response is well documented and we will not elaborate further here, but refer the reader to US Department of the Treasury (2013), Lannoo (2011) and Laeven and Valencia (2012) for the major financial markets. The response, led by the G20, consisted of nationalization of major banks, and support via government stakes and access to liquidity for those that stayed independent; bail-out of major non-bank financial
players; significant Keynesian stimulus to the economy; extension of guarantees and other confidence-boosting measures. Not surprisingly, the response led to a major increase of sovereign debt levels and central bank balance sheets in the OECD economies.

Where we are: regulatory initiatives in overdrive, system in flux

With contraction and indebtedness dominating the public agenda, politicians determined that “the system had to be fixed”, and demonstrating a tough approach to the industry was inevitable. There has been a mad flurry of regulations, mostly in the US, the EU and the UK, which have surely increased the administrative requirements on businesses and focused on piecemeal aspects of the sector, even if major issues remain substantively unaddressed. The question of whether we have focused on volume and vindictiveness of regulation rather than solving the problem remains. Regulatory reforms have been mostly aimed at identifying systemic actors, reducing their risk profile and increasing transparency – and their side-effects have not been worked out yet.

The majority of financial reforms focused on the banking system. Collectively, the Dodd-Frank Act in the U.S. and the Basel III, Capital Requirements Directive IV (CRD IV), and Solvency II acts in the E.U. serve as the primary vehicles for change. They seek to increase leverage, capital, collateral, and liquidity requirements and limit the ability of banks to engage in proprietary investing or trading. The overall objective is to reduce the risk profile of financial institutions and to make them better able to withstand shocks in the future.

Regulators are also seeking to increase the level of transparency in the financial system. The E.U. and U.K. driven Packaged Retail Investment Products (PRIIPS), Undertakings for Collective Investment in Transferable Securities V (UCITS V), and Alternative Investment Fund Managers Directive (AIFMD) laws and the Foreign Account Tax Compliance Act (FATCA) law in the U.S. are key initiatives. The laws require investment firms to register with authorities in their jurisdiction, provide detailed financial and operational information on an on-going basis to regulatory authorities, share detailed tax information on clients, and make available materially more information to the public than was the case in the past.

Regulators are keen to better define the nodes of the financial system, particularly in derivatives. Dodd-Frank, UCITS V, AIFMD, European Market Infrastructure Regulation (EMIR), and the Markets in Financial Instruments Directive II (MIFID II), require financial intermediaries to clear most derivative contracts on centralized exchanges and investment firms to utilize independent depository firms. The goal is to reduce counterparty risk at the systemic level and to reduce fraud at the investor level.

Compensation and incentives are one of the areas where cross-border synchronization has broken down completely, as U.S. regulators have elected to refrain from any related rules. In contrast, the E.U. and U.K. have introduced new guidelines on both quantity and structure of remuneration.

While all these efforts are well intended, their sheer number risks a proliferation of at times incompatible rules with high compliance costs. Furthermore, many of those rules will carry secondary effects that are not yet clear; Figure 18 provides our first cut at what they may be.

Ironically, most of these efforts have been partial and fairly segregated. They have focused on particular institutions, slivers of the financial services sector, without considering the systemic issues that emerge. For instance, even the major jurisdictions summarized above (the U.S., the U.K. and the E.U., which together hold the vast majority of global banking assets) have advanced differently, and often competing regulations, leading to a host of cross-border regulation issues. Also, regulations aimed at financial resilience have led to serious credit contraction for some groups of customers - especially the SME and mid-sized corporations, while favoring sovereign debt, as we note further on. Most important of all, the role of the rating agencies, deeply embedded in the web of the financial
services world yet still privately held, profit maximizing public listed companies (or subsidiaries of corporates) has not been addressed.

Post crisis, regulation has been piecemeal, focusing at one problem or institution or facet at a time. Ironically, the excessive fragmentation which (applied to mortgage banking) led to the collapse of the financial system is making a comeback in leading to a fragmented regulatory agenda, with little understanding of its systemic and unanticipated consequences. All the while, the sinful practices of easy lending that it was intended to cure are starting to re-emerge, be it in high LTV mortgages or covenant-light business loans, are becoming ever more present as a result of easy money from central banks.

