

## Andrew Crockett: Financial Stability in the Light of the Increasing Importance of Online-Banking and E-Commerce

Lecture by Mr Andrew Crockett, General Manager of the Bank for International Settlements and Chairman of the Financial Stability Forum, at the Center for Financial Studies at the Johann Wolfgang Goethe University, for the Colloquium Series on "Financial Markets and E-Commerce", Frankfurt, 31 January 2001.

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### Introduction: Revolution and uncertainty

It is a great pleasure to speak in the Colloquium Series on "Financial Markets and E-Commerce", organised by the Center for Financial Studies. Over the years, the Center has gained a well-deserved reputation for high-quality analysis of topical issues facing the financial sector. And this Colloquium series is a good illustration of its ability to identify timely subjects and bring different perspectives to bear on them. In dealing with the subject of electronic finance, I will naturally take the view of an official sector observer, with a particular interest in financial stability implications.

I should admit at the outset that I approach the topic with a variety of feelings. One is **enthusiasm**. The internet, and the other innovations made possible by information technology advances, have the potential to transform the financial industry in ways that will bring enormous benefit to businesses and consumers alike. Many of you who are deeply involved in the development of e-finance will understand the excitement of being involved at this technological and business frontier.

A second feeling, however, is one of **uncertainty**. Although a lot has been written about e-finance, it is difficult to identify at this stage what will prove to be its essential characteristics. We inevitably tend to look at the future wearing the spectacles of the past. This does not always help us to distinguish innovations of lasting significance from those of more passing interest.

Finally – and this may not surprise you from me – there is a feeling of **caution**. Any major change in the financial industry carries some risk of undermining financial stability. Only when we understand the risks involved can we be confident about the approaches we use to manage them.

Both the private sector and the official sector have much to do to ensure that the potential gains from new technology are effectively exploited without undermining the resilience of the financial system. This aspect will be the main focus of my remarks this afternoon. I will discuss what e-finance means for financial institutions, for markets and for the official sector.

But before doing that, I would like to make two general remarks. The first is that e-finance has the potential to be more than just another incremental change in ways of doing business; it could be a real revolution. The second is that the precise nature of e-finance development in the years ahead is impossible to predict. Let me elaborate a little on these two points as they have important implications.

First, the issue of the **scope of change**. Some argue that e-finance is simply another technology wave adding a new delivery channel. On this view, relatively few new policy issues arise, although many existing dilemmas may be accentuated. The other view is that the financial landscape will be fundamentally transformed by the new technology. I find myself much closer to this second view.

Earlier waves of technological advance focussed on the **elaboration** of information, for example, the development and pricing of new hedging instruments; and on the **transmission** of information, i.e. faster and cheaper communication of product and price data. The wave based on the internet makes a further quantum jump. As you know, the internet relies on open networks and standards, allowing much wider and easier access by consumers. This is a radical change. Recall that the previous electronic technologies employed by the financial services sector were generally based on proprietary networks and standards with restricted access.

There are good grounds for supposing that the internet and financial services have unique synergies: the internet offers convenience, price transparency, broader access to information and lower cost; financial services are information-intensive and generally require no physical delivery. E-finance has the potential, not only to take business away from traditional, "bricks-and-mortar" delivery systems but also to introduce new business models, changing financial structure and driving financial consolidation. I will come back to these points in a moment.

This does not of course mean that the financial system is going to be transformed overnight. During the last year we have witnessed an enormous swing in sentiment towards e-commerce from almost frenzied over-optimism to much greater realism, and even pessimism. A huge number of companies were created and many have since died without generating any profit. So far, the financial industry has been largely spared in this cycle of entrepreneurial creation and destruction, partly because of prudential limits of entry through licensing rules. Such a situation will not necessarily persist, however.

My second general remark concerns the **nature of change**. If we accept that e-finance will ultimately have a major impact on the financial industry, exactly **how** the changes will take place is quite uncertain. True, some trends may be relatively easy to understand. For instance, the shift to online has been most noteworthy in the case of brokerage, somewhat less in banking, and much less impressive in other sectors. The advantage of real time transactions is clear in the case of securities and foreign exchange dealing. But it is less evident for mortgages, sales of insurance products and so on.

