
The geography of finance: after the storm

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This article reviews the idea that geography is becoming less and less important in finance as a result of the revolution in information and communications technology and of deregulation, in the aftermath of the economic and financial crisis of 2008. Reviewing four scenarios for the future of finance, it seems likely that the drive towards 'the end of geography' will be slowed by the crisis, as the wisdom of allowing the marketplace to self-regulate is reconsidered. Future information and communication technology developments may help improve information management, combating one of the features of recent market failure.

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The end of geography in finance

The central hypothesis of *The End of Geography* (O'Brien, 1990, 1992) was that “geographical location no longer matters in finance¹ or matters much less than hitherto ... financial regulators [will] no longer hold full sway over their regulatory territory ... for financial firms the choice of geographical location can be greatly widened ... for consumers ... a wider range of services will be offered outside the traditional services offered by banks ... new products and services enter protected markets ... yet there will be forces seeking to maintain geographical control ... product differentiation will intensify ... intense battles between stock exchanges will delay the march towards 'seamless' markets ... retail banking will still rely on close proximity to the customer ... operations and people will still have to have a location ... many location decisions have a deliberate geographical rationale ... geography will remain one of the most powerful,

evocative and obvious reference points ... yet money, being fungible, will continue to try to avoid and will largely succeed in escaping the confines of geography” (O'Brien, 1992, 1–2).

Geography, of course, is still relevant, in the immortal words of Eccles in response to Seagoon's question—“What are you doing here?”—cited in *The End of Geography*: “Everybody's got to be somewhere!”² Instead, what the 'end of geography' thesis contended is that the geography of finance would matter less and less even if it did not end (see Martin, 1994, for an assessment). This article revisits the end of geography thesis, both to see how it stands the test of time, after almost two decades of phenomenal growth and change in finance, as well as in relation to the major debate now underway on the future of finance as the world economy tackles its worst crisis of modern times, with a financial crisis at its heart.

The starting assumption of *The End of Geography* was that money is primarily an item of

information governed by rules. Money is therefore shaped by the development and adoption of information and communication technologies (ICTs) (how the information is managed, and to a degree the very nature of the information) and regulation (how information is ruled). Therefore, one driver behind the 'end of geography' was the anticipated continued increase in computational power and improvements in communications technology: the development and adoption of ICTs. However, the development and adoption of ICTs is a necessary but not sufficient condition for an 'end of geography' world. It is possible to imagine a world in which ICTs have advanced and been adopted to make an end of geography world feasible but where there are controls in place—e.g. capital controls—that restrict financial flows. Thus, financial liberalization (deregulation) is also required to 'end' geography. Together, the development and adoption of ICTs and deregulation have allowed capital to flow much more freely than ever before and have led to a world consistent with that laid out in *The End of Geography*. This paper argues that these factors remain critical shapers of the geography of finance, and through a set of alternative scenarios will suggest how far geography may continue to be eroded in the future.

The present economic and financial crisis is an important part of the story of the future. First, the crisis itself has undoubtedly been facilitated by the 'end of geography' world of fast flowing, lightly regulated finance across borders. Secondly, the resolution of the crisis may be an important determinant of the future geography of finance, through the resultant regulatory reactions that may or may not follow the extreme credit crunch and through the ways we continue to manage a networked world of accessible information. A future scenario of high regulation as regulators seek to stop negative spillover effects and limit global systemic risk may well restore many of the controls allied to geography that have been increasingly absent in the past few decades. Furthermore the risks inherent in the 'end of geography' world do not pertain only to the capital imbalances which were permitted in a deregulated world but also to the risks inherent in a networked

world resulting from the advance and adoption of ICTs (Castells, 1996). The crisis also signals how 'new' finance geographies—e.g. China—will be more important.

This update suggests that in the short term, the present model of finance is going to require serious reform, likely to slow the enthusiasm for *The End of Geography*, possibly redefining geography around the emerging new powers, moving us away from the almost uninterrupted drive towards a world shaped by fast development and adoption of ICTs and deregulation. Moreover, by looking at the current crisis through these two lenses, it will be argued that rather than in addition to looking at experiences of the past for policy prescriptions, policymakers should also focus on what is unique about the crisis.

This article brings together three analyses: the 'end of geography' thesis written at the beginning of the 1990s, as the world of finance was getting up a head of steam powered by new technology and the deregulation revolution; analysis of the two drivers, the development and adoption of ICTs and deregulation, that can be expected to continue to shape the future geography of finance; and four scenarios for the future of finance.

The global financial crisis through the lens of the 'end of geography'

The conventional account of 'The global financial crisis' (see, for example, Turner, 2009) can be summarized in the following stylized fashion. The trade imbalances between deficit countries, led by the USA, and surplus countries, notably oil exporting countries and China, led to a global savings glut as surplus countries saved their income from exports (Bernanke, 2005). This savings glut also expressed itself as a current account deficit between the surplus and deficit countries as the savings were recycled as investment from surplus countries to deficit countries. A notable feature of two of the deficit countries—the USA and UK—was also that an increasingly large share of their corporate profits went to the financial sector. For example by some estimates the American financial services industry's

share of total corporate profits rose from 10% in the early 1980s to a peak of 40% in 2007 (*The Economist*, 2008). The global savings glut facilitated an era of historically low long-term interest rates reaching 25 year lows in the first half of the decade in both the USA and UK (Wu, 2006). This era of cheap money allowed households to become highly leveraged—for example, total US household net liabilities as a percentage of nominal disposable income rose from 95% in 1996 to 142% in 2007 and from 107% to 186% in the UK (OECD, 2008). The era of cheap money not only financed the deficit countries' consumption boom but also allowed a housing bubble to develop in the USA, the UK and elsewhere. For example, the indexed price-to-income ratio (where the long-term average equals 100) was 111.6 at the peak of the US housing market in 2006 and 149.7 in 2007 in the UK (OECD, 2008). One particular dimension of the housing bubble were the subprime loans which were repackaged by the finance sector as particular mortgage-backed securities (MBS) and collateralized debt obligations (CDOs)—ostensibly to better manage risk. Thus excess liquidity was channelled both directly into the purchase of increasingly complex financial instruments (including derivative products) and indirectly by allowing the funding of subprime mortgages which were then repackaged as MBSs and CDOs.

When the housing bubble burst it became apparent that the value of MBSs and CDOs had not been accurately reflected on banks' balance sheets. Financial instruments had become so complicated that where risk lies had become obscured. When the subprime mortgage market collapsed there was widespread contagion into the global financial system as a whole, as a result of the global distribution of the complex financial instruments and derivative products amongst the globally interconnected financial firms. The 'toxic' combination of an asset price bubble and the way the risks were passed on into the system has been key to making these financial instruments into such financial weapons of mass destructions to use the apt language of Warren Buffet in 2003 (Buffet, 2003, 16).

To what extent has the credit crunch crisis been facilitated by the 'end of geography' conditions that have developed in the past few decades? We can

posit three key links. First, the ability to package risk and send it off to investors and risk takers anywhere in the world, with a huge physical and mental gap between the original risk and the final investors, has been much easier in a deregulated world, where the authorities almost blindly trusted the marketplace to self-regulate and know what they were doing and managing. Secondly, many financial institutions have been increasingly reliant on funding themselves from wholesale markets, without a solid local (often retail) funding base, as has been the case for UK retail banks and building societies, so that when the wholesale market imploded, there was no local relationship of funding to rely upon. Localness of course does not prevent a run on the bank by local depositors, but the scale of the run has been much greater in the wholesale meltdown. Thirdly, the collapse of trust has perhaps been all the faster when people realized just how much they relied on trust rather than real knowledge about their financial relationships e.g. UK bank depositors suddenly waking up to the risk they may be running from depositing funds in Icelandic banks, let alone in local high street banks. Relationships over a distance in knowledge and culture can be particularly fragile, though in some respects geography doesn't matter a great deal—a bust bank is a bust bank.