**Figure 18: Post-crisis regulatory efforts and likely impacted actors**

![Post-crisis regulatory efforts and likely impacted actors](source)


**Towards a dynamic view of the financial system**

*A structural evolutionary approach to the financial system*

Our analysis above provides an illustration of what exactly a systemic analysis can offer- and how the sector’s structure could, predictably, lead to this evolutionary disaster. The problem wasn’t that there was some exogenous increase of greed or incompetence- but rather that the system allowed people to focus on their own limited part, which led to a collective disaster. As Rajan (2011) put it, “each of the actors—bankers, politicians, the poor, foreign investors, economists, and central bankers—did what they thought was right. Indeed, a very real possibility is that key actors like politicians and bankers were guided unintentionally, by voting patterns and market approval respectively, into behavior that led inexorably toward the crisis.”

The problem, then, was that there was little understanding of the dynamics of the system as a whole. Even worse, as just discussed more attention is being focused on each of the individual components of the system, potentially working to destabilize, rather than redress the risks and imbalances. And even today, we may already be building the next bubble, as lending practices are starting to converge to their risky pre-crisis structures: covenants are reportedly becoming ever lighter, and with excess
liquidity in the system and few deals competing to absorb it, risk may be creeping back into the system.

It is remarkable that in most economic models, there still is “one central bank” with “one interest rate”, and a banking sector which is nothing like the complex institutional set of arrangements that we see today. Even more so, that there is little effort to try and comprehend the institutional complexity and the regulatory challenges it produces. Regulators are often unaware of the business structures they regulate, and there is no locus of exchange of opinion on systemic dynamics in the financial service sector, leaving any opportunities of jointly overcoming these issues to waste. The engagement of different players is, sadly, predictable: regulated entities try to fend off regulation, whereas regulators try to assert their authority, suspicious of their regulated entities. The possibility of a regular forum for exchange of views of what the issues are, which would include those providing capital, those needing it, and sets of the intermediaries and their (often manifold) regulators is absent, be it on a national or international level. The FSB has a nominal set of 78 “systemic” priorities at the time of this papers’ writing, predictably very few of which progress.

What we advocate is an institutionally grounded, business-model focused approach, which recognizes the different species in the financial services ecosystem, considers their evolutionary dynamics, and intervenes to manage risk. In this sense, we feel that there is significant mileage in leveraging the recent work of Andrew Haldane and others, who laid forth a vision of the financial system as an ecosystem akin to that found in the natural world [Haldane (2009)], as well as the rich tradition of evolutionary economics [Nelson and Winter (1982)], which has spawned a large research stream which we may usefully draw on. There is little gainsay on the value of mapping and understanding the topology of the financial network; system-wide properties such as connectivity, diversity, and complexity are clearly important. But we think that we need to complement this approach by a better understanding of the business logic of the different participants. That is, we would argue that we need to consider the specific distribution of rules and roles in the sector, of the nature of agents within it, and how this shapes the propensities of the actors involved [Jacobides and Winter (2010)].

We are aware that systemic analyses have a bad name in their propensity to delve into discussions of complex systems that provide little practical guidance. We do, however, think that this need not be the case, neither in principle (as we will discuss in this section) nor in practice (as we will argue in the next).

A systemic approach could manifest itself more than as a set of institutional mechanisms. It would allow us to be more critical of some of today’s attitudes of policy makers, including a strong desire to eliminate “negative” financial actors (e.g., short sellers); narratives that emphasize only positive outcomes – “banks will never be bailed out again”; or an emphasis on “safe” and “simple” business models (when viewed in isolation), as if the rest of the system did not exist.
We note that little attention is paid to the financial system’s equivalent of biodiversity – diverse business models that neither rely on the same input nor pursue identical strategies. An example of reliance on the same input was the systemically dangerous funding model of the majority of the banking sector on short-term wholesale markets. An example of identical strategies are ‘crowded trades’ leading to imbalances and asset bubbles (e.g., the yen carry trade for most of the 2000s). Top-down regulatory approaches tend to bring about such dangerously homogenous strategies as they try to force business models into supervisory buckets that can be easily understood and monitored. The natural response of actors will be to optimize the business model against the static regulatory parameters, which over time will lead to homogeneity.

