



Introduction: Volatility in finance, art, and culture

Benjamin Lee

The New School, USA

Emily Rosamond

Goldsmiths, University of London, UK

Abstract

The term ‘volatility’ applies to changeability: both that which can be measured, such as temperatures and stock prices, and that which cannot be easily measured, such as affects and emotions. Quantitative financial volatility has typically been studied quite separately from art, culture, and everyday life. Randy Martin’s work, which addressed the resonances between volatility in dance and finance, was a notable exception. Martin focused on derivatives, which played a critical role in the development of financialized capitalism, especially between 1973-2008. Arguably, however, derivatives are no longer the key drivers of volatility as a social and cultural logic. New assemblages of asset managers, rentiers, and online platforms – along with a pandemic, new banking crises, and ongoing climate emergency – are reshaping how volatility is produced and navigated. How might we rethink volatility in order to better grasp its changing logics? This introduction unpacks existing debates on volatility in finance, art, and culture, suggesting several directions in which new work in this area might depart from existing frameworks – some of which are pursued in this special issue. We focus on three broad lines of exploration: rethinking the intellectual histories of volatility; rethinking volatility across disparate post-2008 contexts; and imagining volatile futures through art practice.

Keywords

Volatility, finance, art, culture, derivatives, crisis, options, futures

Introduction

Colloquially, ‘volatility’ refers to the propensity to change suddenly and unpredictably. Often, it implies a tendency to change for the worse, as in volatile weather, volatile markets, volatile

Corresponding author:

Benjamin Lee, The New School, N-66 Fifth Avenue, New York, NY 10011, USA. Email: leeb@newschool.edu
<https://doi.org/10.2218/finsoc.8987>

political situations, and volatile persons. Derived from the Latin *volatilis* (from *volare* – to fly), in Middle English, ‘volatiles’ referred to winged creatures, such as butterflies and birds. Since at least the 1640s, ‘volatile’ meant ‘readily changing’, ‘fickle’, and ‘flighty’. Specialist studies of volatility, in a wide range of senses, have been developed across chemistry, mathematics, and physics. In the twentieth century, key innovations in financial markets hinged on the discovery and pricing of volatility. In 1973, financial derivatives markets began to vastly expand, thanks, in part, to the development of new means to price options based on volatility: the Black-Scholes differential equation. Following a period of great expansion, derivatives trading played a devastating role in the 2008 financial crisis; toxic mortgage-backed securities, meant to hedge portfolios against market risks, triggered a systemic failure.

Since the 2008 crisis, the world seems, if anything, more volatile than ever. And yet, the sources and social logics of volatility have significantly changed. Arguably, any remaining optimistic expectations for neoliberalism died with the Great Recession of 2008-9. The years since have witnessed the election of President Donald Trump in the United States (US), Brexit in the United Kingdom, the Covid-19 pandemic, the Ukraine War, renewed political tensions between China, Russia, and the US, social media polarization, inflationary and recessionary pressures, banking crises, cost of living crises, and a burgeoning climate emergency which remains woefully ill addressed, despite the dubious claims of ‘green’ finance (Buller, 2022). This is the rise of an age of volatility – but one arguably less wedded to financial derivatives than in prior decades. Twentieth-century financial markets inaugurated financial volatility as among financialization’s crucial mechanisms, enabling investors to ‘surf’ volatility waves, hedge risks, and gain great returns on volatile conditions. Now, in a time of so-called polycrisis, ‘disparate shocks interact so that the whole is worse than the sum of the parts’, as Adam Tooze (2022) has put it. Multiple volatilities resonate with one another, stretching ever farther beyond financial markets.

Volatility can imply either changeability that can be measured (as in stock prices), or that which cannot be readily measured (as in affects and emotions). Yet financial debates on volatility have largely been kept separate from considerations of volatility’s many qualitative dimensions. Behavioural finance does recognize that risk has an affective component in the form of ‘animal spirits’ (Dow and Dow, 2011), but there is still a need for more research that explores the many intersections of quantitative and qualitative volatilities. Critiques of neoliberal culture, neoliberal subjectivity, and financial subjectivities are well-placed to do this. Although many have privileged the lens of ‘human capital’ (Schultz, 1961; Becker, 1993; Foucault, 2008; Feher, 2009) – which arguably has been rendered more volatile through apparatuses such as social media platforms – few critics have explicitly foregrounded volatility as a constitutive force across finance, culture, and politics. Randy Martin’s work on the ‘financialization of daily life’ and the ‘social logic of the derivative’ is a notable exception (see Martin, 2002, 2015).

This special issue aims to further explore the seam between quantified financial volatility and the many forms of qualitative volatility that characterize contemporary life. How might we rethink volatility in an ever more volatile world, in which cultural, social, political, and climate volatilities vastly exceed the financial frameworks to which they are still inextricably linked? The special issue addresses this question by bringing together a range of articles, essays, artworks, and reviews. Together these interventions invite a reappraisal of volatility in three broad directions: rethinking the conceptual histories of volatility; reconsidering how volatility operates across disparate post-2008 financial contexts; and envisioning volatile futures through art practice. In this introductory article, we briefly sketch out each of these directions and identify some themes warranting further research in the future.

Positioning volatility beyond derivatives

Throughout the past few centuries, diverse approaches to volatility have been developed across a range of disciplines. Within chemistry, for example, volatile substances are those which readily vaporize. An important progenitor of thinking on volatility has been the discovery of random movement. The physiologist, biologist, and chemist Jan Ingenhousz noticed the irregular, jittery motion of coal dust particles on the surface of alcohol in 1785; in 1827, botanist Robert Brown similarly observed that pollen grains moved randomly when suspended in water. These early discoveries led to the theory of Brownian motion, or the randomness (we might say volatility) of particles' movements when suspended in a medium. Brownian motion became the subject of scholarly treatment within mathematics and physics by Louis Bachelier, Albert Einstein, and Marian Smoluchowski, among others, as statistical mechanics and stochastic process models within probability theory developed. In the twentieth century, the possibility that volatility could be measured as a statistical dispersion became crucial to financial theory and practice. In 1921, the economist Frank Knight differentiated between risk (randomness with calculable probabilities) and uncertainty (randomness with probabilities which could not be known), thereby laying the groundwork for differentiating between statistically calculable volatility and incalculable uncertainties in financial markets (Knight, 2009). In 1973 – just a few years after the collapse of the Bretton Woods system, which guaranteed the convertibility of US currency to gold, and of other currencies to the US dollar – the Black-Scholes model for pricing options was published, and the Chicago Board Options Exchange (CBOE) was founded. Both would turbo-charge trades in options contracts: financial derivatives which enable their holders to hedge against market fluctuations, by granting them the option, but not the obligation, to buy or sell an asset at a set price at an agreed future date. The Black-Scholes equation allowed options to be priced according to implied volatility – i.e., how much future market prices are expected to fluctuate. This facilitated a vast expansion in derivatives trading from 1973 onward, via CBOE (see MacKenzie, 2006). By 1993, Cboe® (formerly the Chicago Board Options Exchange) even introduced 'volatility trading' into its arsenal of investment opportunities. The Cboe Volatility Index® (VIX®) measured the market's expectation of 30-day volatility, implied by options prices. Since VIX has “a historically strong inverse relationship with the S&P 500 Index”, it offered options holders opportunities to hedge their portfolios against the risk of “broad market decline”, and provided futures contract holders with “a pure play on the level of expected volatility” (Cboe, n.d.). In derivative finance, volatility is continuously calculated, priced, and invested in, and takes on a new, specialized meaning: a “statistical measure of the dispersion of returns for a given security or market index” (Hayes, 2023). VIX, in turn, transformed volatility into a commodity, making it self-referential.

