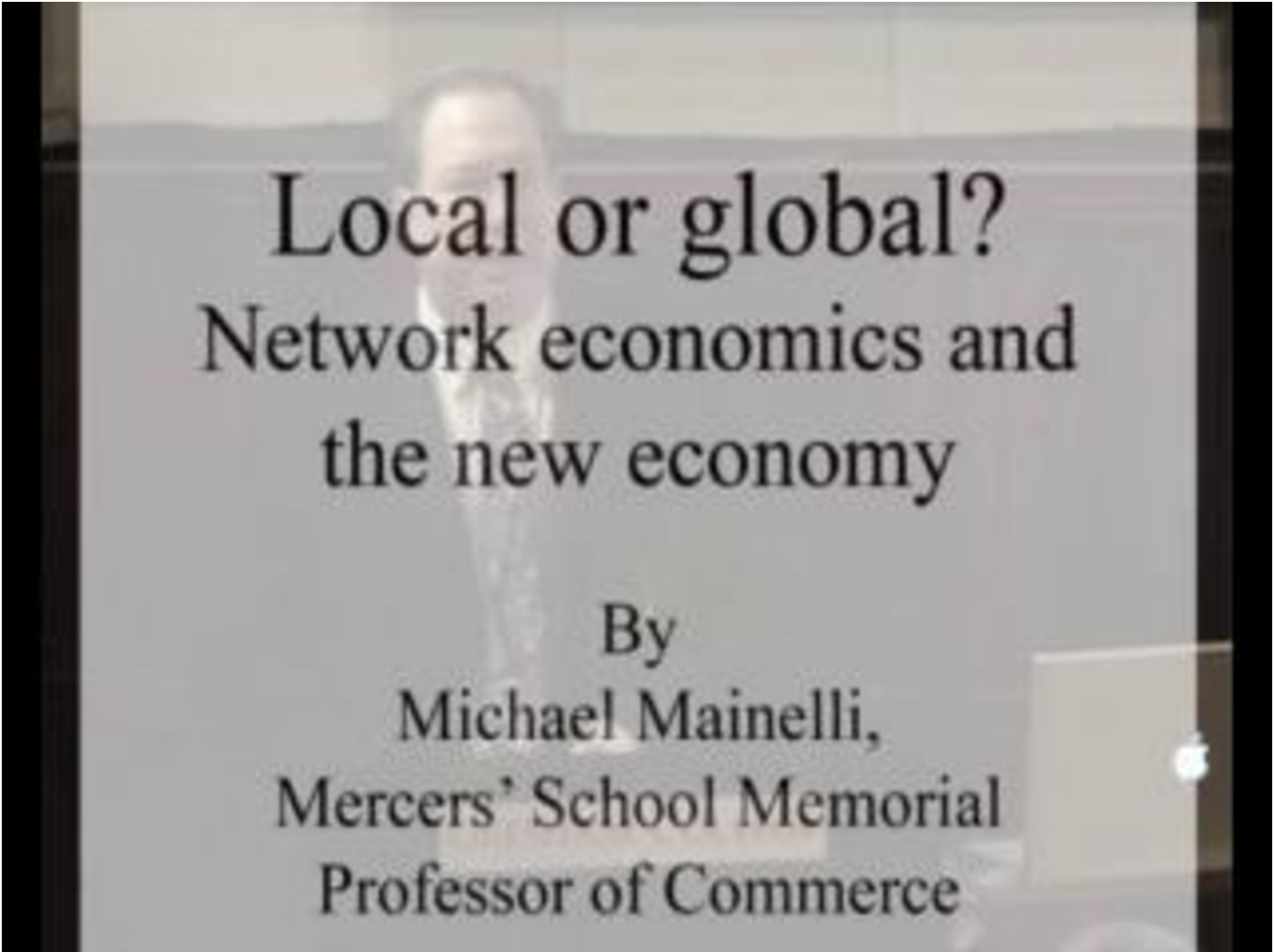




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Local or global? Network economics and the new economy Transcript

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By
Michael Mainelli,
Mercers' School Memorial
Professor of Commerce

Local Or Global?

Network Economics And The New Economy

Professor Michael Mainelli

[SLIDE: OUTLINE]

Good evening Ladies and Gentlemen. Tonight we explore "the near and the far". In a globalised economy are our networks the "new new" or the "same old". Before we start, as Gresham regulars know, it wouldn't be a Commerce lecture without a commercial so I'm pleased to announce that the next Commerce lecture will be "Beyond Price: Trust Me, I'm Commercial" here at Barnard's Inn Hall at 18:00 on Monday, 2 March 2009.

An aside to Securities and Investment Institute, Association of Chartered Certified Accountants and other Continuing Professional Development attendees, please be sure to see Geoff or Dawn at the end of the lecture to record your CPD points or obtain a Certificate of Attendance from Gresham College.

Well, as we say in Commerce - "To Business".

Global Village

[SLIDE: THE GLOBAL OLYMPIC VILLAGE]

When I was a child in the summer of 1964 my father hired a television set to watch the XVIII Olympics in Tokyo. I was mesmerised. Joe Frazier won the gold in boxing and an unknown Billy Mills won the 10,000 metres gold for the USA for the first, and last, time. It was amazing to have the finest athletes from around the world performing in our sitting room. As I grew up, I discovered cheating. So did the Olympics. As I grew up, I discovered drugs. So did the Olympics. As I grew up, I discovered corruption. So did the Olympics, and on a global scale.