As a result, how the crisis is managed is likely to test the degree to which geography remains an important dimension of the world of finance. There is a temptation to protect constituents in countries by creating screens around local financial markets and institutions. Nationalisation of banks clearly links banks to national controls, with local taxpayers expecting a return on 'their money'. All the familiar arguments for and against protectionism can be seen in the financial rescue debates. These risks may blow over—but they may stick. Geography became really important after 1929: it may again as we shall discuss later in the scenarios.

ICTs and deregulation: a Promethean mix

Advances in ICTs have allowed financial markets to be increasingly integrated and connected. The

integration of financial markets has been further supported by a political climate which has driven deregulation. As described in *The End of Geography*, at the forefront of the liberalisation process has been the effort to let the market decide on the allocation and pricing of economic resources. As far as the 'end of geography' in finance concept is concerned, a particularly strong manifestation of this greater freedom has been the liberalization of capital flows across borders. This driving force was at the time supplemented by substantial programmes in each of the major financial markets—Japan, the USA and Europe. "These changes lead to a significant redefinition of the role of money and of financial intermediaries" (O'Brien, 1992, 17).

ICTs and deregulation have allowed the increase in transborder capital flows as a proportion of gross domestic product. Accordingly, capital inflows into the UK increased 5.5 times, 4-fold in emerging markets and 3-fold in the USA over the period 1999 to 2007 (IMF, 2008). This liberalization process had been brewing for a while, with the development of the Euromarkets since the early 1960s, the collapse of Bretton Woods in 1971 with the floating of exchange rates, then spurred on by the Reagan supply side revolution, given a further 'demonstration effect' by Margaret Thatcher's surprise ending of exchange controls in 1979 and by the Big Bang in the City in 1986. Big Bang was seen as a particularly international phenomenon (more than New York's May Day in 1975) and London was still showing the ability to retain leadership characteristics despite "one of the world's most cumbersome processes of regulatory reform" (O'Brien, 1992, 19) Each country and market had its own issues: the repeal of Glass Steagall in the USA to allow the merging of commercial and investment banking and the removal of the final barriers to US interstate banking. Japan had its own Glass Steagall process (in part thanks to the 'inheritance' of its system in the post-war years from the USA). Europe was developing its single market (removing cross-border barriers) as well as reviewing the relationships between banks and commerce and other sectors such as insurance—with the special issue of how to manage Anglo-Saxon systems

alongside the universal banking structures of the Continental (Europe).

The free flow of capital eventually led to the current account imbalances that led to a global savings glut being recycled into the USA and UK financial sectors; a necessary condition for households and the banking sector to become highly leveraged. High leverage among households drove the housing bubble. High leverage in the banking sector in part drove the growth in financial innovation (part of which was securitised mortgages), as the money was recycled into investment opportunities.

Moreover, high capital mobility and current account imbalances are associated with financial crises. From analysis of datasets dating back to 1800, it has been argued that "Periods of high international capital mobility have repeatedly produced international banking crises, not only famously as they did in the 1990s but historically" (Reinhart and Rogoff, 2008). Markets have liberalized as flows have increased, with frequent crises requiring remedial action. Thus, the growing Euromarket met its first major challenge in the 1980s developing country bank debt crisis, as developed country banks 'recycled' oil country surpluses to developing countries, through 'syndicated loans'. As with today's crisis, this involved innovative financial instruments, a massive cross-border savings/consumption imbalance and fears of contagion.

But high capital mobility alone is not the only feature of the latest crisis—the other important features have been the mispricing of risk and the inability of many to truly understand where the risks were going. The packaging of risk obscured the realities. Money, as already stated, is in one sense simply information. Therefore, in addition to the unforeseen risks inherent with high capital mobility, another important element to the crisis is information mismanagement—leading to poor knowledge in a so-called knowledge economy.

Writing in 2003 Robert Shiller commented that "Advances in information technology promise to serve us well in achieving radical financial innovation ... With such technological and cultural ferment afoot, fundamental transformations in the nature and quality of our lives are possible through

financial progress” (Shiller, 2003). Five years later, such optimism is more muted when George Dyson, a historian of technology, argues that the synthesis between digital computing and economics is happening so fast that it is not surprising we find ourselves in moment of disequilibrium (Dyson, 2008). Dyson’s analysis states that unlimited replication of information is generally a public good—one only has to think of the Internet. However in the case of money, Dyson contends, this is not necessarily the case. The replication of money is represented by the growth of the complex computer-generated financial instruments or derivatives. The notional value of the over-the-counter derivatives market in the second half of 2007 was estimated at US\$596 trillion (Bank for International Settlements, 2008). To give some extent of the replication of money, the total value of the world’s financial assets was estimated to be US\$54.6 trillion (McKinsey, 2008). Based on these estimates, the notional value of the derivatives market was almost eleven times the value of the world’s financial assets.

Derivatives in themselves can play a useful function in providing a tool for better risk management. The problem instead becomes one of imperfect information: actors not knowing where their risk lies. The same imperfect information about where risk lies exists with the MBSs and CDOs which lay at the heart of the subprime mortgage crisis. Advances in computing power have fuelled financial innovation to a point where risk is ‘sliced and diced’ to the extent that actors did not understand where risk lies. This risk has long been apparent, ever since the first early heavy losses in the derivatives markets, such as for that eclectic foursome, Orange County, Metallgesellschaft, Gibson Greetings and Proctor and Gamble, big losers in the early 1990s, cited in a Harvard Business Review article that also noted “in this fast paced environment, regulators are entrusted not only with preserving a system they no longer thoroughly control that they nor the players thoroughly understand” (O’Brien, 1995, 151). In short, in the global credit market it is harder to understand where risk lies. Risk has become *delocalized* and outsourced. As Raghuram Rajan has commented, “You don’t borrow from your

neighbourhood bank anymore, you don’t deposit in your neighbourhood bank. You invest more widely, and you invest through a group of intermediaries” (Altman, 2007).

Indeed the (current) crisis could be regarded as belonging to the same lineage of crises resulting from technological risk as the collapse of Enron and Long-Term Capital Management (LTCM). Both Enron and LTCM were businesses which relied on complicated information management based on complex mathematics and computational power (Sigma Scan, 2009). Technology drove financial innovation at Enron—such as setting up a market for futures trading in Internet bandwidth or capacity. With the case of Enron, the US legal system judged that senior management knowingly used off-balance sheet accounting and structured investment vehicles to hide losses and over inflate Enron’s stock price: a case of fraud enabled by the development and adoption of ICTs and deregulation. Today, the use of off-balance sheet accounting has obscured the true value of losses and has led to a breakdown of trust between financial institutions leading to a global financial crisis. The difference this time around is that rather than the damage being confined to the collapse of one institution (an Enron or a LTCM—although there were serious contagion fears with LTCM at the time), now there has been system-wide contagion and the near collapse of many institutions.

ICTs have also accelerated the transaction times. Writing in 1996 Manuel Castells foresaw how “The annihilation and manipulation of time by electronically managed global capital markets are at the source of new forms of devastating economic crises, looming into the twenty-first century” (Castells, 1996, 236–437). By speeding up transactions, finance is a ‘global casino’ with the same capital being shuttled back and forth between economies, in a matter of hours, minutes and some-times seconds:

... a significant and growing number of financial transactions are based on making value out of the capture of future time in present transactions as in the futures, options, and other derivative capital markets. Together these new financial

products dramatically increase the mass of nominal capital vis-à-vis bank deposits and assets, so that it can be said properly that time creates money, as everybody bets on and with future money anticipated in computer projections. The very process of marketing future development affects these very developments, so that the time frame of capital is constantly dissolved into its present manipulation after being given a fictitious value for the purpose of monetising it. Thus capital not only compresses time: it absorbs it, and lives out of (that is, generates rent) its digested seconds and years (Castells, 1996, 435–436).

