

WHAT THE IT REVOLUTION CAN DO TO ECONOMICS AND FINANCE

This is a very open-ended topic, and I am not at all sure how to approach it. Indeed, I wasn't really even given a title – just a set of related issue-areas that I have had to refine for myself. But that is not really a problem, because it has given me the space to let my own natural cynicism about technology come through. I am not exactly a technophobe; indeed, the little think-tank that I run in London has, over the last six years, held well over 150 meetings on the impact of technology on finance. It has also published a hefty book on the Internet and financial services, and I myself have written two (somewhat polemic) pamphlets on the subject.

So – at least, for a 55-year old male who has never programmed his VCR and who has no idea what his mobile phone number is – I know what I am talking about. (More or less.)

What I am going to do in this paper is straightforward:

- First, I am going to paint a fairly broad-brush picture of what I believe current technology and imminent technological offerings *could* mean for finance, both within a particular national market and globally. (I will also throw in, *gratis*, some discussion of the wider macroeconomy.)
- Second, I will say that it ain't going to happen – and why the next five years or so are going to be a struggle for those foolhardy souls who still believe in the technological imperative and who remain convinced that we are on the cusp of a massive technological revolution comparable only (in a European context) to the development of printing.

I should mention that I was a member of the financial services Foresight panel, set up by the UK's Department of Trade and Industry, the remit of which was in large part to see what the financial services sector *could* look like in 2010. Some of what follows is, therefore, based on the Foresight initiative.

Just to impress you with the breadth of my culture, I should also point out that in contemporary Western philosophy, the error that (I believe) the techno-nuts make is known as the “normative fallacy”. They leap from the fact that technology makes something *possible* to the opinion that it *ought* to happen – and, from that, to a confident prediction that it *will* happen. Well, it won't. Or, if it does, it will happen in such a serendipitous way as to be virtually unrecognizable to the confident

technologist who made the prediction. (This is no surprise: if there are ten variables that determine the future, and in reality there are many more, there are factorial ten futures – or just over one million. So the chances of getting your prediction right are effectively zero.)

I should also point out that I am writing this in the aftermath of September 11, just as US military retaliation is beginning. At the moment, I would not go so far as to say that the global economy has been irrevocably changed (though I wouldn't rule it out either). But I would say that the macroeconomic environment over the next few years is going to be much more difficult than appeared likely only a few months ago. At this point, I don't want to expand on this, since I will deal with it later. But it is worth bearing in mind that – the romantic myth of the high-tech pioneers notwithstanding – technology needs a favourable soil and a favourable climate for it to thrive. And September 11 makes it even less likely that this will be available.

But that is to jump ahead. Let us now look at what technology *could* offer – and to whom.

First, however, what do we mean by “technology”? And by the IT revolution? This is a bit like US Supreme Court Justice Potter's definition of pornography: “I know it when I see it” – even if it is practically impossible to give a comprehensive definition. It certainly includes:

- the processing revolution embodied in Moore's law;
- the almost equally exponential growth of connectivity through the Internet, the world-wide web and whatever (second generation Internet, the “grid”, etc.) is coming over the horizon;
- WAP phones, I-mode, 2½G, 3G and even 4G mobile telephony;
- effectively unlimited bandwidth, etc. etc.

Second, let's look at what we mean (or I mean) by the financial services sector. There are lots of ways to break this down. For instance, by traditional sectors:

- banking;
- insurance;
- brokerage;
- asset management;
- exchanges; etc.

Or by the wholesale/retail split. Or by differentiating the “client interface” (the front end) from the “utility function” (in the back office or middle office, or outside the institution altogether in the world of custody, clearing and settlement netting, etc.). Again, even if we cannot define it, we know it when we see it.

It is, however, worth one digression: Accenture, the former Andersen Consulting, is currently promoting a new way of looking at the banking function. The Androids call it “capability-based restructuring” (CBR) – and they are actually trying to get a business process patent on it. (See below for why this is part of the problem.) What it boils down to is the assertion that the financial institution of the future will (probably) be a very thin customer interface, with virtually all other functions outsourced – to other financial institutions or to third party service providers (like Accenture). It even leaves open the possibility that the customer interface itself could be outsourced; it is certainly something that banks today don’t seem to get right.