Cumulatively, this stance might well be the equivalent of the “zero fires” approach in forestry that is now discredited (see Figure 19) – financial crises that happen less frequently, but with much greater intensity [see World Economic Forum (2010) for further parallels in risk management between the financial system and other domains]. The recent initiative to introduce stress-testing exercises for banks and systemic financial actors is welcome in this context – however, it remains to be seen whether those largely model-based exercises can fulfill the function of a “controlled burn” or will simply end up being another game-able regulatory parameter.

As we consider how we can best draw on, and leverage the lessons from ecosystems [e.g., Haldane (2011)], we need to be mindful of the role of structure and recall that human actors are unique in their ability to not only optimize their personal outcomes within a given system, but they also have the power to shape the system itself (of which lobbying is only one example). The emergence of the securitized mortgage banking sector was the result of endogenous pressures to change from actors who stood to benefit from this [Jacobides (2005)] – a theme also pervasive in Tett’s account of the derivative market growth [Tett (2009)]. If actors are continually seeking to alter the ecosystem to their liking, then regulators too must continually adapt to the changing state of the system. In such a world, static rules will naturally depreciate with time; the idea of “building a safe system from now onwards” is nothing short of self-delusion.

### Figure 20: Comparison of natural ecosystem and the financial system

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Natural ecosystem</th>
<th>Financial system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composition</td>
<td>Diverse set of species with various specialisations/ niches (biodiversity)</td>
<td>Diverse set of actors with various business models</td>
</tr>
<tr>
<td>Creation of system</td>
<td>Natural evolution</td>
<td>Man-made, with internal evolution</td>
</tr>
<tr>
<td>Evolution cycle</td>
<td>Generation</td>
<td>Continuous</td>
</tr>
<tr>
<td>Evolution mechanism</td>
<td>Genetic evolution (random mutations, recombinations)</td>
<td>Business model evolution (designed ‘mutations’)</td>
</tr>
<tr>
<td>Explicit set of rules</td>
<td>No, self-regulating</td>
<td>Yes, plus some self-regulation</td>
</tr>
<tr>
<td>Hierarchical structure</td>
<td>Food chain(s)</td>
<td>Value chain(s)</td>
</tr>
<tr>
<td>Interplay between actors</td>
<td>Competition and collaboration</td>
<td>Competition and collaboration</td>
</tr>
<tr>
<td>Lifespan of players</td>
<td>Bounded by genetic makeup, shortened by failure</td>
<td>In theory unbounded, shortened by failure</td>
</tr>
<tr>
<td>Motivation of actors</td>
<td>Self-interest, survival</td>
<td>Self-interest, economic profitability/growth</td>
</tr>
<tr>
<td>Selection mechanism</td>
<td>Survival of the fittest' plus resource constraints</td>
<td>Economic viability plus regulatory constraints</td>
</tr>
<tr>
<td>Success criteria for players</td>
<td>Number of offspring</td>
<td>Economic profitability/growth</td>
</tr>
</tbody>
</table>

Source: World Economic Forum

We argue that we should move beyond the application of the analogy of an ecosystem, which has been, by and large, limited to a topological discussion of “banks” as “nodes” and of the role of “interconnectedness”. We consider the crucial role of the changing division of labor – the changing
industry architecture of the financial services world, but also the changing architecture of the rules, responsibilities and remits of the regulators, which might be sowing the seeds of the next, likely crisis, by its inadvertent systemic side-effects. We claim that a better understanding of the structure of the financial services sector, not only in terms of the regulated part, but also on the “shadow banking” side, and of the role of other providers of capital, is crucial. And we believe that a full mapping of the activities following [Pozsar et al. (2010)], is a critical part of the analytical and empirical foundations of the sector. In other words, we feel that an evolutionary approach, which concentrates on the incentives and propensities for action in the financial system, is a critical element in both understanding the sector (and what problems it might bring about) and regulating it.