Financial markets calculated volatility to hedge risks, but they also produced widespread systemic uncertainties. As sociologist Elena Esposito put it, following the 1971 collapse of the Bretton Woods system, rapidly expanding financial markets were “much more volatile, unpredictable, and subject to ‘contagion’ phenomena that expand rapidly and out of proportion to the initial problem” (Esposito, 2011: 116). In part, she argued, this was because derivatives markets were now “directly addressed to second-order observation”: observing the observers of a phenomenon, rather than the phenomenon itself (Esposito, 2011: 116). In financial markets, Esposito argues, “one does not observe the prevailing opinion, but what the prevailing opinion considered to be the prevailing opinion”; with financial derivatives, “the point is not to predict the future, but to observe observers” (Esposito, 2011: 117, 115). In a world in which financial derivatives encourage investors to observe each other's observations

of the market, assessments of assessments spiral out of control.

Such insight did not escape all investors, despite the general mood of frenzied enthusiasm for financial derivatives that prevailed in the years running up to the 2008 crisis. In 2002, Warren Buffet famously warned his holding company Berkshire Hathaway's investors: "Derivatives are financial weapons of mass destruction, carrying dangers that, while now latent, are potentially lethal" (Berkshire Hathaway, Inc., 2002). Derivatives could, indeed, hedge portfolio risk if used sparingly, Buffett argued; but overall they were "time bombs", which could lead to large-scale meltdowns, when overleveraged investors were left unable to meet margin calls if market movements went against their holdings. The 2008 financial crisis bore out this dire warning; derivatives trading became a key culprit in the crisis. As toxic mortgage-backed securities wreaked havoc on Wall Street, giants like Lehman Brothers collapsed, and governments scrambled to bail out big banks in hopes of avoiding a systemic meltdown. Waves of foreclosures befell households, hitting Black, immigrant, and single-women-headed households earlier and harder (Harvey, 2010: 1; Chakravartty and Ferreira da Silva, 2012: 365). Given the chaos they had caused, derivatives had to clean up their act. According to a 2021 International Swaps and Derivatives Association (ISDA) report, derivatives markets had become "safer, more resilient and more transparent" since the financial crisis, thanks to extensive regulatory reforms, including central clearing, higher margin requirements, and improved trade reporting (ISDA, 2021: 3-4). Although still huge, derivatives markets have shrunk slightly over the last decade. Measured in terms of notional outstanding, or the total amount of all banks' and major derivatives dealers' outstanding positions, over-the-counter (OTC) derivatives totaled \$594.5 trillion in June 2009, peaked at \$706.9 trillion in June 2011, and came down to \$606.8 trillion in June 2020 (ISDA, 2021: 7). However, gross market value, "the sum of the absolute values of all outstanding derivatives contracts with either positive or negative replacement values evaluated at market prices prevailing on the reporting date" (ISDA, 2021: 8), is arguably a more reflective measure of the scale of market risk than notional outstanding, since many derivatives are used to hedge other positions, and therefore would offset one another at any given time. In 2009, the gross market value of OTC derivatives was \$25.1 trillion; by June 2020, it had dropped to \$15.5 trillion (ISDA, 2021: 8). Markets and economies are still, of course, abundantly volatile, but the reasons why have shifted. Recent banking crises have far less to do with derivatives trading than the 2008 financial crisis did. The 2023 Silicon Valley Bank (SVB) failure, for instance, reflected an altogether different set of macroeconomic conditions. As former Minister of Finance for Greece Yanis Varoufakis argued, the SVB failure was a product of the fall in US government bonds prices thanks to the Fed's interest rate hike (like other banks, SVB held large amounts of this usually un-risky asset), and the fall of Big Tech share prices, thanks to the Fed's termination of its quantitative easing (QE) program, which affected SVB's clients, and sparked a run on the bank. This situation, Varoufakis argued, demonstrated the impossibility of post-2008 macroeconomic conditions. With one interest rate, central banks must achieve three things: "price stability, banking system stability, and balancing between liquidity and investment" – but "there is no longer one interest rate that can achieve all three of these objectives simultaneously" (Varoufakis, 2023). While the world may never have recovered from the 2008 financial crisis, that does not mean that things have not changed. Rather, the world has become plagued with ever more interlocking crises – and as a result, has become volatile for new reasons and in new ways. Given these changeable conditions, we must continually rethink how volatility operates as a social and cultural logic.

Volatility in politics and culture

Despite ongoing commentary on contemporary society's volatility, relatively little work in the social sciences systematically foregrounds volatility itself as a concern. As Lee and Martin (2016) pointed out in their introduction to *Derivatives and the Wealth of Societies*, surprisingly little work clearly differentiates between uncertainty, risk, and volatility; or considers how the quantitative and qualitative dimensions of volatility interact:

The concept of volatility exists in a no man's land between finance and the social sciences. Despite the explosion of interest in risk and uncertainty created by works such as Anthony Giddens' 'Risk and Responsibility' and Ulrich Beck's *Risk Society*, most social science research does not clearly distinguish risk and uncertainty from volatility. The distinction is the fundamental insight of Black-Scholes and is foundational for contemporary financial capitalism. At the same time, financial work on volatility tends to focus on its mathematical aspects, eschewing the social and cultural dimensions of volatility that trading and market activity presuppose. (Lee and Martin, 2016: 4)

Following the expansion of derivatives trading in the early 1970s, two books from the late 1980s explored how Western societies had transformed since that time. With hindsight, they can be reread as discourses on volatility.