I don’t necessarily want to endorse this. Outsourcing is tricky. For instance, it implies a loss of managerial control, which can be very dangerous in times of stress. And, in the banking area at least, regulators seem to disapprove of it. The new Basel proposals on risk-weighted capital, for instance, hit outsourcing with a double capital charge for operational risk since the company that is doing the outsourcing is deemed to take on the operational risk of the company with which it is contracting. But what Accenture’s promotion of what it calls CBR brings home to me is that the very structure of a financial institution may be in flux. A bank (and, equally, an insurer, a fund manager etc.) may be nothing more than a brand and a tiny head-office staff that negotiates and coordinates dozens (perhaps hundreds) of contracts for the provision of services that have traditionally been considered the core competence of a bank – from IT to treasury, from call centres to human resources, perhaps even the management of bricks-and-mortar branches or of websites.

There is an interesting parallel here with the intellectual battle that has gone on for years between competing visions of personal computing offered by Microsoft’s Bill Gates and Oracle’s Larry Ellison. Gates’s vision (which has won out so far) has been to put the PC on the client’s desk, and to have it store all the software, programmes and memory that he needs. Ellison’s much more elegant vision has been to limit the desk-top presence to a very thin client interface – with software, memory, etc. distributed around the network to avoid duplication and to make best use of capacity.

If Accenture is right, banking could be just about to move from the Gatesian era to the Ellisonian world.

Digression over: let us get back to what technology might have to offer in each financial area – but let us also bear in mind that there is nothing immutable about what we know of as a bank (or a fund manager, etc. etc.). We live in fast-changing times, and in a business area where even basic definitions are under constant stress.

Let us look first at retail banking. Leaving aside the outsourcing issue, there has already been a huge internalization of technology, which we shouldn't underestimate – ATMs, credit and debit cards, telephone banking (especially successful in the UK), and of course Internet banking, either as a standalone (e.g. Wingspan in the US, or Uno-first in Europe) or as a bolt-on to an existing operation.

Most of this is now so routine that we don't think twice about it. And most of it – with the notable exception of Internet banking – makes a profit. Absent any constraints (and I might add, absent too much common sense) how might this develop? Well, if you believe any of the futurologists, the retail bank of the future will almost certainly:

- have no branches at all;
- be accessed overwhelmingly via a mobile phone;
- be available “24/7” (known in Europe as Martini banking – “anytime, anyhow, anyplace”);
- offer “wraparound” accounts and constant super-efficient sweeping from one account to another; and
- almost certainly be offered by players other than the traditional banks (since banking is a “trust” business, and traditional banks generate very little trust today in clients who feel they have been alternately ripped off and ignored for years).

Plus, if you believe Accenture, the banking of the future will just be a little sliver of core competence, with a great deal of its managerial effort going into managing lots of other contractual arrangements. (Actually, there is a strong parallel with the auto industry, which already routinely employs contractors working cheek-by-jowl with company staff on assembly lines.)

And that's a very conservative vision. A more radical vision might involve “me-bank” – in other words everyone acting as his or her personal bank, lending money direct to corporates (or others) who need it and borrowing from corporates (or others) who have surplus cash.

This isn't crazy; indeed, there is nothing whatsoever to stop this happening (except inertia and all the other obstacles I will mention later). All you need is a modest step forward in the application of technology to smart cards such that an individual can be paid on to a smart card (or, even better, on to a bio-chip) and can then lend or borrow via the smart card (or chip) and some kind of card reader (fixed or mobile) to/from corporates, either directly or through some sort of intermediary. Lending isn't actually a problem since money (specie or electronic) is money. But borrowing does require the involvement of some sort of rating agency – on a practically real-time basis, since I might want to borrow late at night after a trip to some sleazy night-club. So far, to my knowledge, the big rating agencies (which are the only ones with the financial clout to do this) aren't really looking to individual credit rating – which is generally left to smaller players. But practicalities aside, it is theoretically do-able given the virtually unlimited space on a smart card and the enormous amount of personal financial data that is going to be floating around.

This vision of the future does make some assumptions about developments in cryptography and identification that could be contentious. But I believe very few *technologists* would dispute that the picture I have painted is realistic (and many would say it is inevitable). The problem is not technology (but then it never has been).

One thing I haven't mentioned which is equally realistic in technical terms, but which might be seen as going beyond even “me-bank”, is the elimination of government-issue money altogether, and its replacement by competing claims on corporates or even other individuals. We already have lots of examples of so-called LETS (local exchange trading systems) around the world, which run in parallel with “high-powered” government money. Technologically, there is no reason why I could not keep on my smart card lots of competing special purpose currencies, just as today I could keep national currencies – with the possibility of converting between them, say, over a mobile phone.