As I grew up, I also discovered sport. Baron Pierre de Coubertin's famous quotation is "L'important n'est pas de gagner, mais de participer." - "The important thing is not to win, but to take part." Aside from participating in the vast television and promotional rights, budget overruns and "legacy" developments, Olympic participation apparently still has something to do with sport. As sport, the Olympics are phenomenal, but they are also intimidating; intimidating enough to impede participation. I've watched people quit certain sports because "they wouldn't be good enough", good enough compared to some professionals they watched on television. Don't bother unless you have a genuine shot at being the best.

In today's global village you rarely have unobserved success or failure. Imagine Charlie, a footballer of a couple of generations ago coming from a small hamlet. You meet him regularly in the village pub. In his youth Charlie was the most gifted and talented footballer amongst all the local teams. Charlie went off to play for his county and country. Unfortunately, Charlie choked on a key goal at some world event far away from the village. At worst Charlie's mistake may have been heard on the wireless. Back in the village folks would buy him a drink - "That's my mate Charlie. Used to play football together when we were kids. Did you know he played in the national final?" Today's Charlie will be constantly reminded of failure from mates who watched him choke on national television, who rerun the botched play for the rest of his life on video highlights or YouTube. "That's Charlie. He blew the key goal in the national final. Wanna see it?" The global village can inhibit just as the isolation of a tiny hamlet can inhibit.

Before moving on, I'd like to note another issue with the Olympics pertinent to tonight's talk, the intensification of nationalism. Modern Olympics seem to promote nationalism, rather than peace. Each participant is "owned" by his or her nation. The citizenship of over 100 athletes was challenged in Sydney; the Athens games closed with roars of "Hellas, Hellas"; the Beijing games ended with displays of national power. Each event ends in a ritual draped with flags and emblems of nationality. The closing ceremonies are an almost martial display of nationalism, and the national team organisers go back to count the national medals as if they were owned by the nation, not the athletes, in order to justify larger budget appropriations from the national government. Here's a heretical thought - perhaps we should abolish national affiliations during the games and just allow the finest athletes to participate? Which brings us nicely to the next point in tonight's talk, central or local.

[SLIDE: NETWORK OPTIMETER]

One of tonight's questions is should we prefer the brittle resilience of a very nervous central system to being nervous about robust but decentralised economic systems? In my fourth lecture three years ago, "Goldilocks Government and the Market: Not Too Little, Not Too Much, But Just Right", I postulated a measuring tool for optimality; there was a government optimizer, a competition optimizer and a community optimizer. I pointed out that Hayek and Buchanan believed that community interaction and exchange, i.e. commerce, was the proper focus of economics. I put forward Simon Jenkins' calculation "that France, for example, has one elected official for every 116 electors, Germany has one for every 250. In the UK the figure is one for every 2,605. ... In 1900 Londoners elected 12,000 citizens to run public services, councils and boards. In 1997, Londoners voted for 2,000 officials, but some 10,000 people were appointed by central government to boards and quangos." This lecture moves on to some economic implications of new communities, examining what a network optimizer might read - what are the balances between global and local, between centralised and decentralised.

We all know of absurd centralisation. The picture here is of Chao Kli Ning's Kwik Klining Duck Tea House and Laundry in the fifth century BC at the time Chao Kli Ning created the Kwik Klining Duck Tea House and Laundry's centralised Sanitation Facility. To quote the great man, "... the common theme is soap and water. Henceforth we shall save both time and money. Take the clothes from this laundry and the dishes from that restaurant to the same place. There they shall be washed together to the benefit of our bottom line." [Mainelli and Harris 2000, page 20] Of course, the hero's plan was a failure as laundry was tainted by tea and socks turn up in customer teapots.

[SLIDE: CENTRAL AUTHORITY - MARTIAN INSIGHTS]

We live in a country where the answer is often, "Centralise!; What was the question?". If a Martian had to conclude what two countries most resemble each other based on a view from outer space, it might well conclude France and the UK were most similar. If you look at a map you see that all roads and railways lead to Paris or London, the main decision-makers reside in Paris or London, even the night sky points you to both capitals. Every government review of two or more functions concludes that centralisation could result in savings. Government bureaucracies will employ 10,000 people just to ensure that two people don't wind up duplicating some effort. Nobody in UK government, or any centralised organisation for that matter, would agree with Robert Frost's [1874-1963] poem "The Hardship of Accounting":

*"Never ask of money spent
Where the spender thinks it went.
Nobody was ever meant
To remember or invent
What he did with every cent."*

[SLIDE: STARFISH OR SPIDER?]

So, is this a paean to decentralised government, such as the USA or Germany? Not necessarily. Decentralisation too incurs waste and duplication, though of a different nature. There are immense turf squabbles among the federal authorities, the state authorities, the counties and the cities. The various branches of government quarrel with each other. Savvy actors play off various parties against each other. As Chao Kli Ning concluded, "Decentralisation is especially good as long as everyone marches to the same beat." [Mainelli and Harris 2000, page 26]

Further, isolated communities lose diversity and virility. You may have experienced the social dynamics of a small village or an island community. Visiting is one thing, but there are different, non-urban behaviours must be observed to live there. Whether one takes literature, for example Nathaniel Hawthorne's [The Scarlet Letter](#), to look at how dysfunctional isolated communities can behave, or takes economics, for example the presumed Japanese keiretsu business networks' isolation from market forces to see how closed networks are sub-optimal, not all decentralisation is good.