Looking ahead, however, it is difficult to know which technologies will work best, how customers will respond and so on. The fast pace of developments means that there is considerable uncertainty about which parts of the financial system will feel the greatest stress. How quickly institutions will have to adapt to changes remains uncertain. From what we have learnt so far, the adoption of online delivery seems to differ across sectors, mainly reflecting the complexity and time-sensitivity of the product or service.

Uncertainty about the nature of the prospective changes has some major implications for both the private and the public sector. The private sector would be prudent to maintain a questioning attitude about specific IT developments. It is wise to recall examples of earlier over-estimation of demand for technical products such as smart cards. Although many electronic purse pilot schemes are still in place, the customer resistance they have encountered has turned initial euphoria into, at best, cautious optimism. Another example would be pure internet banks, which have had only a limited success so far.

In making IT investment decisions, firms need to balance two conflicting considerations. On the one hand, technology is constantly changing and prospective returns on new technology may be undermined by still newer technology. This calls for caution and the need to discount future returns heavily. On the other hand, so-called “network effects” may create “first mover” advantages that encourage market players to adopt quickly the latest technology, without awaiting a full evaluation of costs and benefits.

The public sector faces a dilemma too. On the one hand, the authorities cannot predict the future shape of the financial industry. This argues against actions that risk stifling the process of innovation, for example by regulations that “freeze the present”. On the other hand, there is a danger of new unregulated developments going too far, too quickly. It may then be more difficult to introduce prudent guidelines: once the genie is out of the bottle, it may be difficult to put it back.

Balancing these two concerns is not easy. In principle, the public sector should be “technology-neutral”, neither favouring nor hindering particular technical approaches. But what this means in practice may vary across countries and industry sectors. Many European countries, for instance, favour limiting e-finance to regulated institutions. The United States, on the other hand, tends to favour a more hands-off approach in dealing with the types of institutions that deliver financial products and the types of delivery channels used. However, US supervisors are strong advocates of the systematic on-site inspection of unregulated service providers. You may remember a similar difference in views between the EU and the US as to the issuance of e-money several years ago.

Against the background of these general remarks, let me now address some specific aspects of e-finance developments. First, I will take a look at the implications of prospective trends for banks and other financial institutions. Second, I will review implications for markets. Next, I will outline some key risks in these developments. I will conclude my remarks with some preliminary thoughts on an official sector agenda.

### **Implications for banks and other financial institutions**

There are many ways of classifying the implications of e-finance for the institutions involved, but I will group them under six headings. First, it is becoming clear that the **physical start-up costs** of e-financial institutions are lower than those of traditional institutions. Even the cost of setting up IT

systems – sometimes regarded as a barrier to new entry – can be reduced by outsourcing to a well-established service provider. Lower cost barriers to entry could well intensify competition and increase the threat of disintermediation of existing institutions.

Because it is cheaper to open a selling point on the internet than to open a network of physical branches, the distribution cost and marginal operating costs of electronic-based platforms are significantly lower. This impact will be significant in sectors that rely on a high-cost network of agents, who can be replaced by electronic communication of content. These agents, whether employees or independent contractors, may not have enough special advantages over firms that engage in direct distribution to justify the widening cost differences.

Secondly, e-finance is **blurring the barriers** between banks and other institutions. The internet, combined with data-processing advances and deregulation, is reinforcing the trend to de-couple manufacturing of financial products from their distribution. Institutions now find it easier to retail products they have not themselves produced. Though it remains an open question how much further this integration of financial activities will progress, the boundaries between banks, brokers and insurers are likely to be further eroded. One force behind this is increasing consumer demand for personalised money management services, which is pushing banks to respond with products that cross financial boundaries. These “hybrid financial services” are nothing new, but the advent of technologies such as fixed and mobile internet as well as digital TV promises to transform both their design and their delivery.

