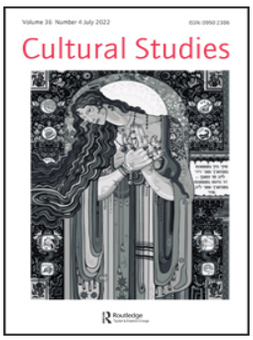

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The price of speculation: fintech risk regimes in Hong Kong

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ABSTRACT

In what ways do fintech (financial technology) innovations mediate and articulate heterogenous facets of uncertainty in the context of finance capitalism? Arguing that uncertainty is a resource both produced and exploited, this article analyses how fintech trading applications configure market uncertainty as figures and scenarios of risk and opportunity. Moreover, foregrounding the experiences of novice retail traders, I analyse the weighing of financial risk against extra-financial forms of uncertainty, namely historical contingency, lived precarity, and infrastructural opacity. To map articulations between the various facets of uncertainty involved (i.e. risk, contingency, precarity, and opacity), I propose the concept of *risk regimes*: sociotechnical constellations or assemblages that interweave technologies of financial calculation and prediction; discourses of probability, possibility, risk, reward, *et cetera*; technologies of the self; and infrastructures of datafication key to fintech. This study is set in Hong Kong, a context that testifies to the instability of such assemblages. Whereas finance capitalism exploits uncertainty in multiple ways, contingency can also render the future of finance capitalism itself uncertain. Conceptually, I draw on recent media theories, theories of uncertainty and prediction as well as theories of value. Methodologically, I combine app analysis, in-depth user interviews, and digital-methods experimentation.

KEYWORDS Fintech; uncertainty; finance capitalism; risk; retail trading apps; Hong Kong

Introduction

Democratization of financial speculation is upon us and allowing 'everyone' to 'invest like the ultra rich', according to the slogan of one of the early fintech apps in Hong Kong.[1] Fintech trading and investment apps supposedly create a level playing field for novice retail investors with modest means by providing various forms of support. For instance, Futu offers investor education via its platform and maintains a social network for financial discussion. Aqumon offers robo-advising by allegedly using 100 terabytes of macroeconomic and financial market data.[2] Its website contrasts the information

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asymmetries of the past to the present situation. Whereas in the past institutional and professional traders enjoyed premium services from Bloomberg and direct trading lines, after a decade of technology advancement, 'information which used to be a privilege to financial institutions has been decentralized'.[3] Institutional traders such as 'hedge funds basically have lost all their edge in the trading game'.[4]

Situated in Hong Kong, this paper focuses on fintech infrastructures and innovations that support financial speculation, such as data-driven computational modelling, automated, algorithmic trading, social networks, and robo-advisors. All these innovations grapple with market uncertainty, yet modelling and automated trading are deployed by professional and institutional traders, while fintech trading apps and platforms are promoted for amateur use with the promise of financial inclusiveness and democratization. My central question is as follows: how do these various fintech applications mediate different but interrelated facets of uncertainty in finance capitalism? In other words, how do the calculative technologies and discourses of risk and reward surrounding fintech trading configure market uncertainty as figures and scenarios of risk and opportunity? And, how do they engage extra-financial modalities of uncertainty such as lived precarity and historical contingency in fintech practices and finance capitalism at large? Last, as novel technologies and infrastructures, how do they generate further uncertainty due to opaque operation? To map articulations of the various facets of uncertainty (risk, contingency, precarity, and opacity), I propose the concept of *risk regimes*, namely sociotechnical constellations or assemblages that interweave technological, discursive, affective, and infrastructural forms and forces. The risk regimes advanced in the context of fintech straddle the boundary between the financial and extra-financial by rendering commensurate diverse modalities of uncertainty. Drawing on Lupton's (2013) classifications, I consider risk here in poststructuralist terms by highlighting the technologies and discourses undergirding its construction. I explore the subjectivity of the ideal fintech user that risk regimes invoke, namely the 'laborer-speculator' who accepts the risks, efforts, and lived uncertainties that financial speculation implies. Furthermore, I attend to expressions of critique and reflexivity by actual users.