In order to address these shortcomings, two steps must be taken. First, regulators must draw up historical and present day maps detailing the entire global financial system focusing on the evolution of institutional structure. An emphasis would be placed not only on looking at firms as nodes; but also understanding the business models, and the incentives within them. In this regard, the recent mapping by the U.S. Federal Reserve of the traditional and shadow banking systems [Pozsar et al. (2010)] is a solid step in the right direction.

The second step would entail analyzing this data in order to understand how the system has evolved over time and what the underlying economic rationale for the evolution is. Critically, such analysis should not be based solely on economic theory, but should also seek to identify and track the runaway growth in business models as a key regulatory metric. This would comprise credit levels naturally, but would also include crowded trades or systemically relevant product innovation – and, for example, would have identified AIG as a systemic node well in advance of the crisis, giving regulators the opportunity to step in before the actual crisis had hit.

Figure 21: Relative wage levels in the financial industry compared to various metrics

![Figure 21: Relative wage levels in the financial industry compared to various metrics](source: Philippon and Reshef (2012))

Looking for business models exhibiting runaway growth can also help with another frequent issue in the financial system – incentives and compensation. While genuine innovation should reward the innovators, rent-seeking should be discouraged in a system that underpins the functioning of society at large. Monitoring business models means innovation turned rent-seeking can be spotted before it becomes a problem. A variety of interventions can help break the self-reinforcing cycle of the best talent being attracted to such potentially extractive areas, of which regulatory intensity could be one (see Philippon and Reshef (2012) for a discussion of the issue in the financial system at large, and Figure 21 as an example of their findings).

Implications for Regulators

Rethinking the current regulatory landscape in a dynamic system

With this background set, we move to an intentionally provocative section, which revisits both the background and state of affairs in terms of the regulation (including our view of its shortcomings,
seen from a dynamic perspective). We conclude with speculative recommendations for regulatory action, hoping to stir debate on the topic.

**Historical background**

In order to craft proposals aimed at strengthening the regulatory system, the structure and limitations of the existing system must first be understood. Prior to the financial crisis, the global financial regulatory system had evolved into a collection of agencies that largely specialized in a particular geography and vertical line of business (see Figure 22). Such a system would indeed make sense in a traditional financial system with limited spillovers between verticals or geographies. However, such a structure would not work well if the system was both dynamic and interconnected (as we have shown the modern financial system to be). Alas, that is precisely the world regulators were tasked with overseeing prior to the financial crisis. The increasing size and interconnectedness of the nodes that made up the financial system limited the ability of actors and regulators alike to track or understand the risks that were building up [Haldane (2009)]. Concomitantly, the increasing complexity of the system and the products that it used also proved too much for the early warning system in the private sector, clouded by rating agencies’ benign risk assessments. The focus on specialization proved highly ineffective, as the narrow purview of regulators left them unable to see how the system as a whole was accumulating unsustainable levels of risk.

Furthermore, the political context within which regulation has happened is fraught with adverse incentives. Politicians, wanting to show themselves spendthrift and decisive in times of crises, have often cut back on the budgets and pay levels of regulators much as the demand for supervision and the skill required to supervise has increased. Given the lack of sympathy banks and bankers elicit, there are some real pressures, only partly countervailed by the ability of major financial institutions as campaign contributors or providers of credit. The result of this difficult balance, and of the relative paucity of means of regulators, amplified by the bureaucratic reflexes of governmental organizations has been to propose new regulations, whose aims are not only to deliver a safer financial system, but also show to the voting public that politicians are willing to “take on” the banks- often creating a series of administrative burdens with very real costs (often passed on to final customers, as price increases or credit availability decreases), yet debatable effectiveness in stemming a potential crisis.

This trend has had another, less understood side effect: Some estimates on the advisory work needed by banks to adjust to new regulators exceeds $4 Billion, and often the advisors who help banks
comply consist of former regulators, who might have been paid scantily in their previous positions but are able to benefit from the largesse of their new employers. The big four accounting and advice firms as well as many consulting firms have ramped up their hiring of former gamekeepers, who, seeing their salaries decrease, have responded to the market needs. This has been leveraged by regulatory authorities—most notably the SEC, which now regularly asks firms to “seek advice” (from a private sector consultant) when it is “concerned” with some practices or compliance issues.

