'A Sort of Umbilical Relation': Capital Flows and the Scopic Portal of the Computer Screen.

Abstract:

Since the boom years of the 1990s, the economic importance of capital flows has superseded that of flows of trade in goods and services. Digital technology has bred the hyper-mobilization of money and a dematerialized financial market. The same technology has facilitated the real-time transmission of images from the public domain, and thus the democratization of news and social media; but it has also fuelled unbridled financial speculation and the volatility of capitalism's boom and bust cycles.

In considering this dichotomy, my paper will look at the virtual environments of 24-hour financial markets and online computer games, comparing traders' immersion in the electronic 'flow world' of financial data with computer game players' projection of their senses into what they consider believable teletopographical scenarios. In Massively Multi-player Online Role-play Games (MMPORG's) such as *Doom* and *Second Life*, players' anxieties, elation, and moral and ethical dilemmas are virtually identical to the emotions and responses they experience away from the monitors. To all intents and purposes, the participants *are* experiencing reality – what the computer game industry refers to as a 'MUSH' – a Multi-User Shared Hallucination'. For financial traders, as for computer game players, the computer screen is the scopic portal to a shared reality: a 'complex architecture of transactions'[1] experienced by all participants.

My paper draws on the processual attributes of electronic financial markets, online computer games, and real-time news transmission, locating their epicentres not in the electronic infrastructure – the conduit through which their data flows – but embedded rather in what Baudrillard described as 'a sort of umbilical relation'[2] – the fluid immersive pull and reality of the computer screen itself.

Introduction:

[1] Saskia Sassen, *The Embedding of Electronic Markets: The Case of Global Capital Markets* in Karin Knorr-Cetina and Alexander Preda eds. *The Sociology of Financial Markets* (Oxford: Oxford University Press, 2005), 17.
[2] Jean Baudrillard, *The Intelligence of Evil and the Lucidity Pact* (English edition: Oxford UK; New York: Berg, 2005), 76.

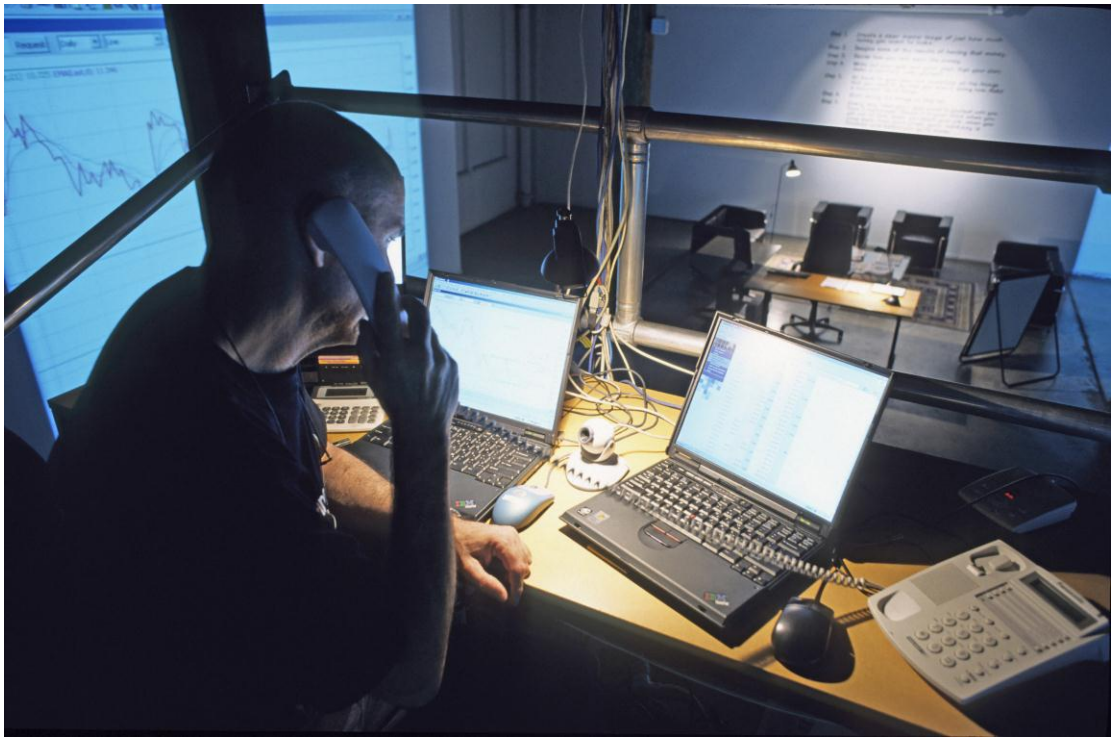
This paper has evolved out of a series of visual art projects I produced during the first decade of the new millennium – a period that saw the bursting of the dotcom bubble, a global stock market crash in the wake of 9/11, and the proliferation of neo-liberal sentiment that has bred the current global economic crisis. My projects addressed post-9/11 financial markets and the free-market economy as constructs that have driven, or at least profoundly influenced, political policy and social behaviour 'from Wall Street to Main Street'[3]; from the corporate boardrooms of developed nations to the informal markets of nations still struggling to come to terms with the demise of classical socialism in the postmodern world.

The performance and installation artworks, in particular *catchingafallingknife.com* – in which I attempted to profit by trading shares in global media giant News Corporation using $50,000 raised from a consortium of speculator/art patrons – engaged in an estheticized exploration of the socio-historical conditions of contemporary capitalism and the mechanisms and strategies of financial speculation. The project's exploration of online trading technologies and their interfaces revealed the 'deep play'[4], as art and cultural critic Brian Holmes terms it, of the millions of transactions between buyers and sellers, which make up the constantly shifting forces of supply and demand[5].

I proposed that the means by which the inequities of financial capitalism might be addressed lay within the very institution itself, and that in order to critique the institution it became necessary to fully comprehend its mechanisms. One of the most effective ways of doing this was to insert myself into the market's capital flows by exercising what pioneer of economic theory Adam Smith – in identifying the economy as the dominant institution of modern societies –

[3] This unattributed expression has become a frequently used metaphor for the relationship between corporate America and the small business interests of America's middle class.
[4] Brian Holmes, writing on my project *catchingafallingknife.com*, in *Escape the Overcode: Activist Art in the Control Society* (Eindhoven; Zagreb; Istanbul: Van Abbemuseum Public Research #02, 2009), 132.
[5] Holmes draws on anthropologist Clifford Geertz' use of the term, 'deep play', as referencing the ritualized betting in Balinese cock-fighting, which at its higher levels is as much about honour and dignity of the participants as they are about material gain. Holmes suggests that the financial market is as much a reflection of desire and status as it is of the profit motive. See: Clifford Geertz, *The Interpretation of Cultures* (Basic Books, 1973), 434.

termed human nature's 'disposition to truck and barter'[6]. In other words, to speculate and trade.



Michael Goldberg, *catchingafallingknife.com*, Artspace Centre for Contemporary Art, Sydney, 2003.

It also became necessary to understand the language and gestures of the electronic trading platforms that manifest the financial market's fluctuations: the ebb and flow of virtual money as revealed on the computer screen, the immersive pull of which has been described by Baudrillard as being like 'a sort of umbilical relation'[7] through which the observer navigates the digital data substrate.

The fluidity of this virtually tactile connection has arguably brought members of disparate societies and cultures closer together, but there is a consequence, as Baudrillard has counselled: 'When an event and the broadcasting [or transmission] of that event in real-time are too close together, the event is rendered undecidable and virtual'[8]. He was referring to the constant flow of news images on cable TV channels, but the description is arguably relevant in the case of a Wall Street banker placing a multimillion-

[6] See: Adam Smith (1723-1790), *An Inquiry into the Nature and Causes of the Wealth of Nations* (first published 1776), (Charleston, South Carolina: Forgotten Books, 2008) 21.
[7] Baudrillard, op. cit., 76.
[8] Ibid., 75.

dollar speculative trade, for example. Executed electronically in a split second, the event is thus rendered timeless and devoid of historicity. And without a sense of history's trajectories, there can be little understanding of what benefits society and what doesn't.

The projects can be viewed on:

www.michaelgoldberg.info

alternatively:

www.theregistry.net.au/michaelgoldberg/

The 24-hour global financial markets encompass a spectrum of speculators' emotions ranging between greed, fear, and what Alan Greenspan, Chairman of the U.S. Federal Reserve Board in 1996, famously referred to as 'irrational exuberance' when describing the speculative fervour of that decade.[9] Greenspan's comment, in what was intended to be a regular nuts and bolts address to the American Enterprise Institute for Public Policy Research, had a marked effect on world markets and a particular resonance when the dotcom boom came unstuck early in the new millennium. A cascade of falling stock prices made it plain that the cohorts of speculative e-commerce start-up companies, attempting to exploit the revolution in digital technology, would not be able to sustain their profitability claims and absurdly inflated stock price-earnings ratios.

The current Global Financial Crisis has demonstrated that the institutionalized speculation bred in the digital era has become an established feature of advanced capitalism, and that the destabilising flow-on effect on society, now clearly observable in the threatened loss of social services in Europe, the predicament of tertiary education in the U.K., and the housing crisis in the U.S., has reached a tipping point.