All this, and more, is technically perfectly feasible in the narrow world of retail banking.

Most of it could also carry over into other financial areas since the underlying technology translates fairly seamlessly. This means, for instance, that the traditional split between current/checking products and savings products could disappear (indeed, I must confess that I think it has already done so to a large extent). There is absolutely no reason why one should not be able to draw on an investment account – bonds, equities or whatever – exactly as one does on a checking account today, with real time marking-to-market. We have already seen Merrill Lynch and Fidelity become “near-banks”; that is a trend that will continue, and, frankly, there is no reason that the new players should have anything to do with banking as we know it.

It also means that a large part of the investment banking franchise might disappear. Why does a corporate need an investment bank to organize an IPO or a rights issue, or any kind of public or private placement, if it has a website of its own? Indeed, frankly, why does it need one or more stock-market listings (expensive, legally constraining) if it can list all its securities – debt, equity, in dollars, euro or yen – on its own website, perhaps supported by one or more “house” market-makers? That certainly might appeal to GM or GE or Citicorp – to anyone of the increasingly rootless band of true multinationals.

Turning back to the retail sector for the moment, the more new players actually arrive on the scene, the more need there will probably be for financial aggregators.

I am intrigued by the idea of aggregators (even if I am not as enthusiastic as some proponents). There are normally considered to be two financial services models in the retail area competing for the hearts and minds of financial futurologists today:

- the in-house branding/*allfinanz* model; and
- the financial supermarket model.

Although these two get confused, they are actually very different. In the *Allfinanz* model, the customer buys all his products from a single institution – and they are branded with the name of that institution (whether or not they have been “manufactured” in-house). In the supermarket model, the customer goes to a trusted site (which may or may not be a bank) – but then buys products that might carry completely different names with completely different guarantees.

The aggregator model is a variant, which has one advantage: it seems to be working, at least, in the US. Techno-sceptic though I am, I expect to see it make some inroads in Europe and perhaps also in Japan.

What an aggregator (Yodlee, Corillian, etc.) does is take an individual's complex financial arrangements with a number of separate providers (banks, fund managers, insurers, credit card companies, etc.) and then present them in a personalized way over the Internet so that he or she can view the entire portfolio virtually in real time, and make whatever adjustments are necessary. In some cases, the aggregator can do this with real-time direct feeds from participating institutions; in other cases it uses "screen-scaper" technology which copies a web-page that can be accessed with the customer's personal code. Either way, what the customer sees is something that has the look/feel of a single personalized, interactive site. This exists; it works, and (at least in the US) it clearly fulfills a need. To me, it is at least as plausible a model as the *allfinanz* or supermarket models. It also permits – indeed, positively encourages – new players into the personal financial market, and that is probably (on balance) a good thing.

(As a coda, however, it is perhaps worth noting that Citibank UK – which has just rolled out its own aggregator service – has already run into problems with competitors who are afraid it will use the service to undermine their links with clients. Several other banks – LloydsTSB, Barclays, IF – refused to cooperate in the first place. Now, Abbey National, the Halifax and the Bank of Scotland have withdrawn their agreement to let data be pulled from their sites.)

What else can we seriously and plausibly look for?

Well, one corollary of the growth of outsourcing is that a great deal of this outsourcing will be cross border. India already has a US\$1 trillion a year software outsourcing business, much of it based in Bangalore and Hyderabad, and it is said to be growing at 50% a year. In the financial world (which is dominated by English-language players) India and, to a lesser extent, Hong Kong seem bound to be major beneficiaries. Software development is now a global industry, and there is now effectively no reason that many technology-dependent back office operations cannot be done thousands of miles away. Even call centres can be located on the other side of the world: it is, for instance, reported that some firms are deliberately teaching Indians to "speak American" so that they can operate call centres in India for American banks. Of course, there are risks: as US auto companies

learned in the aftermath of September 11, when the ostensibly open borders with Canada and Mexico (guaranteed under NAFTA) were closed, geography does tend to reassert itself from time to time. But further global integration of telecom and software businesses seems virtually inevitable.

Beyond this, however, I think the future is a lot less certain than most technologists (or futurologists) would like us to believe, and I want to use the second half of my paper to concentrate, not on the opportunities, but on the obstacles. Please don't think this is negativism for the sake of it; there are a thousand snake-oil salesmen out there selling various rosy-tinted visions of the future. All I want is a bit of perspective.