Therefore as time collapses in the ‘global casino’ financial firms make money through arbitrage, i.e. informational asymmetries in derivative products are necessary for profit-seeking behaviour. Or in other words without informational asymmetry, there would be less scope for high profits. Yet the ‘incentive’ for informational asymmetry within the system under certain conditions also increases risks—as was the case with MBSs and CDOs associated with the sub-prime mortgage market.

The other consequence of this acceleration of transactions is that there is no built-in redundancy to the system. Financial integration was supposed to better manage risk and reduce the risk of contagion (Greenspan, 2003). However, while this might have been a perfectly reasonable outcome, in reality the opposite outcome seems to have resulted. The financial integration bred by deregulation and the development and adoption of ICTs has appeared to increase systemic risk and enabled contagion. Of course, this result cannot be laid solely at the door of fast transactions times, though it has made it harder to manage the crisis—the equivalent to declaring a bank holiday as in 1933 might still be a necessary option. The speed at which market players’ trust in each other has collapsed is perhaps a reflection of how far market players are prepared to believe (and know) that there is considerable ‘toxic waste’ in the system. The idea that all is polluted and no one knows what is in their portfolios is a very credible proposition, now that the question has been so brutally asked.

Rather than creating a financial network with built-in redundancy, it is possible that a very efficient and resilient yet brittle network was created. As the Chief Executive of an investment bank conceded, one problem was that when liquidity dried up it became very hard to hedge positions (Blankfein, 2009). Similarly, Northern Rock faced a problem of liquidity rather than solvency. Its business model was not undermined primarily by defaults on its mortgages, though its liberal lending practices did make it an early focus for concern. The most damaging ‘run on the bank’ was not the individuals lining up at Northern Rock branches (albeit terrible publicity) but when access to wholesale credit markets seized up. Most noticeably, Northern Rock had significantly globalized or delocalized its business model, becoming dependent on wholesale markets worldwide, instead of relying on local depositors in a close mutual ownership relationship. The demutualization process indeed can be seen as yet another manifestation of the stretching of relationships globally, moving away from close customer relations to anonymized relationships with no location or close relationship between customer and institution.

In summary, the twin forces of ICTs and deregulation created ‘end of geography’ conditions that increased the vulnerability of the system to a collapse of financial trust. Brittle and stretched relationships have not been able to withstand the run on the system. The parallel phenomenon has been the build up of significant global financial imbalances, not unprecedented, but this time the system is less resilient to the pressures that can be brought to bear when imbalances reach their own limits. Capital imbalances encouraged and led excess liquidity to be channelled into new financial products. These products delocalized and outsourced risk, to a degree where agents no longer understood where risk lay. In this way, this is the first financial crisis to be fundamentally a product of a networked world; that is a world in which the developments and adoption of ICTs has led to a level of interconnection and management of information hitherto unimaginable and where the protective bulwarks that might have in the past slowed contagion have been largely absent.

Where do we go from here?

To assess the possible future for finance, we shall adopt the scenario technique, building on a previous and well tested set of scenarios shaped by the two factors shaping the ‘end of geography’ story, the advance and adoption of ICTs and the future of regulation. We extend the thinking to consider what will shape these drivers of change and the possible futures or scenarios that may emerge. Before introducing the scenarios themselves, we examine these two key forces.

Technology and the future of finance

There is enough new science and technology in the pipeline to make a strong case for a continued fast advance in our ability to communicate and compute fast and faster. In 1991, *The End of Geography* noted that “a major investment in technology and systems gave one major US bank a ten second advantage... worth billions of dollars” (Hoekman and Sauv , 1992). Today, competition is about milliseconds (MacSweeney, 2007). Moore’s Law (the doubling of computer processing power every 18 months) has continued to hold true and while some physical limits have been projected for the next decade for chip technology, advances in biocomputing may take the technology onto a whole new level. As a result of this exponential growth in the ability to transmit information, we have seen more services become more mobile, with even remote medical surgery a possibility. Finance was one of the services that was ahead of others in loosening its geographical constraints.

Our preceding account of the crisis identified the problem of information mismanagement and imperfect information (in this instance relating to derivative products) and irrational exuberance (relating to asset price bubbles). The development and adoption of ICTs may be able to remedy part if not all of the problem arising from these two challenges.

(i) The promise of better information management—overcoming the challenges of imperfect information

While ICTs make many things possible, there are inherent human limits in its application (Shiller,

2003). While ICTs have led to improvements in the capacity for information management, the present financial crisis can in part be seen as a crisis of information mismanagement. It has been an era of unprecedented availability of information to the market place, alongside a spectacular inability to understand the bigger picture. If the point of weakness is where humans interact with technology, can human fallibility in our interaction with technology be addressed through advances in technology and through further innovation? If so, this would allow the weaknesses in the system to be corrected without having to resort to regulation to try to protect against human fallibility.

The problem of imperfect information could be overcome with advances in data-mining technologies tied to advances in artificial intelligence (AI). A number of technology trends may make a contribution to improvements. Kryder’s Law states that the capacity of hard drives has been doubling every 2 years, a trend which is set to continue (Ayres, 2007). To give some idea of the magnitude of increases in storage capacity, Google suggests that current trends in local storage (increasing capacity, falling real prices) mean that by 2015 consumers may be able to carry a music player in their pockets with the capacity to hold all the music ever written (Storey, 2007). Such an explosion of available data is overwhelming for humans, hence the need for improvements in AI to help make sense of it. If Moore’s Law continues, ever more powerful computers will allow for possible improvements in AI. Ray Kurzweil the technology futurist, projects that by 2029 computers will pass the Turing test (which states that a computer will be able to convince humans that they are having a conversation with another human in a text-based conversation) (Kurzweil, 2006a).

If the problem does not lie with technology itself but human interaction with technology, then there might be a desire to disintermediate humans. The idea summarized in the term the ‘Internet of things’ is that the next logical step in the development of the Internet is to connect inanimate objects to communications networks (ITU, 2005). Coupled with AI, such developments would mean that humans

could be increasingly disintermediated in trading and risk management processes. These ideas are redolent of what Kurzweil (2006b) has termed the Singularity. The term refers to the idea that accelerating technology will lead to superhuman machine intelligence that will soon exceed human intelligence. There are already attempts to apply AI to finance (O'Keefe, 2007). The problem of course is that at that point, no one will understand what is going on—which is where we started!

It is important to recognise that there is no scientific consensus that technology will advance in this fashion and the Singularity takes ideas about increasing storage capacity and processing power to the extreme. However, it is not necessarily within the realms of science fiction to suggest that in the future, value in trading and finance will increasingly lie with who owns the intellectual property to technology which manages risk best and with who owns the human capital that lies behind such innovation. This shift has already been seen in the increased importance of 'quants' in the financial sector even if faith in the quants has been shaken by the financial meltdown. Those humans that have some inkling of what is going on will have an advantage over other humans perhaps, if not over the machines.

(ii) Advances in neuroscience—overcoming human 'irrationality'

There is uncertainty as to whether better information management would lead to more stable markets. Such a view suggests that markets are inherently unstable due to the facts that humans do not behave in a perfectly rational fashion—they are guided by passions and emotions and in this sense are 'irrational' (see, for example, Bronk, 2009). However, if instability does indeed stem from this irrational behaviour then it could be overcome with insights from the burgeoning field of behavioural economics and neuroeconomics—with the development of neuroscience combining with ICTs to allow for better modelling of human behaviour and therefore better risk management.

Behavioural economists look to provide a more complete picture of human motivation beyond the rational motivations posited in the *homo economi-*

cus of neoclassical economics to incorporate the idea that economic actors can be driven by fear and greed. Advances in neuroscience could combine with economics, and the field of neuroeconomics could build on the work of behavioural economics as the predictability of behaviour improves. In 70% of cases, we can read a person's intention before they commit an action, and many scientists including Nobel Laureate Eric Kandel therefore go so far as to suggest that free will may be an illusion (Philips, 2007). Insights from the field of neuroeconomics could lead to improved psychological framing in the design of contracts and greater stability in the financial system. Neuroscience could also lead to improvements in AI. By reverse engineering our brains, and understanding exactly how the brain works, some expect that AI as intelligent as human beings will be created in the next 25 years (Hapgood, 2006).