I suggest that the current financial and social crisis is in no small way a product of the collateral effect of the digital revolution. Instant global

[9] Alan Greenspan, *The Challenge of Central Banking in a Democratic Society*, address to the American Enterprise Institute for Public Policy Research in Washington, 5 December 1995. Full text: http://www.federalreserve.gov/boarddocs/speeches/1996/19961205.htm (accessed: 13/04/11).

interconnectivity and access to virtually unlimited commercial and social opportunities are characteristic of our times. But arguably, many of the major problems we now encounter are the result of the capitalist economy's swing from an emphasis on trade in goods and services, which in most cases contributes to the social good, to a preference for the volatile, but infinitely more lucrative trade in *virtual money* – accessed electronically, and represented by not much more than blips on a computer screen.

The Evolution of Virtual Money:

In the beginning there was gold. Throughout the most tumultuous periods in world history (and mythology) gold has been regarded as a refuge or hedge against the vagaries of socio-political and economic instability. Too malleable to be of primarily utilitarian use, but pure and relatively scarce, the metal became a symbol of power, authority, and consistent and dependable worth.

From the 19th century the *gold bullion standard* came to represent a stable criterion to which international currencies could be linked and converted at fixed rates, thus establishing a common bond between their relative values. However, two World Wars in the following century disrupted the stable structures and international economic co-operation facilitated by the gold standard.

In an attempt to ease these limitations on economic growth, a concerted effort by the Allies to remove the volatility from the global monetary exchange resulted in the 1944 Bretton Woods Agreement. Named after the town in New Hampshire U.S.A. where representatives of 44 participating nations met, the accord aimed to stabilise exchange rates by fixing them, but allowing for a degree of domestic economic policy freedom to stimulate production and thus maintain employment growth.

The desire to return to and maintain the gold standard was reintroduced by the Bretton Woods Accord, enshrining the United States as a major economic and political power by pegging the value of one ounce of gold at US$35. Other countries came under pressure to re-establish links to the calming influence of the gold standard by valuing their currencies against the dollar.

The United States was thus established as the lynch pin of this system, holding 75 percent of the world's stock of gold, and with its factories and production lines having suffered no war damage, the postwar American economy surged.

The Bretton Woods Accord was adopted by most developed nations from its inception to the end of the 1960s, and foreshadowed an unprecedented period in the growth of capitalism and economic development in participating countries.[10]

However, inflation was the inevitable flow-on effect of this progress, and as economic instability loomed once again, a breakdown in the control of international capital movements occurred. Although trading in financial instruments was globally denominated in U.S. dollars, in Europe – outside of the control of the United States – there was vulnerability to the kind of speculation that takes advantage of price differentials between currencies, a trading strategy known as arbitrage. Once again the seeding grounds of deregulated financial markets had been planted.

By 1971, exacerbated by the U.S. having become mired down in the Vietnam War, it was becoming clear that the U.S.-dominated Bretton Woods regulatory system could not take into account anomalies in global economics, such as the need by some economies to cyclically appreciate or depreciate the value of their currencies (in response to trade deficits, for example). The necessity to take into account such variances eventually resulted in gold's convertibility falling out of favour amongst developed nations. The weakening of adherence to the gold standard and its centralised surveillance marked the appearance of floating exchange rates and a resurgence in capital market speculation. By 1973, the Bretton Woods system of fixed exchange rates tied to the U.S. dollar had progressively been dismantled. As Bretton Woods came unstuck, the price of gold began to climb, and the lure of the metal as a safe haven for wealth and a hedge against inflation increased dramatically. With US$35 an ounce a distant memory, gold on the London market in 1972 rose from $46 to $850 an ounce by 1980.

[10] Christopher Shiel, *Globalism: Australian Impacts* (Sydney: UNSW Press, 2001), 23.

The volatile prices paid for the metal clearly indicated that gold no longer held the key to economic stability. As financial historian Peter L. Bernstein describes it, gold had been 'dispossessed of its power over the world of money […] emasculated. Now greed and power and lust for power run down different channels.'[11] At the turn of the millennium that world of money still revolved around the United States dollar and the economy of that country. In the wake of the outmoded Bretton Woods system a breed of money managers who had gathered their skills through the booms and busts of the 1980s and 1990s became embedded in America's Federal Reserve System. Their job became to regulate and control the fast growing hydra-headed global financial market and its complex financial instruments, which had begun to provide greater speculative opportunities and a more efficient hedge against inflation, than did the precious metal. The information standard soon came to replace the gold standard as the foundation of global finance.

With the abandoning of the U.S. dollar's convertibility into gold, a new financial era followed. The effect on fluctuations in the dollar and other global currencies promoted speculative interest in the idea of money as a commodity in itself that could be bought and sold even though its intrinsic material worth was non-existent. The value of this money, or currency, depended entirely upon its agreed market value. Foucault had written his influential *The Order of Things* in 1970, shortly before the abandoning of the U.S. dollar's convertibility and the establishment of a global money market based on the relative values of floating currencies. He had asserted that:

> The two functions of money, as a common measure between commodities and as a substitute for the mechanism of exchange, are based upon its material reality that can be compared to the diversity of things that one wishes to measure […] money does not truly measure unless its unit is a reality that really exists, to which any commodity whatever may be referred.[12]

[11] Peter L. Bernstein, *The Power of Gold: The History of an Obsession* (New York: John Wiley & Sons, 2000), 368.
[12] Michel Foucault, The Order of Things: An Archaeology of The Human Sciences (New York: Vintage Books, 1973), 169.

Some three years later however, the 'material reality' to which he referred became *virtual* and the sign, the index of value, was all that remained of money as a notional constant.

In describing the transformation of the 'real mark' of money in the relative value system of post-1973 global economics, philosopher Brian Rotman describes a dollar bill presented to the U.S. Treasury as that which entitled the holder to an 'identical replacement of itself'.[13] Rotman refers to this abstraction of money's value into sign as *xenomoney*, from *xeno*, the Greek word for 'stranger'. The dollar and its relative value, as well as that of other major world currencies, now circulates as *xenomoney*, freely traded in the cyberspace of international capital markets. By signifying itself, this virtual currency can be traded not only in terms of its current value (known as the 'spot rate' in capital markets), but also in terms of its *future* value determined by market forces (known as its 'forward rate'). In order to be accommodated within a present and a future matrix, the currency needs to be bought and sold in a market in which *time* is included in the equation and functions as a coordinate relative to value.

The drift of money from specie to a time-weighted consideration necessitated the development of appropriate financial instruments to enable specialised capital market trade. In 1972, the Chicago Mercantile Exchange began issuing financial derivatives contracts for currencies known as 'futures' and 'options'.[14] These types of contracts were not entirely inventions of the 20th century, however. They were in evidence as practical market instruments well before this, most notably in the futures trading of rice in 18th century Japan,

[13] Brian Rotman, *Signifying Nothing; the Semiotics of Zero* (Houndmills; Basingstoke; Hampshire: Macmillan Publishing, 1987), 89.
See also: Lawrence Wechsler, *Boggs: a Comedy of Values* (Chicago: The University of Chicago Press, 1999).
Wechsler writes in *Boggs: a Comedy of Values* about American artist J.S.G. Boggs (Steve Litzner) who has established a career rendering drawings of the U.S. dollar and other currency notes (usually the face), and exchanging them for an equivalent value in goods and services in the community. Boggs enjoys notoriety and is celebrated not only amongst aficionados of his art, but also in legal circles, having set precedents when attempts by currency authorities in the U.S., U.K. and Australia to prosecute him during the 1980s failed. Boggs' 'currency' is however significantly different from standard currency notes in circulation in that his drawings, held by collectors, substantially appreciate in value.
[14] Daniel Ben Ami, *Cowardly Capitalism: the Myth of the Global Financial Casino* (New York: John Wiley and Sons, 2001), 91ff.

and tulip bulbs in 17th century Holland, whereby the price for the delivery of the commodity at a future date could be agreed upon.

Financial derivatives do not have any intrinsic value themselves and in their intended form are applied in the financial industry to manage risk and neutralise, as far as possible, future uncertainty. Essentially, they comprise an agreement between two parties regarding price movement – a *falling* as well as a *rising* price – of a share, currency, or commodity without either party having to own the underlying asset or entity. For example, a farmer might use a futures contract to insure or hedge against a failed harvest. In this scenario the contract might bet on the standard wheat price falling.[15] This strategy would compensate the farmer if their harvest were not to make the grade.

The leveraging and two-way capability offered by derivatives has also become a tool that offers a speculator the opportunity of maximizing a modest initial capital investment, and to bet on both a falling and a rising market. In the above example it might be a speculator, and not a farmer, who bets on the possibility of a rising or falling wheat price. As the worth of the contract depends on when it is valued along its specified trajectory, its significance lies in how the contract holder's relationship-in-time with that contract has been constructed.