Against this backdrop, the global regulatory community has been actively engaged post-crisis in seeking to establish new guidelines to prevent a similar crisis from occurring. In doing so, they must work within the framework established by their governing political system, which is subject to pressure and influence by private actors and firms, as well as with the objectives of the real drivers of regulations—politicians, who face a host of conflicting, and mostly shorter-term objectives and often have a limited understanding or patience with this complicated and unpopular sector. Within that context, regulators, whether by choice, inertia, or dictum from their political superiors, continue to focus their efforts on controlling institutions within their defined vertical and “playing God.” In doing so, they (and their political superiors) risk both not resolving the institutional bases of the crisis and not fulfilling their role of ensuring system wide stability.

We identify eight fundamental fault lines in the present regulatory structure that we believe should be addressed in order to strengthen the ability of regulators to ensure a stable and sustainable financial system.

1. **Rules assume that regulators possess knowledge they do not and cannot have** - the regulatory approach is highly formal and process driven. Its reliance on static metrics and one-way reporting by firms is inefficient at best and reduces the ability of regulators to react timely to changes in a dynamic system. The benefits to the system are questionable, but the compliance costs are clear. Financial institutions have committed to hiring thousands of new compliance employees. The trend is reflected at the industry level, with hedge funds alone having spent more than U.S.$3 billion on compliance since the crisis [KPMG (2013)].

2. **Rules assume that regulators have powers they do not and cannot have** - the nimble nature of the private sector, coupled with the talent that it can attract and remunerate, leaves regulators at a structural disadvantage when supervising such actors. Regulators should jettison approaches that rely on an illusory paradigm of omnipotence—the alternative of trying to hamstring the private sector is unlikely to work in practice.

3. **Current metrics are inherently insufficient to prevent future crises** - present metrics focus on analyzing static balance sheets, rather than the dynamic and market-based view that would be needed to measure and mitigate stresses in real time. In today’s complex financial system, a static ‘clean’ snapshot may be the last view regulators have before another crisis comes from an unexpected corner and rapidly engulfs the entire system.

4. **Regulatory framework relies on a classification methodology that is no longer relevant** - basing regulations on fixed verticals associated with well-defined and relatively exclusive roles and populated by mostly pure play actors makes perfect sense in the traditional financial system. For better or for worse, the modern day financial system is no longer so well organized. Examples of firms in one vertical engaging in activities traditionally associated with another vertical include: (1) private equity firms, hedge funds, and asset managers issuing credit and loans; (2) hedge funds providing reinsurance; (3) insurance firms investing in and serving as counterparties to derivatives contracts; and (4) universal banks simultaneously engaging in retail, wholesale, and asset management activities, and interfacing with the shadow banking market.

5. **Regulators use tools that are no longer appropriate to manage the system** - regulators seek to define input constraints (capital) and operating constraints (licenses) based on classifications of industry verticals. This no longer matches a dynamic ecosystem where business models change
according to market opportunities. The fixed capital and liquidity requirements found in Basel III and Solvency II are good examples – like their predecessors, they are likely to invite “crowded trades” by players trying to optimize the rules for themselves. This recognition, which may have underpinned the recent re-orientation of regulators to control leverage, might substitute one blunt measure (which can be perverted by market participants playing with the rules) with another.

6. **Regulatory fragmentation on a geographic and segment level continues** - the global and highly interconnected nature of the modern financial system requires that regulators coordinate their actions and rules to a high degree. Unfortunately, national political concerns result in unique regulations and guidelines pertaining to such critical issues as cross-border resolution requirements, remuneration guidelines, and capital or liquidity requirements. At the very least, a balkanization of the financial system would decrease efficiency of capital allocation. At the worst, systemically threatening imbalances could result if actors actively sought to arbitrage jurisdictions at scale.

