

The Foresight Report on The Future of Computer Trading in Financial Markets: Conference at London School of Economics, Jan 11th 2013

Discussion by Alistair Milne of Foresight Report Section 7 (Computers and Complexity) and supporting Driver Review DR31 “Standards in Computer Based Trading: A Review” authored by Kevin Houston

Introduction

My discussion focuses on the Foresight Final Report priority for action A4 “Standards should play a larger role.” This is supported by the analysis in DR31.

Kevin brings to bear the experience of a long career delivering technical solutions to financial markets, especially his work on the FIX protocol. I offer a slightly different perspective, that of an academic commentator who has worked in particular on financial infrastructure, especially post-trade – securities clearing and settlement and more recently derivatives clearing – and retail payments. From this different perspective I strongly support the argument that standard matter and I recommend reading of DR31.

I divide my discussion into three parts. First what are standards (something also discussed in some detail in DR31)? Second the relationship between standards, competition and economic efficiency (there are several illustrations in DR31). Third the current and potential role of standards in wholesale financial markets and the recommendations for development of standards (DR31 provides a good account of existing standards, although I want to add my own interpretation).

What are standards? A formal business standard is an agreed written statement describing characteristics of a product, service, or business process; developed in order to promote communication or joint operation. Agreement on such characteristics (a standard) may also emerge without a written statement at all or without a widely agreed written statement.

Standards don't just apply to businesses. There are both uncodified and codified standards for most social activities and processes (for example the conventions and vocabulary of language which have emerged and evolved over many years and their formal summary and statement in dictionaries and books of grammar). I will here though restrict my attention to business standards.

Business standards are everywhere. Standards that allow cables to link electronic devices (without which you could not see this computer display). Safety standards to make products and services safe. I hope these will ensure this computer will not

burst into flames. Operating standards e.g. the design of this computer's operating system which allows the software to work on a large number of machines.

The DR31 highlights the range of standards and their importance in both financial and non-financial business. One example from DR31: standardisation threads for nuts and bolts. Without this standard the manufacture and supply of nuts and bolts would be chaotic and costly. As DR31 argues standards make a large economic contribution, with estimates of their contribution to economic growth.

Where do standards come from? Even simple and basic standard as the thread of a bolt can have surprisingly complicated histories and there are many ways in which standards are established. Some standards emerge spontaneously. Other standards are developed privately, either pioneered by individual firms or the outcome of an agreement between firms. Sometimes industries establish special bodies to set and maintain standards (a well known example is GS1 the federation of national standards bodies responsible for standards such as barcoding used in retail sales, the supply chain and health services). Some standards are imposed by government in the form of laws, rules and regulations (for example health and safety standards).

Standards can be closed, with usage restricted or open and available to anyone. There are standards organisations (national organisations and the international ISO) agree formal open standards, following a meta-standard, an established consultation process for developing a standard and ensuring it fulfils the needs of users. Government bodies also participate in private sector setting of open standards, playing a co-ordinating or directive role, but leaving industry or standard setting bodies to work out all the technical details of the standard.

It is one thing to establish a standard. It is another for it to be used. Adherence to a government imposed standard can be backed up by sanctions such as a fine. In the case of private sector standards adherence is voluntary: it does not make sense to manufacture a nut with a non-standard thread, because it will not be of use to users who want to put it on a standard threaded bolt. But this creates a co-ordination game. It makes sense to adhere to a standard only if others are also doing so. For a standard to succeed there must be 'takeoff' i.e. sufficient incentives for adoption by early users so that the standard then becomes attractive to further users, and this reinforcement continues sufficiently far that the use of standard is widely established. Without such a 'takeoff' (which may take some while, DP31 discusses the case of the Blu-Ray disk as an example of slow but eventually successful adoption) a standard will eventually be abandoned.

In the economics literature there is now much discussion of what is referred to as the "two sided platform" when a standard is used by two distinct sets of users. There are many examples. Some of the most widely discussed are music and video artists and consumers (the Blu-Ray is one of many two sided platforms); video games production companies and video gamers (the two sided platform is the video console

such as the Xbox-360, the Wii, or Playstation) or shoppers and retail outlets (the two sided platform is the payment instrument, such as the debit or credit card, or the shopping mall). This literature discusses the possibilities for platform competition (between different competing platforms) and the pricing strategies that encourage adoption of a new platform.