In the following, I will first unpack the concept of risk regimes and subsequently review key technological innovations underpinning current risk regimes. Then I present my analysis of fintech retail trading. This analysis is multi-methodological in design, combining different angles and lenses (Flick 2018). I conducted discourse and visual analysis of websites and promotional materials in addition to app walkthroughs to attune myself to the affordances of fintech trading apps, focusing on Futu and Aqumon (Dieter and Tkacz 2020). By means of in-depth, semi-structured interviews (10 in total, each lasting 1–2 h), I inquired into user practices and genres of

speculation and extra-financial forms of lived uncertainty, or precarity.[5] All interviewees were Futu users, in their 20s and early 30s, and from Hong Kong. Some were university students and others working in jobs, either with or without an advanced degree. Last, I conducted a speculative inquiry into fintech infrastructures and the processes of datafication they afford by means of digital methods. Using the tracker database of Ghostery, I 'track the trackers' that are active on fintech websites in Hong Kong and mainland China (see for explanation, Deville and van der Velden 2016). This digital-methods experiment involves a pool of over 50 fintech companies in Hong Kong, including not just trading but all kinds of fintech applications such as lending and insurance.

Risk regimes and uncertainty

Risk regimes are sociotechnical constellations or assemblages that mediate, articulate and associate various facets of uncertainty, namely *risk*, *contingency*, *precarity*, and *opacity*. They do so by interweaving (1) technologies of financial analysis and interpretation, (2) discourses of probability, possibility, risk, opportunity, and reward that frame and normalize risk-taking; (3) technologies of the self that constitute the subjectivity of the labourer-speculator; and (4) digital infrastructures of datafication that are key to fintech.

To start with uncertainty as financial risk, I explore the ways in which various fintech innovations mediate market uncertainty, namely the unpredictability of price development of securities, by configuring it as figures of risk and opportunity. Market uncertainty is a product of both historical contingency and market volatility. Technological use in finance is informed by the aspiration to tackle (known and unknown) 'unknowns' by devising a calculation or assessment of probability or possibility framed as risk and opportunity. Yet rather than 'taming' market uncertainty and managing risk, the rise of financial technologies has disseminated and redistributed the experience of uncertainty.

Moreover, risk regimes operate at the intersection of financial uncertainty and extra-financial uncertainty, working to subject more and more of 'life' to financialized reasoning and action (Martin 2015). In this process, an additional translation or configuration is at stake: risk regimes involve intuited and reasoned calculations according to which risk-taking makes sense and seems 'the right thing to do', given the circumstances of lived precarity and the felt uncertainty of the future. For Marx, the speculating trader risks social property that is not his own. But nowadays speculative activity is undertaken by diverse classes and groups, for whom it has become a personal responsibility or obligation to engage in the practice (Bear 2020). Given the extent to which pensions, housing, and livable income have

become contingent on participation in stock and cryptocurrency markets, we can speak of the labourer-speculator (Allon 2010). Yet, as I will argue, the 'speculation of price' comes with the 'price of speculation', namely the price paid for engaging in speculative practice in the form of vulnerability, emotional stress, time, effort, and exhaustion. The fact that fintech involves smart phones applications that structure intimate habits, embodied experiences, and daily (including nighttime) routines deepens and intensifies the penetration of speculative practices in everyday life. More so, increasingly pervasive contact with fintech's infrastructures enables datafication. Data extraction is key to fintech operations and profits but generates further uncertainty. What I call data opacity refers to a condition in which datafication implies uncertainty for users due to opaque operation.