This is not a new position for me. Indeed, a paper I wrote at the beginning of 1999 (when Internet fever was at its height) made me no friends by asserting that, in the UK at least:

- Internet banking *could* not work (this was at a time when First-e was in the process of selling itself to BBV for US\$650 million, despite the fact that it had only 16,000 clients);
- Internet broking almost certainly wouldn't work out in Europe anything like as well as it was apparently doing in the US, with the climate in the UK likely to prove extremely inhospitable; and
- If it was going to make money anywhere in the UK financial services industry, the Internet would probably do best at the back end (clearing and settlement, trading platforms, information exchange, etc.)

For a while, I appeared hopelessly wrong – and even I started to lose my nerve. But, as more and more e-ventures have collapsed (notably First-e, or Uno-First as it became, which collapsed in September), I have been vindicated in spades. And it is still going on: for those of you who don't know the site, I recommend a look at the charmingly-named *fuckedcompany.com* which gives the gossip on which e-companies are next for the chop.

I don't want to gloat, but the recent history of Internet finance is pretty dire. Just looking at my press clippings over the last couple of months, I see virtually nothing but bad news. These stories stand out in particular:

- a CapGemini/Ernst & Young study (early October) when reported that almost half of the banks surveyed now believe that the business case for setting up web services may not be viable;

- a *Wall Street Journal* review (October 3) of on-line broking in Germany (the one European market where it appeared to be thriving) which concluded that on-line brokers are now in a critical position – with the best that most can hope for being re-absorption into their (bank) parent; and
- repeated postponements of the much-touted profitability of Egg – the nearest the UK (or anyone outside of the Nordic region or Brazil) has yet come to a successful Internet bank.

Plus, bad results for e-Trade, marketing losses at Yahoo!, falling Internet advertising revenues and a general sense of impending doom in the sector. (And that is only a tiny taster of what anyone can find in the press today.)

But I don't want to get ahead of myself. Before I go through all the reasons why I think the technological revolution is being over-hyped (at least in the financial services sector), I want to deal with a very old-economy (indeed, old-world) problem: the rapid deterioration in the global macro-economy.

It is generally accepted that, with the exception of Japan (which has now experienced a decade of effectively no growth), the industrialized world had – under the guidance of US Fed chairman Greenspan – enjoyed the longest period of sustained economic growth in modern recorded history. Even though a recent report by McKinsey's put this down primarily to productivity increases in "old economy" sectors (notably retailing and the securities industry itself), the consensus, shared by Greenspan, is that this was in large measure due to the IT revolution which had radically changed the sustainable level of productivity growth. With an average GDP growth rate in excess of 3% for most of the 1990s, the US seemed to have solved almost all its economic problems – and many of its political difficulties too. Even though income distribution widened during the period, everyone got richer, crime fell, inflation effectively disappeared (albeit largely because of the falling price of imported commodities) and massive budget deficits were replaced by even more massive surpluses. Up until mid-1999, this best-of-all-worlds (known as the "Goldilocks scenario") seemed set to go on for ever.

Not so. Even at the beginning of 2000, the cracks were showing. The dot.com bubble was starting to deflate, stock market values were falling, the wealth effect was going into reverse and – even though overall levels of both consumer and business confidence were surprisingly high – there were

strong signs that an investment-led recession was imminent. For a while, Greenspan seemed to have everything in hand. Six consecutive cuts in the Fed funds rate (followed, albeit reluctantly, by the Europeans) and an aggressive fiscal policy by the new Bush Administration convinced most economists that the US had a better-than-even chance of avoiding a “technical” recession (defined as two consecutive quarters of negative growth), and the markets in fact did buy back. Then came September 2001.

Obviously, it is too early to assess the full economic impact of the terrorist attacks – even on the US economy (let alone the rest of the world). There is some evidence that, after a virtual collapse of retail spending, there has been some recovery – and that is good news (particularly for stock markets and for the dollar). Plus increased military spending will go some way to offset the impact of that initial hit to consumption. But, inevitably, it will not come close to making up for the loss, and it is hard not to see a further hit to consumer and business confidence if (as I fear it will) the “war” drags on. Realistically, therefore, it seems unlikely that the US will escape recession – and very unlikely indeed that it will achieve total growth of more than about 1-1½% next year. The knock-on impact of that on the rest of the world could be devastating – not least because for a decade or more, the US has been the world’s “importer of last resort”. The IMF, World Bank and OECD have already reflected that in their forecasts for the world economy – which seems likely to do no better than 1.5-2% a year over the next couple of years. For the developing countries, that is going to be devastating.