Since the 1970s the exponential growth in the derivatives industry has led to the regular development of exotic financial instruments in response to changing risk environments. These include, for example, interest rate and credit derivatives. In 2006, responding to the Bush Administration's advocacy of home ownership, and with the enticement of low interest rates, low-income wage earners flocked to buy real estate. However by the following year, as interest rates increased and the U.S. property market dipped substantially, the amount of mortgage defaults increased creating an unprecedented debt crisis. The subsequent global financial crisis was precipitated by the collapse of a large number of financial institutions in the United States that dealt in 'sub-prime' mortgages established for low-income (in other words, high-risk)

[15] In betting on a rising wheat price a financial derivative known as a 'call option' would be applied. In the opposite scenario, betting on a falling market price, a 'put option' would be the appropriate strategy.

borrowers. U.S. Government-backed financial institutions, the Federal National Mortgage Association (a.k.a. Fannie Mae), and the Federal Home Loan Mortgage Corporation (a.k.a. Freddie Mac), were engaged in buying and selling mortgage debt that facilitated the maintenance of liquidity for investment and commercial banks in a complex web of transactions that depended on the stability of the housing market for their success. With the collapse of the housing market, the number of borrowing defaults rose disproportionately to the projected trajectory of the sub-prime debt derivatives. The result was a credit squeeze in which many major banks such as Lehman Brothers and Bear Stearns, unable to cope with the sudden necessity to liquidate capital bound up in convoluted levels of investment, went to the wall.[16] It became apparent that what used to constitute the primary foundation of an economy – trade in goods – had been overtaken by capitalism's meta-sign.

The current global financial crisis has demonstrated how the importance of trade flows has been superseded by speculation on the underlying volatility of foreign exchange and derivatives transactions. The markets are now driven by capital rather than trade flows, as Rotman points out: 'present-day traded financial futures/options [are] the means through which money – *xenomoney* – establishes itself as sign able to signify its own future'.[17]

Jean Baudrillard, in his influential essay 'The Precession of Simulacra', refers to a Jorge Louis Borges tale of an empire where the craft of cartography had attained such exactitude that the map of that empire evolved to the same scale as the empire itself, coinciding with it point for point. Eventually, of course, the map became unmanageable to an absurd degree.

Borges writes: 'Less attentive to the study of Cartography, succeeding Generations came to judge a map of such Magnitude cumbersome, and, not without Irreverence, they abandoned it to the Rigours of sun and Rain. In the

[16] For a detailed account of the underlying causes of the U.S. sub-prime mortgage crisis, refer to Gary B. Gorton, *Slapped by the Invisible Hand: the panic of 2007* (Oxford: Oxford University Press, 2010).
[17] Rotman op. cit., 93.

western Deserts, tattered fragments of the Map are still to be found, Sheltering an occasional Beast to beggar.'[18]

In his essay, Baudrillard inverts the fable as an illustration of the post-modern condition, and suggests that it is the *map* that has survived and the *empire* that has crumbled. The map or abstraction now precedes the territory representing, as he puts it, the 'real without origin or reality'.[19]

In the context of this paper, Baudrillard's conjecture can be used to aptly describe the abstraction of value in the context of the present-day global financial crisis. In this scenario, it is the seriously undermined global economy that is crumbling. The progressive deregulation of financial markets and immediacy of electronic trading has spurred the development of highly complex financial derivatives, esoteric even to many economists. The map that survives is the fugitive matrix of relative values that proliferates in what has appropriately become known as the 'shadow banking system'.[20]

The 'Ultimate' Financial Market:

Innovations in digital technology, particularly the development of online trading software, have provided for unprecedented global participation in financial markets. In sociologist Saskia Sassen's view, this accessibility has given rise to a close approximation of the neoclassical idea of a market governed entirely by supply and demand.[21] This notion is closely allied to the Efficient Market Hypothesis. Supporters of the efficient market theory believe implicitly that markets are held in a rational equilibrium, representing at any moment all the information relevant to their pricing. Any new information about a stock or currency would be absorbed into the market and translated as a

[18] Borges short tale was titled *On Exactitude in Science*. See: Jorge Luis Borges, *Collected Fictions*, trans. Andrew Hurley (New York: Penguin, 1999).
[19] Jean Baudrillard, 'The Precession of Simulacra', in *Art After Modernism: Rethinking Representation,* ed. Brian Wallis (New York: The New Museum of Contemporary Art, 1984), 253. Originally published in *Simulations*, trans. Paul Foss and Paul Patton (New York: Semiotext(e), 1983).
[20] Shadow banking refers to the system in which specialised non-depository banks lend money to investment banks, often for purposes of speculation on derivatives markets.
[21] Saskia Sassen, 'The Embedding of Electronic Markets: The Case of Global Capital Markets' in *The Sociology of Financial Markets*, ed. Karin Knorr-Cetina and Alexander Preda (Oxford: Oxford University Press, 2005), 17.

price movement. Such as a market structure, one that responded so smoothly to the random and unpredictable appearance of information, would not countenance the possible existence of irrational 'bubbles'. Thus, according to the theory, no matter how 'irrational and exuberant' it might appear, speculation's effect on the market was always going to be rational, leading to rational outcomes.

Millions of online investors and speculators now theoretically have equal access to economic data and the mechanisms of the market through electronic trading and online information networks. According to Sassen, institutional *and* public traders alike are thus able to rationally determine the potential risks and optimum rewards of their investments, a process characteristic of an 'efficient' market in which all relevant information is readily available.

As no actual ownership of shares, currencies or commodities is a prerequisite of the contemporary electronic market, the outcomes of the buying and selling process have dematerialized rendering the relationship between supply and demand more fluid. With market deregulation having significantly opened up participation in the globally integrated capital market industry, as already discussed, currencies are no longer valued against gold, nor the U.S. dollar for that matter. As developed economies embrace a free-market ideology and scaled-back government regulation, highly speculative exchange between buyers and sellers has become characteristic of contemporary markets.

In her essay, *The Embedding of Electronic Markets: The Case of Global Capital Markets*, Sassen heralds these developments as constituting the 'ultimate market'.[22] In Sassen's view:

> This is as close an approximation to the model of supply and demand one might hope for: a market that is not encumbered by geography, weight, unequal access to information, government regulation, or particularist agendas given its highly technical character and the participation of millions of investors.[23]

[22] Ibid., 18.
[23] Ibid.

The electronic market comprises what Sassen refers to as 'a complex architecture of transactions'[24], characterised by interconnectivity, simultaneity, and decentralised access wherein supply and demand are based not on money flows, but on transactions themselves. According to Sassen, a productive cycle is thus stimulated: ease of engagement encourages participation by active investors/speculators, which increases the number of transactions. This is in turn beneficial to the market by raising the level of liquidity – or money circulating in the market – providing the stimulus and momentum to drive prices.

Sassen's essay does not address the economic and social impact of the burgeoning activity on capital markets. Neither does it discuss how this speculative focus has shifted emphasis away from investment in markets that encourage production, manufacture and services. The effects of under-regulated markets were to become apparent just three years after publication of her essay with the cascading effects of the subprime mortgage crisis. The value of Sassen's research lies rather in its focus on the relationship between technology and flows of capital, where information technologies have resulted in the hyper-mobilization of money.

In the current economic context Sassen's 'ultimate market' begs closer scrutiny. The validity of the efficient market hypothesis has been challenged as a model to which global economies should aspire. Financial historian, Edward Chancellor writes:

> If markets were efficient and in constant equilibrium, and if price movements were always random, then the activities of speculators could be neither irrational in motivation nor destabilising in effect. Such a conclusion required the historiography of speculation to be rewritten, leading to a denial of the existence of 'irrational bubbles' and replacing them with […] the tendentious notion of the 'rational bubble'.[25]

[24] Ibid., 19.
[25] Edward Chancellor, *Devil Take the Hindmost: A History of Financial Speculation* (New York: Farrar, Strauss, Giroux, 1999), 243.

Considering the 2008 (and progressing) global financial crisis that was arguably a by-product of excessive and pervasive deregulation, the 'ultimate market' might in fact be closer in analogy to a disastrous 'perfect storm'.

The Need for Speed:

With the steady development of global markets came the increasing demand for technologies that would enable the rapid transfer and distribution of data. In 1971, the evolution of publicly accessed financial markets began in earnest with the establishing of the first electronic stock market, the U.S. NASDAQ (National Association of Securities Dealers Automated Quotations). The decade following the elimination of the gold standard saw the proliferation of companies providing, direct to the consumer, financial market trading software, market data and global news. Just two years after the abandonment of Bretton Woods, British news agency Reuters introduced a cable money rate service, and established a 24-hour global foreign currency market.

