

This article was downloaded by: [University of Alberta]

On: 27 November 2013, At: 08:54

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Journal for Cultural Research

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/rcuv20>

Performing the limits of finance

Rob Aitken^a

^a Department of Political Science, University of Alberta, Edmonton, AB, Canada

Published online: 25 Nov 2013.

To cite this article: Rob Aitken , Journal for Cultural Research (2013): Performing the limits of finance, Journal for Cultural Research, DOI: 10.1080/14797585.2013.851834

To link to this article: <http://dx.doi.org/10.1080/14797585.2013.851834>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

Performing the limits of finance

Rob Aitken*

Department of Political Science, University of Alberta, Edmonton, AB, Canada

(Received 10 September 2012; accepted 31 July 2013)

Recent financial turmoil has put emphasis once again on the very meaning and reach of 'finance'. In doing so, recent financial crises have also provoked questions about the very 'ends' of finance: Where are the borders of finance? Given the expansive reach of financial innovation over the past two decades, are there any serious limits to the kinds of practices that can be converted into financial objects? Does the culture of finance (expansive and all encompassing) encounter meaningful interruptions? This paper explores these questions by reviewing a cluster of public-art responses to the 2008 financial crisis mounted by artists critical of the expansive logic of financial abstraction. This paper pays particular attention to the work of Fergal McCarthy and Fred Forest, two public artists who have confronted finance and its rational culture with practices of gameplay, whimsy, and carnival. In doing so, these artists invoke a strategy designed to lay the all-encompassing claims of financial abstraction alongside its own impossibility; alongside performances which undermine the expansive claims of financial abstraction. These are strategies, I conclude, which can interrupt the technocratic discourses which dominate the contemporary cultures of finance; strategies which, in the words of one artist, evoke 'plausible states of uncertainty' about our faith in financial abstraction.

Keywords: finance; abstraction; performance art; materiality; financial crisis

Games are popular art, collective, social *reactions* to the main drive or action of any culture. Games ... are extensions ... of the body politic ... counter-irritants ... Games, then, are contrived and controlled situations ... a kind of talking to itself on the part of society as a whole ... the game, like any art form, is a mere tangible model of another situation that is less accessible ... (McLuhan, 1964, pp. 234–245)

In 2001, artists Lise Autogena and Joshua Portway mounted an art project at the Tate Britain entitled *Black Shoals Stock Market Planetarium*. An ironic invocation of the Nobel-winning Black Scholes formula that has been key to contemporary risk management practices, the exhibit consists of a darkened room with a domed ceiling on which is projected real-time financial data generated by actual stock market trading. This activity is represented by a computer display of the night sky visible to an audience seated below; a planetarium in which real-time stock market activity is transposed onto a map of stars which glow and flash in response to trading in particular stocks. Each star in this night sky is linked to the trading activity of a particular stock listed on the London Stock Exchange; its brightness determined by the volume and volatility of market activity. This night-sky financial economy is also designed as a kind of habitat

*Email: raitken@ualberta.ca

for what are described as ‘amoeba-like’ artificial life ‘creatures’ which evolve and grow over the course of time and which ‘feed’ on trading activity. ‘For these creatures,’ the artists note, ‘the heaves and surges of the world economy are like ... tectonic plates ... the creatures have no way of knowing what lies “underneath” their world – they only know that sometimes there are explosions of money and sometimes there are famines.’¹

In some ways, *Black Shoals* evokes the various languages which imagine the market as a natural artifact – metaphors of the market as a self-regulating organism or the economy as a self-contained biological system (Mitchell, 2002; Raley, 2009; Stallabrass, 2001²). By visualizing financial markets as both a distant world and a world unto itself, *Black Shoals* conjures a certain fantasy which imagines the market as a source of mystery and unknowable awe. Gazing upward at the night sky, we are invited to remember the market as a kind of magical expanse. As one art critic noted, *Black Shoals* is ‘a sublime spectacle, eliciting a genuine sense of wonder. The world of share dealing is as mysterious to most of us as the night sky was to our ancestors’ (Gibbs, 2001, p. 51).

In other ways, however, *Black Shoals* confronts us with a more novel set of questions especially relevant to our world after the 2008 financial crisis. The installation both immerses its audience in an over-bearing sea of financial abstraction and locates us outside of, as an observer of, that ‘natural’ landscape. As the artists themselves note, the planetarium was ‘designed as a kind of parody of the trading desk ... the Mount Olympus from which they would survey their creation’ (Autogena & Portway, 2001). This geometry of inside/outside inserts a kind of disorientation about the kind of market-world created in *Black Shoals*: is this world artificial or real, natural or virtual, imagined or material? As a striking gesture built around a monumental, all-encompassing form of financial abstraction, this market-space also foregrounds the expansiveness of finance; its ambitions as the motor of its own self-contained ecology. In turn, *Black Shoals* provokes questions about the limits of finance, about where the borders of finance lie. What and where are the limits of finance? Are there any borders that might be erected around the reach or ambition of Wall Street? Are there any parts of our lives – intimate, sacred, biopolitical – not touched by finance?

These questions about the limits of finance have become urgently important because both critics and proponents have frequently drawn finance as an expansive force. This includes, for example, an argument regarding the immensity of finance and the political and economic reach of its influence (Panitch & Gindin, 2009; Panitch, Gindin, & Albo, 2010, pp. 21–23). Or, as imagined by its proponents, finance is also frequently depicted as a body of practice capable of addressing social and political problems beyond the allocation of credit: ecological disaster, future political or geopolitical uncertainty or abject poverty (Aitken, 2011; Patterson & Descheneau, 2011). This sense of finance as expansive is deeply related to the extraction of financial value from an increasingly wide group of social practices. As Leyshon and Thrift have noted, financial capitalism is characterized by an incessant prospecting for new asset streams, often involving the conversion of objects, some quite distant from finance, into novel forms of financial asset (Leyshon & Thrift, 2007). At the heart of the financial crisis, for example, was the securitization of assets – subprime mortgages – in ways that brought those objects, and the borrowers they were ultimately connected to, more closely into the sphere of global financial markets (Leyshon & Thrift, 2007, pp. 102–103; Turner, 2009; Warwick Commission, 2009). These expansive processes have led many to conclude that finance is now a pervasive component of everyday life (see Langley, 2008; Martin, 2002; Preda, 2009).

Taken together, these various kinds of claims depict finance as a ubiquitous and over-bearing kind of presence. In some versions of this story, finance is conceived as central to the very ways in which we understand citizenship. Martin et al. note, for example, that finance ‘becomes not simply a form of calculation, a way of knowing, but also invites a kind of being.’³ Taken to its extreme, these kinds of claims can imply that finance is without limit. Finance, notes Alex Preda, ‘has become a membrane which envelops our lives, covering the spaces through which we move and cocooning our projections of the future’ (Martin, 2002; Preda, 2009, p. 4). But where are the ‘ends’ of finance? What are its fragilities that we might overlook by painting finance as an over-bearing or limitless body? What obstacles might confront finance at its limits? Are there evasions or disruptions that might usefully upend its influence or impact?