The big advances in neuroscience, impacting on our management of information in finance, may be some way off. Closer in time, if not in distance may be some threats to the use of ICTs in finance, relating to consumer confidence in information systems, the appetite for regulation of technology and with respect to physical threats to ICT systems themselves.

(iii) Speed of adoption of technology

Technology will always be adopted if it is profitable, *ceteris paribus*. However, there are potential negative externalities in the deployment of ICTs which if factored into consumption decisions could slow adoption. Thus we could envisage concerns over the security of financial information being a limiting factor, as a result of excessive Internet and identity fraud. This has been on the agenda since the early days of the Internet and to date the system seems to have just about kept ahead of crime—but companies and individuals still face constant bombardment from viruses, hackers and fraudsters. Accidental losses of data—the mislaid memory sticks, computers and CDs, misdirected messages and just pressing the wrong button—probably can never be eliminated as long as human error exists. So far society seems to have accepted that the benefit of having data online has

outweighed the risks. Should this tip the other way then the mobility of money would be severely curtailed. There are increasing concerns that despite all the efforts to improve software, the vulnerabilities in systems are getting greater and it would be no surprise to insiders if the stability of systems was shattered, in a similar way to the way confidence in markets was shattered once the bubble burst.³ But it would require a serious blow to confidence, now that online activity has been taken up and accepted and is growing.

(iv) The Internet analogy

Another potential negative externality is that if ICTs are perceived as leading to imperfect information to the value of risk and where it lies, there may be an increased appetite to regulate technology if it is perceived as being a source of systemic risk. However, an interesting analogy can be made with arguments made about the management of information on the Internet. The Internet is the perfect end of geography exemplar: it is a borderless space not tied to geography (notwithstanding the attempts of some sovereign governments to control it, with mixed success, notably China). Internet governance poses analogous questions about how to mitigate risk and at what point to regulate. Some scholars of Internet governance argue that over-regulation and control of the Internet will stifle the innovation that has made it what it is. By regulating the Internet, the baby is thrown out with the bathwater. Instead, it is argued, the best way of mitigating risk is innovating with technology to find solutions, and the best way to promote innovation is keeping the Internet as open as possible (Zittrain, 2008). The same fears could be applied to global finance. By over-regulating financial markets, innovation will be stifled and again the baby will be thrown out with the bathwater: the essential feature of financial innovation which has delivered prosperity in the past will be stifled. This view suggests that the solution does not lie with more regulation but more innovation.

(v) Keeping the communications flowing

Much of the 'end of geography' and integration of markets has been driven by improvements in com-

munications technologies, and there is an underlying assumption that communications technologies will not be rolled back. While this may be a reliable assumption, one dependence that at times seems ignored is the dependence of the global communications system on space satellites, perhaps so far out of sight the risk is out of mind.

Drivers of the direction of regulation

If technology trends since 1992 have continued to push towards the fast adoption of technology, albeit with some new questions arising for the future, the regulation story is at a more uncertain juncture, with the prospect of a world closing down on itself becoming much more possible as a result of a series of drivers, not least because of the crisis in the world of money and finance itself.

The credit crunch starting in 2007 has shaken confidence in the belief in free liberal financial markets. Paul Volcker, former Federal Reserve Chairman, has observed that the "bright new financial system ... for all its talented participants, for all its rich rewards, has failed the test of the marketplace" (Grynbaum, 2008). Alan Greenspan, his immediate successor, has displayed an almost innocent trust that the players knew what they were doing.⁴ It is the biggest test of market liberalization we have seen in the recent era. It is possible that the crisis may pass over when the excesses have been absorbed, as in past eras of financial market crisis; and as the technology boom also survived the Y2K concerns of 1999/2000 and the dotcom bust in 2001. Nonetheless, given its severity the crunch is likely to leave a legacy for financial regulation. Two age-old issues have already arisen: how far should the public sector rescue the private sector in the interest of supporting the system?; and, how far does this mean the reliance on markets to govern their own innovation will be trusted? Behind these questions are the questions of market efficiency: for example, do we believe the extensive securitisation of risk has been good for optimising value or has it been about shuffling risk with few taking real responsibility for their decisions? Furthermore, while the free market has delivered a crisis, it also delivered a boom.

The tricky bit is that with any crisis, over-reaction or any regulatory response may not solve the problem but just push the problem down another avenue. In the fallout of the less-developed-country debt recycling crisis of the early 1980s, the problem was seen as a threat to the system because so much risk was on banks' balance sheets—securitization was supposed to make a more fluid market place for pricing risk which total reliance on loans on the books did not allow (at the time). Hence securitization was seen as a way of usefully spreading risk and improving market liquidity. The devil has always been in the detail of course, as the protracted Basle II capital adequacy reform process has shown. Openness both distributes risk (a potential benefit) while increases the risk of contagion.

A cautionary tale against regulatory over-reaction may have been learnt with Sarbanes-Oxley in the wake of Enron, with the US clampdown for the first time reminding US regulators (generally the primary regulators in global finance) that in an open, fluid 'end of geography' world, firms did not have to take their business to New York if the rules were too tight. What is already abundantly clear is that when markets fail or seize up, as they have today, governments and regulators, on behalf of society (and with society's broad resources) do have to step in. Nationalization of banks is a very rapid form of reregulation even if it is later unwound. For the time being, deregulation has stopped and the question will be, how will that alter the geography of money and finance, if at all?

The story of deregulation is in part the story of globalization: the 'end of geography' in finance is a globalization process. In 2008, we saw a sudden change in the wind. Discredited (pun intended) free markets have lost their allure, and can no longer dismiss the critics by saying they are better at allocating resources, delivering prosperity and security, with a degree of fairness that meets society's needs. The free market ethic is likely to remain a busted flush for quite a while even if it is not yet written off. Currently, it looks as bankrupt as did socialism in the 1980s. A new wave of regulation, for better or worse, seems inevitable in finance, even if the forces of globalization may not be arrested. Further-

more, as it was asked in *The End of Geography* 'are regulators ready for the end of geography? Does the end of geography lead towards a global regulatory system and global rules?' (O'Brien, 1992, 18). We examine this with reference to what we have termed elsewhere the five flows of globalization, the flows of capital, goods, services, people and information and knowledge, (Keith, 2007) themselves influenced by significant drivers of change in demographics, politics, economics and business, resources and environmental change.

(i) The flow of capital

The free flow of capital is central to the story of the 'end of geography' in finance and all periods of globalization or the reverse have been marked by particularities in the openness or otherwise of the capital regime. It is now nearly a half century since the global capital markets, led by the eurocurrency market, freed capital markets, created offshore currency markets (ironically pioneered by communist holders of dollars) and started to undermine the primacy of the US dollar-based regime. It is almost four decades since the breakdown of Bretton Woods. What might lead to greater controls over the flow of money?

The first current pressure comes from the globalization of ownership. The economic arguments would still seem to favour openness to foreign investment, but political and security arguments could well change sentiment. The visibility of sovereign wealth funds (SWFs) is high, and their visibility to wider constituencies could encourage (or discourage) protectionist sentiments should politicians wish to take that route. The second point of pressure for change may come directly with respect to the regulation of finance itself. The present financial crisis has many of the typical hallmarks of previous financial crises—significant global contagion risks, calls for a global regulatory response, serious signs of real market failure, inadequate self-regulation by market players, threats to the system and an immediate hindsight reaction against the excesses and bubbles in the run up to crisis—hence calls for a root and branch change in 'the system'.