Most relevant in the context of the foresight report is that trading venues can also be analysed as two sided platforms, bringing together the security issuer and the investor; and also bringing together the price trader seeking to execute and order either for themselves or for a customer at the best possible price and the inventory trader seeking to make profit from the difference between buying and selling prices and assuming the associated inventory risk until their position can be closed. But this case of financial exchanges is somewhat different from the standard example of the two sided platform. Not only is it multi-sided (issuer, price trader, inventory trader) but also traders (unlike issuers) are not normally locked into a particular platform. To an important degree they can move from one platform to another for different trades. The extent to which they can do so is dependent on standards governing the process of trade execution, clearing and settlement.

Still, regardless of whether participants are locked into a platform or can move freely between them, the pricing of the platform and the extent to which this encourages participation is critical to the volume of activity.

Standards, competition and efficiency. I will now discuss the relationships between standards, competition and efficiency – subjects which have been given a great deal of attention in the economics literature especially in the sub-discipline of ‘network economics’.

Communication and process standards play an essential determining role in the structure and operation of many network industries, such as telecommunications, consumer electronic devices and personal computers. In other network industries, e.g. road, rail and other transport networks or household utilities such as electricity, water and gas it is physical constraints rather than standards that largely determine structure and operation. In all these network industries regulation, especially the application of competition law, are also a major determinant of structure and operatio

The relationship between standards, competition and efficiency looks rather different when considered from a static and from a dynamic perspective (static efficiency meaning the best use of resources given existing human and physical capital, products and technologies; dynamic efficiency meaning the best use of resources taking into account investments in new human and physical capital, products and technologies).

Static efficiency is promoted by adherence to common open standards. This encourages both competition and hence, by reducing market power and better matching marginal costs and revenues, promotes efficiency. This also implies, from

the static perspective, that there may be a need for external regulation to make standards open (for example regulation requiring telecommunications standards to “interoperable”)

Once dynamic efficiency is taken into account the relationship between standards, competition and efficiency is more nuanced. The establishment and development of a proprietary standard, the best known example perhaps being the Apple operating systems for Macs, iPhones and iPads, can be a crucial source of competitive advantage. The ability to gain a competitive advantage from operating a proprietary standard is therefore an important part of the incentive for investment in new products. Without proprietary standards there may be inefficiently low levels of innovation. This parallels the role of patent law in providing an incentive for research and development of new intellectual property.

But there must also be sufficient incentives for adoption of standard, in order for it to succeed. In many cases – the Android mobile phone system is one example but there are many others – making a standard open may be an effective way of achieving acceptance. There is balance of costs and benefits to having an open rather than a proprietary standard. An open standard is associated with a greater degree of competition to produce products and so is likely to reduce market power, margins and volumes but an open standard is also more attractive to new adopters and so is more likely to succeed.

Both the closed proprietary standards of Apple iPhone and the open Android standard have benefited from a virtuous circle of the creation of an increasing numbers of smartphone applications implemented on the platform leading to greater uptake of the platform by phone users in turn encouraging more application developments. Thus both of these standards have emerged victorious in the competition with other two sided smartphone platforms such as those of Nokia and Research-in-Motion.

There is an ongoing and somewhat inconclusive debate in the network economics literature about the relationship between standards and innovation. This suggests that in some circumstances standards create a lock-in into inefficient technology. In other cases competition between standards can actually create excessively rapid change, with customers or firms forced to upgrade to new standards more frequently than can be justified on pure dynamic efficiency grounds, because of the ‘network’ benefit of staying on the same standard as others. The theory is therefore ambiguous about the relationship between standards and efficiency.

There is also considerable variation in the extent and operation of these network effects in different industries. The strong incentives for innovation via platform competition found in mobile telephony do not apply in other network industries. In the case of mobile telephony there is a substantial ‘first mover’ advantage, whether at the level of the platform or the individual device, being the first to introduce an

innovation supports higher margins and profits, until the time when other competitors are able to replicate the innovation. Because of this two sided platform competition, standards – whether proprietary or open – are critical to ensuring adoption and therefore central to the process of innovation.