In this paper, I explore these questions by reflecting on some of the limits of finance which have been enacted in relation to the 2008/2009 financial crisis; a moment when the expansive reach of finance as a source of instability seems as inescapable as the night-sky. I want to do so by reflecting on a series of public art interventions that have responded to these events. There has been a wide range of artistic reactions to the financial crisis: Peruvian-French artist Jota Castro’s 2009 installation, *Mortgage*, a meditation on the French meaning of mortgage as ‘dead pledge’; Laura Gilbert’s *Zero Dollars*, a piece of public art/theatre in which she passed out stylized versions of American paper currency (reduced to worthlessness) in New York’s financial district; Nora Ligorano and Marshall Reese’s *Meltdown* project which entailed the installation of a large version of the word Economy (temporarily) fashioned out of ice block-letters in lower Manhattan; and controversial Italian artist Maurizio Cattelan’s audacious middle-finger statue sculpted out of marble and placed directly in front of the stock exchange in Milan.

In this paper, I reflect on a more specific cluster of interventions that have placed particular emphasis on the practices of financial abstraction. Both academic and popular commentators now often narrate finance as a particularly abstract practice; as a set of spaces supposedly immaterial, ephemeral and divorced from substantial reality. This sense of abstraction has been reinforced by a growing unease with the ways in which finance increasingly occupies, like the world of *Black Shoals*, a unique (virtualized) ecology of its own (Mackenzie, 2012). What has long been at the heart of the power and authority associated with finance is a *perception* which places it within its own abstract – sometimes ‘fictitious’ – world; a world divorced from the substance of material or physical life. The public art I focus on in this paper seeks to challenge in novel ways the kinds of abstraction which now lie at the heart of finance and its cultures.

A longstanding critical lexicon has depicted financial markets as dangerous abstractions, often in ways that sharpen a divide between ‘material’ and ‘immaterial’ practices. This lexicon has (sometimes usefully, sometimes unproductively) framed finance as a practice situated in a series of binary divides – ‘fictitious’ v. ‘productive’ capital, ‘imaginary’ v. ‘real’ value – which map onto a longer set of distinctions common to traditions of critical political economy; sharp lines which separate material from ideal, physical from insubstantial, base from superstructure (see Stanford, 1999). By contrast, some of the most dramatic of recent public art has challenged abstraction by confronting, at the same time, these very oppositions which would place material and immaterial spaces on either side of a divide.

The forms of public art I review in this paper both directly address public audiences in unmediated ways and confront the very ways in which those audiences are often

asked to understand finance as a somehow immaterial or virtual space. Strategies of public art are able to mount this type of disruption by drawing on a language which stresses spaces and practices (gaming, change and carnival) that contrast with the image of finance as a respectable, rational or scientific pursuit (see de Goede global resistance reader). As I have written elsewhere, gaming and game-play constitute one set of what Foucault referred to as the ‘subjugated knowledges’ of finance; forms of knowledge that continue to be used by artists to achieve a kind of ‘making strange’ of finance and its pretensions to scientific rationality (Aitken, 2012; de Goede, 2005a; Foucault, 2003; Mackenzie, 2006).

This ‘making strange’, this disruption, I want to suggest, is achieved through two particular kinds of artistic strategies which, taken together, jar our sense of financial abstraction. A first strategy involves installations – exemplified by Fergal McCarthy’s *Liffeytown* – which confront audiences not with hyper-virtual spaces like *Black Shoals*, but with the inescapable materialities to which all financial practices are ultimately connected. This strategy puts into question any sharp line that might divide ‘immaterial’ and ‘material’ realities. A second strategy involves a much different type of installation – typified by Fred Forrest’s *Traders’ Ball* – which also distinctively challenges the lines that might divide virtual and material practices. It is in this context that I conclude that if there are limits to finance, they are located in the space opened by the type of strategies used in these forms of public art; limits latent in the space created when the all-encompassing claims of financial abstraction and laid alongside performances which diagram the impossibility of those claims. These limits are particularly urgent in a context in which the various policy and political reactions to the financial crisis have often operated *within* the space of financial abstraction and the expert knowledges associated with finance as a ‘normal science’. As I note in the conclusion, opening space for novel critical gestures might mean disrupting, or placing into uncertainty, the broader practices of financial abstraction.

To advance this kind of claim, this paper is divided into three sections. A first section briefly situates financial abstraction within a larger process through which finance became recast by the twentieth century as a rational and scientific pursuit. As this section notes, this was a process that entailed the separation of finance from its ‘subjugated knowledges’ – gaming, chance, and carnival. A second section notes that this separation was neither complete nor stable by suggesting that finance continues to be haunted by the kinds of gestures – game play, whimsy, burlesque – from which it most urgently seeks to dissociate. This section makes this claim by foregrounding a cluster of recent public art interventions which disrupt the kinds of abstraction that give contemporary financial practices much of their power and authority: interventions like McCarthy’s *Liffeytown* which confront everyday actors with the materialities that are central to (but often a disguised part of) financial practices. A third section of the paper turns to a related but, in some ways quite distinct artistic strategy, typified by Forrest’s *Traders’ Ball*, which immerses audiences in purposely virtualized worlds. A final section returns to the limits of finance and punctuates the paper by speculating on the possibility that finance might be disrupted in meaningful kinds of ways.

1. Finance, game-making, subjugated knowledges

In 1719, one British critic complained that those connected to the London Exchange were ‘a few needy Mercenaries, who can turn all Trade into a Lottery, and make the Exchange a Gaming Table: A Thing, which like the Imaginary Coins of Foreign

Nations, have no reality in themselves ...' (Quoted in Preda, 2009, pp. 84–85). This injunction is part of a long line of critique which figures the financial world as an *irreal* space with 'no reality in itself'. This consists of a claim often made about finance as a body of practice somehow immaterial in nature and distant from (or parasitic on) the world of *real* or material objects. These critiques narrate the history of finance as a story of increased detachment from concrete or productive economies. As Bill Maurer depicts it, 'the story of money is repeatedly told as an evolutionary tale of greater and greater distance from actual things, of greater dematerialization, in a linear trajectory from barter, to metal coin, to paper backed by metal, to paper declared valuable by fiat, and, finally, to complex financial entities like derivatives, with future, not anterior, backing' (Maurer, 2005, p. 140).

The various arguments about finance as a special site of abstraction often refer to several related sets of conditions. On one hand, and most commonly, they often refer to the conversion of objects into 'dis-embedded' forms of financial value. This is usually punctuated either by processes which seek to convert a range of objects – commodity prices, the value of foreign currencies, sub-prime mortgages – into tradable financial objects, or by modes of calculation which assign value *only* in financial or economic terms. These abstractions are 'dis-embedding' because they treat objects narrowly in ways which resist non-economic calculations of value.⁴ Contemporary liberal financial markets are most commonly framed as sites of hyper-abstraction deeply implicated in these types of dis-embedding moves (de Goede, 2004; Leyshon & Thrift, 2007). On the other hand, abstraction can also refer to the ways in which financial practices become bound up in virtual networks. Because global financial markets are entangled in complex networks of communication and information technologies, they are often assumed to occupy a kind of virtual world – a space enabled by the speed and liquidity of digital technologies. Taken together these types of abstraction can imply that finance is an unreal object, divorced of substance.⁵

This abstraction – this distance from substantial reality – is most emblematically bound up in financial innovations related to derivatives. Derivatives, which are financial instruments which derive their value from some other underlying asset, are virtual in a number of ways. Not only are they traded through large virtual networks, but they also represent abstract claims (often left unclaimed) on virtual (future) asset values. As Mackenzie notes, these types of financial practices 'are "virtual" in the sense that their value lies not in their physical substance ... but in the claims on future states of the world that they embody ... from what is already an abstract claim, and so the development of derivatives markets can be seen as a further stage in the abstraction of monetary forms' (Mackenzie, 2008, p. 356). Although in some ultimate form derivatives are related to some set of underlying tangible assets, they are increasingly organized in global markets as abstractions often decoupled from these assets.