Greater risks of systemic contagion could increase the costs of such crises. Paul Krugman has

proposed the idea of an ‘international financial multiplier’ whereby changes in asset prices are transmitted across borders through the balance sheets of highly leveraged institutions. As all economies now share leveraged common creditors, balance sheet contagion has become more pervasive. Krugman concludes that increases in financial globalization—in the sense that there are large international cross-holdings of assets—suggest (although does not prove) that the international financial multiplier is more important and there is therefore a greater risk of system-wide contagion (Krugman, 2008).

Briefly stated, financial instability is a consistent feature of financial globalization. As markets are more integrated, it would seem likely that there are greater risks of system-wide contagion. If this is correct, then there is a case for greater global financial regulation—what has been referred to as Bretton Woods 2.0—although what this might look like is still to be defined. If technology continues to drive financial integration, then this would represent a basic tension within any deregulated, high technology world.

The third point of pressure over the flow of capital may come from those powerful economies that may want to offer a more restrictive model generally, that do not have the free market, Anglo-Saxon model hardwired into their system. The expectation is that in the next 30 years China may overtake the US economy in size, that a highly regulated economy, India, may rise up to the ranks of the top three (as well as becoming the world’s most populous country, overtaking China) and that the former superpower of Russia may regain much of its influence, while pursuing far from democratic free market capitalism. It is not impossible that, as these economies grow, they catch the religion of free markets with all the passion of the newly converted, but this is by no means guaranteed.

Thus, we could see the approach to the free flow of capital being shifted by issues of control, concerns over systemic regulation and by a new power structure led by non-free market adherents. The game has moved on from the late 20th century, when debates over competing capitalisms were primarily across the Atlantic and across the

English Channel, between Anglo-Saxon capitalism, Rhenish capitalism and social capitalism, and in banking, between universal and Anglo-Saxon systems.

(ii) The flow of goods, services, people and information and knowledge

The four other flows of goods, services, people and information and knowledge are likely to play a more secondary role in the regulation of finance, although important nevertheless. The free flow of goods, a central pillar of the post-war liberalization through successive trade rounds, still continues within a generally low tariff arena but with a number of critical pressure points, not least around the protection of agricultural products and access to developing country markets. Thus, the Doha Round may be the last of its kind (or technically not even achieving that). Does this mean the spirit of free trade in goods is on the turn? Maybe not in terms of spirit but clearly a number of new forces have brought this about, especially the rising power of emerging markets, led by Brazil, Russia, India and China (BRICs), able to block the wishes of the richer economies. In coming years, if the present concerns prove long term and not another round of concerns over sustainability, then food security issues may increase all countries’ desire to protect domestic food production, for security and not just employment reasons. The flow of goods could also become more restricted if environmental concerns over ‘air miles’ and excessive CO₂ transport costs lead to shorter supply chains. Finally, of course, classic protectionism of jobs in a period of economic disorder (never an impossibility) remains. Should the flow of goods start to be less free, this would undoubtedly be a serious blow for the concept of deregulated markets.

The free flow of services also could be restrained. The boom in offshoring and outsourcing generally has been especially novel in services (services classically being more geographically restrained). A backlash against the shift of services jobs overseas, typified but by no means restricted to call centres, could be driven by job losses, by concerns over the privacy of information, security concerns over data

and cultural barriers where they are part of the human interaction of services.

The fourth flow of globalization includes flows of people both cross border and from country to town as the world becomes more urbanized; in 2008 more people are estimated to be living in cities than in the countryside, for the first time in history (United Nations, 2007). As a result, two decades after the fall of the Berlin Wall, that most potent symbol of the relaxation of controls over the freedom of people to move, walls are reappearing, along the Mexican border, around the Channel Tunnel, between Israel and Palestine. Visa regimes are tightening even though more countries now permit dual nationalities. The only contrast with Berlin is that these barriers are to stop people entering, not leaving.

Economists remain convinced that the free flow of people is good thing, and in ageing Europe remind voters that the inflow of labour is necessary. But as cultural and ethnic mixes change, pressures for control increase. As resource pressures become more visible, calls are heard for limits to population growth. If unemployment rises, calls for controls on immigration may become more strident. In the future, as the number of climate change refugees increases, we will see more demand for more controls and limits to the flow of people. Other pressures to control the flow of people may also come from health concerns—whether to protect against risks or epidemics or pandemics or the spread of diseases such as tuberculosis and most recently bedbugs. Finally, the ‘war against terror’ has seen a concerted effort to control the security dimension of population movement, at a stroke cutting through many freedoms—not dissimilar to the way in which the war against drugs undermined the protective walls around Swiss banking secrecy, walls which could not be penetrated in search of looted national treasuries.

The final flow, of information and knowledge, also is vulnerable to the possibilities of new controls. We live in world of information protection (often creaking intellectual property regimes) and also a world where there has been an explosion of information that has been transported via a totally

unregulated platform, the Internet. Knowledge is powerful and valuable, while the open source approach also has its great advantages. The ‘end of geography’ depends heavily on faster flows of information: if it were to be limited, either by controls to capture economic benefit, or the security worries of people having their personal data on-line, or the battle against fraud online being lost, then a more restricted world could emerge.

So the possibilities of a reversal of the free flow of goods, services, capital, people and money are very real. A significant shift in any one would undoubtedly trigger reactions (counter to or in sympathy) in other flows. Not all have to go into reverse to create a significant shift away from a free market deregulated (in sentiment) world. Economic and political insecurities may reinforce barriers, rebuild the importance of geography and add to regulation. A world of less globalization or a reversal of any of the flows of globalization is likely to increase the importance of geography in finance.

Four scenarios for the future of finance

O’Brien (1998) suggested four scenarios for the future of finance (see Figure 1):

- (i) ‘My word is my chip’: fast technological change; light regulation;
- (ii) ‘Cybureaucracy’: fast technological change, heavy regulation;
- (iii) ‘Safety first’: slow technological change; heavy regulation and
- (iv) ‘Brave old world’: slow technological change; light regulation.

These scenarios reflect the uncertainty in both the future direction in the development and adoption of ICTs, and regulation, as already outlined. At one extreme ‘on the horizontal axis’ the fast development and adoption of ICTs facilitates a world in which better information management overcomes the challenges of imperfect information and combines with advances in neuroscience to lead to a better understanding of human behaviour and to help

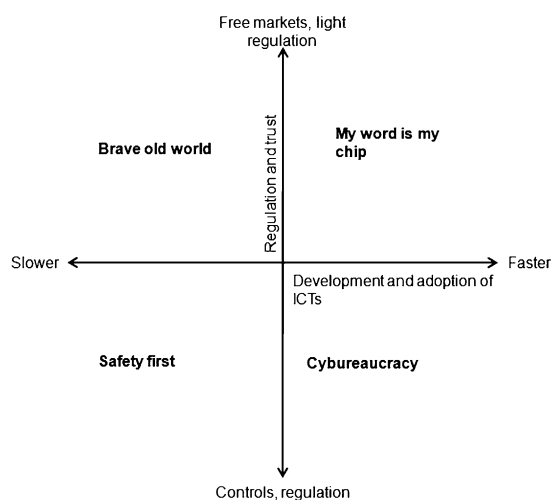


Figure 1. Four possible scenarios for the future of finance.

overcome the problem of irrationality. The other extreme of the axis represents a world in which there is slower development and adoption of ICTs and the challenges of information management and irrational behaviour leading to instability remains. The vertical axis of regulation and trust reflects uncertainty around the future direction of regulation with a continuation of free market and light touch regulation at one extreme and the imposition of extensive, heavy regulation at the other.

While the scenarios were not structured solely with the *geography* of finance in mind, the geography story is different in each scenario. ‘My word is my chip’ is the most likely scenario to lead to the end of geography, where fast technological change continues to eliminate borders and connects markets in faster, novel ways as new forms of communications develop. The light regulation allows the market to self-regulate, with fewer and fewer nation state controls based on geography. This has been the direction in which the world of finance has been moving in recent years.