The first of these is Ulrich Beck's 1986 *Risk Society*, which describes the production and distribution of risks and uncertainties produced by modernization itself. Modernity, Beck argued, transforms dangers into risks: chances that something will go wrong, which can be calculated, managed, and mitigated (Beck, 1992; see also Hacking, 1990). A widespread future orientation takes hold, continually foregrounding risk mitigation protocols, and inaugurating risk as a prominent concern. At the same time, the very prevalence of risk mitigation produces new, distinctively modern, systemic risks, such as ecological catastrophe or nuclear accidents, which defy the scale and logic of risk calculation (within insurance, for instance). Beck's book neither explicitly mentions volatility, nor focuses on financial markets; nevertheless, his account of 'reflexive modernization', brought in by the economic and social pressures of globalization, strongly resonates with, for instance, Esposito's account of how hedging market risks can increase systemic financial market volatility. A second key text that speaks to volatility is David Harvey's (1990) *The Condition of Postmodernity*. Harvey focused on the rise of postmodernism, especially its fascination with fragmentation and transitoriness. He explains the rise of postmodernism in terms of the pressures of economic globalization; flexible accumulation spearheaded by the Asian Tigers dismantles the Fordist economy in the US, releasing an economic volatility that has a direct effect on culture. Harvey famously speaks about the ensuing cultural volatility in terms of the 'time-space compression' that flexible accumulation introduces, specifically by accelerating the turnover time of capital.

If we combine and slightly reframe these insights, we see a conceptual matrix of risk, uncertainty, and volatility emerging at the same time as the beginnings of derivative finance and the rise of neoliberalism. Despite their differences (Beck insisted that risk society was intellectually independent of postmodernism), both position volatility as an effect of other forces ('reflexive modernization' and 'flexible accumulation', both of which have their roots in globalization) rather than as a constitutive force on its own terms.

Political volatilities

Some significant works since 2007 have considered the complex relationships between financial market volatility and political instability – although again, not all of these explicitly

deploy the term ‘volatility’. In *The Shock Doctrine*, Naomi Klein (2008) popularized debates on ‘disaster capitalism’: using moments of collective shock and disaster to execute asset-grabs and force through radically pro-corporate policies. Klein details how neoliberal disruptors have produced and utilized chaos to their advantage, from neoliberalism’s inception in 1973 Chile (when General Pinochet’s economic advisors, the ‘Chicago Boys’, wildly destabilized financial markets, enriching investors while sending the country into turmoil) to the present-day uses of ‘natural’ and ‘man-made’ disasters, from Hurricane Katrina to the Iraq War, as cover for mass privatization events. More recently, sociologists Marlène Benquet and Théo Bourgeron have shown that it was specifically the ‘second wave’ British financial sector – hedge funds, real estate funds, and real estate firms, which had been established in the UK since the Thatcher era – that had strongly backed Brexit (Benquet and Bourgeron, 2022). ‘First wave’, traditional financial institutions shied away from Brexit, since it would sabotage the British economy. The ‘second wave’ financiers, however, saw themselves as well-positioned to profit from the market volatility Brexit would unleash. This development constitutes an authoritarian-libertarian turn, they argue, which destabilizes financialized democracies.

Political geographer Louise Amoore’s recent work on ‘machine learning political orders’ offers a different analysis of the Brexit referendum as harbinger of volatility. In 2018, the Cambridge Analytica scandal broke in headlines around the world; it emerged that the company had worked for the 2016 Trump US Presidential election campaign and the 2016 UK Vote Leave Brexit referendum campaign, using machine learning on data scraped from millions of Facebook profiles to model prospective voters and devise new microtargeting methods. In fact, the SCL Group (parent company of Cambridge Analytica, which was rebranded as Emerdata in 2018) had developed machine learning models to inform political campaigns in Africa, the Middle East and the Caribbean prior to 2016 – “creating fractures in communities and harnessing the data by ‘creating havoc’ and ‘riling up crowds’” (Amoore, 2022: 2). In yet another example of “the ‘boomerang effect of colonial practice’” (Foucault, 2003: 103), the SCL Group/Cambridge Analytica’s machine learning protocols were then turned inward on US and UK voters. Such developments, Amoore argues, should not be framed exclusively as problems of the application, regulation, and implications of artificial intelligence (AI). Rather, we must consider how machine learning within politics creates “new limits and thresholds of possibility of how a political project can come into being, what states can do, what a society can be in the future” (Amoore, 2022: 3). When the UK Vote Leave campaign used Cambridge Analytica to target voters with xenophobic messaging, it unleashed a wave online racist abuse and led to a rise in racist hate crimes. But it also turned online hate speech into “a useful violent data stream for the refining of attributes of a cluster that is classified as ‘susceptible’ to racist images and messaging” (Amoore, 2022: 4). “Machine learning algorithms”, Amoore writes, “learn to recognize features in the environment through their exposure to variability and contingency, and this process of learning via unknown volatilities is actively enhanced by the breaking and fracturing of social relationships”. Thus, “a machine learning political order is one that profits from the volatilities of fractured disorder” (Amoore, 2022: 3).

Sociologist Aris Komporozos-Athanasίου has recently made clear how such logics inform the cultural politics of finance. Drawing on Benedict Anderson’s (2006) concept of ‘imagined communities’, he advances the concept of ‘speculative communities’ as a means of grappling with digital-financial sociality. Speculative communities such as the TikTokers who sabotaged a 2020 Trump election rally, he argues, are imagined collectivities whose “social bonds are defined by a speculative engagement with the future and a connection with others on the basis of shared experiences of volatility and precarity” (Komporozos-Athanasίου, 2022: ix).

Read alongside the work of Amore (2022) and Benquet and Bourgeron (2022), here we glimpse volatility as a contemporary logic at once social, political, financial, and computational.

Volatility in culture

For a detailed analysis of volatility in culture, however, we must turn elsewhere. Several recent books have powerfully reframed financialized culture and capitalist form, including Annie McClanahan's (2017) study of US culture's responses to credit, debt, and financial crisis, Max Haiven's (2018) account of art and financialization, Leigh Claire La Berge's (2019) analysis of decommodified labour within socially engaged art, and Sianne Ngai's (2020) theory of the gimmick as capitalist form. Many of these have renewed Marxian modes of analysis, questioning the predominance of human capital as an analytic framework for culture under neoliberalism (La Berge, 2019: 21-24; Ngai, 2020: 34; cf. Foucault, 2008). It has arguably been Randy Martin, however, who most thoroughly foregrounded volatility as a constitutive force in its own right, seriously considering its social and cultural dimensions. Martin's (2015) account of the 'social logic of the derivative' charted how financial derivatives formed part of a broader social and cultural logic within financialized capitalism, which played out across a vast array of contexts, including postmodern dance, hip-hop, and skateboarding, as well as US imperialism and the 2008 subprime meltdown (see also Martin, 2007). His work offered new ways of understanding how financial derivatives and derivative social logic alike "increase opacity as they spread ownership, [...] enhance volatility as they amplify risk", and convert "what is known and containable in its impact to what is dispersed, conflicted, and unknown" (Martin, 2013: 90). In his ground breaking work on dance and derivative finance, he described "a kinesthetic alignment between dancers and financiers":

The expansion of research capacity, the dissemination of arbitrage as an orientation to a field of difference, the scanning and rapid processing of information, the search for means to generate flow, constitute a kinesthetic alignment between dancers and financiers. So too, the exploration of the relation between risk and uncertainty, the seizing of [a] moment of stability whose consequence is a generative instability or volatility that becomes productive of further instruments of value. (Martin, 2015: 184)