In these terms, the growing abstraction of finance has a kind of double meaning. On one hand, financial abstraction refers to a mode of representation in which real objects are literally re-presented in abstract forms: as prices made real in ticker displays, as calculations generated through algorithmic trading (see Preda, 2009). On the other hand, abstraction has a more general meaning relating to separation: a process design to sever, to abstract, objects from their context. In this broadest sense, growing forms of financial abstraction are part of a much longer process through which finance has been separated from the social, cultural, and political context from which it was originally enmeshed. As Marieke de Goede has shown, for example, the early history of financial markets is deeply intertwined with spaces related to games. She has

demonstrated the emergence of finance out of -eighteenth-century coffeehouses and lotteries; a shared world in which games, risk, gambling, and early forms of insurance all overlapped (de Goede, 2005b; Valenze, 2006; Wagner, 2010⁶). Because finance and gambling occupy shared historical conditions, and because many forms of financial practice have been difficult to distinguish from games of chance, a widespread debate regarding finance and gambling crystallized in the nineteenth century. In this debate, many critics of finance equate ‘fictitious’ practices of speculation with gambling. Because they are bets based on predictions about prices, and not productive investments in ‘real’ enterprises, speculative moves are ‘fictitious’, more akin to gambles than to any meaningful extension of credit or investment. ‘Like all other forms of gambling,’ one critic noted in 1884, ‘betting on the future price of stocks ... is a delusion ... Men have gone into fictitious speculation who would not be suspected ordinarily of patronizing faro or roulette, much less of having a proprietary interest in the “game”. But the difference is mainly in the form’ (Anonymous, 1884, p. 629). Gambling becomes a key language in a protracted contest waged between those keen to denigrate finance and those preoccupied with framing finance as a rational and legitimate pursuit. By offering a diagram which conflates gambling, games of chance and financial abstraction, critics undermined the ways in which the world of finance could make claims to legitimacy or other ‘dignified headings’:

We know that the men who control the pools in Wall Street and who live in uptown mansions and belong to uptown churches think themselves to be, and want the world to consider them as ‘financiers.’ But ... these men and their silent partners are the managers of *the most stupendous gambling game* the world has ever seen ... A game that has its daily doings reported free of charge and at great length in every prominent newspaper in the country under the head of ‘Financial Markets’ or ‘Wall Street Doings’ or some other dignified heading. (Hoyle, 1898, p. 11)

As de Goede has noted, financial institutions reacted to this debate with a strategy that would preoccupy them for a century: the formal separation – in law, in culture – of finance and gaming. Throughout the nineteenth and into the twentieth century, financial institutions were keen to sever themselves from the specter of gambling in a range of ways: in public relations campaigns designed to recast finance as a socially legitimate form; in legal and regulatory struggles concerned to clarify the formal distinctions which distinguished derivatives trading and gaming; in the redefinition of financial risk as a calculable, and hence scientific, category; and in the reorganization of financial markets over the course of the twentieth century as practices legible in all variety of statistical knowledge and scientific expertise (Aitken, 2007, 2011; de Goede, 2005a; Hochfelder, 2006; Mackenzie, 2006; Preda, 2009; Seabrooke, 2006). As de Goede summarizes it:

Gambling on a wide variety of uncertainties was part and parcel of early modern finance ... [However] in the nineteenth century, this lack of conceptual distinction ... became an obstacle to the legitimacy of financial practices ... Faced not just with moral and political criticism, but increasingly with legal restrictions of their activities, it became clear to the financial exchanges that dissociating their practices from gambling was vital to the survival of their profession. (de Goede, 2004, pp. 200–202)

In the shared history of early finance and game cultures, finance became inextricably tied to, and often sought to displace, the language and symbolic practice of gaming. It is in this context that I have suggested, following Foucault, that gaming, in its broadest

sense, is one of the subjugated knowledges of finance. For Foucault, forms of codified scientific knowledge need to purge themselves of those forms of knowledge and practice which might taint claims to rationality, technical authority or parsimony. These 'subjugated knowledges' are 'the historical contents that have been long buried and disguised in ... formal systemization ... blocs of historical knowledge which were present but disguised' (Foucault, 1980, p. 81). For Foucault, subjugated knowledges refer to those bodies of knowledge 'low-down on the hierarchy' and 'beneath the level of required scientificity'. Borrowing Foucault's language, game-making and gaming are forms of practice that were subjugated as finance became increasingly recast as a scientific and rational pursuit. Moreover, as de Goede has noted, gaming was only one of a whole range of 'irrational' knowledges that were 'disqualified' as finance became recast as scientific and rational. Financial agents also strenuously marked out their own sense of calculative and instrumental rationality by borrowing statistical analysis from physics and by distancing themselves from any notion of 'carnival' or 'comedy'. 'The authority and legitimacy of financial practices,' she notes, 'is underpinned by their rationality and differentiation from emotion' (de Goede, 2005b, p. 381).

Subjugated knowledges, however, are not, in any simple sense, 'defeated' knowledge. Rather, subjugated knowledges remain, in some ways, attached to the body of knowledge from which they are, simultaneously, 'disqualified'. Moreover, for Foucault, genealogy is a method precisely concerned with the recovery of disqualified knowledges. This implies a critical strategy designed 'to entertain the claims to attention of local, discontinuous, disqualified, illegitimate knowledges against the claims of a unitary body of ... some true knowledge' (Foucault, 1980, p. 82). Disqualification, put differently, is never completed in some kind of 'once-and-for-all' achievement. Subjugated knowledges can continue to haunt even as they remain buried and displaced.

2. Dissonance and im/materiality

Although the history of finance pivots on a process that attempted to sever financial practices from those domains it sought to displace – gaming, carnival, whimsy, emotion, burlesque – this separation was neither complete nor stable. This is particularly evident in a series of recent public art interventions which have sought to place finance alongside its subjugated knowledges, and, in particular, to rethread the connection between finance and the material world. This ambition was addressed, for example, in the *Leona Drive Project*. *Leona Drive* consists of a series of site-specific installations on a block of decrepit postwar suburban houses in north Toronto. The houses, an early experiment in postwar suburban development, were slated for demolition in 2009. In advance of the demolition, a coalition of organizations secured a two-week period in which they could mount various artistic installations around the site and in relation to the houses themselves. What resulted was a series of 18 interventions in the aging bungalows which foreground issues of place, community and political being (Marchessault & Propokow, 2009).