Brafman and Beckstrom's book, [The Starfish and the Spider: The Unstoppable Power of Leaderless Organizations](#), puts forward a metaphor. If you cut bits off a starfish they may regenerate or even replicate, but cutting off its head will kill the spider. The spider is centralised. The starfish decentralised. Today's decentralised examples include Alcoholics Anonymous, Apache, Craigslist, Gnutella, Linux, Skype, and Wikipedia. Brafman and Beckstrom ponder, "what happens when there's no one in charge - when there's no hierarchy". To varying degrees these organisations exhibit a type of decentralisation rarely seen in commerce until recently. Traditionally companies emulated military command and control systems. With this decentralisation has come new structures of commerce and ways of making money, such as indirectly via advertising, via donations, via many very small transactions or via selling information about transactions.

[SLIDE: NEW NETWORKS]

While larger, older financial exchanges talk about "global liquidity pools" in times of crisis, the newer exchanges focus on helping their customers get better prices with lower transaction costs. They are also quite innovative at finding new customer needs. For example, there is a plethora of "prediction markets" hoping to capitalize on "The Wisdom of Crowds". Some will become quite large. InnoCentive (www.innocentive.com) is a new stock exchange that connects scientists and engineers ("solvers") with cash prizes for finding solutions to corporate ("seekers") technology problems. Following in the footsteps of the original 1997 SixDegrees website, we now have LinkedIn, Facebook, Xing, Friendster or MySpace, social networks in the jargon.

The new exchanges are social in two senses, they promote more direct social interaction and they are often socially responsible. These new exchanges are creating new communities. For example, Kiva (www.kiva.org) is a social exchange that helps people lend to small entrepreneurs in the developing world in order to help them escape poverty. A New York Times article of 27 January 2008 by Rob Walker, "Extra Helping", points out that Kiva and other similar initiatives are overwhelmed by donors. Intriguingly, in the developed world too there are several analogous exchanges for people who want to lend directly to other people, e.g. the UK's Zopa (www.zopa.com - a P2P/peer-to-peer social money lending service) or the USA's Prosper (www.prosper.com - an online auction site for borrowers and lenders). Zopa and Prosper are really just first-world micro-finance organizations, emulating Muhammad Yunus' Grameen Bank and its third-world lending.

[SLIDE: A LOT OF NET WORK]

At many points in recent years, investors and economists have chanted four expensive words, "this time is different". For a variety of reasons they claim that economics will be transformed by new networks. A network is simply an interconnected system of things or people. Mathematics has a lot of fun with network graphs, for example network graph theory is applied in particle physics, computer science, biology and operations research. Equally, networks are important ways of representing relationships. The World Wide Web only accelerates the application of network mathematics with increasing automation and recording of everything from telemetry to phone calls to web links to social networks. Network mathematical techniques are being applied to communications, sociology and the World Wide Web, leading to applications in fraud detection, epidemiology and pharmacology, with formal definitions of "centrality", "betweenness" and "closeness".

[SLIDE: THREE PILLARS OF SUSTAINABILITY]

The economic sociologist Neil Fligstein observes that "Market society has produced more income, wealth, goods and services than any other form of human social organization. It has done so by creating the conditions for social exchange across large groups of human beings, often separated across large geographic spaces. For most observers, the driving forces of this wealth creation have been technology and competition." [Fligstein 2001, page 3]

Globalisation is about people, resources and capital. Should we examine these new networks and exchanges in terms of their ability to globalise or to localise? Could it be that these emerging new network structures will change social, environmental or economic structures? An appealing call for structure comes from those arguing for "sustainability". For people to live sustainably, our planet's resources must be used at a rate at which they can be replenished. There are many calls for sustainability, sustainable cities, energy, agriculture, architecture or business. Cutting through much debate, there is broad agreement that a simple model of sustainability consists of three "pillars", social, environmental and economic. All three pillars must be present in order to support sustainability. Basically, as with any taxonomic structure, one can argue at length about other hierarchies that might constitute a structure for sustainability. Many people suggest additional pillars, such as culture or education or technology.

[SLIDE: THREE PILLARS OF NETWORKS]

Still, the structure suggests that where social and environmental concepts meet we develop a bearable system for the planet, for example preserving wilderness. Where the economic and social concepts meet we ensure equity, for example eliminating poverty while accepting income variations. Where the environmental and economic concepts meet we create processes that are viable over time, for example not over-consuming resources. Clearly, the ideal scenario is one where social, environmental and economic pillars are balanced and we can claim to have a sustainable society. It is not such a leap to suggest that this lecture should further examine network economics along these three pillars - social, environmental and economic. Let's start with the social pillar.

Social

Dr Matthew Haigh at the Toulouse Business School emphasises the importance of combining economics and sociology. He points out that economic assumptions of perfect competition, perfect information and no external shocks are artificial world, not real world, assumptions. In contrast economic sociology should attempt to examine networks, for example how social relations structure investor, producer, consumer or agent behaviour. The effect of trying to develop economic sociology is to undermine neoclassical assumptions of profit maximisation and provide richer views of economic relations such as fiduciary trust, value, responsibility or incentives.

Many influential thinkers have attempted to enrich economics with sociology, or sociology with economics. Pierre Bourdieu (1930-2002) extended ideas of capital, such as social capital, symbolic capital and cultural capital. For Bourdieu, power derives from connections and responsibilities. In his 1973 paper, "The Strength Of Weak Ties", Mark Granovetter united micro and macro sociological theory by pointing out the richness and complexity of social networks. He developed a sociogram-based diagrammatic approach to examine social relationships. Granovetter diagrams are often used to model social interactions in economics or computer systems. Granovetter's key insight for economic purposes is that economic actors value the relationships in networks as well as the economic value. Granovetter was early at seeing that changing social relationships in social relationships leads to fads and "tipping points", later popularized by Malcolm Gladwell in his book, The Tipping Point.