The point of this is not merely to say that the world economy is in trouble, and that global trade is particularly under threat. It is to emphasize that the industrialized world’s appetite for heavy investment in new technology is going to be very limited indeed; there just isn’t going to be the money to waste. And waste there was in the 1990s. The McKinsey’s study that I referred to earlier makes it clear that a very large part of the surge in IT investment in the 1995-2000 period didn’t produce any improvement in productivity at all. It was wasted. (The figures collected by McKinsey’s are interesting: it is estimated that 62% of the acceleration in IT spending came in 53 business sectors that, together, accounted for just 30 basis points of the 1.1 percentage point increase in productivity growth that accrued between 1995 and 2000.) As this seeps deeper into public consciousness, willingness to make further new high-tech investments will erode even more.

And, of course, there is the 3G Farra go.

I want to explain this a little because I don't believe the full dreadful picture is widely understood in Japan, where your experience with 3G mobile telephony has (generally) been much better than in the rest of the world – at least as far as DoCoMo/FOMA is concerned. Almost everywhere (except in the US, where, for odd cultural reasons, mobile phones haven't made the same impact as elsewhere), telecom operators in the late 1990s decided that the way forward for the Internet, and the only way they could realistically hope to make money, was by moving to increased bandwidth via what was called 3G telephony. Given the fear that new entrants would steal a march on the established telecom providers, the big firms went on an absolutely unprecedented wireless spectrum buying spree – financed by an explosion of cheap debt finance and egged on by the arrival of other big cash-rich players. The result was, as the then-CTO of AT&T put it, a mixture of “hubris and inertia” which eventually led to a global investment of US\$4 trillion in 3G telephony. Just the licenses alone cost astronomic sums: over US\$30 billion in the UK alone, US\$70 billion in Germany and US\$120 billion for the EU as a whole.

And now what's happened? It doesn't work. As academics were pointing out a couple of years ago, in Europe at least, the speeds that were promised under the UMTS 3G standard were always unrealistic given the problems of getting planning permission for the required density of 3G masts and given the obvious fact that the speed of the entire system tends to be determined by the speed of its slowest links. At best, 3G services in Europe are (for the foreseeable future) going to be just a little bit faster than “souped up” 2½G – a fact reluctantly accepted now by both BT and Vodafone in the UK (and about to be accepted everywhere else). This means no live video or music clips over mobile phones. Considering that it is estimated that telecom companies will have to sell about ten times more content over 3G phones than over 2G, in order to make a profit on their investments, and considering that live video is off the menu in Europe at least, the future looks bleak for 3G – and license holders have been hit (quite appropriately) by the markets.

To be fair, the underlying economics of 3G in Europe and the US have changed a bit. In the US, for instance, over 30 broadband carriers have gone into liquidation in the last year or so – which means that competition in the sector is a lot less intense than it was. In Europe, several countries have already done deals to cut the cost of 3G licenses (and/or to extend their life, which amounts to the same thing). France, for instance, has announced that it is slashing the cost of a license from E4.95 billion to E619 million – and extending the life from 15 to 20 years. In Germany, the pressure for

similar relief is almost certainly irresistible. This means that the economics are being improved – but only a bit.

In the meantime, the launch of full 3G services is also being pushed further and further back, and the general climate for taking major technology punts in Europe and the US is awful. There is tremendous admiration for what DoCoMo (and others) are doing in Japan. But, elsewhere, the appetite for this kind of risk is now very limited – and the whole gamut of technology investments will be hit by the problems of 3G.

(Of course, it is not just 3G that has been a disappointing and expensive experience. In Europe, at least, Bluetooth – a local area wireless system that would enable all electronic equipment to be operated on an interactive basis – has proved bitterly disappointing, despite what I certainly saw as a most attractive sales pitch. In the US, WiFi, a wireless LAN, does seem to have worked a bit better, but its penetration is still trivial compared to the investment that has been sunk into it.)

So that's where we are at the moment. But, what are the obstacles that I alluded to earlier, which (in my view) are going to abort the recovery that every technologist still dreams about?

Here, I want to apologise in advance for being excessively US and European in my orientation. The situation may genuinely be different in Japan; certainly, what one hears from the outside does sound more encouraging – even if I have a sneaking suspicion that, were I to know more about technology take-up in Japan, I would probably be less optimistic.