By the time Martin wrote his last book, *Knowledge LTD: Toward a Social Logic of the Derivative* (2015), he had over twenty years of hindsight to rethink what both Beck and Harvey recognized as fundamental socio-economic changes of the 1960s and 70s. Whereas Beck attributed the risk society to globalization and Harvey saw the roots of postmodernism in finance's time-space compression, Martin saw something new in the financial assemblage of volatility, risk, and arbitrage within derivatives trading. Finance seized upon derivatives as a response to the crisis of post-Fordism; in twenty years, the US would shift to finance as its major economic innovation. As derivatives trading expanded in the 1970s, postmodern dance, early New York hip-hop, and skateboarding discovered volatility in their own ways, creating and navigating risky kinesthetic conditions. (Dancer-choreographer Steve Paxton invented contact improvisation in 1972; surfer-skateboarder Frank Nasworthy invented the polyurethane skateboard wheel in 1973.) Many other 'volatile' cultural practices flourished, too. Poker and martial arts became popular among traders, the World Series of Poker launched in 1970, and Bruce Lee's *Enter the Dragon* film appeared in 1973. Although these activities enjoyed wide popularity, derivative finance remained the most successful arena in which to make value out of volatility. When the Black-Scholes equation was published, it only took a few weeks before

sheets of option prices calculated by Black-Scholes appeared on the Chicago Board Options Exchange, fueling pronounced growth in derivatives trading.

In 2012, Martin was a founding member of New York University's Culture of Finance group, where he presented a paper called 'De-centered Social Kinesthetics' to Arjun Appadurai, the director, and members Benjamin Lee, Edward LiPuma, Robert Meister, and Robert Wosnitzer. He then began an intense collaboration with Robert Meister, whose *Justice is an Option* is reviewed in this special issue. These meetings included directed readings and conferences (Ackbar Abbas, Elie Ayache, and Emanuel Derman were special guests) and included in-depth discussions of Marx and finance, especially on the question of liquidity. Martin's paper, which appeared as a chapter in *Knowledge LTD*, described how post-Fordism unleashed an urban social volatility, while at the same time, people invented new movement practices that required balancing between different flows of movement (Martin, 2015: 143-212; see also Martin, 2012). Martin describes these as de-centered social kinesthetics, using technical vocabulary taken from derivative finance. "De-centered kinesthetic practices", he writes, "emerge at the point at which some upward mobility is blocked, and where some scene of ruin has been repurposed for its promises of risk-based creativity" (Martin, 2015: 205). Martin's reading of the resonance between dance and finance was not meant to be analogical; nor did it posit a deterministic relationship between an economic 'base' and a cultural 'superstructure'. As a good Marxist social theorist, Martin saw that the changes in the structure of capitalism had direct social and cultural effects. However, remembering that cultural activities approached volatility at the same time as finance did, he didn't see cultural form as either merely following from, nor analogizing finance – even though he used the technical vocabulary of derivative finance to describe postmodern dance. The following passage best captures this intellectual persuasion and ambition:

It is time to break the tyranny of metaphor, for dance and finance share more than rhyme; they move in consonant rhythm. The relation is not mimetic, not of an origin that starts in one place and emanates outward or proceeds through a trail of anxious influence. Rather, the relationship of movement practices across disparate sites that share certain kinesthetic attributes is derivative in character. The founding fables of finance are that the originary ideas on which all is modeled sprang fully grown from the mind of an Irving Fisher or Messieurs Black and Scholes, yet in actuality, the genealogies, contexts, and vectors of determination are far more diffuse and multilayered ... The rhythms and cadences of bodies in motion and the manner in which value circulates through society share mutually constitutive principles of association whose language is poorly articulated and more readily explained as a succession of ideas from exalted individuals. The turn to dance here is meant to make this language of social movement audible, perceptible, sensible, and legible. (Martin, 2015: 144)

Martin challenges us to discern more of the multiple "vectors of determination" that constitute derivative sociality, such that "the language of social movement" is no less a progenitor of derivative sociality than "Messieurs Black and Scholes" themselves. Martin knew that the larger socio-economic processes of capitalism had released volatility; but he also knew that standard Marxist accounts that saw finance as 'fictitious capital' would not understand the global rise of volatility. He envisioned postmodern movement practices as inventing their own processes of navigating volatility, risk, and arbitrage, alongside derivative finance. This has sometimes been a sticking point in the interpretation of Martin's work, as not all readers have been convinced that he entirely avoids positing an analogy between finance and culture.

'De-centered Social Kinesthetics' opens with: "Finance works through flows. It moves production inside of circulation" (Martin, 2015: 143). In the first of these two sentences,

Martin identifies that the basic problem of finance is to understand “flows”, or liquidity. In the second, he signals his break with traditional Marxism. Traditional Marxists believe that finance is ‘fictitious capital’ because it lies in the realm of circulation and not production (Marx, 1981: 525–542). Martin’s account of financialized capitalism, on the other hand, understands finance as thoroughly integrated into production. This is clearly demonstrated in Martin’s update of Marx’s famous ‘dancing table’ in *Capital: Volume I*. Marx described the “mystical character of the commodity” through the homely table. Imbued with abstract labour, it appeared “far more wonderful than if it were to begin dancing of its own free will” (Marx, 1976: 164). Martin updated the scene for an age of derivative finance:

In finance, derivatives insert commodity production, with its specific purposes and local destinations, into global economic circuits and transnational dynamics. A table might be made to serve a simple meal. But when interest rates on loans to the factory, futures contracts on the price of wood, and currency exchange rate variations are blended together with similar factors of production in other quite distinct goods and services, upon the humble table can be placed a global feast. (Martin, 2012: 68)

In financialized capitalism, finance cannot be relegated to the realm of ‘fictitious capital’; it is entangled within every aspect of production. This entanglement produced a ‘derivative logic’, creating a new dynamic among volatility, arbitrage, and uncertainty across financial markets, culture, and social life.

For instance, postmodern dance neutralized the vertical postures of classical ballet and the horizontal and inner directionality of modern dance to play with the volatility of the interval between dance steps; from John Cage and Merce Cunningham’s experiments with randomness to Trisha Brown’s *Walking Down the Side of A Building*, postmodern dancers mixed improvisation with uncertainty to produce ‘local’ experiments with volatility. In the wake of the volatility unleashed by post-Fordist economic and urban development, multilayered, “mutually constitutive principles of association” (Martin, 2015: 144) replaced the directionality of Harvey’s time-space compression, heralding a new age of derivative financial capitalism.