[SLIDE: NETWORK THEORY]

Lately that social context has been more strained. We have more of Granovetter's weak ties at the expense of strong ones. Studies of heavy Internet users show that they have larger overall networks of contacts, but strained relations with family members. We struggle to know whom to contact best, how - email, text, broadcast, phone call, video conference, even a visit. We know how to mash up, but not how to make a cup of tea and listen. This affects the nature of commercial networks.

Haigh points out that "Granovetter and Fligstein [2001] argue that networks serve to generate trust between actors and discourage malfeasance and by so doing, guarantee stable outcomes and market survival. - Organisations and individuals engage in economic exchanges to accrue various forms of capital: social, economic, cultural and others." Haigh refers to a definition of social capital found in [Portes and Sensenbrenner \[2001, page 114\]](#):

"those expectations for action within a collectivity that affect the economic goals and goal-seeking behavior of its members, even if those expectations are not oriented toward the economic sphere."

This definition recognizes that many of these new networks are social networks first, then opportunities to influence economics. Perhaps a corollary is that all social networks do affect economics. The implication of Bourdieu and Granovetter is that, when associated with many forms of social interaction, "maximization" is pathological. Henry Markowitz [1952, 1971] grounded much of modern finance using portfolio optimization. Economic sociology points out how artificial any maximization seems in social contexts. As an example, Haigh notes that "Fiduciary responsibility is manifestly something different to the kind of asocial attention to maximization suggested by the individualised classic mean-variance optimizers of Markovitz [1952, 1971]". Yet many global social structures are cold, distant and artificial, lacking in humanity. We have grown distant from our fellow man, more accustomed to terms such as "collateral damage" or "strategic necessity". To paraphrase an expression I first heard at the International Fund for Animal Welfare, compassion means caring about the specific as well as the species. "Lahouari Addi wryly points out, "C'est peut-être la raison pour laquelle les sociétés modernes ont besoin d'inscrire dans leurs Constitutions ce principe naturel que les hommes naissent libres et égaux." "It's for this reason [that people forget nature when deep into structural hierarchies] that modern societies need to write into their constitutions the natural principle that people are born free and equal".

It's popular to apply human behaviour to economics to turn the economically irrational into the humanly rational. Applying sociological economic analysis also often turns the economically irrational into the socially comprehensible. Applying sociology is not new. Karl Polanyi, in his book The Great Transformation, first mooted the idea of "embeddedness", the economy is embedded in social institutions which control the market so it does not endanger other aspects of human life. Polanyi sees embeddedness as an essential control of markets, while Granovetter sees embeddedness as an essential viewpoint; markets grow from social relations. "What looks to the analyst like nonrational behavior may be quite sensible when situational constraints, especially those of embeddedness, are fully appreciated." [Granovetter 1985, page 506] Socially sensible interpretations of economics explain why you may deal with a particular storekeeper despite him or her not having the lowest prices, why there is such emotional stress over small shops, or how people value personal medical advice at certain times and impersonal medical advice at others. Muhammad Yunus says, "Mainstream free-market theory suffers from a "conceptualization failure", a failure to capture the essence of what it is to be human." [Yunus, 2007, page 18]

So, in summary, commerce is social; social relations matter; and changing social relations will change economics. Recognising the richness of social and economic relations shouldn't be strange to Gresham regulars. In many ways Gresham College's use of the term "commerce" attempts to unify social interaction with economics.

Environmental

[SLIDE: STRINGBALL COLLECTORS OF THE WORLD UNITE!]

Not surprisingly, while there is a large amount of wider environmental sustainability to discuss - and a lecture last autumn devoted to it - the biggest environmental issue in many of these new network economics is the World Wide Web. These new networks are grounded in the assumption that the cost of connecting people over distances and time has fallen significantly, forever. While I question this assumption, for tonight let's look in a bit more detail at the changing environment of commercial intercourse. This diagram illustrates in 3-D the actual domains and connections of the world wide web. Colours have been added to represent .edu, .gov, .com, etc., domains. Of course, as this representation of the World Wide Web underscores, what many analysts are claiming is that the Internet's structure reflects changing social and economic networks. Given that some of these links are global and small, probably. For example, you can find links among all the sites dedicated to the abolition of seal hunting. In times past, those links would have been sparser, as the committed are few relative to the population, and the links would have been expensive to maintain. I suspect new connections apply to the collectors of stringballs as well.

It's interesting to revisit historic Internet claims. Michael Wolff, writing about his Internet adventures in his 1999 book, Burn Rate, describes the Internet in 1994: "Internet users, working in ASCII text and UNIX commands, were really very modest in their claims about the medium. The grandest metaphors had to do with community, with town meetings and bulletin boards. No one was saying that the Internet had anything to do with TV or entertainment. (Even if you could, why would you want to turn this into a medium that mimicked television? We already had television.)". [Wolff, 199, page 143] The implication of all this is that the Internet has been more than a social or technical change. By changing connections, information and the costs of both, it has transformed the environment too.