7. **Regulation maintains an unhealthy link between banks and sovereigns** - as a remnant of an older regulatory philosophy, regulation primes sovereign debt, especially in terms of bank balance sheets, by zero-risk weighting. This means that, both for capital but also liquidity reasons, banks tend to rationally hold increasing amounts of sovereign debt, to the detriment of other forms of loan. This creates an unhealthy link, whereby banks are exposed to sovereigns’ risks (as evidenced in the Cypriot banking crisis); and also where sovereigns build dependencies on banks, which absorb their own sovereign debt when it is issued, turning us back to the Medici era of financiers supporting the state. Unfortunately, with many countries (especially in Europe) having both sovereign and bank debt issues, the resolve to sever this unhealthy link appears limited.

8. **Rating Agencies are still as nodal and as problematic as before** - while rating agencies have been shown not to be effective during the last crisis, and while it has become obvious that their payment and governance structure would make it unlikely that they would change themselves effectively, little has happened to remove their quasi-regulatory license. We still have a system which depends more than regulators would like to acknowledge on the links between regulated and non-regulated intermediaries, with the capital markets being essential to its function, yet the gatekeepers and regulatorily mandated assessors of risk still have not been properly restructured. Even their governance structure (publically listed companies or subsidiaries, as opposed, e.g., to partnerships, or structures with some liability in the model of auditors who also make representations) has not advanced.

**The fault lines in action – inadvertent consequences**

The complexity of the modern financial system and the breadth of reforms being enacted simultaneously has notably increased the risk that the law of unintended consequences will strike both the traditional and alternative aspects of the financial sector (as Figure 18 showed). The ability to target reforms at a particular actor group and isolate the effects may hold true in the old static model of finance, but it no longer holds true today. In the modern system, regulators must consider how a rule will impact not only the target group or function, but also all of the other parts of the system that are connected to it.

The current slate of financial reforms, whilst quite beneficial in many respects, runs the risk of unnecessarily slowing the pace of the economic recovery due to their inadvertent effect on areas beyond the target of the reforms. We give four examples of such unintended consequences in the traditional financial sector.

The current U.S./E.U. capital and liquidity guidelines (as laid out in Basel III, Solvency II, Dodd-Frank, and updated IFRS accounting standards) incentivize firms to hold highly liquid securities. In practice this means prioritizing sovereign and mortgage debt over riskier loans to SMEs and
infrastructure projects. The benefit to society of supporting job creating SMEs and investing in much needed infrastructure is clear, but the current regime serves to undermine both intents.

Another key area of concern is the effect of regulatory differences in cross-border resolution regimes. A certain tendency of national regulators to ring-fence local operations of global banks might create “capital traps” that lead banks to either shrink their footprint or increase prices to compensate for the inefficient allocation of their resource. While it is understood that cross-border resolution regimes are difficult and therefore the regulatory reaction to atomize the financial system is understandable, a delicate balance needs to be struck here.

The introduction of government mandated remuneration structures in the financial sector in the E.U. and U.K. is another delicate point. The goal of better aligning incentives for individuals with broader societal goals is admirable. Unfortunately, the policies might drive talent into the unregulated sector and away from the parts of the system where they could provide innovation needed by society (e.g., in infrastructure finance).

Proposals by the European Commission to introduce a financial transaction tax on most types of securities trades would hit the repo market, on which the majority of banks depend for their overnight funding, especially hard. The International Capital Markets Association and the European Repo Council of ICMA recently warned that the number of repo transactions could fall by 50-66% [Stevenson (2013)] if the original proposal by the E.C. was approved and implemented. Both the U.S. and the U.K. have expressed concerns, fearing severe ramifications for their domestic and the global economic system [Atkins (2013)].

The impact of post-crisis regulatory reforms is also being felt by the non-traditional financial sector, both indirectly through the large number of connections to traditional players, and directly as the industry now increasingly falls under the regulatory umbrella.

The reforms will force the industry to become far more transparent, which is in principle a good thing. However, second-order effects could also lead to a reduction in the level of innovation in the sector, as well as the ability to make the patient investments society requires to generate wealth in the long-term.

As banks shrink their balance sheets in order to comply with new capital regulation, the level of leverage they can extend to alternative fund managers such as private equity is curtailed. This in turn reduces the ability of those players to make acquisitions and (if their value proposition is accepted) optimize the operations of companies.