The most striking of the installations was *Title Deed*, a project mounted by Toronto artist An Te Liu, which consisted of Liu's reinterpretation of a small brick bungalow at No. 19 Leona Drive, built in 1948. In making the installation, Liu cleaned the house of external clutter (an old satellite receiver, wires, various mechanical parts) in order to return the house to the pure, simple forms that characterized its initial construction, and then painted it a color of Monopoly-green (see Figure 1). In doing so, he transformed the bungalow into a striking analog of a Monopoly game house.



Figure 1. *Title Deed*, An Te Liu, site-specific installation, *Leona Drive Project* (Liu, 2009b).

In Liu's treatment, the house *becomes* a game-piece, a physical transformation into what, in the context of the subprime crisis, it had been reduced. In Liu's own words, *Title Deed* is a reminder that the mundane spaces of suburban housing were reworked into financial assets, pieces in a much larger global financial game. The 'value of a home, the debt represented,' notes Liu, 'could be infinitely traded and swapped and repackaged into incredibly abstract, cryptic investment vehicles' (Liu, 2009a). No. 19 Leona Drive, once a modest house designed for returning war veterans, becomes a playful metaphor for the 'trading' and 'swapping' of financial debt.

This metaphor, the house *as* an abstracted game piece, is accomplished by a striking physicality. By refiguring the game-piece as a monumental object, Liu provokes questions about the ways in which we understand scale. An over-sized game piece, the house overwhelms with its starkness. As one reviewer put it, Liu's installation has the effect of displacement:

Displacing a simple prop in the popular board game by altering its scale, Liu effectively displaces the viewer from his or her usual experience of the game as a subject in control. Disempowered, the viewer is menaced by the sheer physicality and impenetrability of the uncanny, achromatic house and experiences what the bungalows on Leona Drive have endured: a long wait for the revelation and fulfillment of their future. (Chu, 2009)

Liu's *Title Deed* confronts us with its inescapably physical presence, a gesture which offers a number of inversions: the inversion of the game not as a site of control but of disenfranchisement; the game not as a space of play and fantasy but of decay. By extension, the physicality of the game-piece house also critically inverts our conception of finance not as an ephemeral pursuit, but as a practice with a physical and *material* type of presence.

In doing so, Liu's work echoes a strategy more explicitly developed by Irish artist Fergal McCarthy that I want to describe as a kind of dissonant materiality. At one level the experience of Ireland and Canada throughout the financial convulsions of 2008 were quite different. Ireland became a key flashpoint in a crisis where the securitization of mortgages intersected with a fragile bubble in housing markets in ways that resulted in spasms of instability. Canada, by contrast, was relatively insulated from the subprime crisis, in part because of a somewhat traditional approach to banking regulation. On another level however, and although from different contexts, both Liu and McCarthy invoke a kind of shared strategy designed to disturb the easy ways in which financial discourses separate material and immaterial practices. This strategy is particularly visible in McCarthy's *Liffeytown*, essentially a 'housing estate' consisting of large green and red monopoly houses (lit at night) which McCarthy floated on the River Liffey in Dublin's city core for two weeks in September 2010 (see Figure 2). The game-piece houses were conceived and constructed over a two-year period culminating in an installation which coincided with a moment of intense political fallout from the Irish financial crisis and IMF bailout negotiations – a historical juncture that helped constitute an important Irish audience for interventions like *Liffeytown*.

McCarthy initially conceived the installation (while cycling along the river) as 'an antidote to what was happening on land' (McCarthy, personal communication, April 11, 2011). In part, it was a reaction to the Irish property boom and to what McCarthy describes as the 'monopolistic finance capitalism' that made that boom possible. The purposeful invocation of game pieces was precisely an attempt to foreground the 'finance game' at the heart of the crisis, as well the ways in which 'we all became complicit' in the speculative fever which fueled the boom. The installation was also a commentary on the quality of housing the boom generated and the impact that housing boom has had on the built environment. McCarthy has publicly complained about the ubiquity of poor quality housing in estates that have transformed the Irish countryside. By installing an idiosyncratic housing development in the river, McCarthy offers his



Figure 2. *Liffeytown*, McCarthy (2010).

own version of the expansive forces associated with financial and real estate speculation. *Liffeytown*, he notes, was ‘my way of staying stop to that,’ a gesture made real by ‘placing an estate on the last place to be built in Ireland’ (McCarthy, personal communication, April 11, 2011). *Liffeytown*, which was mounted as the financial boom reached its devastating crescendo, ‘presents itself, hopefully, as the last of these “ghost estates”, as a beacon that its time has passed.’⁷

At a very different level, the installation was also an explicit attempt to reshape the ways in which we see and understand the river. For McCarthy, although historically central to the shape the city has formed, the river has become an ignored part of the city’s landscape, a largely inert surface at the edge of how the city is imagined and marginal to the ways in which the city is experienced. This neglect has been paralleled by a decline in the biophysical status of the river itself, marked by increasing pollution and degradation. Placing red and green houses onto the river was a strategy designed to make the river striking in its visibility, no longer a permanent but unseen part of the city’s background. Conceiving of the river as an untapped ‘resource’ that might once again be important in an explicit and visible way, McCarthy pleads in *Liffeytown* for a renewal of the river and its lines of visibility. ‘In my imagination,’ McCarthy notes, ‘I placed this sort of estate on the river as a way of redirecting our gaze toward it’ (Conway, 2010). Returning our gaze to the river is accomplished by the jarring experience the game-piece houses provoke. As the chief theatre critic at the *Irish Times* put it, *Liffeytown*:

Steered attention towards something so obvious it had become invisible, a contour of the city as unconsidered as the roofs of buildings ... to draw our focus back to the river. How I saw the city, and the nation, changed each time I approached McCarthy’s surreal flotilla, disarmed by its delightful incongruity and jolted into different feeling and deepening consideration. (Crawley, 2010)

Liffeytown resonates partly because of the *dissonant* strategy it invokes. By literally attaching the world of finance to the very material space of the river, McCarthy opens a dissonance with representations of finance as an ‘imagined’ or immaterial face. The stark materiality of McCarthy’s installation sits in discordant contrast with an image of finance as immaterial practices with no reality in themselves. The deeply intimate experience of the river evoked in this installation both suggests, but also longs for, a material inseparability between us and the river, even in the face of forces of financial abstraction supposedly built around detachment and removal.

Liffeytown evokes a sense of physical intimacy, a call to submerge ourselves in the material spaces most reworked by, or rendered invisible by, the forces of financial calculation. McCarthy describes his artistic practice as an attempt to ‘physically assimilate with a place’ (McCarthy, personal communication, April 11, 2011), to create installation spaces and gestures which upend the ways in which we experience place and which demand a kind of reattachment with those spaces in a fully material and physical manner. In doing so, McCarthy offers a particular style of ‘making strange’ by associating finance (ostensibly immaterial, fleeting, ephemeral) with the materialities it so frequently seeks to displace. This inserts a stutter into the ways in which we understand financial discourse and knowledge, by placing financial abstraction alongside its impossibility. McCarthy’s *Liffeytown* upends any easy sense of financial immateriality by inviting us into, by assimilating us, back into the very physicality of the river. This assimilation displaces the narratives which commonly represent the financial world as

detached from substantial reality or as a reality into itself and in doing so opens a dissonance between fantasies of financial abstraction and the materialities from which finance is unable to disconnect. It is this sense of assimilation, or submersion, moreover, which is relevant, although in a radically different manner, to another artistic strategy developed in reaction to the financial crisis; an assimilation not with material realities but with its fantasized opposite, a world of virtual invention.