Thirdly, the rapidity of change and the unfamiliarity of the names of some new players highlight the critical importance of **public trust**. As I mentioned earlier, pure internet banks have not so far been very successful, in part because of problems of public acceptance. While technology has been lowering barriers to entry, brand establishment and customer acquisition have remained disproportionately expensive, particularly in banking. One survey indicates that even the most promising demographic groups – such as young, educated, wealthy, active consumers of financial services - are unlikely to switch to technology firms for financial products. A “brand premium” is probably the best protector of established banks against pure internet banks. The fact that some banks that started as pure internet operations have opened physical branches as “relationship enhancers”, or acquired ATM networks for the consumers’ cash withdrawal and deposit convenience, illustrates the continuing importance of physical presence. This experience seems to suggest that the choice is not that of “clicks-versus-bricks”: it may be “*clicks-and-mortar*” (or multi-channel distribution) that will have the ultimate advantage.

However, the need to inspire the trust of the public does not necessarily favour existing banks, because firms that have built up consumer trust and achieved high degree of name recognition in other lines of business (Siemens, Sony, General Electric, etc) may also command confidence. While hardly unique to e-finance, the increasing reliance on untested and sophisticated technology implies a greater need to have a brand name that the public knows and trusts. It may lead to new forms of conglomerate that bring together financial and non-financial companies. The most serious challenge to the banking industry probably comes from the entry of telecommunication companies that already possess the necessary IT skills, exercise command over an important delivery channel and have built an extensive customer base.

The fourth consequence, then, is the increased likelihood of **entry of non-financial institutions** into financial activity. A major challenge for supervisors is the adaptation of supervisory techniques that are traditionally used in licensing new entry (such as fit and proper tests; the clarification of business plans; policies on mergers and acquisitions; etc). And the very meaning of concepts such as consolidated supervision becomes problematic in this context, as does the distinction between banking and commerce.

Fifthly, some believe that the internet will speed up the process of **financial industry consolidation**, both cross-border and cross-sector. Operating costs that are low relative to those of initial start up costs, give rise to significantly increased potential for economies of scale. In order to pursue these, financial service companies are increasingly forming alliances with IT vendors and telecommunication companies. Large client lists made available through consolidation increase the profitability of the provision of a broad range of different financial products. As I have already said, name recognition also favours big players. E-banking facilitates cross-border expansion at minimum cost. Moreover, the resources devoted to foreign e-banking business (staff, computing resources, etc) can more easily be centralised, so that service output can be readily switched from one foreign market to another. It is much easier to retrench quickly from a virtual offering than a branch-based one. However, full fledged

consolidation is not inevitable since strategic alliances could in principle achieve the same goal of saving costs without requiring a full merger. The merger of back office functions is a case in point.

The sixth and final implication is the most difficult to come to grips with, yet it is arguably the most important. It is the potential of e-finance to create new and radically **different business models**. In the current model, a bank makes use of private information it has gathered about its customers in evaluating and pricing credit risk. The internet, by transforming information gathering and by altering the way communication is handled, will make several new models possible.

One example of such a new business model that has attracted much attention is that of the so-called “aggregators”, firms that offer customers one-stop shopping for financial and non-financial products offered by a multitude of suppliers. By monitoring the transaction patterns of their customers, such firms are uniquely placed to observe individual consumption patterns and obtain information on the financial profile of an individual. Such information can in turn be used to directly market financial products, assess credit risk etc. This poses various threats to banks. Banks may lose their direct links and delivery channels to reach customers. At the same time, banks fear being held responsible for the mishandling of confidential customer data by the aggregator.

In a move to counter attempts by non-financial players to enter the banking market, banks could capitalise on their brand name and the trust they enjoy with the public by expanding into services like certification, digital signatures and secure communication. An important issue in that context is even-handedness in the official treatment of financial and non-financial firms. As you know, supervisors are usually reluctant to allow banks to expand into non-financial commercial business. But how can and should they react to traffic in the opposite direction?

### Implications for markets

I turn now to the implications for financial markets. Internet technology is beginning to have a major impact on the structure and functioning of exchanges and trading systems. In equity markets, automated trading systems that use computer software to match buy and sell orders have developed rapidly. These Electronic Communications Networks (ECNs) are expanding not only in the United States but also in Europe, in part benefiting from the continuing development of an equity culture among retail investors.