In my view – beyond the problems posed by the dismal history to date of Internet finance, beyond the crippling debt burden that many tech companies now face, beyond the sharp deterioration in the global macroeconomy and beyond the huge structural changes that are going to obsess the financial sector over the next few years anyway – one must also look at a half dozen other factors:

- the absence of a general management “buy-in” on technology;
- the near-certainty of a crippling clash between individual Internet users’ increasing demand for privacy and (post-September 11) the insistence of Western governments on a “right to snoop”;
- the continuing obsession of consumers everywhere with the alleged insecurity of the Internet;

- the unsustainability of effectively tax-free e-commerce;
- the virtual certainty that lawyers are going to gum up the system; and
- the propensity of governments (particularly in Europe) to regulate everything to death – a propensity from which the Internet will not be exempt.

Let's look at management first. Every couple of years the CSFI publishes a survey of what worries senior bankers (retail, corporate and investment) in the UK. The last survey we did was in 2000 – and it was very revealing. Among the “top ten” risks (most of which had come from nowhere) were:

- e-commerce (No.2)
- grasp of new technology (4); and
- high dependence on technology (5).

In other words, three of the top ten fears revolved around technology (the top fear, incidentally, was an equity crash).

When we tried (in part, through qualitative interviews) to understand these fears, we discovered that there are really two things on managers' minds:

- the fear that some disaster will strike; and
- the fear that they don't really understand what is going on in the first place.

Obviously, the two concerns are linked – and they are both quite rational. Sooner or later, there will be a big disaster – if you like, an “e-Barings”. To date, though no one has much data to go on (which is itself a problem, since reputational risk means that losses may not be publicized), scams have been pretty small-scale and losses seem to have been fairly trivial. (The fact that everyone still tends to reference the problems Citicorp had with Russian hackers moving money out of private accounts, something that happened five years ago, reinforces the impression that nothing terrible has happened yet.) In the end, however, something big *will* happen – and managers seem glumly resigned to it, and to the fact that they won't understand what it is when it does hit them.

What this means, in my view, is that, generally, managers are not fully committed to the new way of doing things. In fact, many may well be looking for a way out – and now they have plenty of excuses.

Second, the privacy/snooping issue – which I think has become much more problematic (and, potentially, much more damaging to the prospects of high-tech finance) since September 11.

There are also two issues here, which tend to pull in diametrically opposite directions (though both are damaging):

- the individual's growing demand for electronic privacy; and
- governments' increasing demand that no area of the Internet (or indeed of technology more broadly) should be off-limits to officials.

It is, I think, insufficiently appreciated in Europe (and perhaps also in Japan) that one of the big drivers of the early Internet in the US was the American e-public's stunning indifference to privacy – and to what happened to the information that was collected by companies like Doubleclick. Data collection, list selling and data mining were all fine in the US, so long as no one really knew what was going on. But when Doubleclick bid for Abacus a couple of years ago, everything changed – and US consumers are now even more paranoid than Europeans about Internet privacy. The problem is that, if you improve privacy protections, costs will rise sharply. Unfortunately, that is the direction we are going in – and the recent US/EU “safe harbour” agreement (which some still believe is a solution to the problem) effectively does little more than enshrine a new high cost approach to e-commerce.

To my knowledge, no one has yet tried to quantify the impact of this. But services that were, in the past, already overwhelmingly uneconomic to sell over the Internet, even in an environment in which data mining could be a business in its own right and in which personal data could usually be sold by the company that collected it, are not going to be made any more attractive (or more profitable) if service vendors have to get specific permission every time they want to sell on data – and, indeed, in some cases, if they want to cross-market themselves. And that, I fear, is the way things are going.

As for governments' propensity to snoop, you are no doubt already aware of:

- the extreme distaste with which almost all governments (with the notable exception of the UK) viewed attempts to introduce “unaccounted” digital money; and
- the new powers that many governments had taken on, even before September 11, to track activity on the Internet.

The problem with restricting electronic money to those versions where the chain of ownership can be established retroactively is that, for many (perhaps most) people, that removes its comparative advantage over specie. Whatever the convenience of plastic or a chip, the anonymity of cash gives it a tremendous edge – and, so long as governments continue to frown on unaccounted e-money (DigiCash, original Mondex) take-up will be limited. I see no sign that governments are going to change their view on this; indeed, I think it will be reinforced by what happened on September 11.