Martin’s social logic of the derivative remains hugely significant for contemporary scholarship on the financialization of everyday life. However, we need to extend his thinking in unexpected new directions, given that derivatives – while still crucial – are no longer the privileged drivers of volatility that they were in 2008. In addition to the increasing prominence of environmental, climactic, political, social, and medical volatilities, many structural developments in global capitalism explicitly reconcentrate asset ownership, rather than rendering it more diffuse, as derivatives can (although derivatives, too, have arguably concentrated wealth overall, by enabling well-placed investors to hedge their bets more effectively than others). For instance, ‘family capitalism’, as Melinda Cooper (2022) has called it, foregrounds private, family-run businesses, which are not publicly traded. Meanwhile, recent accounts of ‘asset manager capitalism’ and ‘asset manager society’ foreground the rise of massive asset management firms, which control vast amounts of global wealth (Braun and Buller, 2021; Christophers, 2023). These developments must be addressed head-on. Without abandoning Martin’s important insights on the social logic of the derivative, how might we rethink volatility as a social and financial logic both within *and* beyond derivatives?

Provocations

This special issue seeks to expand debates on volatility in finance, art, and culture. We have brought together articles, essays, reviews, and artworks from a wide range of disciplinary

backgrounds, with a particular focus on the arts and humanities. Broadly speaking, the included works rethink volatility's intellectual histories, rethink volatility across disparate post-2008 contexts, and envision volatile futures through art practice. We hope to initiate dialogues between scholarly and artistic responses to contemporary volatility, in search of ways to expand the field. We see this special issue as a beginning, rather than an endpoint: a set of provocations, which we hope will lead to further reflections on our ever more volatile world.

Rethinking volatility's intellectual histories

Ackbar Abbas (2023) and Benjamin Lee (2023) rethink the intellectual histories of volatility, producing new ways of thinking about the relationships between financial and cultural form. Through close readings of poetry, dance, and film, Abbas (2023) identifies three 'figures of volatility' in culture: *anamorphosis*, *anachronism*, and *catachresis*. *Anamorphosis* is "the point-by-point transposition of an image from one representational grid (e.g., a flat surface) to another (e.g., a convex or concave space)", which indicates "a twist in space"; *anachronism* points to "a twist in time"; and *catachresis* – the use of an incorrect word – indicates "a twist in language" (Abbas, 2023: 21-22). Crucially, these figures of volatility direct readers away from a prevalent red herring: confusing volatility with speed. Drawing on the thought of Paul Virilio, Paul De Man, and Gilles Deleuze, among others (far from the expected canon on volatility in culture), Abbas argues that it is not speed as such – nor, even, the rapidity of change – that makes artwork volatile. Rather, it is "the fact that *change itself has changed*" – that a movement is occurring in relation to a whole that is *also* changing – and thus, involves navigating "multiple, *overlapping* frameworks" (Abbas, 2023: 19), like the volatility of volatility in derivative finance. Volatility often takes surprising forms in art. Abbas offers a powerful reading of the volatility of slowness in Tsai Mingliang's films, and considers how, in Pina Bausch's *Tanztheater*, "volatility does not revolve around visual spectacles of mobility, but around the way an *indiscernible detail* can transform movement" (Abbas, 2023: 26). There is a risk, Abbas concedes, that these figures of volatility might appear "vague and merely 'metaphorical'"; but it is a calculated one. After all, "if volatility were susceptible to precise formulations, it would not be volatile anymore". Thus, to account for volatility in art means finding "the *appropriate kind of precision* ... arriving at the *precisely illegible*" – rather than superficially reducing its complexity (Abbas, 2023: 21).

Benjamin Lee (2023) instead focuses on relationships between quantitative, statistical conceptions of volatility in finance, and qualitative conceptions of volatility within philosophy and culture. Lee draws from a dizzying array of ideas and practices, from animal spirits and delta hedging to surfing, tightrope walking, and the trading floor. He offers an important reappraisal of the early intellectual histories of volatility – notably, by rereading Henri Bergson as an early philosopher of volatility. Developing novel readings of how qualitative and quantitative conceptions of volatility cohabit financial trades and cultural forms, Lee theorizes "the tactile nature of volatility underfoot" (Lee, 2023: 49), which surfers, traders, tightrope walkers, and contemporary dancers navigate. Lee extends the work of his late collaborator, Randy Martin, by delving into mathematics, in order to discover new ways to link the embodied practices of volatility to its mathematical debates.

Both Abbas and Lee write about De Man's analyses of rhetoric, dramatically rethinking volatility's intellectual histories. Although literary criticism seems quite far from Black-Scholes, both authors agree that rhetoric, too, suspends directional interpretations to uncover the creative volatility of language. For Abbas, De Man is "the major literary theorist of volatility", who rejects directionality in favor of volatility:

... the three moments of flight, return, and the turning point at which flight changes into a return or vice-versa, exist simultaneously on levels of meaning that are so intimately intertwined that they cannot be separated... (De Man, 1983: 163)

Lee, in turn, looks closely at one of De Man's classic essays, discovering that both metafigural functions, the rhetorization of grammar and the grammatization of rhetoric, neutralize or 'delta-hedge' directional interpretations. This is the volatility and undecidability of rhetoric:

We end up therefore, in the case of rhetorical grammatization of semiology, just as the grammatical rhetorization of illocutionary phrases, in the same state of suspended ignorance ... Literature as well as criticism – the difference between them being delusive – is condemned (or privileged) to be forever the most rigorous and, consequently, the most unreliable language in terms of which man names and modifies himself. (De Man, 1973: 33)

Here, volatility is a virtual spread of counterfactual alternatives to whatever happened; it doesn't follow deterministic laws, but in retrospect it always appears as stochastic – a statistical distribution of randomness. It is discovered by suspending directionality in a variety of areas, from finance to cinema, dance, theatre, surfing, and rhetoric. Whether in finance or in cultural activities, making 'value' out of the volatility of movements (in the form of money or satisfaction) entails neutralizing directionality and discovering a new equilibrium: the 'risk-free' rate in finance, or an internal resonance in culture.

Abbas and Lee also rethink Bergson and Deleuze as philosophers of volatility. Duration was the basis of Bergson's philosophy. One of the philosophical forefathers of contemporary affect theory, Bergson offers a 'flow model' of subjectivity that has profoundly influenced contemporary literary cultural studies. His contemporary influence was mediated by Deleuze, who wrote books about Spinoza and Bergson and uses Bergson's ideas about time in his *Cinema* books (Deleuze, 1988b, 1988a, 2001, 2013). The rise of affect theory in the humanities contrasted with economics and finance, which promulgated a 'scientific' model of subjectivity that came from expected utility and game theory. These formal decision-making models had a profound impact on economics and finance. However, there is another line of thought that could be traced back to Keynes' remarks about 'animal spirits' and how stock prices behave more like a 'beauty contest' than a rational market (Keynes, 2007). In light of volatility's new, post-2008 configurations, it is crucial that we return to those philosophers who might open up new ways of thinking about volatility's qualitative aspects.