[SLIDE: LAWS OF POWER]

Scale free networks are interesting - a power law or fractal description of networks is often more appropriate for social networks. In a scale free network the distribution of node connections is logarithmic. Noteworthy networks that are scale free include protein networks, while social networks such as the world wide web and citation networks are believed to be scale free. This power law idea is important. A power law distribution means that very few people or websites or blogs get most of the traffic, though everybody gets a bit. A few Googles or Yahoos or Amazons, and lots and lots of holiday snap sites. In a normal distribution the mean and the median are similar, so most sites are average with a few very large or small. Following a power law, some people have 10 times the average connections, a few 100 connections, even fewer 1,000 connections. People are beginning to analyse the Internet, and thus the economic connections of the Internet, with a greater appreciation of what it means to have non-normal distributions, the so-called fat tails and long tails.

[SLIDE: ERDÖS OR BACON NUMBERS?]

Equally, connectivity has led to a bit of fun. Small world networks epitomise the idea behind Six Degrees in 1997, that we are separated from every other person on the planet by only six connections. The prolific Hungarian mathematician, Paul Erdős is taken to be the core of many mathematical cooperations. Mathematicians now have an Erdős number - how far they are removed from Paul Erdős. Taking the idea a step further, actors and actresses now have a Bacon number. No, this is not the distance from scientific studies conducted jointly with Francis Bacon, but rather the distance the actor is from Kevin Bacon in terms of films. Even better, based on Six Degrees of Kevin Bacon, there is a game to find, through Wikipedia links, the fewest number of pages between any two random subjects. The person with the fewest links to topic wins. At this point we should probably break out into the Disney song, "It's A Small World", but they'd probably hear us over the Internet and we'd get sued.

Many researchers apply these network techniques to a variety of subjects. For example, Professor Geoffrey West at the Santa Fe Institute asks, "Why are large cities faster?". By implication, how does one take the social temperature of a city? The Boltzmann Constant relates particle energy to temperature of a gas. Is there a Boltzmann Constant linking the energy consumption of a city to its social temperature, or the metabolic rates of cities and villages?

David Orr suggests a sustainability principle that "no human being has the right to diminish the life and well-being of another and no generation has the right to inflict harm on generations to come". [Orr, 2006, page 266] The closer I can get to another

human being the more likely I am to be able to judge what diminishes their life or well-being. I wonder how that can be achieved at a global scale. It probably can't, and I wind up relying heavily on what other people tell me in a concentrated way.

[SLIDE: THERE OUGHT BE A LAW]

Net popularisers invoke Metcalfe's Law or Reed's Law. Robert Metcalfe helped develop the Ethernet, thus George Gilder coined Metcalfe's Law as "the value of a telecommunications network is proportional to the square of the number of connected users of the system". As in the diagram here, one telephone is worthless. Two telephones are a bit limited. Five telephones is getting somewhere. Many telephones are worthwhile. According to the law, a network with 20 telephones is four times more valuable than a network with 10. There are some arguments about users versus devices, that all connections are not equally valuable, logarithms versus exponents and the rate of growth, but the main point of Metcalfe's Law is the observation that the growth in value of a network is not linear. Naturally, people apply Metcalfe's Law to social networks. Equally David P Reed coined Reed's Law, stating that the value of the utility of large networks, particularly social networks, can scale exponentially with the size of the network. His key observation is that the sub-groups, each of which have value, create a value for the larger group, a "group forming" law. Is there a richer equation which points out that some networks begin to exhibit diseconomies of scale? When does Metcalfe's Law go into reverse?

Economic

[SLIDE: RUSHEY GREEN TIME BANK]

Many people extol the idea that changes in both the cost and availability of information, combined with new social networks, shall transform markets, their scale and their logistics. Of this I have little doubt. Today's day traders can move across borders and buy and sell currencies, stocks and commodities on a global basis. We've gone in a decade from the idea of car boot or garage sale or flea market being local affairs for the school or church or community centre, to the great jumble sale in the sky of Ebay.

We've talked about global social, environmental and economic trends, but let's look at something very local, Rushey Green Time Bank near Catford in London. A partial inspiration for this lecture was reading David Boyle's 1999 book *Funny Money*. As the publicity states, "Only our limited idea of money is keeping us poor". Boyle and others point to numerous alternatives to the fiat money of government. There are all kinds of alternatives to government money. Folks talk about local currencies such as Ithaca dollars, Brixton Bricks, Manchester Bobbins. A very popular approach is a local "time bank" where people can swap hours of each other's time.

Jorge Luis Borges said, "You can't measure time in days the way you can money in dollars because every day is different." Despite Borges, for every hour you spend helping someone at Rushey Green, you are entitled to an hour's help in return. Rushey Green Time Bank was one of the first of its type to be established in the UK, and since 1999 it has proven to be a radical, empowering and transformational form of volunteering that gives self-confidence and stewardship to people who had previously been passive recipients of care or marginalized.

Numerous mutual exchanges take the form of simple housework, clearance, shopping, DIY, befriending, cooking, baby-sitting, paperwork, massage, IT help, walking someone's dog, picking up mail, lifts to hospital or doctor's appointments or exercise classes. Rushey Green Time Bank blurs the distinction between givers and receivers and encourages more vulnerable people such as the elderly and those with mental health needs to get involved. Rushey Green Time Bank helps to build grass roots community based self-help and mutual support. It promotes coproduction, the idea "that services are successful only when the people being served are involved". Local Exchange Trading Systems (LETS) such as Rushey Green Time Bank are trying to link up; there is a UN programme, UNILETS; there is a shareware system, Ripple. While time banks are an excellent example of community exchange, they supplement rather than supplant traditional money. Few make a transition from community organisation to influencing significant chunks of local business. There are problems defining the value of time, for example a solicitor's versus a babysitter's.