It is not yet clear just how September 11 will affect governments' approach to the Internet (and to technology more widely), but it is already clear that, in future, everyone's favourite Internet cartoon will no longer be so relevant: "On the Internet, nobody knows you're a dog" will have to be rephrased – *governments* will know. They will know partly because of the aggressive use of existing legal powers (in the US, for instance, the Digital Millennium Copyright Act, and in the UK the Regulation of Information Provision Act) and partly because of the new latitude given to governments post-September 11. In the US, for instance, the Senate debated for only 30 minutes before giving the government increased powers of Internet surveillance via its controversial monitoring software, Carnivore. In the UK, new anti-terrorist legislation will apparently require all businesses to retain records of e-mails and Internet usage for 12 months – up from three months at present. (And, unlike at present, the law is likely to be enforced.) The extra cost of this, though to date unquantified, is likely to be very considerable – and seems likely to push marginal e-players out of the business altogether.

The third big stumbling block for Internet finance is the perception that it is hopelessly insecure.

Everyone who knows anything about the Internet is aware of just how insecure it can be. After all, *phrack.org* provides a perfectly comprehensive website for anybody who is either a hacker or who wants to be one. There are also hacker magazines, even hacker conventions, and all the tools for the up-to-the-moment hacker can be downloaded from sites like SATAN. I well remember one meeting at the CSFI, where the main speaker was the chief executive of Actis Technology, one of hundreds of UK electronic security specialists. While he was lecturing us on the dangers of cyberspace, he actually made four perfectly acceptable credit cards (with legitimate numbers), with which he could have purchased (*though he didn't*) goods and services over the Internet. We have

had the same general point made by SRI, by Kroll Associates, and by lots of other security specialists: e-commerce is inherently insecure.

Of course, at one level, everyone realizes that much of this is nonsense: after all, even today, shopping for anything over the Internet is much more secure than giving out credit card details over the phone (or giving one's credit card physically to a waiter). But that isn't the point. As an executive of Virgin told us some years ago, when his company was trialling Internet banking in a small English town, he managed to convince everyone that the Internet was safer than using a credit card – and the only measurable impact was that people in the town stopped giving their credit cards to waiters.

Every recent study of Internet use (including one the CSFI did) puts security at the top of any list of consumer concerns, and it is clear that a feeling that Internet banks are not secure is a big reason for the pathetic take-up of most Internet finance offers.

It is true that this is a problem that can be addressed. Indeed, it is being addressed through trust services (like the Identrus multi-bank initiative) or the new(ish) SET standard. There are also endless international initiatives at the EU, G8, Council of Europe, OECD and UN levels. But there are two problems:

- any solution is going to add to the complexity of using the Internet or e-commerce more widely, and it is going to be expensive; and
- no solution is really going to work, since the fear it is trying to address is largely irrational – and will be magnified by every child hacker who penetrates NASA's computer systems and by every "pump and dump" share scheme on some otherwise insignificant bulletin board.

We at the CSFI suggested a few years ago that it would be in the general interest to have a public data-base of cyber-crime, perhaps on an anonymised basis, so that some of the worst myths of Internet security could be exploded. Our proposal – which involved all regulated financial entities being required by their supervisors to report breaches of consumer security to a third party – has gone nowhere. But there are public/private partnerships in the US, known as ISACs, which have worked quite well at promoting information-sharing on security issues within the financial industry. So far, however, they haven't even made a dent in consumers' perceptions about Internet security.

The next big problem is taxation

Put crudely, e-commerce is, at present, living in a fiscal inter-regnum that is unsustainable in the longer term. In the US, interstate sales over the Internet (of anything) benefit from a sales tax moratorium which lasts until 2003 (or 2005) and which is estimated (by state governors, who admittedly have an axe to grind) to cost the states themselves up to US\$30 billion a year. In the EU, sales over the Internet by entities that are not based in Europe can avoid VAT rates of up to 25%. Even ISPs are affected: Freeserve (UK) has, apparently, only just noticed that AOL was able to avoid charging 17.5% VAT to British subscribers by signing them up to AOL (US). As a result, UK-based ISPs have (it is said) threatened to move offshore *en masse*.