3. Financial space and virtual immersion

In 1983, French media and digital artist Fred Forest mounted an exhibit in Paris entitled *Stock Exchange of the Sensational* which featured the stylized headquarters of a news wire service. For five weeks, Forest and his staff operated a national ‘news exchange’ in which fictitious news stories were created and circulated. The installation included a national toll-free number so that members of the public could provide or receive story ideas. Part of a longstanding interest in new media, Forest’s *Stock Exchange* was an attempt to highlight, in particular, the dilemmas of an era dominated by the exchange of ‘imaginary’ value.

An iconoclastic figure in radical French art circles, Forest has long been an exponent of a very particular type of interactive and public art increasingly keen to explore the spaces of digital and virtual exchange. This interest rotates around what he calls the ‘dematerialization’ and the ‘disintegration’ of the art object as traditionally understood and, in particular, the dilemmas and possibilities associated with new media. New media, he argues, is ‘often immaterial: its substance comes from the impalpable stuff of information technology. In the sky above our heads, the electric signals of this information trace invisible, blazing and magical configurations’ (Forest, 1984, p. 10). For Forest, there are both daunting constraints, as well as unique possibilities which lie at the intersection of dematerialized everyday experiences and novel digital forms of communication which he describes as a kind of ‘electro-magnetic caress’ (Forest, 1984, p. 19).

To address this novel context, Forest has engaged in a series of art projects designed to reshape the ways in which we relate to digital forms of communication. At one level, this entails a rejection of contemporary art in which ‘objects’ are formally and carefully displayed in ways that set out strict demarcations between art and audience. In contrast, for Forest, art is a public practice in which audiences are activated – or activate themselves. At another level, Forest’s installations almost always depict, use or mimic virtual spaces. By creating public spaces organized around virtual or digital communication, Forest’s form of public art seeks to introduce public audiences to virtual worlds in ways that make them alive to the possibilities of those spaces. As critic Michael Leruth notes, Forest’s work over the past several decades consists of:

public happenings conceived as ... opportunities for dialogical communication ... events that reverse the tendency to accelerate the speed of exchange, which is how electronic capitalism would have us use the Internet ... Virtually all of his media works function somewhat like rites of passage ... symbolic thresholds to cross between the ‘real’ world and the ‘virtual’ space of communication and information. (Leruth, 2004)

This concern for the conditions and possibilities of virtuality brings Forest’s work directly into confrontation with finance. The world of finance is often conceived not only as a site of abstract commodities but also as a set of practices which are made

possible by vast virtual grids of information and communication technologies; the ultimate node in a globalized ‘network society’ (See Castells, 1996).

It is in reaction to the role of virtual abstractions in the financial crisis that Forest mounted *Traders’ Ball* in June 2010 at the Lab Gallery in New York City. The gallery, constructed to confront the ‘furious’ midtown street traffic in a immediate manner, is visible only through large fronting windows. As such, the gallery is a unique experiment in public art ‘designed to confront modern relationships between art and audience’⁸; not an attempt to ‘draw in’ audiences with a very particular and well-defined relationship to a specific piece, but a more interactive, confrontational, immediate, even fleeting type of public art experience. Forest’s installation, consisted of a scene of mannequins costumed, somewhat whimsically, as financial traders (some blindfolded), dancing around over-sized specimens of American currency among other symbols of the financial world. The installation at Laboratory is supplemented by an ongoing presence in the virtual game-space of *Second Life* which allows a space of interaction between dancing avatar-traders and anyone that might wish to join what one critic has referred to as the ‘macabre dance of the financial-dead’ (Sacks, 2010). The avatar-traders dance in rhythm to music written by New York hip-hop artist Jamalski which incorporates a beat derived from real-time stock market trading. The *Second Life* space is framed by a background populated with signs of financial crisis and panic (See Figure 3). As art critics noted, the virtual space of *Traders’ Ball* was an explicit attempt to use virtual game-space to facilitate a playful indifference. The laboratory installation and the ongoing virtual space of *Traders’ Ball* were both accompanied by a project launch that consisted of a real time street celebration in front of the gallery in June 2010. As the official invitation suggests, the piece itself was framed as an elaborate moment of public ‘joy’ – in both ‘real and ‘virtual’ spaces – designed to mark the financial crisis; simultaneously a public ritual, a playful game, and a kind of dance orchestrated by the beat of financial markets themselves. ‘The French Media artist Fred Forest,’ it noted, ‘cordially invites you to join him in *Second Life*, in the shadow of



Figure 3. *Traders’ Ball*, Fred Forest, *Second Life* screenshot.

Wall Street, for the Traders' Ball, a grand and joyous public celebration he has planned in honour of the global financial crisis ...' (Forest, 2010).⁹

At one level, *Traders' Ball* makes a series of playful claims leveled against financial abstraction. Inspired by the virtuality of both game-space and financial markets, Forest's striking piece stages a financial drama in an environment – *Second Life* – which is a virtual life-world onto itself. The props with which Forest has populated this virtual world (the blindfolded traders, the oversized currency specimens), figure a world without any sure-footed relationship to 'real' life. In doing so, Forest implies, as Goggin has noted, that the "real" economy is increasingly dematerialized, fictionalized and rendered both virtual and playful' (Goggin, 2012, p. 442). The 'inflationary reality' of *Traders' Ball* implies the exaggerations, the mis-correspondences, which mark the relation between financial instruments and the objects they purport to represent. The virtual space the installation occupies, as one art critic notes, 'reflects the unreal quality of the financial world ... [where] investments no longer easily ... relate to what can be understood in terms of ... real kinds of goods' (Sacks, 2010). A virtual world with its own logic and forms of engagement, *Traders' Ball* operates as a kind of mimicry of finance itself, insubstantial and distant.

The ironic celebration staged in *Traders' Ball* offers a kind of double-gesture. It both ridicules the kinds of callousness with which financial abstraction is enacted but also signals our own complicity in the value created, if only fleetingly, in that financial world. To do so, Forest's piece makes use of the practices of virtual game-play. For Christiane Paul, Adjunct Curator of New Media Arts at the Whitney Museum, both finance and virtual game-play are enabled by the same kinds of abstract algorithms; although the financial crisis signifies an 'algorithm gone bad', a system which rests precariously 'on non-existent commodities'. The most complex virtual game-spaces, like *Second Life*, host virtual economies which simulate the kind of virtualized financial exchanges so central to the subprime crisis. *Traders' Ball*, for Paul, makes effective use of game-making as a perfect set of metaphors for a financial system increasingly characterized by virtual abstraction:

I think it's a very nice metaphor to depict traders as avatars in *Second Life* ... *Second Life* has its own economy ... Although there is nothing new about virtual commodities, the game world has looked at that for quite some time ... it seems the most appropriate environment for critiquing the financial system ... The trader, the financial markets, all of us as complicit consumers, are contributing to ... [the] increasingly virtualized economy and commodification. (Paul, 2010)

At another level, this installation draws a very particular kind of relationship between art and the public it targets. I want to draw on the work of German art critic Oliver Grau to describe this as a strategy of *immersion*. For Grau immersion is a process marked by the 'enclosure of the observer within an image-space.' Although immersion as an artistic strategy has a long history in relation to visual art (in all forms of panoramic art, in all variety of cinematic immersion – for Grau the films of Eisenstein are important here), virtual realities have played with immersion in a particular and striking kind of way. 'Virtual realities,' notes Grau, 'seal off the observer ... from external visual impressions, appeal directly through the use of three dimensional objects, [and] expand the perspective of real space into illusion space' (Grau, 2002).¹⁰ As Darley puts it, immersion refers 'convincing impression of presence in a fictional world ... even though one is not ... the production of the 'suspension of disbelief', an aesthetics of realistic illusion' (Darley, 2000, p. 161; see also Huhatamo, 1996).