On-line trading is more cost-efficient, accelerates trade execution and potentially expands the price information available to investors. As a result, traditional dealers are finding their margins coming under increasing pressure. Some of the larger dealers may try to respond by chasing volume, which electronic trading can facilitate. Others may unbundle their services and concentrate on certain niches. Some may just withdraw totally from trading and concentrate on advice and research.

An important issue arising from the growing reliance on electronic trading is its impact on market liquidity. Market liquidity is a multi-faceted concept and it is therefore very difficult to assess the relationship between electronic trading and liquidity. On the one hand, electronic trading leads to tighter pricing (ie lower bid-ask spreads) in equity and securities markets by decreasing transaction costs. Thus one dimension of liquidity may be improved. But there are two other factors that may **reduce** liquidity. First, in some currently centralised markets, lower barriers to entry may mean that new trading systems proliferate, none of which individually is particularly liquid. Markets may therefore become more fragmented. Second, by reducing bid-ask spreads, electronic trading will tend to reduce the profitability of active market-making, causing financial institutions to scale back this activity. Markets may become shallower, resulting in increased intra-day volatility and a less efficient price-discovery mechanism. This may be all the more likely in periods of market stress, and may exacerbate turbulence. This is an unresolved issue on which we need to keep a close eye.

The use of electronic trading is also spreading in other financial markets where contracts have historically been traded over-the-counter (OTC). A recent report by the Committee on the Global Financial System<sup>1</sup> suggests that electronic trading in foreign exchange and fixed income securities is centralising many OTC markets and putting some dealers under pressure. However, the report found no conclusive evidence that these developments have led to a marked reduction in liquidity.

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<sup>1</sup> The Committee on the Global Financial System, *The Implications of Electronic Trading in Financial Markets*, Bank for International Settlements, January 2001. The report is available on the BIS Website at [www.bis.org](http://www.bis.org).

A final concern is about the difficulty of transposing existing market standards to trading platforms which are purely virtual. For example, securities regulators will want to ensure that disclosure standards are not avoided by marketing new issues directly on the internet. Investment advisers are often required to be licensed and “suitability” obligations are imposed. It is not clear how these requirements would apply to advice offered on a website.

### **Key risks in these developments**

Let me next discuss potential risks in these developments. Needless to say, assessing and dealing with these risks is the key challenge to central bankers and other regulators and supervisors worldwide. But this is not easy. Not only is reliable data on the current situation difficult to come by, its growth is extremely hard to predict. While e-broking, some types of e-banking and some e-trading have spread much more rapidly than earlier predicted, e-money developments have failed to meet earlier expectations of growth.

Even when trends have been identified, it is necessary to distinguish between developments that simply raise familiar prudential oversight problems in a new guise, and those that give rise to totally new challenges. It will inevitably be difficult to make such a distinction. It is hard to isolate the contribution of the internet separately from the effects of other complementary innovations, and equally difficult to distinguish internet effects from other long-term industry trends and exogenous factors. With these caveats, let me list several key risks that merit attention. I will group them under four headings.

Firstly, there is the risk of **strategic and business misjudgements**. Needless to say, this is always a possibility during periods of rapid technological change characterised by the kind of uncertainty I discussed earlier. A characteristic of internet-related firms has been the acceptance of high initial costs in the hope of long-term profits. The absence of a simple short-term profit test, given relatively little near-term revenue, makes it very difficult for companies to assess whether their strategy is working. That mistakes can be made is quite evident from the volatility of high-tech stocks and the failure of many high-profile ventures. Banks can also make big mistakes in their e-finance strategies. Bank managements today need to be more knowledgeable about IT matters than in the past.

The second risk is **operational**, resulting from reliance on complex technology. Such risks can arise not only when technology is developed in-house but also when it is outsourced. The practice of outsourcing core technologies and processing operations raises questions about how far, and by what mechanisms, a bank’s management should oversee the operations of service providers. The existence of increasingly complex arrangements between a financial institution and a whole chain of service providers – a main contractor with multiple sub-contractors providing the various different elements of the IT architecture – creates novel oversight problems. A recent report by the Basel Committee on Banking Supervision<sup>2</sup> suggests that the comfort from outsourcing may be illusory.