This isn't really the place to discuss all the issues raised by Internet taxation, but two points are worth making:

- Whatever happens in the US (and at the OECD level), the EU seems determined to bring e-commerce into the fiscal net. Although the UK has (so far) dissented, the general feeling is that some way must be found to stop Europeans evading VAT by buying digitized services (be they financial, entertainment, or whatever) over the Internet. Several proposals are currently under consideration; whichever is finally chosen will inevitably have two consequences – the Internet will suddenly become a significantly more expensive place to do business, and selling any kind of business cross-border will suddenly become more difficult. (There will be more forms to fill out, more boxes to tick.)
- The economics of the Internet are already so fragile that it is hard to see how it will absorb this kind of shock. In this case, attacking what the EU refers to as “harmful tax competition” could actually kill a high proportion of e-commerce activity.

Next is the issue of legal uncertainty. There are several aspects to this, but again I want to highlight two.

The first is the danger that e-commerce will be overwhelmed by a mass of business process patents. I have already alluded to Accenture's attempt to obtain a patent for its CBR approach to banking. There are even more ridiculous examples: Amazon.com's “one-click” fulfillment system, a simple

algorithm used to determine the order in which offices in New York are cleaned in the evening, etc. etc. I particularly like one patent (acquired by DE Technology of Maryland) which claims to cover any computer-to-computer process for carrying out cross-border financial trades using Internet protocols. At the moment, this is no more than an irritation; but GE Capital has over 300 lawyers working full-time on business process patents, and intellectual property specialists around the world are seriously afraid that virtually any kind of financial innovation could become bogged down in endless IP litigation. As one lawyer put it to us, if the Eurobond was invented today, it would be patentable.

The second is the choice of law issue. This is one of those fiddly legal debates that is all too easy to overlook, but that could suddenly blindside the unwary. There is a debate going on today – in the EU and more broadly – over amendment of two international agreements, The Hague and Brussels conventions, that, together, determine what kind of legal redress a consumer should have if he/she purchases something on a cross-border basis. Although, in the EU, the recent agreement (at the Commission level) on a Distance Selling Directive for Financial Services does provide some assurance that the seller will not be liable to be sued in every country where a purchaser is resident, this still could be the case if the consumer lobby gets its way. What is certainly not the case is the only approach which makes any sense in an e-world: that, if you visit a website to buy a service, you are actually buying the services (and, therefore, all the ancillary protections) in the country where the company advertised on the website is located. In the end, the failure of governments (who are in thrall to consumer lobbies) to accept this simple and straightforward approach will be a very big blow to the continued take-up of e-commerce.

My final obstacle to the shiny new high-tech future that everyone else seems to see for global finance is the propensity of governments everywhere to regulate that which they do not understand or which they believe threatens their franchise.

There are lots of excuses for regulation. Indeed, I have already alluded to many of them. The use of electronic technology by terrorists, either to communicate or to transfer money, is a pretty obvious one post-September 11. The desire not to see the tax base erode is another. There is also the continuing threat of pornography, racism, sexism and all the other “isms” that good citizens of today don’t like. You will remember the incarceration of CompuServ executives in Germany, and

France's ruling that it is illegal for any website accessible in France (which means any website at all) to offer for sale Nazi memorabilia that reminds the French of their deeply inglorious war record.

One could go on. The RIP Act in the UK; in the US, the legal persecution of Napster. In the EU, the apparently endless bickering over the Distance Selling Directive (though, I hope that it is now coming to an end)... The point is that the authorities, who gave the Internet a generally easy time while it was growing, now want their piece, and they can easily use the consumer lobby to justify a much more interventionist approach. I don't want to be too parochial, but, on this score, I think what is going on in the EU Commission is in some sense a microcosm of what is going on more generally. In Brussels, there are two directorates-general with wildly differing approaches to e-commerce which they are trying to incorporate into European legislation:

- (what used to be) D-G XV, which is broadly supportive of financial innovation, and which is felt (by opponents) to be in the pocket of the banks; and
- (what used to be) D-G XXIV, which believes (and this is almost a verbatim record of what a D-G XXIV official told a CSFI meeting) that the Internet is dangerous, that consumers are easily confused, and that, therefore, it is the job of the Commission to identify and plug any loopholes as far as consumer protection is concerned.

So, to conclude, while most reasonably intelligent analysts see us poised to make a great technological leap into a new high-tech world of Internet banking, "me bank", 24/7 banking, etc. etc., I find myself painting a very different picture. In my picture, a malign combination of governments and lawyers – which sees the Internet in particular as a threat – is on the verge of capturing what was the wonderful anarchy of technology. In taming technology, I fear it could well strangle it.

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October 24, 2001