[SLIDE: LOCAL CALCULATIONS]

The problem is that "community" is many things, ranging from lending to people with similar ethnic, gender or religious biases, to investing locally. Businesses are communities too. In the 1980's I had the opportunity of seeing first-hand how hard it is to define communities analytically when I did some strategic planning work with the Post Office. There were over 20,000 post offices then, but which ones mattered for the community? We deployed models, such as the Voronoi diagram you see before

you, to try and optimize locations, but against a central plan. I've had to use similar modeling approaches in areas such as waste pickup or water distribution points. Paul Collier points out though that small, isolated communities will miss out on "spatial economies of scale in manufacturing". He refers to Paul Krugman and Tony Venables' concept of "economies of agglomeration" [Colliers, 2007, page 82], where firms benefit by clustering. I agree that these economies exist, though they do not need to be national. Clusters of furniture makers across northeastern Italy or manufacturers in central Germany show that strong clusters do not need to be that large, while a global customer base and competition ensures connection rather than isolation.

And it's not just physical distribution, people also want to lend and invest within their communities. In the UK, a host of regional stock exchanges died by the 1980's as trading centered on London. In the USA a century ago there were hundreds of stock exchanges, but things consolidated on a handful of national platforms. This national consolidation was not just due to competitive success, or "liquidity begets liquidity", it was frequently driven by regulatory or legislative forces that believed centralization, consolidation or size were important to regional or national success.

Geographic risk is real. If you want to invest wisely, it can make a lot of sense to invest in firms you see daily. As you pass by you can see the customers' cars or bicycles, you meet the employees socially, you can tell whether the firm is well off, or not. Studies of venture capitalist investment note that there is a bias for successful investments to be closer to the headquarters. Geographic proximity reduces uncertainty by improving information quality and interpretation. The "local" venture capitalist knows more things of more relevance, and makes better investment decisions as a result. A simple, but real, example, when accompanying one venture capitalist on a tour of a potential foreign investment he remarked at how "quiet" the local economy seemed, not realizing that it was a local religious holiday. He declined to invest in what turned out to be a fantastic company.

Given the resurgence of "locality", often unremarked is the scale and organization of local barter networks or exchanges (e.g. www.nationaltradebanc.com or www.itex.com), where people can exchange your hairdressing skills for my tins of paint for her small airplane flight. Some of these barter networks are enormous, and not just because a few people may not be declaring tax. Equally there are significant moves to create local exchanges for investors. It may sound strange, but it is hard to find local investment opportunities in a national or international environment. You can google investment opportunities half-a-world away, but not realize that the same opportunity might exist locally, around the corner from your house or office. In the UK, the regional development agency for the West Midlands (i.e. the Birmingham area), Advantage West Midlands, fought regulatory battles to get permission for a pilot project to build a local investment exchange, the LBX project. The basic idea was to promote investment opportunities in the region by matching local investors with local companies.

Extra-National

[SLIDE: FREE REPUBLIC OF FARRINGDON WITHOUT]

Traditional analysis, a bit like the Olympics, evaluates things using national boundaries. We have seen the rise of micromovements based around someone publishing a manifesto. They then make it easy for followers to connect with them, and with each other, and then increase feed-through by finding ways of tracking progress. Money is rarely the object. Many of these micromovements transcend national politics. Professor Ian Angell of the London School of Economics & Political Science was one of the first to point out that the boundary-crossing ventures were likely to create new communities and new elites as he expressed in his 2000 book [The New Barbarian Manifesto](#). Expect more confusion over boundaries and natural communities as people find more and more ways of linking up, Reed's Law again. What is the boundary of an organism or a city or a network? We have enough trouble defining cities already, imagine the difficulty establishing the boundary of an online network. Registered users? Frequent users? These questions may start to affect real world measures such as GDP or value-added for tax purposes.

Further, expect challenges to the idea that government controls trade - new communities might be much more vocal about how governments inhibit their effectiveness through trade restrictions, and have the democratic clout to do something about it. On the other hand, looking at things like news articles on six French aid workers in Chad or Britons caught in Sirius Star hijackings, avalanches, tsunamis or other incidents abroad and you can easily see that the state both extends its ownership at the same time as we happily accept its implicit protection. The free state of Farringdon Without (Gresham College's City ward) is a long way off. In fact if anything is clear, it's that these new networks transcend physical geography. Expect to see novel definitions of social geography, leading to novel definitions of taxation.

Mutual Currency

Modern definitions of money state that money is a medium of exchange with two properties - it can be used as a unit of account

and it can be used as a store of value. When you think about it, with whom do you need units of account and stores of value other than your community. If the units of account and stores of value had no social context, then why would people care about Sovereign Wealth Funds affecting local economies - money should be odourless.

Every time you deal with the world you need a rate of exchange for the unit of account. For some time government has held the monopoly of force on your assets and labour and dictated the value of the unit of account. I wonder if this age of Credit Crunches doesn't raise serious questions about the unit of account. An hour of labour stored in some of these time banks doesn't sound so stupid when we look at wild fluctuations on the value of what the government-based currency is worth.

