**The regulatory response to financial innovation**

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The credit crisis triggered profound changes in financial markets and institutions. Sine it started, regulators have sought to address the systemic failure that led to it. They have named, shamed and fined the guilty parties (see table). That said, regulators have yet to fundamentally question their own failure to keep pace with financial innovation. They should not forget that it was the creation and promotion of new financial instruments, technologies and business models that sowed the seeds of the crisis. Unless we become more pro-active in regulating them, we are set to repeat the mistakes of the past in novel new ways.

The response to the crisis prompted wide ranging regulatory change in both Europe and the United States. Some of the response was for the better. The point, however, is that it was a kneejerk reaction and not supported by critical analysis. There was little research into how the changes would impact capital markets.

There has also been little debate on what differentiates good regulation from bad (or overly onerous). Academia has a clear role to play in answering this question and in bridging the gap. It can do this through empirical evaluation and robust testing. After all, it was asset pricing research that led to the very innovation that now requires regulation. The academic body of knowledge, as encapsulated in the CISI exam syllabus, shaped capital markets into what they are today.

The credit crisis started because of issues in the sub-prime lending and securitization markets. That said, the two common denominators that made the crisis systemic were financial engineering and deregulation. The lesson that should be learnt is that regulation has to keep pace with financial innovation in order to accommodate free functioning capital markets.

If one wants to see how rapidly innovation is occurring, one only needs to look to what has become termed Fintech. Pre-eminent amongst financial innovation, Fin tech promises the

creation of a global crypto-currency. When (rather than if) this happens, payments and financial transactions will move to an instantaneous settlement basis. Regulators will have to be ready for this. It's not possible to shut the gate after the horse has bolted, or in this case the trade settled.

It is not just digital money that is changing. Any product that can be traded can become financialized. Consider carbon credits and energy trading for example. Indeed, data of any kind is an "asset" that has "value". New products will be based on these, such as the oft cited "cloud". These will have to accommodate mainstream markets. They will have to be monitored and regulated.

Meanwhile, the internet is changing the world. It is not just secondary markets that are evolving. Primary markets are also being impacted. Crowd-funding, for example, is an area in which developments are currently outpacing the regulators. There is a need to keep up with both the digitalization and financialization of industries. Look at what is happening to investment in art markets or developments in derivatives on the weather. Further change is on the way.

The pace that regulators adapt to innovation is important because theory suggests the regulatory process as one of competition among interest groups. This suggests that financial institutions, who are likely to receive concentrated gains from regulation, are typically more effective at lobbying for their interests than investors or savers. This can distort markets. There is therefore a need to provide an independent and impartial advocate to promote the best interests of capital markets in the face of new financial innovation.

Clearly, the pace of change is fast. The crisis revealed many systemic problems arising from so called shadow banking activities. Such "credit intermediation" came from innovation. In effect, financial markets created entities and activities outside the regular banking system. This is another area of innovation that has to be addressed.

In the same vein, new and novel strategies are being devised. These come from new areas, such as Behavioral Finance and Neuroeconomics. Regulators do not fully understand them but and responsible for their oversight. Systems, product design, investment process and measurement will all change. Even our very concept of risk (their proxies, variance and standard deviation) is being revisited.

Regulation should not just be about making law and enforcing it. It must support trust and confidence. This is particularly true in the financial services sector and for its participants. Adoption of new rules and oversight should be done in conjunction with the development of a strong culture of ethics, a focus on clients and a respect for fiduciary interest. It should promote skills other than just make boxes for people to tick.

Some may question whether academic research can fill the gap. Many practitioners complain about the assumption academics make and on which financial models are built.

Let us not forget that academic theories have changed the world of finance. A large part of the world's professionally managed money is indexed. The Arbitrage Pricing Theory gave birth to factor based risk evaluation. The Black Scholes options pricing model underpins the derivatives markets. Capital decisions, firm structure and the amount of leverage a firm should optimally be based on theory. Thanks to academic models it is generally agreed that there is a mathematical relationship between risk and return.

Practioners argue that individuals are not rational, markets are not frictionless, information is not ubiquitous and data normally distributed. They are to some extent right. Theoretic research does not take account of asymmetric information, trading costs, liquidity and tax. That said, it is robust and its conclusions are statistically based. Even so, research often pits academia against the world of active asset managers. This is because theoretical academics tend to be too dismissive of the persistence of risk adjusted investment outperformance. It is a grey zone that needs to be more clearly delineated. Not everyone can be passive participants in financial markets.

Despite all this, market efficiency is an important element in finance. Regulators need to worry about it because it is the backbone of finance. It provides the basis for price discovery and the continuous restructuring of the economy. Well run markets support economic growth and facilitates capitalism. On a similar note, sound implementation of financial theory improves the efficiency of capital decisions, thereby favoring a better allocation of scarce economic resources.

Current issues, such as governance and internal corporate capital allocation, particularly in respect of pay and incentives, are even more immediate. The role of institutional investors is under scrutiny and regulators have taken note. Once again academia can step upto the plate. Research designed to improve institutional investor involvement and shareholder participation is needed. The billions of dollars of fines paid by the banks are testimony to the importance of getting governance right.