In previous speculative booms professional brokers provided the interface between the public and the markets, and trades could only be initiated and terminated through these agents. The rapidly expanding capability of the digital and Internet eras rendered such intermediaries redundant. Broad public access to online trading platforms, and the same sources of market data available to professional traders, heralded a popular attraction to financial speculation unprecedented since the frenzied 1920s.[26]

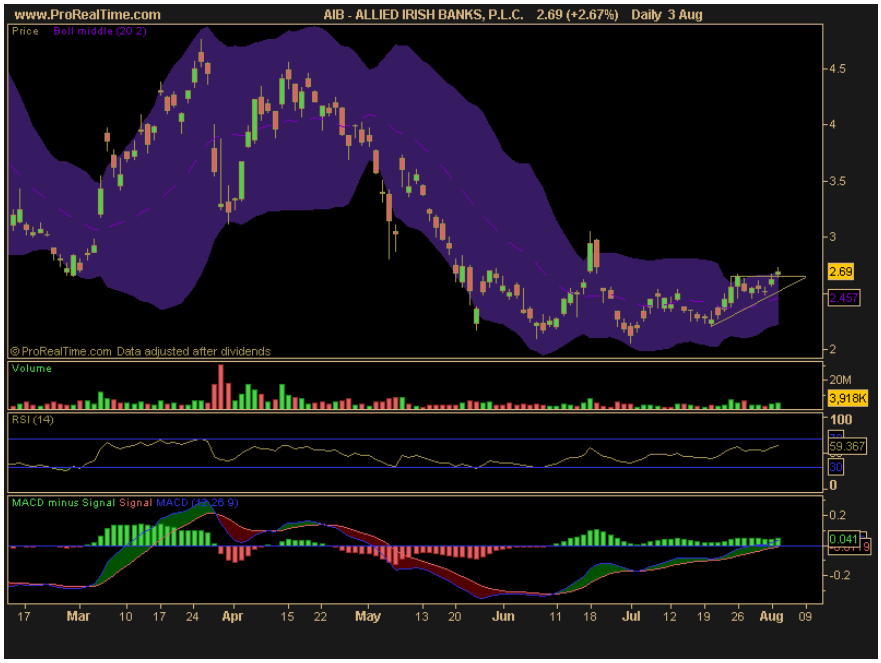
Economist Robert J. Shiller locates the widespread use of the Internet to facilitate speculative financial activity four years after the World Wide Web first featured in news reports in late 1993 (the Mosaic Web browser first became available to the public in February 1994). He notes: 'Large numbers did not discover the Web until 1997 … marking the very years when the NASDAQ stock price index soared, tripling to the beginning of 2000, and the price earnings ratios took off into unprecedented territory'.[27] According to Shiller,

[26] Shareholder rolls in American corporations increased dramatically from 500,000 in the 1900s to 2 million in 1920, to over 10 million by 1930. The rapid rise of market participation was not confined to the very wealthy, with a greater percentage increase amongst lower income brackets. Statistics in George Frankfurter et al, *Dividend Policy: theory and practice* (Boston; Amsterdam: Academic Press, 2003), 31.
[27] Robert J. Shiller, *Irrational Exuberance* (Princeton NJ: Princeton University Press, 2000), 19.

'the turnover rate (the total shares sold in a year divided by the total number of shares) for the NYSE nearly doubled between 1982 and 1999 [and] the NASDAQ shows an even greater turnover rate increase, from 88% in 1990 to 221% in 1999'.[28] Whether or not any correlation can be drawn between Shiller's observation regarding high Internet participation and the surge in stock prices is moot without a full statistical study available, however, the possibility is an interesting one.

After the 1987 stock market crash, in an effort to improve efficiency and profitability, a strategy known as 'downsizing' began to emerge, with many large corporations in the West jettisoning what was perceived as non-essential or non-productive staff. The lay-offs led to a widespread undermining of job security, and it became an imperative for employees-at-risk to find alternative means of independent and self-motivated financial support. As Shiller describes it, this resulted in 'a change in the way people viewed their lives', and a move for 'workers to take control of their own lives and to rely less on employers, to become in effect economic entities unto themselves, rather than parts of a larger economic organization'.[29] He suggests that the desire to become an independent 'economic entity' drew many to the immense waves of speculative capital that flow around the world 24 hours a day. The term 'day trading' became synonymous in the 1990s with the growing cohorts of domestic speculators who participated in the market through online trading platforms provided by discount e-brokers.

[28] Ibid., 39.
[29] Ibid., 23.



Stock chart showing Bollinger trading bands, volume, relative strength index, and moving average convergence/divergence indicators (Source: ProRealTime.com)

Prior to the wide availability of the Internet, domestic traders relied on the slow telegraphic technology of the ticker-tape machine to provide data feeds from the bourse. The ticker-tape could not represent a comprehensive account of the market's rises, falls and trends; it could simply print out stock prices on strips of paper as alphanumeric sequences. From the opening price to the closing price each day, over weeks and years, the relationship between supply and demand had to be laboriously configured by hand on charts, diagrams, graphs and statistical tables. But this changed by the e-commerce boom days of the late 1990s when the home trader, using the Internet and specialised trading software, could now receive live data from global bourses that provided an instant CGI market gestalt by means of interactive real-time charts.

Using online trading platforms, privateer traders could execute buy and sell orders as rapidly as their commercial counterparts. If desired, the interpretation of market data and execution of strategic trades based on a vast array of probability algorithms could even be entirely automated, relieving inexperienced speculators from having to make any decisions about which stocks to buy, and when to sell.

In a global market, company stocks, stock exchange indices, currencies, futures, options and other exotic financial instruments became available to all equipped with a high-speed Internet connection. Positions could be entered into and exited from without any consideration of the traded company's product, its balance sheet, or its ethics. Through the interplay of specialised and highly leveraged stock derivatives, falling share prices were traded with as much bravado as rising ones. Long-term investment was not the object, with day traders seldom holding a position overnight, avoiding the liability of unforeseen global events. Trades are conducted over a few hours, often minutes or even seconds, to pursue maximum gains with minimised risk. As with computer role-play, such as in first-person shooter games, the relationship with the environment (in this case, the market) often becomes adversarial, with the day trader required to act decisively in order to take advantage of rapidly changing scenarios.

According to Shiller, this period was accompanied by the 'aggressively optimistic forecasts of stock analysts'[30], with news media taking a leading role in providing the public with comprehensive coverage of the spectacle unfolding in the business world.

Online discount brokers such as E*Trade and TD Ameritrade continue to facilitate participation by members of the public in speculative trading, providing sophisticated, graphics-rich platforms where even inexperienced traders can enter into and out of positions at the click of a computer mouse. Internet-based information communication services and chat rooms encourage minute-by-minute attention to the market. After-hours trading on the exchanges have increased obsessive interest in the market with traders able track changing prices in their living rooms, even around the dinner table with CNN and CNBC permanently open windows to the world in the corner of their computer screens.

Almost 10 years after the 2002 'tech-wreck', day trading survivors still bivouac around the online trading chat-rooms and commune with each other in cyberspace, where the camaraderie is as palpable as in a gym locker room.

[30] Ibid., 19.

Multinationals and the surviving dotcom merchants no longer offer promises of 'blue sky' opportunities, but there is a steady stream of income for the well prepared. Short-term profits can be chased on the 24-hour currency markets. At 8am in Sydney Eastern Standard Time, day traders are watching Tokyo getting into gear; at 4pm Frankfurt and London are firing up, and at 11pm the beast in Wall Street begins to stir.

The Computer Screen's 'Flow World':

In the teletopographic environment of electronic stock trading, the accuracy of the visual representation of the market is critical for the trader. Different forms of stock charts and a range of graphic indicators represent the ebb and flow of the market, and even though they manifest as seemingly abstract patterns and configurations, they reflect the composite trading decisions made by thousands of invisible individuals within a shared virtual world.

Sociologist Karin Knorr-Cetina describes the global financial market in processual terms, as a time or 'flow world'. Its existence – its architecture – is readily visible at any moment in time on the computer screen. The screen itself is paramount in this scenario. Computer terminals are more than a means to enact transactions and to issue communications to colleagues across the globe; their screens are scopic portals through which one can be 'in the market'.[31] This is a *shared world*, visible to all participants, facilitated by technology and information systems.

[31] Karin Knorr-Cetina and Alexander Preda, *The Sociology of Financial Markets* (Oxford: Oxford University Press, 2005), 45.

(Source: Associated Press/Alastair Grant)

Knorr-Cetina cites a trader referring to the market manifested on the screen as being like a 'life form in its own right', virtually a 'greater being'.[32] The epicentre of the trader's world is not the electronic infrastructure, the conduit, through which transactions flow. It is the *screens* that 'instantly reflect, project, and extend the reality of [the] markets in toto'.[33] Identical screens on commercial trading floors form what Knorr-Cetina refers to as 'one huge compounding mirror' that reflects on all market participants. For Knorr-Cetina, this presence constitutes a complex *other*. The screen is not simply a medium for transmitting data but, in displaying the vast array of information detailing the ebb and flow of prices, book-keeping details, global news and research, the screen is thus 'a building site on which a whole economic and epistemological world [of the trader] is erected'.[34]

Like participating players in online simulation games, traders experience a co-presence, a consensual hallucination. They are linked to each other in time, watching the same data flickering on the screen. This degree of immersion in the markets, with the computer screen as an intermediary, suggests a strong even obsessive engagement. Knorr-Cetina and Bruegger describe this

[32] Ibid., 147.
[33] Ibid., 48.
[34] Ibid.

relationship as *postsocial*[35], where a relational bond exists between humans and objects and object-worlds (such as a computer and its networks).