Financial services are rather different. Typically such ‘first mover’ advantage is relatively small and in the case of a service supports the process of exchange – for example payments instruments or clearing and settlement – there is typically no first mover advantage at all. In these cases it is necessary for an innovation to be adopted simultaneously by the industry as a whole, and this means no individual firm can benefit from being the first to market. Thus financial services standards, while potentially supporting improvements in customer service, are not a key driver of profit and innovation. If the adoption of new standard is costly then it is unlikely to take place, even when from a customer perspective the benefits are large enough to outweigh the costs.

This relatively small degree of first mover advantage also helps explain a general reluctance on the part of many financial service providers to accept open standards, such as interoperability with other service providers, even though openness encourages initial uptake and successful adoption of a new standard. The problem here is the same as in relation to static efficiency that greater openness of standards tends to reduce market power and hence lower margins and profits. An open standard may support considerable cost reductions for customers but still be resisted by providers.

What are the policy implications? Generally these favour the promotion of open standards. DR31 cites Swann (2010) as making a general case that “access to standards should be free, as the extra benefit of wider adoption will outweigh the extra revenue generated from charging for access to standards.” Although the example of Apple suggests that this may not always be applicable. European Union analysis (The EXPRESS report) has stressed the importance of the European Commission co-operating with national and European standards organisations to develop open standards to promote a competitive and innovative Europe.

Implications for financial services, including computerised trading.

DR31 provides a useful review of various financial services standards, with an emphasis on wholesale financial markets. This notes four user group maintained standards (a) FIX the trade-messaging standard used for pre-trade communication and order routing; and for some post-trade pre-settlement communication; (b) FpML financial product mark up language to represent derivative contracts in a computer readable form; (c) XBRL the machine readable encoding of financial statements; and (d) SWIFT MT messages for post-trade securities settlement and cross-border payments.

There are many other standards used in financial services. These include additional exchange standards, e.g.ITCH the NASDAQ owned direct data feed protocol used in a modified form by other exchanges; and OUCH the order and execution protocol used by several exchanges for their proprietary interfaces. Because the implementation of these standards varies, these exchange standards do not avoid the problem of requiring multiple interfaces to deal with different service providers. Also there are standards used more by the asset management industry such ISIN the system of securities identifiers, but these are little used in the trading process.

DR31 accepts the general argument that the development of open standards supports innovation and competition (a “good thing”) but reports important barriers to standards adoption.

- When initially introduced in 1992 FIX was initially seen by Salomon brothers as an opportunity to lock in Fidelity order flow to their own firm and a few other brokers. But, being an open standard, its widespread adoption (today in equity markets any buy-side order management system is able to communicate with any sell-side order management system because of FIX) had the opposite impact “it increased competition and resulted in reduced commissions all around” and also resulted in the commoditization of order flow services with over 500 firms as vendors of FIX engines or FIX based solutions. The lesson seems to have been learned that the widespread adoption of a new standard is not necessarily good for the bottom line. Fidelity as a large customer played a critical role in encouraging the development of FIX but similar customer engagement has not supported many other standards in financial services.
- Even when a standard is developed and is supported by a number of firms, a lack of credibility may hamper further adoption. There are several reasons for this: (a) inefficiencies of the US patent system (the possibility that adoption of new standard could lead to exposure to a possible action under US patent law, something that is possible because the US is almost alone in granting patents to business processes.(b) lock in to existing standards (FIX arguably is sub-optimal as a technique for routing direct orders into exchanges because it was based originally on ASCII because of a need to retain human readability) (c) underfunding of both standards development and of subsequent investment (FPL, FpML and XBRL are all funded by voluntary membership and as a result suffer from a ‘free rider’ problem with many beneficiaries not supporting costs and a focus on short term rather than long term development).
- DR31 highlights the failure to find industry agreement on a high performance binary gateway standard for routing orders to exchanges. The resistance by the exchanges has arisen partly because of US patent fears and partly because of wishing to avoid the possible increase of competition should a standard gateway be used in all exchanges. The consequence has been a proliferation of different proprietary solutions to the detriment of final

customers through a substantial increase in technology costs and (according to DP31) would create “greater transparency ... [that] could be an important step in restoring trust in computer based trading.”