At the opposite quadrant of the scenario matrix, ‘Safety first’ is the world which should most suit a return of geography. Technology is developing slowly or is even constrained, and high levels of regulation, especially if based upon geographically

constructed powers, will reinforce the relevance of place. In the search for security people and players may favour places and spaces they know best and can trust—insecurity being likely to undermine trust in players on the other side of the world. Even the Internet space is likely to be less trusted. This scenario is probably closest to where we have come from over time.

In ‘Cybureaucracy’, the world of fast technological change, heavy regulation, we might well expect regulators to use new technologies to exercise control—e.g. firewalls abound and by definition rulers will be seeking to be ahead of the marketplace in the use of technology (though the market will undoubtedly also be trying to use technology to avoid rules, as today). Potentially, this is a world where everyone is using technology to try to escape the bounds of geographically defined rules. It may be a virtual world, a heavily regulated Internet world. Thus, this world could be both an ‘end of geography’ world or very much the opposite. Heavy regulation may be a supporter of geography if there is a strong link between regulation and the geography of regulators and regulations, even if applying to extensive online activity.

Finally, ‘Brave old world’, the world of slow technological change and light regulation, is more likely to have quite a high degree of geography, if we assume the virtual worlds of the future do not happen, so the new spaces in the ether are not exploited. However, the light touch of regulation may well mean a relaxation of geographically based rules, the free market moving where it wishes. Again like its opposite quadrant, there is a less clear *a priori* geographical outcome.

The future geography of finance

How might all these changes and challenges play out in the financial marketplace in terms of the future geography of finance? The analysis which has preceded demonstrates a degree of uncertainty as to how the two drivers central to our telling of the story of finance over the last 20 years—technology and regulation—will develop, an uncertainty which is reflected in the scenario structure.

In reviewing the scenarios we shall examine the future geography of finance from three perspectives:

- (i) Location—e.g. of power and governance, of physical financial centres and infrastructure, markets, financial institutions, customers and online finance.
- (ii) Relationships—e.g. how players network between their various locations, how customers, providers and governors network.
- (iii) The structure of financial firms and markets.

Running through these perspectives are the themes of trust, convenience, security, risk, efficiency, competitiveness and power.

Location

If the 2008 financial crisis confirms itself as a major event in the global economy, it will be in part because it may lead to a major shakeup in the power, governance and regulation of finance. Which countries emerge as the future locations of power may be shaped by their financial muscle: the BRICs and asset rich oil states are already using the crisis to make their mark, such as China as a holder of US debt seeking a seat at the table, Russia offering loans to beleaguered Iceland (not for the first time), and in contrast the International Monetary Fund left with a paltry \$200 billion war chest to support nations in difficulty—a third of the US bailout plan, half of the UK's own bank bailout plan, even if the monies are not quite like for like, and small in comparison to the holdings of SWFs (Elliott and Stewart, 2008). Nations are competing, within the G7, to determine the style of bailout and regulatory solution which may or may not be resolved in some new 'Bretton Woods 2.0' approach of cooperation. The crisis may thus both trigger a shift in the locus of power while at the same time reinforce the global level of cooperation, given the integration of markets—where the risk of contagion is seen as being as big a threat as the much vaunted ability of integrated, global markets to distribute (and thereby manage) risk.

Where may be the future central locations of finance? Given the existing levels of infrastructure

they are likely to include the current global centres of New York, London, Hong Kong and Tokyo. As stressed in *The End of Geography*, only three major centres are essential across the globe. However, these centres are likely to see continued competition from the Gulf States (now investing massively in service industries), from alternative centres in China (Shanghai) and within Europe some competition for London (though it should be noted that despite the advent of the euro, there has not been a significant shift of activity from London to Frankfurt or Paris).

If the world starts to turn inward on itself, should globalization falter, or economic and political security become more of an issue, then questions of risk and trust may arise. Can one nation trust its resources being owned or traded overseas in foreign financial centres? Do we need to have greater knowledge as to the location of our money? As noted earlier, certainly foreign holders of Icelandic deposits have had a wake-up call—both at retail and institutional levels. What is a safe haven in an insecure world? What rules will be invoked by countries to seek protection: the UK use of anti-terrorism laws to protect UK deposit holders was a surprise to many, as was the US application of the Racketeer Influenced and Corrupt Organization Act to seize banking assets in the Bank of Credit and Commerce International case in 1991.

The continued success of London as a financial centre despite intense competition mounted from Paris (the home of EuroNext, Europe's stock market alliance now merged with the New York Stock Exchange (NYSE)) and Frankfurt (the home of the ECB) has given strong indications of what it takes to be a global financial centre and to attract the global players: a comprehensive array of markets, trusted regulation, openness, high quality business services and available skills, good transport links, a large attractive city in which to live, a favourable tax regime, a history of global trade and an international language. Within its time zone, it is quite likely to remain very competitive. It is probably in Asia where the competition will intensify between more cities, as the megacities arise, as China and India become more powerful—China as a source of savings, India proving

its ability to compete in certain services as seen in the outsourcing revolution. The levels and styles of regulation differentiate these countries from each other and may be an important shaper of the locus of global financial services at least in Asian time zones.

Of course, an important dimension of the ‘end of geography’ of finance is its loss of physicality as financial transactions move online, albeit backed by physically located call centres. The electrification of the payments and trading systems is now well embedded in wholesale finance with the switching of markets from trading floors to computer screens,⁵ though the advance of online shopping is still in its development (it is still well below 10% of retail spending, albeit growing and forecast by some to reach 40% by 2020 in the UK),⁶ and cash still lives though we steadily move closer to the ‘cashless society’. Cash seems set to stick around for a good deal longer, whatever card companies’ advertisements suggest; “the use of cash is decreasing at only 2–3% a year in the EU15 and if this trend does not accelerate, the use of cash will remain dominant for many years, especially in the central and southern parts of Europe”.⁷ Finance has also led the use of mobile technology: the first call ever placed on a commercial Global Standard for Mobile phone was on 1 July 1991 by the Governor of the Bank of Finland, telephoning the Mayor of Helsinki to talk about the price of Baltic herring. Looking to the future, the current Finnish Governor suggests, “The mobile phone can become the ideal platform for personal payments” (*ibid*). Nonetheless, the adoption of technology by consumers is never guaranteed: the first ATM was installed in New York City in 1939 and withdrawn 6 months later for lack of consumer interest, the return of this new geography-changing technology having to wait until 1967 with the first Barclays ATM, in the UK.

Relationships

Global cooperation but with new power balances looks set to underpin the new relationships, at the level of power, governance and regulation. The alternative is still a 1930s collapse into isolationist

behaviour. Are financial firms going to continue to consolidate into a few global super players? Consolidation clearly results where failed firms are rescued by others. Nationalization may work in the opposite direction, in the short term at least, as nations recapture their own less-than-commanding heights of capital. At a supra-regional level, just as the integration of Europe’s banks was accelerating (the acquisition of ABN Amro being a standout case), the financial crisis may have brought this process to an end for a while, unless failure ultimately leads to extensive cross-border firesales of assets. Will geography return as a unifying factor for institutions, focusing on local relationships and services, or will part of the solution be the integration and consolidation of niches and horizontal mergers? New relationships via ownership may result where rescue programmes are led by cash rich overseas players, e.g. SWFs bailing out banks.

Threats to customer security from the prospect of failed financial institutions—banks, pension funds and insurers—may lead to a risk-wary consumer thinking harder in the spirit of *caveat emptor*, reviewing with whom they deposit their funds and from whom they borrow their money. A renewed sense of the importance of the relationship is likely to develop, which may limit some players wishing to extend their geographical reach too far—even if their local system is also in trouble—better the devil you know?