Before the technology that paved the way for instantaneous global data exchange, consensus on prices had to be achieved through the use of a complex network of telephone lines between banks and brokers. Knorr-Cetina points out that after the global availability of market data was provided by Reuters in 1981, 'the market no longer resided in a network of many places, but only in one, the screen'.[36] This radically altered the spatial relationship between traders. As a community, unlike other computer-based communities that are related spatially (such as in online gaming virtual space), traders on 24-hour markets interact across *time zones* as each regional trading session commences and ends. What holds participants together across space is a dematerialized '"community of time" rather than a community of space'.[37]

Computer Simulation Games and Online Trading:

In referring to the digital photographic image it is no longer reliable to define it as that trace of reality captured through the aperture of a camera. The digital image is better described as resembling a flexible framework or fluid substrate that can be entered into, modified and expanded. The contiguity of photographic reality and the virtual reality of CGI[38] necessitates a broader definition of the image. In what he referred to as the image's 'deregulation',[39] Baudrillard has questioned the relationship between photography and the digitally generated image. He asks with regard to the latter, 'Can this be an image, where the technical fine tuning […] is perfect [and] there is no room for fuzziness, tremor or chance?'[40] Baudrillard has as much suggested that digital multi-mediatising constitutes an 'opening up to the infinite', and that this deregulation represents 'literally the death of photography by its elevation to

[35] Karin Knorr-Cetina and Urs Bruegger, 'Traders' Engagement with Markets: A Postsocial Relationship' in *The Blackwell Cultural Economy Reader*, ed. Ash Amin, Nigel Thrift (Malden, Massachusetts: Blackwell, 2004), 163.
[36] Knorr-Cetina, The Sociology of Financial Markets, op cit., 54.
[37] Ibid., 56.
[38] Computer-generated imagery.
[39] Baudrillard, The Intelligence of Evil or the Lucidity Pact, op. cit., 28.
[40] Ibid., 28.

the stage of performance'.[41] If Baudrillard was correct in presaging photography's demise, its remains are however well manifested in a host of reality simulating 3D modelling algorithms embedded in *computer game* software.

Reality simulation computer games (a.k.a. 'sims') include first-person shooter games, geo-political games and role-play scenarios. Their legions of players comprise, to borrow from Virilio, a community of believers for whom the fusion/confusion of the factual and the virtual represents a desirable condition. There is an interesting correlation in the development of sophisticated mouse-navigated games such as *Doom*[42], through the 1990s, and that of capital market online trading platforms.

The online trading 'community of believers' bears a number of similarities to computer game scenarios in which players project and apply a number of their senses into what they consider to be believable teletopographical locales. In Massively Multi-player Online Role-play Games (MMORPGs) players interact by means of avatars, personal entities that exercise one or multiple identities. During the process of gameplay anxieties, elation, and moral and ethical dilemmas are identical to those emotions and responses experienced away from the monitors. To all intents and purposes, the participants *are* experiencing reality.

Similarly, the electronic trading market – with its abstract and shifting scenarios – is a virtual environment rendered real on the computer screen by means of constantly updating price matrices, charts and interactive graphic indicators. With each mouse click as they enter or exit a trade and ponder their decisions, online traders might experience anxiety, elation and even moral and ethical dilemmas. Traders' avatars are the 'buyers' and 'sellers' interacting in a zero-sum game in which one participant's gains and losses must be equally balanced by another's gains and losses.

Many multiplayer online role-playing games feature virtual financial systems, which have developed in parallel to, and mimicking online speculative

[41] Ibid., 110.
[42] See: http://au.wireless.ign.com/articles/104/1041847p1.html (accessed: 14/04/11).

financial markets. *Second Life* (SL)[43] was launched by Linden Lab in 2003 and as of 2008 reportedly had over six million players, of whom over one and a half million had logged on in the two months prior to the report's publication[44]. The viewer interface known as the *Second Life Grid* has free access, with serious players becoming 'Residents' and earning the right to purchase virtual land and services from Linden Lab using SL currency, Linden dollars. Players circulate in SL as avatars whose personas and physical appearances are formed using 3D modelling software provided on the grid. Residents can model architecture, environments and consumer items such as jewellery, weapons, and avatar accessories including 'skins' with which to embellish their appearances.

Avatars engage socially with each other (virtual cybersex between avatars is common, with Residents constructing erotic scenarios using motion-capture software), and enter into transactions in which goods and services are bartered, or bought and sold for Linden dollars. The buying and selling of real estate is common in the virtual world, with Residents able to profit as they might in the real world by purchasing property from Linden Lab and selling it on to other Residents for a premium. Residents can exchange Linden dollars for real-world currency (U.S. dollars) through SL accounts linked to the PayPal system. Linden Lab finances the SL economy from subscriptions of Premium Members and by featuring the commercial interests of real world companies who have their own retail outlets selling avatar-ware, with links to their real world online stores.

Writing in *The Making of Second Life*, Wagner James Au reports that by 2007, 'Capitalists, whose dominant SL activity is running a business […] comprised well over 42,000 Residents with a positive cash flow, earning more Linden dollars from their enterprises than they were paying for virtual land and other services'.[45] According to Au, 'the Linden dollar equivalent of hundreds of

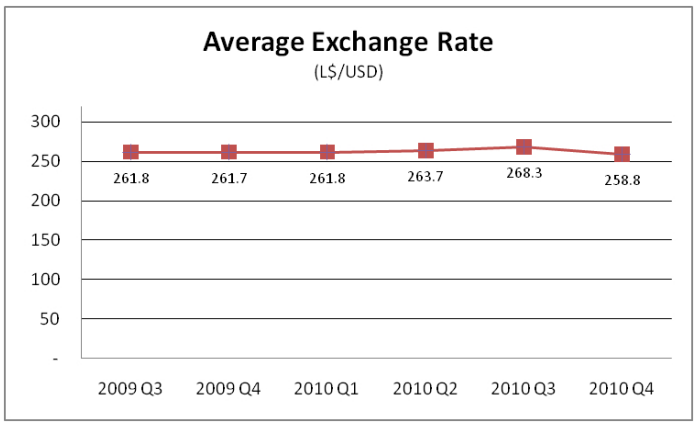
[43] *Second Life* was developed by U.S. software company *Linden Lab* (formed in 1999). The *Second Life* virtual world is extensive and complex, and thus will not be described in detail in this thesis. For further reference, see: Wagner James Au, *The Making of Second Life* (New York: Harper Collins, 2008), and www.secondlife.com

[44] See: http://www.betanews.com/article/How-Many-Users-Does-Second-Life-Really-Have/1178573043 (accessed: 27/04/11).

[45] Au op. cit., 150.

millions of dollars changes hands every day'.[46] More recent statistics (2008) revise upward to 160,000 the number of Residents with positive cash flow.[47]

Linden dollars can also be bought and sold in accordance with daily market rates on the SL currency exchange, *LindEx*. At the time of writing, US$1 equals 260 Linden dollars.[48] Second party currency exchanges have sprung up around SL, such as *CrossWorlds Xchange.*[49] Arbitrage profits can be made from buying and selling Linden dollars and U.S. dollars on different online markets, taking advantage of rates of exchange that fluctuate over 24-hour periods. A shadow SL currency market is also in evidence with tranches of Linden dollars regularly auctioned on *eBay*.



(Source: www.secondlife.com)

Economist Edward Castronova suggests that 'virtual worlds may also be the future of e-commerce, and perhaps of the Internet itself'.[50] In 2001, Castronova embedded himself in the virtual world of *Norrath*, situated in the multiplayer online game *Everquest.*[51] The principles of the game are basically the same as *Second Life*, featuring interaction, social networking and trade between avatars. The unit of currency is the PP or 'Platinum Piece'. Castronova's research revealed that the average individual currency holding

[46] Ibid., 166.
[47] See: http://secondlife.reuters.com/stories/index-3551.html (accessed: 27/04/11).
[48] See: http://secondlife.com/statistics/economy-market.php (accessed: 27/04/11).
[49] http://www.crossworldsxchange.com/ (accessed: 27/04/11).
[50] Edward Castronova, 'Virtual Worlds: A First-Hand Account of Market and Society on the Cyberian Frontier', *The Gruter Institute Working Papers on Law, Economics and Evolutionary Biology*, Volume 2, Issue 1.
http://www.bepress.com/cgi/viewcontent.cgi?article=1008&context=giwp (accessed: 23/04/11).
[51] *Everquest* was launched in 1999 by Verant, a holding of the Sony Corporation. See: http://everquest2.com Castronova estimates the population of the original *Everquest* game at 'tens of thousands', op. cit. 3.

of residents is the equivalent of US$3,000 each.[52] This would rate the Gross Domestic Product of *Norrath* in 2001 in the millions of dollars. Sony Corporation has declared the currency of *Norrath* is the company's intellectual property and hence any trade outside of the game is illegal. Nevertheless, Castronova notes, 'several dollar-based markets for platinum pieces, avatars, and other items exist on Web auction sites.'[53] Mimicking trade in the real world shadow banking system, *Norrath* foreign exchange and trade flourishes on the online secondary market.[54] Castronova compares the economic state of *Norrath* to Cuba's, where 'U.S. dollars trump the official economy'.[55]

Barter between residents resembles a bazaar, where, according to Castronova, 'In *a2a* (avatar-to-avatar) commerce, avatars on the supply side must constantly shout out what they have, and avatars on the demand side must hear the offer, find the seller, and then haggle over price'.[56] This to all intents and purposes is the same as the 'open outcry' system of financial derivative markets, such as that of the Chicago Mercantile Exchange, where prior to the transfer to electronic systems, traders reached agreements by calling out bids and offers in the trading pit.