While agreeing with all of these points, I also believe that standards for securities clearing and settlement – which do not get discussed in DR31 – have been of considerable importance for supporting competition in European equity markets. In Europe the combination of MIFID and the various efforts to establish a single market for post-trade securities clearing and settlement have provided critical support to competition between trading venues. The combination of regulatory recognition of Alternative Trading Systems in MIFID and the various initiatives by the European Commission to promote interoperability of different clearing and settlement processes, notably standardised access to central counterparties, has supported substantial competition between trading venues. The need to compare trading opportunities in these different venues has in turn been a critical driver of high frequency trading. In the US the story is somewhat simpler, the presence of DTCC as a single settlement service provider across venues means that there has been no need for enforcing post-trade interoperability; SEC recognition of different trading venues has been enough to promote vigorous competition between trading platforms. Thus in US Fix standards plus admission of multiple trading venues has been enough to support vigorous competition; in Europe standardisation post trade was also necessary.

I want to raise a further issue – not addressed in either DP31 or as far as I know anywhere else in the Foresight report and supporting discussion. This is whether there is any relationship between high frequency trading, greater competition between trading venues and the structural decline in the profitability of brokerage activities in the past couple of years. Such a link makes intuitive sense to me, that computers are very much better than humans at identifying short term profitable trading opportunities. Despite concerns about “dark pools” the impact of competition between trading venues in conjunction with high frequency trading has been to greatly reduce trading costs to buy side institutions and a correspondingly reduced profitability of brokerages and exchanges, especially in their equity and foreign exchange business. The outcome would seem to me to be higher numbers of trades, less overall value of trading, and a decline in employment and value added to sell side firms. Is this not linked to the substantial reduction of employment at UBS, Morgan Stanley and others? To the extent that there is such a link, this is a reflection of efficiency gains with the same level of service to customers being achieved at lower cost.

If I am correct then this also suggests increasing resistance, by exchanges and brokers, to continuing standardisation, even though such standardisation is to the benefit of customers. So we might expect to see considerable resistance in other markets, e.g. fixed income, derivatives to standardisation and also to further standardisation in equity markets beyond that provided by FIX.

Turning finally to the recommendations in DR31. The paper makes two general proposals and two specific proposals. The general proposals are the need for better governance of standards in financial services taking greater account of externalities i.e. overcoming the free rider problem and the need for co-ordination; and also following the thinking set out by Andy Haldane of the Bank of England in his March 2010 speech, for the development of more common financial language. I agree with both these recommendations, but with the qualification that the devil here is in the detail. I am doing some work at the moment, sponsored by SWIFT, on a common financial language, and it is clear that this is quite a substantial challenge requiring very careful specification of who is using the language and what is used for. Good governance is also easier said than done, in theory regulators could take responsibility for governance of standards and ensure they operate for the general good; but in practice they have insufficient understanding of business process to take on this task. So ensuring the proper governance of standards is no easy task. That said regulators and also the buy side of the industry must take a strong role in ensuring that producers do not excessively limit standardisation to protect their own market position.

The specific proposals are for a shift to high resolution time stamping; for a common protocol for accessing all exchanges; and an agreed approach for anonymising data so it can be made available for academic research and public scrutiny. DR31 identifies some of the obstacles that have prevented them happening and the resulting unnecessary costs and also potential for transparency problems in high frequency trading. These specific standard developments can be strongly supported.

Conclusions

I agree that standards are important for promoting efficiency and reducing costs in financial markets. Policy makers and industry should exert substantial effort to promote the widespread adoption of open standards.

The specific recommendations in DR31 on time stamp, low latency exchange access and on placing anonymised data in the public domain should all be relatively straightforward to implement and are well worth pursuing

The more general recommendations about governance of standards and common financial language will be much harder to progress. It is not that these are bad ideas, but that standards have very contrasting impacts on different market participants and the same financial language can mean very different things to different people. As a result there will be many views on what exactly needs to be done. All the more reason therefore that industry and the authorities need to be closely involved in co-ordinating standards and in agreement on financial language.

Postscript (added after conference)

One further point should be acknowledged that was not in original discussion. My discussion did not cover the second main recommendation of Section 7 of the foresight review:

“A particular issue is the vast increase in financial data, which are often not standardised, nor easily accessible to third parties (for example, regulators or academics), for analysis and research. The creation of a European financial data centre to collect, standardise and analyse such data should be considered.”

I would simply like to add that I have long taken the view that data issues are critical in regulation and creating such a centre, paralleling the Office of Financial Research in the US, would be a very valuable step. It would help the authorities deal not just with issues surrounding computerised trading but many other aspects of their new responsibilities for systemic financial stability.

17th January, 2013