The third risk arises from **legal and regulatory uncertainty** in e-finance transactions. Even a question of “Where is the headquarters of an e-finance firm?” cannot always be answered easily. Another question is whether location is physical or legal. Under such circumstances, it is all the more important that the definition of home and host supervisors and the division of responsibilities between them be clarified. This should include any requirement for licensing in the “targeted” host country. It is also all the more desirable that common standards are set and enforced across countries to avoid financial firms moving their notional headquarters to laxer supervisory regimes. Cross-border mergers of exchanges would pose even harder questions. Similar considerations apply to different sectors of the financial industry within one country. The risks of “regulatory arbitrage” must be kept clearly in mind.

The fourth risk I want to note is **systemic risk**. Because financial institutions use similar software programs, there is a risk that many large institutions could be simultaneously subject to a common adverse shock. This was one worry about the 2000 year bug, which happily turned out to be well-contained. But can we rely on always being so fortunate? A simultaneous technology-related problem would be a potential systemic nightmare.

We know that there is no computer systems technology that is absolutely “hacker-proof”. And the more open platform the greater the risk. A failure of a large internet service provider could be a major

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<sup>2</sup> Basel Committee for Banking Supervision, *Electronic Banking Group Initiatives and White Papers*, October 2000. The report is available on the BIS Website at [www.bis.org](http://www.bis.org).

disruption. So far, incidents have been relatively minor, but the risk remains. For instance, insufficient or inadequate segregation between internal systems for retail and large-value payments could allow the breach of the lighter security net around a lower value system, such as a bank's retail website, which would in turn allow entry to a high value system via the bank's internal network.

Moreover, the deeper involvement of greater numbers of new and different firms – including non-financial firms – in financial markets may make it much more difficult to monitor the links between the various actors and to assess the risks to which they are exposed. As the links between financial and non-financial markets become more pervasive, the sources of systemic threat are likely to become harder to identify.

### **An official sector agenda**

I come now to my final substantive point, which concerns the official sector agenda for dealing with some of these issues. I have five points to make. First, and I put this above all else, the official sector should do some serious thinking about how e-finance could change the **structure of the finance industry**. Is it possible that the impact could be revolutionary and rapid? The transformations engendered by the spread of e-finance could at some point raise systemic concerns for central banks, particularly given the greater importance of unregulated entities outside the present reach of supervisors. Prudential concerns about individual institutions and markets may need to be supplemented from the perspective of systemic risk to address directly market dynamics and industry structure issues.

Ironically, while the internet has vastly expanded the availability of information, there are too few reliable data on e-finance itself. The statistics produced by market analysts are generally piecemeal, based on different definitions and assumptions and sometimes include optimistic biases. But before new data collection systems are considered, a clearer conceptual framework is needed to pose relevant questions. We need the help of the private sector and of the academic community in this endeavour.

Secondly, as discussed earlier, e-finance is also likely to blur further the distinctions between different financial sectors as well as products. This will pose **co-ordination problems** for financial regulators, regardless of whether supervision is organised along product or institutional lines. It will make banks less "special". There is a need to be aware of linkages across sectors, particularly links between banks, insurance companies and securities companies. This implies a greater need for consultation and co-ordination among regulators. As depositors are less familiar with e-banks, and know deposits can be withdrawn faster, e-banks may be more susceptible to erosion of their deposit base than traditional banks. The challenges for banks, supervisors and central banks will remain the same, but the nature of cyberspace may leave them far less time for crisis management and resolution.

The Financial Stability Forum<sup>3</sup>, which brings together national regulatory authorities and international standard setters, has a special role to play in this effort of cross sector cooperation and coordination. As you may know, the Forum prepared a mapping of e-finance issues and international groups working on them. A contact group that comprises of Chairpersons of the various e-finance working groups of the standard setting bodies and Basel-based Committees has now been established to examine areas where enhanced cross-sector cooperation and coordination on e-finance issues would be beneficial. In time, it may be necessary to extend and formalise the current network of contacts.