As has been said*,* academics can help policy-makers, regulators, and finance industry professionals address the issues pertinent to financial regulation and innovation. They need to be the strategic link between policy-makers, regulators and other financial industry participants. In this way, research insights into financial regulations, banking policies, risk management, investment benchmarks and corporate governance can be adopted by capital markets. This can be done with investigation and appropriate comment; especially on policy matters that relate to global financial markets in general and in the United Kingdom and the European Union in particular. After all, peer reviewed theoretical research drives both growth and innovation in the financial sector. It can assist government, regulators and industry. The aim should be utilize it to anticipate appropriate industry structures, governance and policy frameworks, regulatory systems, and responses.

In conclusion, with financial innovation happening at such a fast pace, there needs to be timely, economic, industry and social arguments for any change in regulatory oversight. There is a need for new rules, based on innovation that involves either leverage, derivatives or risk models. These must be developed with a better understanding of their impact. More effective capital markets and decision making is Pareto optimal for society.

Regulatory fines US$ m

| Description | 2015 Q3 | 2015 Q2 | 2015 Q1 | 2014 Q4 | 2014 Q3 | 2014 Q2 | 2014 Q1 | 2013 Q4 | 2013 Q3 | 2013 Q2 | 2013 Q1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Reasonably Possible Litigation Costs Beyond Current Reserves | 24010 | 25632 | 23726 | 22013 | 22260.87 | 25800.22 | 26206.68 | 27098.23 | 26093.58 | 24409.63 | 22686.99 |
| U.S. Banks | 19148 | 20178 | 18230 | 17771 | 18857 | 20292 | 20738 | 22324 | 21902 | 20418 | 19123 |
| JPMorgan Chase & Co | 5000 | 5500 | 5500 | 5800 | 5900 | 4600 | 4500 | 5000 | 5700 | 6800 | 6000 |
| Citigroup Inc | 4000 | 4000 | 4000 | 4000 | 5000 | 5000 | 5000 | 5000 | 5000 | 5000 | 5000 |
| Goldman Sachs Group Inc/The | 5300 | 5900 | 3800 | 3000 | 2500 | 3200 | 3700 | 3600 | 4000 | 3500 | 3500 |
| Bank of America Corp | 2400 | 2300 | 2500 | 2700 | 3100 | 5000 | 5000 | 6100 | 5100 | 2800 | 2600 |
| Wells Fargo & Co | 1400 | 1400 | 1200 | 1100 | 950 | 1200 | 911 | 951 | 951 | 1100 | 1100 |
| PNC Financial Services Group I | 725 | 725 | 725 | 650 | 750 | 725 | 725 | 800 | 425 | 400 | 400 |
| SunTrust Banks Inc | 160 | 170 | 170 | 180 | 300 | 200 | 350 | 300 | 250 | 400 | 350 |
| US Bancorp* | | | | | | | 200 | 200 | 200 | 200 | |
| Regions Financial Corp | 40 | 40 | 160 | 160 | 170 | 180 | 100 | 100 | 90 | 60 | 60 |
| Fifth Third Bancorp | 51 | 60 | 103 | 105 | 103 | 104 | 117 | 113 | 116 | 88 | 73 |
| Comerica Inc | 32 | 43 | 32 | 36 | 44 | 43 | 85 | 110 | | | |
| M&T Bank Corp | 40 | 40 | 40 | 40 | 40 | 40 | 50 | 50 | 70 | 70 | 40 |
| * USB "immaterial" excess legal | | | | | | | | | | | |
| cost after 1Q14 | | | | | | | | | | | |
| European Banks | 4862 | 5454 | 5496 | 4242 | 3403.869 | 5508.219 | 5468.677 | 4774.225 | 4191.582 | 3991.633 | 3563.993 |
| Deutsche Bank AG | 2892 | 3542 | 3605 | 2431 | 2146.93 | 4380.894 | 2754.359 | 2070 | 1759.03 | 1560.6 | 1666.86 |
| Credit Suisse Group AG | 1970 | 1912 | 1891 | 1811 | 1256.939 | 1127.325 | 2714.318 | 2704.225 | 2432.552 | 2431.033 | 1897.133 |
| Litigation Expense | | | | | | | | | | | |
| Mortgage Repurchases | | | | | | | | | | | |
| Committee on Capital Markets Regulation | | | | | | | | | | | |
| Notable Fines | | 5400 | 5400 | | 23700 | 9000 | | 13000 | | | 20600 |
| Deutsche Bank | | 2100 | | | | | | | | | |
| Barclays | | 2000 | | | | | | | | | |
| Citigroup | | 1300 | | | 7000 | | | | | | |
| Morgan Stanley | | | 2600 | | | | | | | | |
| Standard & Poors | | | 1400 | | | | | | | | |
| Commerzbank | | | 1400 | | | | | | | | |
| Bank of America | | | | | 16700 | | | | | | 11600 |
| BNP Paribas | | | | | | 9000 | | | | | |
| JPMorgan | | | | | | | | 13000 | | | |
| Mortgage Servicing Settlement | | | | | | | | | | | |
| Foreclosure Settlement | | | | | | | | | | | 9000 |

Source: Bloomberg

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The author, Daniel Broby, is a Director of the *Centre for Financial Regulation and Innovation*, part of Strathclyde Business School. Its mission is to foster policy relevant research to support the practical application of innovation in Finance. It aims to encourage regulatory principles, rules and guidance that are simple, understandable and clear. It supports regulatory requirements, oversight and intervention that reflect the nature, scale, sophistication and complexity of financial market participants.