Thus the financial crisis can be expected to lead to a re-examination of relationships within finance, the role of institutions versus markets, capital backed risk versus securitised risks and a realization that in the high-tech ‘My word is my chip’ world, at present no one knows what is going on. Geography may become more important for a while, as customers place trust in those they know, which may be the local bank as much now as the big global bank. For the first time the level, relevance, even existence of deposit insurance has become widespread knowledge and phrases such as ‘moral hazard’ and ‘too big to fail’ have entered the popular lexicon.

There is another key relationship issue, that between risk and responsibility. The massive

outsourcing of credit risk responsibility in a securitised system, lenders relying on rating agencies for risk assessment, reliance on clients to rate themselves (self-certified loans), the reliance on the self-regulation of banks and the reliance on black boxes, algorithms and equations to replace tough judgment calls, has played a significant role in the current crisis. Such outsourcing is in itself a form of 'end of geography', a relaxation of the close relationships often tied to place but not necessarily to physical proximity. In response to delocalization there could be relocalization.

Structure

Thus, the structure of financial firms will be under re-examination: where is the chain of command, who regulates whom and who takes credit judgments, and preferences between local and global. As *The End of Geography* was being completed, the USA was going through the final touches of the repeal of Glass Steagall, the regulation introduced in the 1933 crisis to separate the powers of US commercial and investment banks. It has taken the 2008 crisis to complete this process, with the remaining investment banks now finally seeking the ability to take retail deposits. While it may be that, with hindsight, we conclude that the 2008 crisis is far less significant than it may seem today, we can ask, what laws put into place today may shape financial markets for another 75 years (like Glass Steagall) before they disappear?

In the immediate future, the first structural revision is likely to separate many of the high risk, trading activities from the M&A corporate finance activities of investment banking, to review the role of the unregulated activities of hedge funds, to re-establish stronger retail relationships where local banks had switched to reliance on wholesale funding, to separate toxic assets from healthy assets (through 'bad bank' ideas and nationalization) and to re-examine relationships between banking and insurance, remembering that the biggest single support act in 2008 was for American International Group. The process is not being confined to the banks themselves, with regulators re-examining their structures, as well as clearing and other 'infrastructure' activities.⁸

The geography of the future scenarios

With these three dimensions in mind, location, relationships and structure, how may the future geography of finance develop, using our four scenarios as a background?

'My word is my chip': fast technological change, light regulation

The prospects for this classic end of geography world will depend on the regulatory impact of the present crisis to prove temporary, or at least not reintroduce significant new powers that rebuild the power of geographically based rules. To remain open, these rules themselves will need to be based on global cooperation as opposed to protective actions policed by a Bretton Woods-style deal.⁹ The old Bretton Woods was full of geography, being an agreed fixed exchange rate system dominated by the USA, far from a free market. In this world, regulators will need to acknowledge that cooperation amongst regulators to sustain openness as far as possible is the way forward and re-establishing forms of light regulation that allow the market to take risk decisions, albeit under sounder conditions than to date. 'My word is my chip' is a chastened world that learns from its mistakes, not business as usual but nonetheless generally a free market allowing players to drive innovation. In that case, we can envisage continued consolidation across borders of firms and markets, even if the legacy of the crisis may be that some of the 'big beasts' will be nationally owned (a geography angle) but working as global actors. If regulators and players revert to national identities in their pursuit of power, we will be heading for 'Cybureaucracy' (the scenario whose odds of emergence must surely have risen).

However, if light regulation is to work, it will need to be based on trust. Relationships in finance need to be based on strong levels of trust, trust of firms in each other and between customers and financial players and with regulators—and ultimately trust in the reliability of the system. A return of geography could well be part of this revived level of trust, in that all actors will be seeking to better understand and relate to the identity of others. Familiarity

with the counterparty's location, culture and attitudes could well revive. If 'My word is my chip' is the future, then as its name suggests, markets will continue to be shaped by new technological inventions. Mobility of trading away from even screen-based dealing rooms should increase, with the ability to trade from your mobile—in the manner of the Finnish Governor's conversations on the price of herring. Machines will do more of the trading. Humans will focus on the human relationship needs and perhaps involve themselves more in creating the added level of trust over and above that which will have to be there in machines. Trust in the efficient management of information will draw on the ideas discussed earlier as information technology management advances.

'Cybureaucracy': fast technological change, heavy regulation

The odds on 'Cybureaucracy' being a likely future scenario must have increased, with the critical uncertainties around what types of regulation, who is the regulator and where this leaves the free market approach. Location is likely to be more important, in linking rules with regulators and governments, especially with nationalized players more important. Even if funds still move rapidly, players will want to know more about geography from a security point of view, just as the 1974 Herstatt crisis forced a re-examination of the settlement risks, in time and space. Will each country act to ensure they have some sort of stock market for the trading of their own companies? This is the world where foreign ownership will be under new scrutiny. In 2007, the slow integration of stock markets took another of its periodic steps forward in ending geography with the coming together of the NYSE and EuroNext (itself having brought together the bourses of Lisbon, Paris, Amsterdam and London International Financial Futures and Options Exchange in London) to create NYSE EuroNext.

The realities of interconnected markets and technologies, the questions of competitiveness in a global world, suggest big will remain quite beautiful, but within these large players, might national players and components wish to reassert their iden-

ties? Will the rapid consolidation of banks driven by crisis merely push us towards ever bigger global institutions? What is the future for the global-but-local brand approach, strongly played over the years by big globally networked banks such as HSBC, Bank of America, Citibank—noting that such players are now as likely to come from China, India and others as from the G7? How far will national identity matter? Again the case of Dutch Bank ABN Amro is of interest: a product of national market consolidation, it pursued its ambition to be a major global player, at one point its US subsidiary being a very significant part of its earnings. But it always sought to sustain a strong sense of being Dutch. Is there a future where the reestablishment of large national banks occurs?

'Safety first': slow technological change, heavy regulation

What happens to the geography of finance, location, relationships, structures, if the antithesis of the end of geography world, 'Safety first', dominates the future? Such a world may well fit a future shaped by countries turning inwards, controlling risk, erecting boundaries around ownership, around firms and markets. The pace of technological change could be arrested not least by a long period of sluggish growth, with a return to tried and tested methods, lack of trust in the models and equation-based marketplaces. Not quite a return to the Dickensian world of written ledgers and clerks but with managements needing to understand the whole process of risk and the relationships upon which they depend. Innovation stops during a long period of review. The unwinding of global leviathans continues. Place matters as a basis for trust. National regulators reinforce the sense of geography.

'Brave old world': slow technological change, light regulation

Of all four worlds, a straw poll today would probably give a 'Brave old world' of slow technological change and light regulation the least likelihood. In the very short term, it is pretty unlikely that re-regulation fever will take time to die down, even if

over time a reassertion of the globalization and free market ethic may be very credible. But should the regulatory fever cool, then it may nonetheless cool alongside a slower advance of technology, if lack of trust in algorithms and black boxes reinforces the need for understanding old fashioned relationships, if slow economic growth has slowed innovation and if the reestablishment of trust starts based on technologies we know. In those circumstances, a slower pace of technology may be a necessary condition for the reestablishment of trust in light regulation. Thus, if we are to see the reestablishment of the free market approach after the burst of regulation, slow technological change may be part of that environment. The review of the excesses of banking would have resulted in a settling down of existing structures, with unworkable large players broken up, and those that still make eminent sense confirming their status. Nationalized players would need to be working as market based players and either selling off their stakes or maintaining them to maintain trust in some of the large players.

Conclusions

The size of the 2008 financial crisis means that it cannot be ignored as a shaper of the future. Yet perspective is important. 9/11 was a dramatic event but did not have to lead to a war on terror or a long war in Iraq. It did so because there were policies and actions ready to be triggered by the event, giving 9/11 massive catalytic power.