Thirdly, **a flexible and adaptive regulatory approach** becomes vital. This does not mean an absence of regulations. In particular, licensing rules for banks, investment advisers, etc, will remain crucial in maintaining high standards in the financial system and building public confidence. But it does mean that the old regulatory mind-set is no longer appropriate. This will be particularly so in the world of e-finance where change is the norm. There is a need for guidance, not rules. Different contexts require different responses. There will have to be more emphasis on operational and reputational risk. E-finance raises many additional complexities: for example, the question of "What is a bank?" becomes even more difficult to answer. Moreover, the answer could well differ from one supervisory jurisdiction to another. The good news is that advanced technology permits more effective monitoring of the complex issues that technology has created. For example, the use of intelligent electronic agents

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<sup>3</sup> More information about the Financial Stability Forum is available at its Website; [www.fsforum.org](http://www.fsforum.org).

should enable consumers to monitor their journey through cyberspace and warn them when they are entering a site whose privacy policies do not match their preferences.

Fourthly, there may be cases where **additional prudential buffers for risk-seeking institutions** are needed. It can be debated whether e-banks are inherently riskier than traditional banks, but some aspects of e-banks do require much more careful examination. They have generally needed to offer higher interest rates to attract deposits, which can be very rapidly transferred to another bank. They may be more vulnerable to operational breakdowns and security breaches by “hackers” as I mentioned earlier. The management challenges, such as credit assessment at a distance, are less well-understood, though technologies could be employed to monitor and overcome these risks. It is interesting to note that in some countries (for example, Singapore and Hong Kong), e-banks cannot be established except through the conversion of existing local banks. Some countries require a physical presence for e-banks within their national jurisdiction, but this may be difficult to enforce.

Fifthly, it is important to make sure that the current levels of **market and operational integrity** are not undermined by the development of e-finance. A continued effort will be required to transpose disclosure for listing as well as licensing for investment advisers to purely virtual markets, however difficult this might be. The information technology infrastructure supporting the settlement of financial market transactions must be entirely reliable. The safe and orderly operation of banking and financial systems at all times is essential to ensure public trust. Security is critical to allow customers to do financial transactions online. It is important that a “virtually closed” network is built supported by robust technology such as cryptography and digital signature. As long as online payments are cleared and settled through the existing clearing and settlement infrastructure that complies with “best practice”, such as the Core Principles recently published by the Committee on Payment and Settlement Systems<sup>4</sup>, the development of e-finance should have only a limited impact on payment system risks. E-finance will continue to increase the demand for more efficient and robust back-office operations. This “straight-through” processing will not only reduce operational risks by minimising errors caused by human intervention but also reduce settlement risks by shortening the settlement cycle.

## Conclusion

I will end by saying a few words about cooperation between the private and the public sector in charting the way forward. I began by noting that we have much to learn about the development of e-finance and its impact on the financial system. Some challenges are novel, while other may be old issues in new guise. The net impact of conflicting forces will vary significantly by product, by player and by market. While it is retail financial services that have been most radically transformed by the internet to date, there may be a major impact on the business-to-business segment in the medium term. The business models will also keep evolving with the enabling technologies (such as mobile data communications or interactive TVs) bringing about major change in the nature of financial services. But which business models will work, and which will fail, is difficult to know at this stage. How these models will behave under stress as well as during normal market conditions is also very difficult to predict.

These uncertainties make it all the more important to have a regular and deep exchange of information between central banks, supervisors and the private market players. Periodic reappraisal of the global e-finance landscape and the main policy issues becomes therefore vital. Policies toward e-finance are at present being carefully reviewed by Committees that meet in Basel such as the Basel Committee on Banking Supervision, the Committee on the Global Financial System and the Committee on Payment and Settlement Systems.

And as I mentioned, the Financial Stability Forum will continue to play a role in ensuring regular exchange of views between those responsible for different aspects of e-finance. A major future task is to clarify where there are gaps in the structure of official oversight. I would also like to encourage the private sector to play a full part. We all have much to gain from the existing developments that are under way, but only if we monitor and control the associated risks.

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<sup>4</sup> Committee on Payment and Settlement Systems, *Core Principles for Systemically Important Payment Systems*, Bank for International Settlements, January 2001. The report is available on the BIS Website at [www.bis.org](http://www.bis.org).