Similarly, increased transparency requirements for many alternative asset managers might lead to a similar short-term focus already observed in other parts of the financial system and the corporate world, to the detriment of longer-term investment choices – probably not what rule makers would like.

Some might argue that fewer private equity deals is exactly the right answer to the crisis. Before jumping to that conclusion, we submit that society (e.g., through pension funds that invest through hedge funds and private equity) does benefit from the innovation and intelligence of the non-traditional financial sector – and many activities of the sector respond to direct needs of the real economy.
Recommendations for Regulators

Implications and recommendations for regulators

There is no question that regulation must exist to ensure the stability and proper functioning of the financial system with as few “unintended consequences” as possible. Since the financial crisis (and before), many well-intentioned regulatory initiatives have sought to improve the stability of the system. While we do not want to belittle those at all, we nevertheless believe they have been to a large degree reflecting a mix of Newtonian and Olympian philosophies – namely a reliance on the illusion of an omniscient and omnipotent regulatory body that can govern based on a set of fixed rules. Such an approach is in our view bound to invariably fail again as it cannot cope with a dynamic system comprised of intelligent, self-interested actors.

Transitioning to a dynamic system can be gradual, as new regulations (or the removal of old ones) are best made incrementally. In this spirit, we offer nine recommendations on how regulators could improve their ability to ensure a stable system. Some might sound provocative or counterintuitive, and we submit them for precisely that reason – to stimulate debate beyond the existing paradigms that have shown too many shortcomings in recent years.

1. **Create a map of the shifting architecture of the financial services intermediaries** - while it might be challenging to undertake, it is essential to understand the institutional layout of the sector, which would then allow us to assess both the incentives and potential pathologies of current institutions *given the actual business models in place, and not the assumed interest of “a bank”*, and also understand which actors want to change the architecture of the system – as well as the potential risks for doing so. This should include both the regulated and unregulated parts of the system - since it is in the interactions between the two that the potential risks (or solutions) may lie.

2. **Upgrade regulators’ talent and understanding of the private system** - regulatory staff currently consists of highly skilled individuals trained in economic theory and highly trained auditors knowledgeable in applying complex sets of rules. Regulators would benefit from staff with a deep understanding of the business models employed by the firms they are overseeing, how they generate profits and evolve. Unfortunately, such individuals are currently scarce inside regulators. Having them would make for a more constructive dialogue with regulated entities, both sides having a closer match in vocabulary.

3. **Monitor runaway business models rather than static financial parameters** - regulators would benefit from teams monitoring the industry for business models and products that exhibit rapid growth out of line with the underlying economy. This will allow them to spot imbalances before they become systemic. To achieve this, they need to have more staff with a business strategy background, as well as work closely with the business development and product approvals units of the institutions they supervise. (This is analogous to the WHO working with local virologists as well as monitoring public sources for keywords that could signify a disease outbreak.) Once a runaway business model is identified, it can be dampened with a combination of: (a) increasing input constraints (e.g., higher capital requirements); (b) attracting alternative competing business models into the space; and (c) constraining growth/volume outright. This point is a pre-requisite for the following two additions to work properly.

4. **Increase ‘biodiversity’ by allowing negative market signals** - given the complexity of the financial ecosystem, it seems highly inappropriate to restrict available market signals or business models only to those that convey a ‘positive’ message. In this spirit, short sellers should be viewed as highly useful indicators of potential fault lines as well as ‘stressors’ that can increase the resilience of the financial system. Similar considerations apply to other business models that are the equivalent of ‘predators’ in natural ecosystems with highly beneficial effects in that context.
5. Increase ‘biodiversity’ by lowering barriers to entry for innovators - doing so will allow new entrants to emerge and pursue the potential excesses in the market, thereby naturally reducing extractive or rent-seeking behavior. Specific examples where this approach could be applied currently include: (1) further enable crowdfunding/P2P models to enter the start-up lending space; (b) avoid the vertical oriented regulations and allow non-banks to actively engage in SME lending; and (c) relax licensing requirements for financial firms below a certain scale, to be reviewed once these firms grow.