Castronova is of the opinion that the global convergence of virtual worlds will become increasingly economically viable. The Swedish 3D Internet developer *Mindark*[57] has expressed its intention to merge online games, virtual worlds and social networking into a single interconnected unit that the company refers to as the *Entropia Universe*. The aspiration to form an entity with shared interests appears to have some resonance with that of the European Union (even reflected in its proposed acronym, EU). Theoretically, within this global matrix players would socially interact, trade and network with commercial interests across a porous interface between virtual and real

[52] Castronova op. cit., 23.
[53] Ibid., 25.
[54] See: *MMORPG Trade Portal,* http://mmotp.com/trade/ (accessed: 27/04/11).
[55] Castronova was writing in 2001 when the U.S. dollar was still legal tender in Cuba. See: http://news.cnet.com/2100-1040-823260.html (accessed: 27/04/11).
[56] Castronova op. cit., 22.
[57] See: www.mindark.com/company (accessed: 27/04/11).

worlds. Millions of users would be united in what the computer game industry refers to as a 'MUSH' – a Multi-User Shared Hallucination'.[58]

Arguably, participants in electronic markets do experience an equivalence of the multi-user shared hallucination. With markets no longer physically contained, the dance between buyers and sellers is now purely representational. This is clearly demonstrated in the derivatives financial market innovation known as *Contracts for Difference* (CFDs). Trading in a host of markets from currencies to options, based on real market prices, the CFD provider acts as the market maker and conducts its dealings with the public via an online trading platform. CFDs mimic leveraged financial instruments, and the agreement entered into between a trader and a provider to all intents and purposes resembles the mechanisms and processes of the real market.[59] However, the values of transactions are based purely on consensual agreement between provider and consumer. Most CFD providers also provide a trading app. for IPhone and other Smart phones. The innovation of *Contracts for Difference* represents the zenith of casino-type speculation, and if its popularity continues to rise it might well constitute the true 'ultimate market', although surprisingly CFD derivatives are not permitted in the U.S. under Securities and Exchange Commission restrictions.[60]

Terror, Paranoia and the Market: Shared Electronic Platforms

In *The Spirit of Terrorism*, published in 2002 just before the 'Shock and Awe' invasion of Iraq, Baudrillard asked: 'How do things stand with the real event then, if reality is everywhere infiltrated by images, virtuality and fiction?'[61] Baudrillard was referring to the observation of global events transmitted, often

[58] Au op. cit., 4.
[59] To take into account the slippage between the real market and a virtual one, CFD providers usually publish a disclaimer stating that all displayed prices 'are indicative only'. As no *actual* share or currency transactions are involved, trades are settled in profit or loss according to the *difference* between the opening and closing level of that particular trade. The outcome of the transaction is based on the *performance* of the share or currency on their respective markets. Because no stock or derivative is actually held, CFDs are closely related to 'spread-betting'. Through their complex legal definition CFD outcomes are determined on relative performance rather than actual outcome, and as this is regarded as a form of wagering, trading profits are thus effectively capital gains tax-free (equally, losses cannot be declared as capital losses). CFDs were developed in the U.K. in the late 1990s, and are available in the U.K., Europe, Africa, Asia and Australia feature simulations of all market instruments, including options and index trading.
[60] Refer to the website of *IG Markets*, a major international provider of CFDs: www.igmarkets.com
[61] Baudrillard, *The Spirit of Terrorism*, op.cit., 27.

in real-time, on cable news channels and the Internet. He suggested that, 'When an event and the broadcasting of that event in real-time are too close together, the event is rendered undecidable and virtual'.[62]

In February of the same year, U.S. Secretary of Defense Donald Rumsfeld, in a Defense Department press briefing, effectively rendered as 'undecidable and virtual' the alleged satellite image evidence of Iraq's manufacture of weapons of mass destruction. He declared in his now famous reality-bending koan that:

> Reports that say that something hasn't happened are always interesting to me, because as we know, there are "known knowns". There are things we know we know. We also know there are "known unknowns". That is to say we know there are some things we do not know. But there are also "unknown unknowns", the ones we don't know we don't know.[63]

Dealing with 'unknown unknowns' is a task familiar to the U.S. Department of Defense. In 1958, at the height of the Cold War, the department established the *Advanced Research Projects Agency*, later to be known as the *Defense Advanced Research Projects Agency* (DARPA). The initiative was a response to the launching of the first orbital space satellite by the USSR, when the Soviet's technological competiveness was perceived by the U.S. as a military threat. DARPA's mission was (and remains) to 'maintain the technological superiority of the U.S. military and prevent technological surprise from harming [the U.S.] national security.'[64]

The agency has been credited with the technological developments that led to the advent of the Internet, originally conceived as an *intranet* to allow the Department of Defense to coordinate resources and military responses across the country in the event of nuclear attack. According to DARPA's mission statement, current research ranges from 'scientific investigations in a laboratory, to constructing full-scale prototypes of military systems'. The agency also funds 'research in biology, medicine, computer science,

[62] Baudrillard, *The Intelligence of Evil*, op.cit., 75.
[63] http://www.defense.gov/transcripts/transcript.aspx?transcriptid=2636 (accessed: 2/04/11).
[64] http://www.darpa.mil/about.html (accessed: 2/04/11).

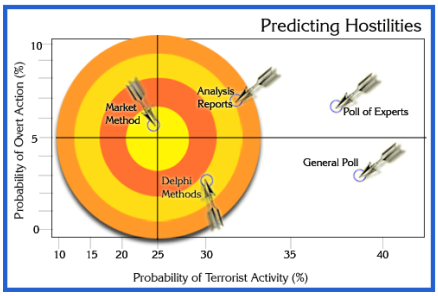
chemistry, physics, engineering, mathematics, material sciences, social sciences [and] neuroscience'.[65] According to Robert Looney, Professor of Economics in the Department of National Security Affairs at the U.S. Naval Postgraduate School, DARPA also supports the 'development of advanced computer systems capable of scanning commercial databases containing information on millions of Americans.'[66]

Within its remit of conducting research into national security, one of DARPA's intentions is to harness the vigilance of U.S. citizens as an early warning system. This is often achieved by the staging of community games and competitions, the aim of which is to establish countrywide surveillance. In December 2009, DARPA used the 40th anniversary of the development of the Internet to launch the *DARPA Network Challenge* to test the efficiency of the Web as a potential surveillance system. Ten high-visibility weather balloons were tethered to unpublicised sites across the U.S., with participating teams challenged to precisely locate the balloons using social networking sites as a communications device. A team from the Massachusetts Institute of Technology won the US$40,000 prize by identifying the locations of the balloons in the shortest possible time – less than nine hours.[67]

Since the events of 11 September 2001, DARPA's efforts have focused on potential international terrorist threats to national security. In July 2003, the agency launched its *Policy Analysis Market* (PAM). The ill-fated project proposed the establishment of a prototype futures-trading website whereby speculators could bet on a range of possible international events such as the assassination of a world leader, or regime changes in the Middle East. In theory the futures market would achieve a moving average equilibrium, where sudden spikes of buying could theoretically reveal a heightened probability of such events actually occurring. The motivation for establishing a predictive

[65] Ibid. This has included research into a stimulant ('Go Pills') that would keep soldiers awake and alert for seven days straight. See: http://www.globalsecurity.org/org/news/2003/030103-speed01.htm (accessed: 2/04/11).
[66] See: Robert Looney, 'DARPA's Policy Analysis Market for Intelligence: Outside the Box or Off the Wall?', in *Strategic Insights*, Volume II, Issue 9 (September 2003), http://www.au.af.mil/au/awc/awcgate/nps/pam/si_pam.htm (accessed: 2/04/11).
[67] See: https://networkchallenge.darpa.mil/Default.aspx (accessed: 26/04/11).

market was based on alleged evidence of a sudden increase in the short-selling of airline stocks just prior to the 9/11 attacks.