Traders' Ball, in its *Second Life* incarnation, attempts to immerse its audience in a virtual reality, to separate its audience from the contamination of 'external impressions' beyond the 'illusion space' it creates – something even more fully achieved in *Black Shoals*. In doing so, both of these pieces of public art replicate, echo, the kinds of immersions and abstractions common to the financial world. By extension, both of these pieces are allegories of financial abstraction. Financial abstraction, like the world of *Second Life*, occupies a space separated from 'external impressions', from other realities, and exists (like games) in relation only to codes of meaning that emerge from the self-referential rules, language and modes of value which predominate in that space. Immersion is an artistic gesture which, as Grau notes, is enabled by virtual art, and allows a kind of radical separateness from the world; a shared radical demarcation often characteristic of game-space, virtuality and the fantasies associated with financial abstraction.

If Fergal McCarthy's *Liffeytown* invokes a strategy of dissonance built around what he describes as 'physical assimilation', then Forest's work invokes its inversion. McCarthy calls for 'assimilation' as a way to open up a contrast, a point of dissonance, with the kinds of abstractions so central to financial exchange. This helps disrupt conventional narratives of finance by placing claims of financial abstraction alongside their own impossibility; situating finance directly in relation to the materialities it seeks to displace. Forest, by contrast, suggests immersion not in physical but in virtual spaces in ways which *model* the worlds of finance and the abstractions which enable those worlds. Crucially, however, Forest's artistic vision rests ultimately on a less strict delineation between 'real' and 'virtual' worlds than is often implied in forms of financial abstraction. Forest insists, for example, on the inseparability of materiality and virtuality. For Forest, virtuality is a device which gives us purchase on social life at its broadest, and the ways in which we might *imagine* that life differently. As Leruth notes, Forest's works are not art 'objects' but are rituals which allow us, at least momentarily, to inhabit *virtual* spaces as a way to remake the *material* worlds we occupy. In his terms, Forest's unique artistic practice:

... does not mean ... nostalgically fleeing the virtual for the mythical real world that used to be. It is a question of recreating a real world out of the virtual one that now envelops us ... there is no true opposition between the real and the virtual ... one is always the projection of the other ... In concrete terms, Forest tropes the virtual space of communication in various ways that have the ... effect of transforming that space into something real, if only for but a fleeting moment ... Forest takes up position in ritual time to 'consecrate' a form of space that is neither real nor virtual but the threshold between the two, passing through which plunges one into a space of liminality ... (Leruth, 2005)

The critical strategy invoked by Forest, although enabled by immersion, is ultimately measured by liminality, by an ability to 'plunge' its audience not into one space, but into the liminality, the border-zone, between spaces. *Traders' Ball* seeks out this kind of liminality, a threshold between (but which also connects) the virtual and the real, crisis and celebration, and in doing so it situates its 'audience' at the borders of finance and those whimsical knowledges it seeks to eclipse; a point which also forms the murky border of finance and its possible limits.

4. 'Plausible States of Uncertainty' and the limits of finance

In 1900, Henry Clews, a longtime figure in New York's financial district, described what he conceived as the ubiquity of Wall Street's power. 'The district known as Wall Street,' he glowed, 'embraces more wealth in proportion to area than any other space of similar dimensions in the world ... Wall Street is a place where the laws of cause and effect are conspicuously potent, and it is as impossible for any combination of men to resist these laws ... as it is for a human being to defy the forces of nature' (Clews, 1900, pp. 1–2). This expansive sense of Wall Street's reach, its status as a law of nature, is part of a longstanding conception of finance as a powerful and encompassing force. This is a narrative, however, which also raises important questions regarding the possible limits of finance and about the spaces where finance might encounter interruptions or disruptions.

In this paper, I have addressed this question about the limits of finance by foregrounding the complex relationship between scientific and subjugated knowledge. As Foucault notes, subjugated knowledges are 'buried' as part of the processes through which particular bodies of scientific knowledge become consolidated. As this paper has shown, however, subjugated knowledges are not rendered mute or 'defeated' in any simplistic sense, but remain active in various kinds of ways. I have suggested throughout this paper that this is particularly the case with respect to finance and the knowledges it eclipsed as it became consolidated as a rational (and by extension legitimate) form of knowledge over the course of the eighteenth, nineteenth, and twentieth centuries. Although the rationalization of finance has required the subjugation of game, play, and whimsy, this has not been accomplished in any kind of complete or full manner. Rather, as I have argued, the subjugated knowledges of finance remain important resources that are mobilized by artists to engage publics in various ways.

The publics engaged by the art reviewed, in this paper, are in particular, confronted with questions about financial abstraction. In their distinctive ways, the art this paper has focused on has attempted to lay the all-encompassing claims of financial abstraction alongside performances which undermine those claims. McCarthy and Forest ask us not only to consider the destructive power of financial abstraction or the impossibility of the ambitions those forms of abstraction seek – something well gestured at in the startling ecology of *Black-Shoals*. They also disrupt any easy claim about what financial abstraction actually is. By reminding us of the inseparability of im/materiality or by inviting us into a certain type of virtual immersion, they effect a disorientation about abstract practices and their fantasized removal from something that might be sketched, in equally reified ways, as strictly material or substantial. It is in this sense, that these various disruptive gestures are, like the financial practices they target, increasingly complex. The gestures reviewed in this paper do not in any simple sense, seek the 'ends' of finance, some utopian space devoid of finance and its pretensions of rational abstraction. Rather, they have a more discordant (possibly more modest) goal. They seek to introduce a sense of disorientation in the ways in which we understand and relate to the financial world and the abstractions so associated with that world. They do not offer a programmatic strategy, but a kind of 'jarring', a 'making strange' of finance and the rationality it so easily claims in our lives.¹¹ 'The goal,' notes one critic, 'is to create "plausible states of uncertainty" in the minds of the users, to force them to look beyond what they normally expect to find' (Leruth, 2004). These 'plausible states of uncertainty' are the result of a provocative form of public art designed to interrupt our lives and the ways in which we seamlessly relate to dominant practices within our

everyday experience. As Forest puts it, his form of public art is designed to ‘bring about “jamming”, deviation of the prevailing code ... or destabilisation ... to create in the potential recipient ... a rupture, a paradox, an interrogation ...’ (Forest, 1984, p. 17; Forest, Sugarman, & Weston, 1988).