Exploring volatility across disparate post-2008 contexts

Another group of texts, the special issue's essays and reviews, prompt us to consider how volatility animates disparate post-2008 contexts in unexpected ways – beginning with the Chinese stock market. Abbas (2023: 21) describes China as profoundly volatile economically and politically, since the "socialist market economy" attempts to "substitute one political-economic grid for another, to establish neoliberal practices on a socialist base". In her essay, Giulia Dal Maso further investigates this anamorphic space, focusing on how Chinese investors understand themselves as navigators of stock market volatility. The Chinese stock market is "the most volatile in the world", she points out, largely thanks to the state's repeated interventions. Because of the state's ever-changing rules, Chinese market volatility (*bodong*) appears as "a systemic shock, potentially lethal in its magnitude", rather than just a wobbly situation which carries both risk and opportunity for investors (as it normally does in many Western markets) (Dal Maso, 2023: 58, 61). Drawing on Chinese online forums and financial

literature, Dal Maso details how small-scale investors position themselves in relation to the Chinese state, which both enables and threatens their investments. The self-mocking term *jiucaï* ('garlic chives') emerged, as a way to deal with the anxiety of investing in highly volatile conditions. *Jiucaï* refers to the investors' willingness to keep throwing money at the markets, even though the sickle of the state might cut them down at any time. Financial literature picking up on this meme advises investors to develop a 'resilient attitude'. "The message", Dal Maso (2023: 63) writes, "is that *jiucaï* investors voluntarily submit to the sickles of the big players (such as the state market actors) because of their own greediness". Drawing together the ninth-century BC *Yijing* (or *Book of Changes*) with contemporary debates on biopolitics, Dal Maso's essay usefully extends Western debates on financial subjectivity, such as those around 'responsibilization', whereby neoliberal subjects are made to assume responsibility for systemic risks (Shamir, 2008; Brown, 2017). As she points out, the *jiucaï* metaphor calls for "a rethink of the notion of subjectivity production within financial capitalism", since, to a certain extent, small investors' volatility "becomes a weapon to escape the volatility of the Chinese state's rhetoric and policies" (Dal Maso, 2023: 64).

After Dal Maso come two reviews of recently published books on the politics of financial volatility. The first is Dick Bryan's review of Robert Meister's (2021) *Justice is an Option*, which explores how financial derivatives might enable more sustainable forms of political activism to flourish. Neither 2011's Occupy Wall Street (OWS) nor 2021's GameStop furore were sustainable forms of activism, Bryan points out. OWS was "a politics of grinding Wall Street to a halt" which could only last so long, while the GameStop furore saw small investors coming together on social media to squeeze a few hedge funds short-selling GameStop shares – ultimately at great cost to themselves (Bryan, 2023: 92). By rethinking reparations for historical injustices such as colonialism and slavery according to options theory, Bryan argues, Meister's book "is reframing long-term, sustainable political gains from the impact of political activism ... He is opening a new political space" (Bryan, 2023: 92).

The second book reviewed is Brett Christophers' account of asset manager society, *Our Lives in Their Portfolios*. Christophers' (2023) book joins a wave of recent titles on the rise of asset management firms such as Vanguard and Black Rock. Patrick Cleary (2023) highlights how Christophers' book stands out for focusing on the infrastructural and real estate investments of such firms. Asset managers were able to greatly expand their real asset holdings after the 2008 financial crisis, but are hardly invested in the long-term stewardship of critical infrastructure. Cleary (2023) also spotlights the book's implications for the politics of climate change adaptation. Because asset managers have invested heavily in renewable infrastructure, "the transition from fossil fuels to renewable also represents a transition to asset-manager society" (Christophers, 2023: 125). This problem may well be formative in diagnosing new financial-political volatilities as the climate crisis worsens in the years to come.

Envisioning volatile futures

Three artistic contributions to the special issue envision volatile futures. In response to the Covid-19 pandemic, among other crises, London-based artist Ami Clarke created a virtual reality artwork, *Pandemonium (do androids dream of?)*, originally released in 2022. A 360-degree video version is included in this special issue (Clarke, 2023). Clarke's piece offers a glimpse into a strange, animated world: a post-digital, post-apocalyptic London financial district, with partly ruined buildings overtaken by moss. A shimmering purple sky suggests entrapment within some kind of bubble. Black and pink blips flick through the air, and animals

– from the recognizable (penguins, a polar bear) to the fantastic (a huge, translucent mouse-like creature, hopping on its hind legs) – roam freely through the streets. Slowly, a herd of deer begin to gather. Like a troupe of music video back-up singers, they begin to dance, swinging their antlers and side-stepping in unison. Then, they change size, growing taller and thinner as they merge into a composite deer-cluster, and a translucent bubble descends around them. Slowly, the cluster disintegrates.

Clarke assembles a post-apocalyptic future landscape in which financial, biological, digital, and environmental volatilities collide. Her piece is a meditation on the porosity of bodies that the Covid-19 pandemic made painfully clear, as well as risk management protocols and wealth derived from extractive relations across a wide range of activities, including disaster-capitalist asset-grabs rammed through using ‘emergency measures’, surveillance capitalism, sentiment analysis, and reinsurance (Clarke, 2021). The sometimes-synchronized animal clusters – nods to Keynes’ ‘animal spirits’ (which she has explored in prior work) – also unexpectedly echo another thinker: Frankfurt School theorist Siegfried Kracauer on ‘the mass ornament’. “The position that an epoch occupies in the historical process can be determined more strikingly from an analysis of its inconspicuous surface-level expressions than from that epoch’s judgments about itself”, Kracauer (1995: 75) argued. In a striking passage on the Tiller Girls, the dance troupe known for their precise, if kitschy, numbers featuring linked arms and high kicks, he described them as “indissoluble girl clusters whose movements are demonstrations of mathematics” (Kracauer, 1995: 76). Rather than exuding personality, individuality, or content, “the girl-units drill in order to produce an immense number of parallel lines, the goal being to train the broadest mass of people in order to create a pattern of undreamed-of dimensions” (Kracauer, 1995: 77). In *Pandemonium*, multiple risk management protocols move through digital animal clusters, imbued with a Kracauer-like emptiness of patterning. Clarke’s many research interests are not merely illustrated in her work; rather, they produce a way of seeing within a possible world, in which envisioning collectivity collides with over-calculation and multiple social, financial, and ecological crises. The deer routine suggests new ways to think about the volatility of dance and movement, in a moment when risk management renders the worlds it purports to describe ever stranger and ever more crisis-ridden.