(Source: http://www.iwar.org.uk/news-archive/tia/futuremap-program.htm)

As Michael C. Ruppert – founder and editor of *From The Wilderness* a newsletter and website dedicated to investigating political cover-ups – explains in his book *Crossing the Rubicon: The Decline of the American Empire at the End of the Age of Oil*: 'Although uniformly ignored by the mainstream U.S. media, there is abundant evidence that a number of transactions in financial markets indicated specific (criminal) foreknowledge of the September 11 attacks on the World Trade Center and the Pentagon'.[68]

Ruppert claims that senior members of global intelligence services, the CIA among them, had prior knowledge of the intended attacks on the World Trade Centre. He infers that parties with knowledge of the intended attacks bought a significant number of 'put options' in American Airlines in the days prior to the planes crashing into the twin towers, betting on the price of the stock price falling. Ruppert regarded it as highly suspicious that the brokerage firm used to transact the purchase was, until 1998, managed by the individual who went on to serve as one of the executive directors of the CIA between 2001 and 2004.[69]

Ruppert supports his claims by citing a report appearing on 21 September 2001 in the *Herzliya International Policy Institute for Counterterrorism* in Israel. The report, titled 'Black Tuesday: The World's Largest Insider Trading

[68] Michael C. Ruppert, Crossing the Rubicon: The Decline of the American Empire at the End of the Age of Oil (Gabriola BC: New Society Publishers, 2004), 245.
[69] A.B. "Buzzy" Krongard.

Scam?' documents evidence of a trail of suspicious trades in put options[70] taken out against American Airlines. The report claims that:

> Between September 6 and 7, the Chicago Board Options Exchange saw purchases of 4,744 put options on United Airlines, but only 396 call options … On September 10, 4,516 put options on American Airlines were bought on the Chicago Exchange, compared to only 748 calls. There was no news to justify this imbalance … The levels of put options purchased above were more than six times higher than normal. No similar trading in other airlines occurred.[71]

In 2003 DARPA, noting these events, proposed that the creation of an electronic futures market 'would have provided the U.S. intelligence agencies access to a wide variety of markets in various events'.[72] For example, petroleum futures, the market concerned with the price of that commodity for delivery at an agreed future date, has proven to be a reasonably accurate barometer of major political upheavals, particularly in the Middle East and other major oil-producing countries. The rationale is that market prices reflecting the sentiments of a large number of speculators would constitute a collective intelligence. For example, petroleum futures prices fell with the decisive events signalling the commencement of the Iraq war. However, when it became apparent that the Iraqi regime was going to be more difficult to remove than first thought, petroleum futures rose again. According to Leigh et al, cited in Ruppert, prior to the commencement of hostilities oil prices reached highs suggesting that 'there was a very high probability of conflict'.[73]

To support its PAM proposal, DARPA subscribed to the efficient market hypothesis, which many economists and academics particularly in the 1980s, believed to be an accurate reflection of information affecting financial markets. As described previously, the theory purports that market prices at any point in

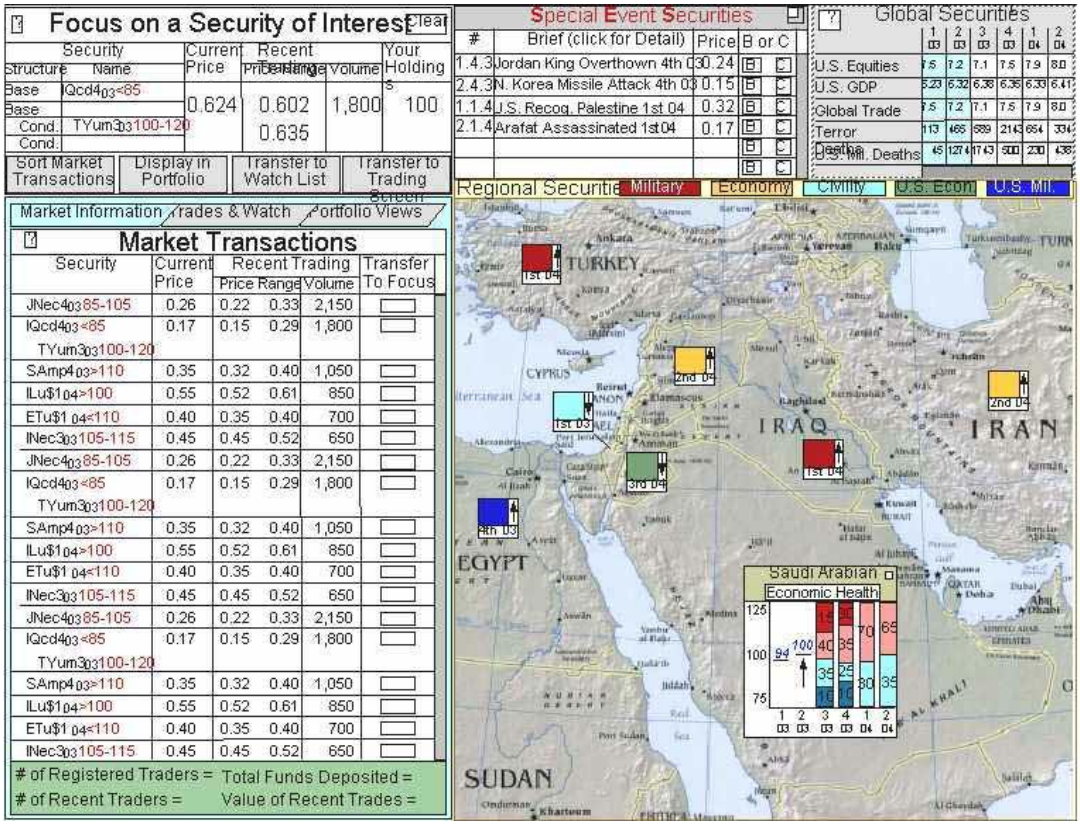
[70] Put options are based on the price of a stock falling; call options are based on a rising price.
[71] Ruppert op. cit., pp. 246-249. The report continues: 'On the Chicago Exchange in the days immediately preceding Black Tuesday, Morgan Dean Stanley Witter & Co., which occupied 22 floors of the World Trade Center, saw 2,157 of its October $45 put options bought in the three trading days before Black Tuesday; this compares to an average of 27 contracts per day before September 6. Morgan Stanley's share price fell from $48.90 to $42.50 in the aftermath of the attacks. Merrill Lynch & Co., with headquarters near the Twin Towers, saw 12,215 October $45 put options bought in the four trading days before the attacks; the previous average volume in those shares had been 252 contracts per day. When trading resumed, Merrill's shares fell from $46.88 to $41.50.'
[72] Looney op. cit., 1.
[73] Ibid.

time reflect the entirety of information that could be known about the market to all investors at that time. Hence, the performance of PAM futures prices would similarly reflect what is known about its specific areas of interest. Initially PAM was to be focused on potential political, economic, civil and military eventualities of the major Middle Eastern countries. As Looney states: 'A typical bet would involve issues such as whether the United States would pull its troops out of Saudi Arabia, or whether the Egyptian currency was likely to fall by 20% by the end of 2003'.[74]

PAM's futures contracts covered specially configured indices in the following interest areas:

• Quarterly contracts based on data indices that track economic health, civil stability, military disposition, and U.S. economic and military involvement in Egypt, Iran, Iraq, Israel, Jordan, Saudi Arabia, Syria and Turkey
• Quarterly contracts tracking global economic and conflict indicators such as the likely occurrence of a regime change in Syria
• Specific possible events (e.g. U.S. recognition of Palestine in the first quarter of 2005)[75]

[74] Ibid., 2.
[75] Ibid.



Prototype PAM futures trading platform

(Source: http://www.worldchanging.com/archives/003622.html)

The PAM futures market had a very brief life, pulled from the Internet only one day after its launch, resulting in the resignation from DARPA of its initiator, Admiral John Poindexter (late of the Iran-Contra fiasco). The major resistance came from both academics and politicians accusing the scheme of being a waste of taxpayers' money and criticising its ghoulish nature. A further criticism cited the potential scenario of a trader taking out a 'likely assassination of a political figure' futures contract, and carrying out the deed to realise the profit. Events unrelated to PAM's interest areas but displaying similar characteristics, such as rumours of pending terrorist acts outside of the Middle East, could also cause significant price fluctuations.

However, the CIA even now maintains the viability of predictive markets such as PAM as having broad applications. A paper on prediction markets by international relations consultant Puong Fei Yeh, published on the CIA's website in 2007, details how wagering on the likely outcomes of future events,

using financial futures market structures and methodologies, could improve on conventional approaches to strategic intelligence.[76]

As well as supporting his claim by referring to the efficient market hypothesis, Puong Fei Yeh also refers to the market hypothesis of economist and supporter of free-market capitalism, Friedrich Hayek (1898-1992), which maintained that market prices were an efficient mechanism for aggregating disparate information. Puong Fei Yeh quotes Hayek's claim that, 'The mere fact that there is one price for any commodity [...] brings about the solution which [...] might have been arrived at by one single mind possessing all the information which is, in fact, dispersed among all the people involved in the process'.[77] The paper offers an example of this process, citing an *American Economic Review* report that orange juice futures prices constituted better predictors of weather patterns than the U.S. National Weather Service's forecasts.[78]

The intentions behind DARPA's Policy Analysis Market are currently being reprised in the Massachusetts-based corporation *Recorded Future*. The data-mining company trawls the Internet capturing subject-specific and time-specific information from sources as diverse as foreign government websites and Twitter. In a range of possible pathways designed to suit individual clients links are made between news events, actual or rumored, and predictive or probability analysis attached. The client base ranges from media companies to Wall Street firms, as well as U.S. government intelligence analysts. 'Recorded Future' is in fact financially backed in part by *In-Q-Tel*, a non-profit investment organization set up by the CIA.