6. Use arbitrageurs to stabilize the system - rather than decreeing regulatory arbitrage away through presumed omnipotent fiat, regulators should create a (confidential) repository where all such arbitrage needs to be logged without reprisal as long as the arbitrage is legal. Regular review of this repository will allow regulators to fix systemic loopholes. As a side note, this is analogous to the computer security industry employing hackers to test their software.

7. Regularly test the relevance and applicability of regulations - regulations should have a fixed shelf-life (say, 3-5 years), after which the continued validity and applicability is tested with real-world feedback. The tests should focus on usefulness to the economy and financial system as a whole, rather than on static definitions/interests of verticals or actor groups. Creating such a dynamic and flexible structure would allow regulators to better mirror the ecosystem and reduce the risk for system-wide failures.

8. Create a non-partisan platform for regulators and financial actors to discuss the financial system - the financial system and society at large would benefit significantly by establishing a permanent forum through which all key stakeholders in the financial system could regularly communicate and engage with one another. The Financial Stability Board might prove an adequate platform for this. Such dialogues would enable all participants to deepen their understanding of the constantly shifting state of the financial ecosystem and thus be in a better position to maintain its stability and prevent a future crisis.

9. Engage key global regulators in events-based tests and war games - regulatory tests could vastly improve if they utilized an events based approach with a ‘red team’ actively trying to break the system, in addition to stressing economic model rules. Engaging in war games with fellow regulators (and industry players) would help supervisors better predict how different actors might behave in a crisis. It would also serve to identify previously unknown or unexpected issues, which will in turn allow regulators to design interventions. The BIS and Nordic regulators have reportedly engaged in such exercises, and such workshops of a more or less informal nature do take place. Yet we think that a scenario-based resilience check may be much more important, and needs to be much more mainstream than the ones currently in effect. This would be a large-scale change in terms of the way regulation is practiced, locally and globally.

Conclusion

As the complexity of the world around us changes, it is entirely understandable to hark for a simpler world [Haldane (2012)]. Yet the quest for a simpler past is likely to be nothing short of a chimera. All the while, the regulated and unregulated (or differently regulated) parts of the financial system are coevolving in new, potentially unstable ways. Our paper suggests that we would be well advised to change our vantage point and analytical tools as we engage with the sector. A firmer base in the business models, the evolving industry architecture, and the dynamic properties, seems overdue. We need to shift from the study (and regulation) of individual “species” in the FS ecosystem to a dynamic analysis of the messy reality firms inhabit. We hope that this paper, selective in its short space and provocative in its approach, will be a step in this direction and will engender further debate and discussion.
References


Bernstein, P. L., 1992, Capital ideas: the improbable origins of modern Wall Street, Maxwell Macmillan International


Farrell, M., 2013, “The computers that run the stock market,” CNN Money, 8 July


Graeber, D., 2011, Debt – the first 5,000 years, Melville House Publishing

Haldane, A., 2009, “Rethinking the financial network,” presented at the Financial Student Association, 28 April in Amsterdam


Jacobides, M. G., forthcoming, “Rethinking the financial crisis: structuring our historical understanding of a predictable evolutionary disaster,” *Business History Review*
Jones, S., 2009, “The formula that felled Wall St.,” *Financial Times*, 24 April
Kaplan, S., T. Jenkinson, and R. Harris, forthcoming, “Private equity performance: what do we know?,” *Journal of Finance*
Lim, J., 2013, “The role of activist hedge funds in distressed firms,” working paper
Muhtaseb, M. R., 2012, “Hedge funds are the alternative mainstream,” *Journal of Investing* Summer, 57-60


Piñol, J., K. Beven, and D. Viegas, 2005, “Modelling the effect of fire-exclusion and prescribed fire on wildfire size in Mediterranean ecosystems,” Ecological Modelling 183, 397-409


Rogoff, K., and C. M. Reinhart, 2008, This time is different: eight centuries of financial folly, Princeton University Press


Stevenson, A., 2013, “Bank funding threat from EU tax,” Financial Times, 8 April

Taleb, N. N., 2012, Antifragile: things that gain from disorder, Random House

Tett, G., 2009, Fool's gold: how the bold dream of a small tribe at J.P. Morgan was corrupted, Simon & Schuster