In her video, *Teslaism: Economics After the End of the End of the Future*, Bahar Noorizadeh (2023) presents a video-game-like, animated dystopia in which volatility has been newly captured as a progenitor of value. The artist describes ‘Teslaism’ as a mode of production succeeding post-Fordism, which embeds the fluctuation of reputation ratings directly into factory production. We see a car driving through a desolate, climate-apocalyptic landscape; it’s Elon Musk, heading to Tesla’s annual shareholder meeting. “The CEO (or the president) here is a sort of DJ”, Musk’s character muses, through speech bubbles superimposed on the scene, “Weaving together one tweet, or one dance move after another. He creates a set of perpetually postponed and too-fabulous-to-be-fake stories to make time make power”. In the *Teslaword*, Musk declares, “everyone is free to speculate on the value of their assets, be it their gender, their skin color, or their house”. Noorizadeh’s fiction parodies the company’s regressive, techno-solutionist pseudo-cyberpunk imaginary, riffing off Musk’s outlandish social media statements and Tesla’s new, futuristic production hubs, like the Gigafactory Berlin-Brandenberg. She envisions a future in which the CEO boasts about helping climate refugees rather than “producing the same old crappy car”, spinning a tragic situation into compelling reputation-fodder. The CEO – a producer of fast cars – must double as a spinner of tall tales, which are part of the production line, rather than a PR afterthought. Producing reputation volatility becomes every bit as integral to capital and power as the

company's ownership of production sites and infrastructures. Noorizadeh's piece offers a fascinating fictive study of oligopolistic power in an age when social media renders reputation's volatility newly palpable. Completed before Musk's 2022 hostile takeover of Twitter, the piece seems all the more prescient since.

Finally, Vermeir & Heiremans' artwork addresses the mutability of valuation infrastructures. Their film *A Modest Proposal (in a Black Box)*, originally released in 2018, explores "whether financialization can be repurposed towards generating a more equitable arts ecology" (Vermeir & Heiremans, 2023a: 74). The accompanying article (Vermeir & Heiremans, 2023b) investigates the ambitions of the video, a multi-layered work which revolves around a proposal to redeploy instruments of financialization to redistribute value to artists (whose work so often fuels gentrification, but rarely in ways they benefit from). Vermeir & Heiremans then consider the landscape that has emerged since their film, in which cash-strapped art institutions have, indeed, tried to generate more liquidity from their illiquid assets, by selling NFTs (non-fungible tokens) of the masterpieces in their collection, for example. They explore the problems and potentials of blockchain, NFTs, DAOs (Decentralized Autonomous Organizations) and DiSCOs (Distributed Cooperative Organizations), asking whether such tools might be repurposed to build "a solidarity economy by the mutual distribution of collectively generated values among all contributors" (Vermeir & Heiremans, 2023b: 75). Their text carefully considers the possibility that these technologies could equally function as commoning tools or as apparatuses of extraction and enclosure. The terrain that emerges is fraught with challenges. "We know", they write, "that today's highly financialized institutions often benefit from turbulence and volatility, which might be caused by social movements' actions" (Vermeir & Heiremans, 2023b: 86-87). In dialogue with Abbas' and Lee's articles on volatility and culture, Clarke, Noorizadeh, and Vermeir & Heiremans offer varied visions of volatile futures.

Conclusion

Volatility involves "the fact that *change itself has changed*" (Abbas, 2023: 19). This introduction has explored some of the many ways in which volatility itself is changing – from its reimagined early intellectual histories; through its expansion as a self-reflexive financial, social, and cultural logic, especially between 1973-2008; to its new configurations in the post-2008 era. Volatility increases when the 'fat tails' become thicker – when more extreme values become more probable. There are many ways in which our abundantly volatile moment feeds the fat tails. In the coming years, we hope to see further research which takes up volatility as an explicit concern and stretches beyond the approaches tested here. This might include further reflection on volatility and climate; volatility and plutocracy; volatility, infrastructure, and asset management; and volatility in the Global South. We also see potential for further work which more explicitly foregrounds volatility in social media, especially given that social media algorithms and reputation metrics make reputations, opinions, information, and personality newly volatile, as Noorizadeh's artwork suggests, and as one of us has explored elsewhere (Rosamond, 2020, 2023). This should include particular attention to new configurations of race, gender, and volatility, given how social media metrics and algorithms are fusing platform logics with those of racism and misogyny (Ging and Siapera, 2018; Noble, 2018). Following Amoore (2022), we also hope to see further reflection on how AI and machine learning operationalize volatility differently from derivative finance and feed new social volatilities in the process. Just as Cboe's VIX rendered volatility reflexive, social media makes projected identities and social affinities (turned to 'likes') newly volatile and self-

referential. From Fox News to Reddit and QAnon, ever more extreme mediascapes feed the fat tails, evacuating the middle. We are living in an age of media-driven volatility, climate volatility, and plutocratic volatilities. It's volatility all the way down.

Acknowledgements

We would like to thank Amin Samman, Eleanor Beckett, the anonymous peer reviewers, and the featured authors and artists for their work on this special issue.

References

- Abbas, A. (2023) Figuring volatility. *Finance and Society*, 9(3): 18-36.
- Amoore, L. (2022) Machine learning political orders. *Review of International Studies*, <https://doi.org/10.1017/S0260210522000031>.
- Anderson, B. (2006) *Imagined Communities: Reflections on the Origin and Spread of Nationalism*. London: Verso.
- Beck, U. (1992) *Risk Society: Towards a New Modernity*. London: Sage.
- Becker, G.S. (1993) *Human Capital: A Theoretical and Empirical Analysis*. Third edition. Chicago, IL: University of Chicago Press.
- Benquet, M. and Bourgeron, T. (2022) *Alt-Finance: How the City of London Bought Democracy*. London: Pluto Press.
- Berkshire Hathaway, Inc. (2002) 2002 Chairman's Letter, Berkshire Hathaway. Available at: <<https://www.berkshirehathaway.com/letters/2002pdf.pdf>>. Accessed 13 July 2021.
- Braun, B. and Buller, A. (2021) Titans. *Phenomenal World*, 6 November. Available at: <<https://www.phenomenalworld.org/analysis/blackrock-asset-manager-capitalism/>>. Accessed 8 March 2022.
- Brown, W. (2017) *Undoing the Demos: Neoliberalism's Stealth Revolution*. New York: Zone Books.
- Bryan, D. (2023) Who can exercise the option of justice? *Finance and Society*, 9(3): 91-94.
- Buller, A. (2022) *The Value of a Whale: On the Illusions of Green Capitalism*. Manchester: Manchester University Press.
- Cboe (n.d.) *VIX Index*. <https://www.cboe.com/tradable_products/vix/>. Accessed 24 July 2023.
- Chakravartty, P. and Ferreira da Silva, D. (2012) Accumulation, dispossession, and debt: The racial logic of global capitalism – An introduction. *American Quarterly*, 64(3): 361-85.
- Christophers, B. (2023) *Our Lives In Their Portfolios: Why Asset Managers Own The World*. London: Verso.
- Clarke, A. (2021) On pandemonium. *RADAR*. Available at: <<https://radar.lboro.ac.uk/contexts/on-pandemonium-a-new-work-by-ami-clarke/>>. Accessed 27 July 2023.
- Clarke, A. (2023) Pandemonium (do androids dream of?) *Finance and Society*, 9(3): 69-71.
- Cleary, P. (2023) Asset managers in the everyday. *Finance and Society*, 9(3): 95-97.
- Cooper, M. (2022) Family capitalism and the small business insurrection. *Dissent*, Winter. Available at: <<https://www.dissentmagazine.org/article/family-capitalism-and-the-small-business-insurrection>>. Accessed 8 March 2022.
- Dal Maso, G. (2023) The sickle and the garlic chives: Volatility in the Chinese stock market. *Finance and Society*, 9(3): 58-68.
- De Man, P. (1973) Semiology and rhetoric. *Diacritics*, 3(3): 27-33.
- De Man, P. (1983) *Blindness and Insight: Essays in the Rhetoric of Contemporary Criticism*. New Haven, CT: Yale University Press.