The 2008 crisis—if that is how history finally refers to it - is likely to be a major influence for the geography of finance. The odds of a world akin to our scenario of 'Cybureaucracy' have increased with the world of 'My word is my chip' facing some challenges. In summary, we have argued that the crisis can be analysed using the same macro-drivers—the development and adoption of ICTs and deregulation—which lay behind the end of geography thesis:

- (i) advances in ICTs have allowed global financial markets to be increasingly integrated (a neces-

sary but not sufficient condition for the integration of markets);

- (ii) the increasing integration of global financial markets has been also enabled by a political climate which since the 1970s has led to increased deregulation in global financial markets;
- (iii) financial integration has facilitated large capital imbalances which typically are associated with financial crises and led to excess liquidity;
- (iv) advances in ICTs have led to financial innovation—including a swathe of increasingly complex financial instruments—into which the excess liquidity was channelled, both directly into the purchase of derivative products but also indirectly—e.g. by allowing the funding of sub-prime mortgages which were then repackaged as MBSs and CDOs;
- (v) while derivative products have the aim of better managing risk, instead a situation resulted where imperfect information existed over where risk lay or what can be described as the unknown geography of risk (through outsourcing and delocalisation); and therefore technological innovation further increased the risk of instability in the financial sector;
- (vi) just as in 1987 when the October stock market crash was in part blamed on programme trading, so excess volatility in the stock market today is attributed to the role of computerised trading and algorithms (Grant and Gangahar, 2008).
- (vii) it is also likely that the increased integration of financial markets has led to the increased risk of system-wide contagion.

Thus, the world of the 'end of geography'—'My word is my chip'—has resulted in a crisis, as the development and adoption of ICTs and financial deregulation have combined with 'toxic' forces, destroying trust and value—as well as shattering Alan Greenspan's faith in the self-regulatory abilities of financial players. 'My word is my chip' is a very potent scenario—a high risk, high reward world—and it is of little surprise that its opposite is the 'Safety first' scenario. Does the crisis mean that the 'end of geography' has run its course? Stipulations in government bail-outs that banks

receiving government support give preference to lending to domestic banks would suggest that geography might be reinstating itself (*The Economist*, 2009). Yet the world of ‘My word is my chip’ has also delivered an almost uninterrupted, near two decades of rising global prosperity. If it is to be restored after the interruption in service, reforms will be needed to mitigate the risks inherent within its powerful free market, high-tech construct:

- (i) Further technological innovation to overcome the limitations of mathematically-based decision gaming which have been exposed—a microeconomic solution focusing on the better functioning of individual markets;
- (ii) Regulation leading to the tempering of technological innovation—this may explicitly focus on the downside of technological innovation or not, but either way, the outcome of less innovation will be the same;
- (iii) Global regulation to overcome the systemic risks inherent in an ‘end of geography’ world—a macroeconomic solution with a new global order: a Bretton Woods 2.0.

All regulatory solutions do of course suggest a move towards ‘Cybureaucracy’, a heavily regulated but still high-tech world. In many senses, this is now the great choice: how far in this direction to go? What the scenario analysis does suggest is that any fix to recreate the old system is both unlikely and undesirable. Indeed, in thinking about the crisis policy makers should not just focus on what is familiar but also what is unique. Capital imbalances coupled with the development and adoption of ICTs have created the first financial crisis of the networked age (that is, in a world interconnected and in which information is managed in ways hitherto unimaginable).

There may also be a push in the near term towards less trust in technology, at least in the belief in the innovations that have separated risk and responsibility and created the ‘black box’ world of trading. This suggests a re-reliance on those you know and a reliance in the geographies you know: a relocalization of risk. In the longer term, the ability of technology to help remove the human error

element may be tempting and useful, as we have discussed in reviewing some of the next waves of science. For the near term trust in the technology may well have been put on some form of hold, hopefully not as long as the 38 years mothballing of the 1939 ATM. Thus ‘Safety first’, heavy regulation with low technology has its possibilities today. The future looking least likely in the near to medium term outlook would seem to be ‘Brave old world’, the low-tech world of light regulation.

The deepest root and branch review is likely to be in institutional structures in finance: how banks and other institutions trade, reconstruct their balance sheets, deal with risk, understand their business and take decisions. Reviews of remuneration will doubtless be part of the process, but more fundamental changes may be in the manner of trading risk, reining in some of the outsourced responsibility so prevalent in the free market era.

There is a final factor that may become more dominant to shape the geography of finance. The world is undergoing a significant power shift, from West to East, from the richer world to the emerging markets. It will progress in fits and starts. The BRICs are not immune from the crisis: a collapse of Western consumer demand means a collapse of exports. The financial system of China is hardly robust. Nonetheless, new powers from resurgent geographies may seek to put their mark on the future. As a result the future debates may not be between Keynesian logic, European social democrats and the Chicago School of Milton Friedman et al. and the libertarian political philosophy of Friedrich Hayek. The future may well see a number of rival and alternative forms of capitalism and economic models develop with rival forms of finance (and we have not mentioned Sharia banking, for one). The aptly geographical-cultural sobriquet of Anglo-Saxon capitalism may have peaked.

Endnotes

¹ ‘Finance’ in this instance covering the widest definition from wholesale to retail, from rich to poor economies.

² From a classic Goon Show radio episode: Eccles has been in the cellar since he delivered coal and forgot to let go of the sack. He has been eating coke to survive. Possibly the

highlight of the show, the encounter of Seagoon and Eccles produces what may be the quintessential Eccles quote:

Seagoon: What are you doing down here? Eccles:
Everybody's got to be somewhere!

The philosophical appeal of this was not lost on the audience, who responded with the slow-building but long-lasting laughter that is the sure sign of a palpable hit by the scriptwriter. Source Wikipedia http://en.wikipedia.org/wiki/The_Last_Goon_Show_of_All, accessed 20 February 2009.

³ Based on confidential interviews with the authors. The Millennium Bug/Y2K episode is a clear example of how fragile confidence can be in systems when it is impossible to fully understand the whole, or to be able to prove that a system is truly stable. Climate change is a further complex challenge that involves a lot of trust being placed in imperfect knowledge.

⁴ Testifying to the US House of Representatives Committee on Oversight and Government Reform Greenspan noted "Our regulators became enablers rather than enforcers. Their trust in the wisdom of the markets was infinite", before acknowledging that his approach had a 'flaw' that had been shocking "because I'd been going for 40 years or more with very considerable evidence that it was working exceptionally well"; see 'Financial crisis 'like a tsunami'', BBC News, 23 October 2008, <http://news.bbc.co.uk/1/hi/business/7687101.stm>.

⁵ The London Stock Exchange (which had only been in its new tower block for a dozen years when it became redundant) has since moved to a new building which in reality is a few offices, and TV studio and conference centre, with traditional ceremonies such as new issues being celebrated above an modernist sculpture over the opening stairway—ceremonies need locations even if markets do not.

⁶ 'Internet shopping: An OFT market study', Office of Fair Trading (2007) http://www.of.gov.uk/shared_of/reports/consumer_protection/of921.pdf.

⁷ 'Electronic and mobile payments—moving towards a cashless society', speech by Governor Erkki Liikanen to the European Parliamentary Financial Services Forum, Brussels, 1 April 2008 http://epfsf.org/meetings/2008/presentations/liikanen_speech_1apr2008.pdf.

⁸ As reported at the time of writing, <http://uk.reuters.com/article/governmentFilingsNews/idUKL29075420090220>, accessed 21 February 2009.

⁹ Analogies with Bretton Woods have to be dealt with carefully—in this context, we refer to its characteristic as

a workable framework for global regulation, despite its reliance on tight controls over capital flows. A free market friendly Bretton Woods deal would need to provide a liberal context, but offering a useful level of global cooperation and understanding. It would be very easy of course for the intent to result in merely a high level of global regulation. The Marshall Plan may be a better analogy, in that the spirit was one of providing the means (money) for Europe to rebuild itself and the funds enabling the flows of activity to restart.

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