This commitment to uncertainty is politically urgent in the context of both the ongoing financial turmoil and a significant ‘Occupy’ movement wrestling with its own hesitation to issue a defined program of political-economic demands. Although there have been hints at more radical gestures – and the Occupy movement has pushed the discourse in an intriguing direction – much of the official policy and political responses to the financial crisis has been grounded in the knowledges associated with finance as a rational and scientific practice. Put a bit differently, the responses to the crisis, and the policies crafted in its wake, have relied on forms of expertise central to finance, especially conventional forms of financial economics, credit rating, investment analysis, and audit/financial accounting. These are forms of expertise, moreover, that are deeply implicated in the kinds of financial innovation and deregulation that helped create the conditions of the crisis in the first place. To place into question the very processes of financial abstraction, and the forms of knowledge which enable it, requires the introduction of uncertainty for a form of knowledge (finance) hegemonic across many policy, academic and popular settings. As the Occupy movement has begun to highlight, there is now serious political appetite for the broad discussions that can be opened by interventions which aim themselves at the issue of financial abstraction in its broadest forms.¹²

This argument implies that if there are limits to finance, they might be found in the space created when financial abstraction is confronted with its own impossibility. In this space, there is imaginable not so much a removal of finance, but a kind of interference with its peculiar sense of instrumental or calculative intent. It is in this space that we might be able to talk about jamming and about introducing uncertainty to a body of practice certain of its scientific credentials and comfortable in its expansive reach. Novel forms of public art are sites at which the possible limits to finance can be examined, negotiated and explored.

Of course, the reach and scope of public art is itself subject to constraints and limits of all sorts. On the eve of the financial crisis, for example, Goldman Sachs commissioned Ethiopian-born artist Julie Mehretu to paint a panoramic mural in its new building on the western edge of Manhattan’s financial district, in the shadow of the former World Trade Centre. The work was completed after the financial crisis in which Goldman starred as an important protagonist, and was conceived as a monumental diagram of global capitalism. Possessing its own impressive ambition for visual immersion, *Mural* embodies Mehretu’s characteristic layering techniques. What results is a piece consisting of four layers, many of which refer to the history of finance or global economic exchange. Some of the first layers, for example, are references to maps which relate to trade routes and financial institutions. There is also a layer consisting of architectural drawings including an early Massachusetts bank, the New Orleans Cotton exchange, and the facade of the New York Stock Exchange. *Mural* commissioned for \$5 million (USD), was initially designed as an explicit piece of public art, a piece that would hang in the lobby of the new Goldman building and be freely accessible to members of the public. However, as the financial crisis crested, and its implication in the crisis became a source of public controversy, Goldman quietly reversed its decision. *Mural* now resides in a private lobby, the object of intense



Figure 4. *Mural*, Julie Mehretu (photograph by author).

security protections, accessible only through partly obstructed windows and viewed only from the distance imposed by a security perimeter (see Figure 4; Tomkins, 2010).

The public debate over *Mural* has raised important questions about the nature of art and exchange, public gesture and private property. It is in the crucible of these various pressures that the possible futures of finance, and its cultural status, will be worked out. It is also these same types of pressures that reveal the fissures *and* connections that exist when finance and art, rationality, and gameplay, are pushed against each other; a confrontation that might reveal as much about limits as it does about finance and its expansive ambition.

Notes

1. See <http://www.blackshoals.net/project.html>. See also Raley (2009).
2. As Raley notes, the installation created the sense of an ‘absence of an externality to capital’ (Raley, 2009, p. 120).
3. This quote is pointed to in a blog posting by Australian graduate student Richard Glover. See <http://richardrglover.wordpress.com/2011/03/08/notes-on-financialization/>.
4. See Carrier (1998): ‘The core of economic abstraction is ... ‘dis-embedded’: that is, the removal of economic activities from the social and other relationships in which they had occurred’ (p. 2).
5. But note the point made by Bill Maurer that ‘calculative’ and ‘social’ practices are not necessarily in opposition to each other. See Maurer (2008).
6. Valenze has noted that ‘In the new world of finance, the “exchange process is portrayed as a lottery, devoid of rationale, principle or justification ... the outcome is perceived as negative”’ (Valenze, 2006, p. 83).
7. See <http://fergalmccarthy.blogspot.com/2010/07/liffeytown.html>. *Liffeytown* generated widespread, and overwhelmingly positive, reviews within the Irish art scene (one reviewer referred to it as a ‘terrific idea ... in all its monopolistic glory’) but also a deluge of attention from the global media. *Liffeytown* was featured in one form or another by over one hundred media outlets including coverage by *Der Spiegel*, *The Wall Street Journal*, *The Financial Times*, *The New York Times* and media outlets in China, Dubai, Brazil, and Canada.

8. See: labgallery.com. As one critic noted, the Lab Gallery ‘blurs the line between spectator and insider/outside.’ See Sacks (2010).
9. As Forest’s long-time collaborator Ferdinand Corte: noted, *Traders’ Ball* called for a ‘dance for a new world, to reinvent this world ... to change the world.’ See Corte (2010).
10. See also Grau (2003): ‘The majority of virtual realities that are experienced almost wholly visually seal off the observer hermetically from external visual impressions, appeal to him or her with plastic objects, expand perspective of real space into illusion space, observe scale and color correspondence, and, like the panorama, use indirect light effects to make the image appear as the source of the real. The intention is to install an artificial world that renders the image space a totality or at least fills the observer’s entire field of vision’ (p. 13).
11. For one reference to the idea of ‘making strange’ see de Goede (2005a).
12. I am indebted to Marieke de Goede for her thoughts on the political urgencies of this kind of intervention. There is way, moreover, in which the argument I am making here dovetails with what Michael Power has called a ‘new politics of uncertainty’. See Power (2004): ‘A politics of uncertainty would need to develop the discursive capacity to challenge the manner in which ... institutions process events. Above all this will be a public politics in which myths of perfect manageability are laid to rest but necessarily imperfect, humanly designed and operated, risk management systems continue to support an engagement with unknowable futures’ (p. 58).

Notes on contributor

Rob Aitken is an associate professor in the Department of Political Science at the University of Alberta. His research interests lie at the intersection of global political economy, cultural studies and everyday financial practices. His recent research has focused on the globalization of ‘fringe finance’, the cultural history of embedded liberalism and the politics of financial dissent. His book, *Performing Capital*, was published in 2007.