- Deleuze, G. (1988a) *Bergsonism*. New York: Zone Books.
- Deleuze, G. (1988b) *Spinoza: Practical Philosophy*. San Francisco, CA: City Lights Books.
- Deleuze, G. (2001) *Cinema I: The Movement-Image*. London: Athlone.
- Deleuze, G. (2013) *Cinema II: The Time-Image*. London: Bloomsbury Academic.
- Dow, A. and Dow, S.C. (2011) Animal spirits revisited. *Capitalism and Society*, 6(2): n.p.
- Esposito, E. (2011) *The Future of Futures: The Time of Money in Financing and Society*. Cheltenham: Edward Elgar.
- Feher, M. (2009) Self-appreciation; or, the aspirations of human capital. *Public Culture*, 21(1): 21-41.
- Foucault, M. (2003) *Society Must Be Defended: Lectures at the Collège de France, 1975-1976*. London: Penguin.
- Foucault, M. (2008) *The Birth of Biopolitics: Lectures at the Collège de France, 1978-79*. Basingstoke: Palgrave Macmillan.
- Ging, D. and Siapera, E. (2018) Special issue on online misogyny. *Feminist Media Studies*, 18(4): 515-24.
- Hacking, I. (1990) *The Taming of Chance*. Cambridge: Cambridge University Press.
- Haiven, M. (2018) *Art After Money, Money After Art: Creative Strategies Against Financialization*. London: Pluto Press.
- Harvey, D. (1990) *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change*. Cambridge, MA: Blackwell.
- Harvey, D. (2010) *The Enigma of Capital*. London: Profile Books.
- Hayes, A. (2023) Volatility: Meaning in finance and how it works with stocks. *Investopedia*, 31 March. Available at: <<https://www.investopedia.com/terms/v/volatility.asp>>. Accessed 3 April 2023.
- ISDA (2021) *Evolution of OTC Derivatives Markets Since the Financial Crisis*. New York: International Swaps and Derivatives Association, Inc. Available at: <<https://www.isda.org/a/8jjTE/Evolution-of-OTC-Derivatives-Markets-Since-the-Financial-Crisis.pdf>>. Accessed 24 July 2023.
- Komporozos-Athanasiou, A. (2022) *Speculative Communities: Living with Uncertainty in a Financialized World*. Chicago, IL: University of Chicago.
- Keynes, J.M. (2007) *The General Theory of Employment, Interest, and Money*. Basingstoke: Palgrave Macmillan.
- Klein, N. (2008) *The Shock Doctrine: The Rise of Disaster Capitalism*. London: Penguin.
- Knight, F.H. (2009) *Risk, Uncertainty and Profit*. Orlando, FL: Signalman.
- Kracauer, S. (1995) *The Mass Ornament: Weimar Essays*. Cambridge, MA: Harvard University Press.
- La Berge, L.C. (2019) *Wages Against Artwork: Decommodified Labor and the Claims of Socially Engaged Art*. Durham, NC: Duke University Press.
- Lee, B. (2023) Varieties of volatility. *Finance and Society*, 9(3): 37-57.
- Lee, B. and Martin, R. (eds.) (2016) *Derivatives and the Wealth of Societies*. Chicago, IL: University of Chicago Press.
- MacKenzie, D.A. (2006) *An Engine, Not A Camera: How Financial Models Shape Markets*. Cambridge, MA: MIT Press.
- Martin, R. (2002) *Financialization of Daily Life*. Philadelphia, PA: Temple University Press.
- Martin, R. (2007) *An Empire of Indifference: American War and the Financial Logic of Risk Management*. Durham, NC: Duke University Press.
- Martin, R. (2012) A precarious dance, a derivative sociality. *TDR/The Drama Review*, 56(4): 62-77.
- Martin, R. (2013) After Economy? *Social Text*, 31(1): 83-106.
- Martin, R. (2015) *Knowledge LTD: Toward a Social Logic of the Derivative*. Philadelphia, PA: Temple University Press.
- Marx, K. (1976) *Capital: Volume I*. London: Penguin.
- Marx, K. (1981) *Capital: Volume III*. London: Penguin.

- McClanahan, A. (2017) *Dead Pledges: Debt, Crisis, and Twenty-First-Century Culture*. Stanford, CA: Stanford University Press.
- Ngai, S. (2020) *Theory of the Gimmick: Aesthetic Judgment and Capitalist Form*. Cambridge, MA: Harvard University Press.
- Noble, S.U. (2018) *Algorithms of Oppression: How Search Engines Reinforce Racism*. New York: New York University Press.
- Noorizadeh, B. (2023) Teslaism: Economics at the end of the end of the future. *Finance and Society*, 9(3): 72.
- Rosamond, E. (2020) From reputation capital to reputation warfare: Online ratings, trolling, and the logic of volatility. *Theory, Culture & Society*, 37(2): 105-29.
- Rosamond, E. (2023) YouTube personalities as infrastructure: Assets, attention choreographies and cohortification processes. *Distinktion: Journal of Social Theory*, OnlineFirst <https://doi.org/10.1080/1600910X.2023.2185873>.
- Schultz, T.W. (1961) Investment in human capital. *The American Economic Review*, 51(1): 1-17.
- Shamir, R. (2008) The age of responsabilization: On market-embedded morality. *Economy and Society*, 37(1): 1-19.
- Tooze, A. (2022) Welcome to the world of the polycrisis. *Financial Times*, 28 October. Available at: <<https://www.ft.com/content/498398e7-11b1-494b-9cd3-6d669dc3de33>>. Accessed 10 July 2023.
- Varoufakis, Y. (2023) Why did the Silicon Valley Bank go bankrupt and trigger a banking crisis? Are we back to 2008? *Brave New Europe*, 16 March. Available at: <<https://braveneweuropa.com/yanis-varoufakis-why-did-the-silicon-valley-bank-go-bankrupt-and-trigger-a-banking-crisis-are-we-back-to-2008>>. Accessed 23 April 2023.
- Vermeir & Heiremans (2023a) A Modest Proposal (in a Black Box). *Finance and Society*, 9(3): 73-74.
- Vermeir & Heiremans (2023b) Volatile properties: A Modest Proposal revisited. *Finance and Society*, 9(3): 75-90.