The National Health Service (NHS) could possibly use some time currency of its own. The legacy that a decade of Labour Government has left is a not-noticeably-improved yet more expensive NHS. In conversation a couple of years ago with a special advisor to the Government we pondered the Labour's legacy. I pointed out, "if the NHS did what it said on the tin, then there would be no need for private health insurance". In the UK, private health insurance is really just queue jumping, i.e. it's really just converting cash into time bank money to get treatment from the same people sooner, outside of their NHS hours and ahead of others. If the NHS worked, private health insurance should struggle. Sadly, private health insurance has had a stonkingly good decade. If we had had NHS time bank money, which way would it flow?

Narrower definitions of value and units might apply to the Credit Crunch. Pierre-Joseph Proudhon, the 19th century radical anarchist proposed a People's Bank, rather similar to many cooperatives or mutuals. In the midst of today's credit crunch, it's intriguing to remember the deluded demutualisation that preceded it. In our modern three-way taxonomy, "public, private, non-governmental organisation", we seem to have lost a key fourth category, mutuals. Mutuals were dull, whether they were building societies or stock exchanges or insurers; someone stood to gain when they were incorporated and sold. Risk then became disassociated from the holder; it lost its social contact. One person sold a mortgage, another funded it, yet another raised the savings for the funder, still one more sold the funded mortgages as packages to a disassociated third party. One of my recommendations for reform post Credit Crunch is to increase mutualisation so social connections keep things more in kilter. Local currencies take this notion to their logical conclusion.

[SLIDE: THE FAROUT]

Recently, the Euro debate has raised its head - should the UK join the Euro, should other countries, should some leave. This debate highlights an interesting related question for a currency - how much you do or don't trust politicians. At one extreme, if you don't trust politicians, then you'd like their hands as far from the levers as you can, and I'd argue that a gridlocked entity with strict rules and over 30 nations participating is almost ideal to ensure they can't muck around with the currency. If you do trust politicians and they are very close to your community, why not give them more control of the levers of the economy and even bring out your own local currency - I'd like to propose the FarOut for this ward of Farringdon Without. In fact, if the government really wanted to reduce inequality in Britain, an interesting start might be to divide the country into two currency zones, London and the rest. On the other hand, Muhammad Yunus believes that eliminating poverty means moving to a global currency.

[Yunus, 2007, page 226]

"Is the Internet in fact too chaotic or too concentrated to yield a more attractive democratic discourse than the mass media did?" [Benkler, 2006, page 239] Benkler answers his own question, suggesting neither, but "if not 'just right', [the Internet] at least structures a networked public sphere more attractive than the mass-media-dominated public sphere". If we have new networks, but money still talks, then local currencies might start to confound economics and democracy. What's so wrong about selling a vote? We talk about democracy as giving each person a voice. Well, in local currency terms those voices may deserve different volumes, just as shareholders vote with different voices depending on the number of shares they own. Perhaps communities and time banks should give each person a vote based on their net community contribution represented as currency. For different communities one person might equal one influence unit, but that influence unit might be time, wealth, talent or military contribution. This sounds radical, but our current voting structures are weak feedback mechanisms run infrequently. Markets interfere with democracy as, first, market changes can't wait for a four or five year democratic cycle to come round and, second, many democratic outcomes are not economically efficient. A frequent result? Corruption.

Resilient Versus Robust

[SLIDE: CHANGING SCALES]

A focus on efficiency drives you to single measures. Economists love discussing economies of scale, diseconomies of scale,

returns to scale and learning curves. Basically, when an organisation focuses on doing one thing, it should get better. When people look to maximise economies of scale, they frequently forget that concentration can increase "brittleness", or the idea that you have a single point of failure. Likewise people in markets like to talk about liquidity, which includes the concept that liquidity attracts liquidity, or that a central market is more efficient. Smaller markets have larger spreads. Imagine trying to sell your house just to 20 of your friends. You'll get a large spread as most of them probably don't need a house. If you advertise the house nationwide, you're more likely to get a small spread on the price offered. Historically large spreads meant trade was inhibited. Further, large spreads lead to high volatility, another indicator that trade is inhibited. But now high volatility and high spreads attract trading. New networks permit new pools of liquidity to be joined up. However, just as many Internet promoters predicted infinite change, economies of scale and liquidity don't just tail off, they usually pass a point where they go into reverse.

Coase looked at transaction costs affecting the size of firms. High transaction costs result in bigger firms, and lower transaction costs in smaller firms. We should be seeing an era of smaller firms as transaction costs fall. The evidence is mixed, and I wonder if we're moving towards a stronger power law distribution of firm size. I also wonder if transaction cost falls are offset by the need to increase distribution to reduce risk. We all deal with Amazon because it's low cost. Amazon has distributed risk globally, both because it needs the scale to achieve low cost, and because it can make more money. You can't run a firm without looking at risk distribution, and one could argue that risk distribution leads to a need for certain larger, distributive firms, or at least firms well distributed throughout networks.

[SLIDE: "WHAT IS THE SOUND OF AN ARMY'S FOOTSTEP?"]

Chao Kli Ning also pondered central and local when he asked, "What is the sound of an army's footstep?" [Mainelli and Harris 2000, page 18] The problem is that all this connectivity and centralisation leads not just to economies of scale, but also single points of failure. A resilient system returns to the state it was in. A robust system can handle major changes of state. I talk of "resilience" as the ability to handle extremes within the same systems, or "robustness" as the ability to use the same system in different environments. Resilience is getting by through a shock - resilient systems perform within the range of historic volatility. Robustness is getting over an enduring change in the environment - robust systems handle step changes in volatility. As a sailor, I think of a Bristol pilot cutter as a robust boat - able to handle a lot of conditions - while an America's Cup boat is resilient - great unless it really blows.