References

- Aitken, R. (2007). *Performing capital: Toward a cultural economy popular and global finance*. New York, NY: Palgrave.
- Aitken, R. (2011). Financializing security: Political prediction markets and the commodification of uncertainty. *Security Dialogue*, 42, 123–141.
- Aitken, R. (2012). *Staging the subjugated knowledges of finance* (Unpublished Manuscript).
- Anonymous. (1884). Business gambling. *The Century*, 28, 629.
- Autogena, L., & Portway, J. (2001). *Black shoals stock market planetarium*. Copenhagen: Black Shoals Stock Market Planetarium. Retrieved from <http://www.blackshoals.net/Thoughts.html>
- Carrier, J. (1998). Introduction. In J. G. Carrier & D. Miller (Eds.), *Virtualism: A new political economy* (pp. 1–24). Oxford: Berg.
- Castells, M. (1996). *The rise of the network society: He information age: Economy, society and culture*, Vol. I. Oxford: Blackwell.
- Chu, T. (2009, October 29). Review: The Leona drive project. *Mondomagazine*.
- Clews, H. (1900). *The wall street point of view*. New York, NY: Silver, Burdett and Company.
- Conway, R. (2010). Liffeytown. *Archiseek*. September 2010. Retrieved from <http://archiseek.com/>
- Corte, F. (2010). Fred forest and the *Traders’ Ball*. New York, NY: Coverage 3d. Retrieved from <http://coverage3d.com/the-lab-gallery-new-york-fred-forest>
- Crawley, P. (2010). A river runs through it. *Irish Times*. Retrieved from <http://fergalmccarthy.blogspot.com/>
- Darley, A. (2000). *Visual digital culture: Surface play and spectacle in new media genres*. London: Routledge.
- de Goede, M. (2004). Repoliticizing financial risk. *Economy and Society*, 33, 200–202.
- de Goede, M. (2005a). *Virtue, fortune and faith: A genealogy of finance*. Minneapolis, MN: University of Minnesota Press.
- de Goede, M. (2005b). Carnival of money: Politics of dissent in an era of globalizing finance. In L. Amore (Ed.), *Global resistance reader* (pp. 379–391). London: Routledge.

- Forest, F. (1984). *For an aesthetics of communication*. Paris: Web Net Musuem.
- Forest, F. (2010). *Environment art on second life and in situ. The Traders' Ball*. New York, NY: Labgallery.
- Forest, F., Sugarman, D., & Weston, J. (1988). Communication esthetics, interactive participation and artistic systems of communication and expression. *Design Issues*, 4, 97–115.
- Foucault, M. (1980). Questions on geography. In C. Gordon (Ed.), *Power/knowledge: Selected interviews and other writings 1972–1977* (pp. 63–77). New York, NY: Pantheon.
- Foucault, M. (2003). *Society must be defended*. New York, NY: Picador.
- Gibbs, M. (2001). Art and money. *Art Monthly* 246, p. 51.
- Goggin, J. (2012). Regulating (virtual) subjects: Finance, entertainment and games. *Journal of Cultural Economy*, 5, 441–456.
- Grau, O. (2002). Immersion and interaction: From circular frescoes to interactive image spaces. *Media Art Net*. Retrieved from http://www.medienkunstnetz.de/themes/overview_of_media_art/immersion/.
- Grau, O. (2003). *Virtual art: From illusion to immersion*. Cambridge: MIT Press.
- Hochfelder, D. (2006). 'Where the Common People Could Speculate': The ticker, bucket shops, and the origins of popular participation in financial markets, 1880–1920. *The Journal of American History*, 93, 336–358.
- Hoyle. (1898). *The game in wall street: And how to play it successfully*. New York, NY: J. S. Olgivie.
- Huhatamo, E. (1996). Encapsulated bodies in motion: Simulators and the quest for total immersion. In S. Penny (Ed.), *Critical issues in electronic media*. New York, NY: State University of New York.
- Langley, P. (2008). *The everyday life of global finance*. Oxford: Oxford University Press.
- Leruth, M. (2004). From aesthetics to liminality: The web art of fred forest. *Mosaic: A Journal for the Interdisciplinary Study of Literature*, 37, 79–107.
- Leruth, M. (2005). *Utopian art in reverse*. Paris: Web Net Museum.
- Leyshton, A., & Thrift, N. (2007). The capitalization of almost everything: The future of finance and capitalism. *Theory, Culture and Society*, 24, 97–115.
- Liu, A. (2009a). Board games. *Canadian Art*.
- Liu, A. (2009b). *Title deed*. Toronto, ON: Public Access Collective and L.O.T.: Experiments in Urban Research.
- Mackenzie, D. (2006). *An engine not a camera: How financial models shape markets*. Cambridge: MIT Press.
- Mackenzie, D. (2008). The material production of virtuality: Innovation, cultural geography and facticity in derivatives markets. *Economy and Society*, 36, 355–376.
- Mackenzie, D. (2012). Knowledge production and financial markets: Credit default swaps, the ABX and the subprime crisis. *Economy and Society*, 41, 335–359.
- Marchessault, J., & Propokow, M. (2009). *Leona drive project: Curator statement*. Toronto, ON: Public Access Collective and L.O.T.: Experiments in Urban Research.
- Martin, R. (2002). *Financialization of daily life*. Philadelphia, PA: Temple University Press.
- Maurer, B. (2005). Does money matter? Abstraction and substitution in alternative financial forms. In D. Miller (Ed.), *Materiality* (pp. 140–164). Durham, NC: Duke University Press.
- Maurer, B. (2008). Resocializing finance? Or dressing it in Mufti? *Journal of Cultural Economy*, 1, 65–78.
- McCarthy, F. (2010, September 12–26). *Liffeytown*. Dublin: Installation.
- McLuhan, M. (1964). *Understanding media: The extensions of man*. New York, NY: McGraw-Hill.
- Mitchell, T. (2002). *Rule of experts: Egypt, techno-politics, modernity*. Berkeley, CA: University of California Press.
- Panitch, L., & Gindin, S. (2009). The current crisis: A socialist perspective. *Studies in Political Economy*, 83, 7–31.
- Panich, L., Gindon, S., & Albo, G. (2010). *In and out of crisis: The global financial meltdown and left alternatives*. Oakland, CA: PM Press.
- Patterson, M., & Descheneau, P. (2011). Between desire and routine: Assembling environment and finance in carbon markets. *Antipode*, 43, 662–681.
- Paul, C. (2010). Fred forest and the *Traders' Ball*. New York, NY, Coverage 3d. Retrieved from <http://coverage3d.com/the-lab-gallery-new-york-fred-forest>

- Power, M. (2004). *The risk management of everything: Rethinking the politics of uncertainty*. London: Demos.
- Preda, A. (2009). *Framing finance: The boundaries of markets and modern capitalism*. Chicago, IL: University of Chicago Press.
- Raley, R. (2009). *Tactical media*. Minneapolis, MN: University of Minnesota Press.
- Sacks, A. (2010). *Interview with Adam Sacks*. New York, NY: Coverage 3D. Retrieved from <http://coverage3d.com/the-lab-gallery-new-york-fred-forest>
- Seabrooke, L. (2006). *The social sources of financial power: Domestic legitimacy and international financial orders*. Ithaca, NY: Cornell University Press.
- Stallabrass, J. (2001). *A view from the fish tank*. Copenhagen: Black Shoals Stock Market Planetarium. Retrieved from <http://www.blackshoals.net/Writing.html>
- Stanford, J. (1999). *Paper boom: Why real prosperity requires a new approach to Canada's economy*. Toronto, ON: James Lorimer.
- Tomkins, C. (2010, March 29). Big art, big money: Juie Mehretu's Mural. *The New Yorker*. 88.6, 62.
- Turner, A. (2009). *The Turner review: A regulatory response to the global banking crisis*. London: Financial Services Authority.
- Valenze, D. (2006). *The social life of money in the english past*. Cambridge: Cambridge University Press.
- Wagner, T. (2010). *Financial speculation in victorian fiction: Plotting money and the novel genre, 1815–1901*. Columbus, OH: The Ohio State University Press.
- Warwick Commission. (2009). *The Warwick Commission on international financial reform: In praise of unlevel playing fields*. Coventry: University of Warwick.