In the process of filtering out fact from rumour, the company is developing technology that will automatically assign a credibility rating to the individual sources of information that it has gleaned. For example, a random blog might not carry as much weight as the Wall Street Journal. As much as 'Recorded

[76] See: Puong Fei Yeh, *Using Prediction Markets to Enhance U.S. Intelligence Capabilities: a Standard and Poors 500 Index for Intelligence*, https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/csi-studies/studies/vol50no4/using-prediction-markets-to-enhance-us-intelligence-capabilities.html (accessed: 3/04/11).
[77] Ibid., 2.
[78] Ibid., 3.

Future' might resemble a knowledge 'commons', its government agency connections and 'Big Brother' connotations may yet prove to have serious implications for privacy rights and freedom of speech.

Postscript and Counterpoint:

The underlying concerns of this paper have revolved around the rampant, institutionalized financial speculation that has taken global economies and social systems to the edge of chaos – and the digital revolution that has provided the means to fuel the fire.

The free-market capitalist system, in its unregulated institutionalised form, has arguably had negative impacts on the public good. Writing in 1998, French sociologist and philosopher Pierre Bourdieu identified an 'extraordinary growth in disparities of income' in the new millennium's 'neo-liberal utopia' of free-trade faith.[79] He also noted an increasing proportion of society in the most advanced economies as experiencing poverty, and referred to an unregulated market as an 'infernal machine', foreseeing dire implications for cultural production in the face of intrusive commercial interests. He also expressed his dismay at what he refers to as the destruction of collective cultural institutions capable of resisting the infernal machine.[80]

Bourdieu wrote *Acts of Resistance Against the Tyranny of the Market* at the height of the e-commerce, dotcom boom. Had he lived beyond 2002 however, he would have witnessed the exponential growth of online information, as well as audio and image sharing. He may well have participated in the coming-of-age of democratised news media and online information resources achieved through the open source software and user-led production sites, such as blogs and wikis.

These innovations have proposed and promoted a co-operative model for society, one based on the notion of the *commons,* the communally held resources that Hardt and Negri, in the concluding passages of *Empire*, offer

[79] Pierre Bourdieu, *Acts of Resistance: Against the Tyranny of the Market*, trans. Richard Nice (New York: The New Press, 1998),102.
[80] Ibid.

as the key to the 'incarnation, the production, and the liberation of the multitude'. They propose that the recent transformations in modes of production – consequences of the age of digital 'informatization' – have established a more 'radical and profound commonality than has ever been experienced in the history of capitalism'.[81]

This notion of commonality is reflected in Axel Bruns' study of user-led spaces such as *Wikipedia* and *Second Life*, in which he reframes the *producer* > *distributor* > *consumer* equation, and proposes a transformation of the production cycle into what he terms *produsage.*[82]

Bruns' interest lies in how the traditional production cycle – characterised by the Fordist[83] industrial model that aligns in linear fashion the *producer* > *distributor* > *consumer* relationship – might be interrupted to facilitate a more active and productive engagement by the consumer. He cites Internet technologies commentator Clay Shirky's apt description of the conventional relationship between producer and consumer: 'The historic role of the consumer has been nothing more than a giant maw at the end of mass media's long conveyor belt'.[84] This linear model is also characteristic of modern mass media, previously discussed in this thesis in terms of how the means of production and distribution, as well as reception, have become widely available to global information communities; what French media analyst Pierre Lévy refers to as the decentralised *collective intelligence.*[85]

In terms of financial markets, through direct engagement not as passive investors (or *consumers*) relying on third party brokerage firms, individuals have the opportunity and technical facility to insert themselves into flows of global capital as participating *users*. The terms of Bruns' study can be

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[81] Michael Hardt, Antonio Negri, *Empire* (Cambridge, Massachusetts; London: Harvard University Press, 2000), 300ff.
[82] Axel Bruns, *From Production to Produsage: Blogs, Wikipedia, Second Life, and Beyond* (New York: Peter Lang, 2008), Pp. 9-33.
[83] The Fordist model was derived from the revolutionary post-industrial mechanised production lines of the Ford Motor Company with its emphasis on worker efficiency. The model is also related to early 20th century Taylorism (named after the U.S. industrial engineer, Frederick Winslow Taylor) whereby, in seeking production efficiency, tasks are fragmented into elementary units in order to enable assemblage by lesser-skilled (hence lower paid) workers.
[84] See: Clay Sharky, *RIP the Consumer 1900-1999*, in *Writings down the Internet: Economics and Culture, Mass Media and Community*, Open Source: http://www.shirky.com/writings/consumer.html (accessed: 24/04/11).
[85] Bruns op.cit.,16.

adapted to online trading platforms, market forums and financial chat rooms where users:

> … are able to involve themselves flexibly and fluidly in the tasks confronting the collaborative 'hive' community; they collaborate not by performing only the monotonous, repetitive, predetermined tasks of the production line, or by contributing fully formed new ideas to the information commons, but instead engage in an ongoing, perpetually unfinished, iterative and evolutionary process of gradual development of the information sources shared by the community.[86]

The disruption of the production cycle as described by Bruns has enabled the *consumer* to become both a *user*, and a *producer* of information. The financial market is continually evolving, with prices changing constantly. Accordingly information, rumour and speculation integral to the functioning of the marketplace require constant updating by the information commons and its constituent *produsers.*[87]

A domestic trader participating in the ebb and flow of bids and offers is theoretically able to move the cogs, even if they are small ones, of Bourdieu's 'infernal machine'. This process also provides the opportunity for groups of individuals to engage with and evaluate the very structure and management of public companies. Shareholders can attend and vote at annual general meetings. Collectively, individuals who are represented by large shareholder groups, such as superannuation funds, can also exert an influence on companies and thus the market sectors the funds invest in. This process might involve maintaining an overview of the checks and balances regarding corporate governance, and the social and environmental impacts of a company's research and development activities. Active engagement on this level has become known as *shareholder activism*.

Economic anthropologists Chris Hann and Keith Hart suggest that with the maturing of online connectivity, a more pluralist version of society composed of mobile networks has emerged, outmoding the conventional capitalist model that situates the idea of 'society' and its consumers within a single locus.

[86] Ibid., 20.
[87] Ibid., 21.

According to Bruns, a flexible societal model facilitated by the provision of 'tools for widespread, equitable collaboration across large communities of users [would] remove the real-world limitations placed on social and/or collaborative behaviour by factors such as language, geography, background, financial status'.[88]

Resisting neo-liberal governments' tendencies to confuse social democracy with free-market liberalism, in my performance and installation projects such as *catchingafallingknife.com*, I have instigated the cultural co-option of the financial market's ideological apparatus by taking on its actions and gestures. The 'disposition to truck and barter', as a cultural act, has been engaged to *re-frame* the market through what Bourriaud refers to as the 'filter of a critique of the institution'.[89] I take heed of Bourriaud's concerns regarding the shift from a goods-based economy to a service-based economy, where 'anything that cannot be marketed will inevitably vanish'.[90] However, this reservation may be counteracted by the rise of *produser* and commons-based, peer-to-peer communities, which challenge the passive character of the modern consumer. Instead, a social figure is evolving engaged, as Bruns proposes, in 'a fundamental reconfiguration of our cultural and intellectual life, and thus of society and democracy itself'.[91]

19th century French politician, philosopher, socialist and self-avowed proto-anarchist Pierre-Joseph Proudhon – in a statement seemingly paradoxical to his dictum 'Property is Theft'[92] – declared in 1840 that speculation as 'a creative social force (along with industry and trade), is an intrinsic feature of human nature and an expression of human freedom; all human beings are endowed with this force and must therefore exercise it'.[93]

Heading into the second decade of the millennium produser/speculators have the potential to become, as Proudhon had advocated, 'a creative social force',

[88] Ibid., 3.
[89] Nicholas Bourriaud, *Postproduction* (Siena: Galleria Continua, 2003), 70.
[90] Nicholas Bourriaud, *Relational Aesthetics*, trans. Pleasance and Woods (Dijon: Les presses du réel, 2002), 9: 'For anything that cannot be marketed will eventually vanish. Before long, it will not be possible to maintain relationships between people outside these trading areas.'
[91] Bruns op. cit., 34.
[92] See: Pierre-Joseph Proudhon, *What is Property? An enquiry into the principle of right and of government* (first published 1840), trans. Benjamin R. Tucker (London: William Reeves, 1969).
[93] Preda op. cit., 155.

with the proliferation of cohorts of online market players, bypassing banking institutions, and heralding the era of a truly democratised financial market.

Thus the methodological enquiry that underscores this paper does not reject the free-market economy or financial speculation. Instead, I suggest that the market might be re-framed through an exploration of the 'deep-play' of cultural intervention. Through participation in its capital flows, a direct engagement that digital technology has made possible, and by addressing the fears and anxieties bred in the financial market's domain, I propose that we might gain a better understanding of capitalism's complexities. And in the process, even in some small way, find the means to offset their significant political and societal impacts.