One can build resilience into a traditional electrical system, let's have a backup power station. A robust power system might be solar cells on rooftops. Perhaps more expensive, but difficult to see how it would ever cut out. There are systems in between, for example water cisterns in the UK. Though the cisterns were originally installed to help provide local pressure and separate local water from getting back into the mains systems, when there is a water outage the cisterns provide a temporary store of water. The cisterns provide an unintended robustness.

So connectivity and locality can provide robustness. If the Internet is down, I can run round for a chat. On the other hand, many of these localised units, while adding to global robustness, have a single point of failure in their dependence on the Internet.

[SLIDE: GLOBAL VERSUS LOCAL]

I'd like to marshall our thoughts so far against this slide that contrasts views of global and local. On the vertical axis we have competition, from low to high, protected to open. On the horizontal axis we have diversity, from left to right, low to high. The four resulting intersections are worth a mention:

- ◆ low competition and low diversity can be efficient in terms of economies of scale. This is fine so long as situations are known and stable - known knowns you might say. For me, one of the most interesting economic problems in this space is posed by Airbus. As it looked as if Boeing would have a monopoly on large passenger aircraft, the European community, at great expense, created a competitive duopoly by launching the Airbus. Though Europe has probably come out even, the benefits from Airbus have spilled across the world through more diversity and lower prices;

- ◆ high competition and low diversity are found in a lot industries, for example less-regulated utilities (these days) such as phone companies or oil companies. Firms don't want to deviate too far from established technologies, such as how to drill an oil well, and compete on many factors of efficiency and effectiveness. These industries tend to be resilient - often with a large asset base needing protection - but react poorly to radical environmental changes;

- ◆ high diversity and low competition is rarely found, and when found it is often due to peculiar regulation or high, but uncertain growth. An example here might be the peculiar relationship of travel agents and airlines before the Internet leading to lots of

small firms; or the high growth rate of blogs on the Internet as people try to work out how to make money. Another case is where there are high barriers to entry and much uncertainty, so people don't invest heavily, awaiting a transition to a more stable environment;

◆ high diversity and high competition is characteristic of very robust systems, very often accompanied by decentralisation. However, this is not an unalloyed good. Analysis frequently shows easy ways to increase efficiency, but analysis tends to ignore social forces and power structures. If these robust systems become powerful, people tend to get nervous. The Internet has moved in 15 years from being a peculiar place for geeks to something that everyone has opinions on regulating. Power centralises if you can move people from a decentralised robust system to a more centralised resilient one where you control some of the bottleneck points. Watch the current battles over clean tech and whether we should have some decentralised wind and solar points selling excess energy over the grid, or just some new large, centralised nuclear or "clean" coal plants.

One final analytical problem is worth noting. Resilient systems are often measured on the "economies of scale" of how much cost per unit. Resilient systems are usually cheaper on this measure. Robust systems are better measured as options, they provide a richer range of responses, but cost more.

New Economy

So what can we anticipate? First, look to see ideas and structures flowing back across the Internet. Too often we seem to view the Internet as peer-to-peer communication in the developed world, but broadcast to the third-world. Many of the so-called third-world or developing economy micro-finance models seem equally appropriate in the developed world. The developed world has its poverty too. Moreover, if necessity is the mother of invention, look to the third-world for inspiration. Expect more application of third-world ideas in first-world contexts, e.g. mobile-telephony-based exchange applications developed in Africa moving to the streets of New York City or London.

Second, networks and exchanges need to promote more direct social and local interaction. Too many networks and exchanges seem to believe that globalization should reduce direct social interaction - let's be all virtual. Actually, the more social interaction exchanges can provide, the more likely they are to keep their members or customers. Barry Fineberg promotes "spatial ordering: communities of interest at appropriate levels of need" as important for sanity as well as investment. Perhaps networks should be more modular, cells, cascading groups of ten, cohorts, fractal units. Technology can help here, using geo-referencing and networking tools to create micro-clubs, but we need the human aspect of real people meeting other real people, not just cyber-bots transacting with avatars. So, expect to see as much investment directed towards social networking and tools, e.g. interest group meetings, conferences or magazines, as towards trading technology.

Thirdly, expect to see many changes in the way we analyse businesses. There are far too many exchange opportunities left, wherever risk or opportunity can be exchanged, direct peer-to-peer insurance, peer-to-peer pensions, property exchanges - for any existing exchange to try and develop them all in-house. Consider Amazon providing you with a set of books for a study programme that is audited by a testing network and underwritten by a network of mutual employment insurance. If you read the books and pass the tests, you're guaranteed to get a job, or draw unemployment benefit from your peers.

Network analysis will be deployed more and more. Instead of focusing on old economic ideas of optimal firm size being a debate around marginal cost equaling marginal revenue, we could see optimal network size. Optimal network size might be measured on many dimensions, social, environmental and economic. Like marginal revenue and cost, each addition to the network should increase the value of the network more than it costs, or the network is beyond optimal, but then we have networks of networks and portfolios of relationships, not a straightforward corporate delivery model.

Customers may want scale in technology and reach, but they also want it hidden behind a local face. If social networks are changing, then economics is changing. The challenge for those seizing the opportunities of network economics will be, "to think global, act local, be social".

[SLIDE: DISCUSSION]

Thank you.

Discussion

1. Who pays for increased robustness?

2. Might it be rational to prefer isolation to competition?

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