The concept of risk regimes paves the way for further discussions about the production of value in finance capitalism, particularly in the technologized and digital context of fintech. Important in several places of this article is the work of political economy theorist Moishe Postone (2012, 2017), who has argued against the Marxist transhistorical category of labour and its centrality in the theory of value. Instead, he suggests that labour is a historically particular 'quasi-objective form of social mediation' that (re)produces and organizes a social order for capitalism, rather than simply being exploited by it (Postone 1993, p. 5). But value can be produced and accrued in various ways, including financialization (Postone 2017). This article concurs that, in the context of fintech and finance capitalism, the production of value shifts away from exploiting labour and toward exploiting market uncertainty as well as lived precarity (Bear 2020). Facilitating the exploitation of uncertainty, risk regimes guide subjects (i.e. markets, societies, individuals) in how to weigh the financial and the extra-financial by seeking commensuration between what cannot be understood or translated in single terms (Grossberg 2010, p. 162). Boundaries between financial and extra-financial instances of uncertainty are crossed and displaced when weighing and rendering commensurate financial risk, lived precarity, historical contingency in times of political turmoil, *et cetera*. For instance, market uncertainty includes exposure to historical contingency and predictive insight must somehow account for this. Yet for the individual trader, the correlation of risk and reward in finance implicates risk not as a standard financial category but always as a personal, situated, and embodied sense of the present and future.

Furthermore, rather than labour, it has been discussed to what extent the production of value resides in digital contexts in the extraction of data (Arvidsson and Colleoni 2012, Couldry and Mejias 2019, Mezzadra and Neilson 2019, Kaplan 2020). Extraction and datafication via internet infrastructures draw life itself within capitalist and financialized relations and render it the object of speculative and probabilistic gazes. Postone (2017) notes that

financialization requires that 'life' itself is turned into the '"raw materials" of price and profit', meaning that it is constructed and calculated as a source of wealth for the financial agent to extract (p. 52). Drawing on Postone, Couldry and Mejias (2019) argue that 'the extraction of data from bodies, things, and systems create new possibilities for managing *everything*', leaving no 'outside to capitalist production' (p. 343). This line of inquiry is pertinent to fintech. For instance, accounting and advisory firm KPMG claims that 'Data is the lifeblood of any financial institution, and it is what the new generation of fintechs, insurtechs and regtechs are built upon.'[6] More than an asset, data is the 'driver and facilitator of new business models and innovation'.[7] However, as this paper argues, datafication does not yield value in any straightforward sense (Arvidsson and Colleoni 2012, Kaplan 2020) and gets articulated into multivarious, experimental and hence opaque operations that straddle areas of endeavour including financialization, advertising, and social control.

The setting of this study, Hong Kong, manifests the exploitative relation of finance-capitalist fintech to uncertainty as well as the possibility of a more tensional relation between the two. The ways in which risk regimes operate on, and encounter, 'the intimacies of private lives' (Grossberg 2017) are particular yet not entirely unique to Hong Kong. Hong Kong is a financial city where global investment banks invest in Chinese companies, but it is also a city where a 20-something-year-old can be heard lamenting that they 'missed out', because they never acquired investment skills, as did their peers during secondary school. Whereas globally young people have turned to trading and investment to deal with a shortfall in income affording middle-class stability (Kale 2021), in Hong Kong intense economic, housing-related, and (geo)political precarity coalesce. Hong Kong's housing market features the world's highest house price-to-income ratio: it takes a family with a median income 20.8 years of saving to be able to afford a modest flat in the city's characteristically high urban towers and vertical suburbs (Archibal 2021). But in addition, the future of Hong Kong is experienced as highly uncertain due to political instability and what many see as the loss of a degree of autonomy vis-à-vis mainland China (Ip 2020). At stake is disagreement over the city's mini constitution and the Sino-British treaty, which was signed in 1984 in preparation of the Handover of the territory from colonial Britain to China and which formalized the principle of 'one country, two systems'. These extra-financial uncertainties, experienced intimately in private life, play a role in fintech trading, as risk regimes advance rationalities and intuitions that guide retail traders to assess and accept financial risk in the light of, and weighted against, lived precarity. In particular, (geo)political uncertainty motivates Hong Kong users to trade in global stocks and this is what the app Futu, which is central to this study, enables. The app invites Hong Kong and mainland-Chinese retail investors to invest in these

stocks via its affiliations with the Hong Kong and Singapore Exchanges (HKSE, SGX) alongside the New York Stock Exchange (NYSE) and NASDAQ. Currently available for trading are Stocks, ETFs, Warrant, CBBCs, IPO, Margin Trading, Short Selling, and Options, while Futu has announced that more extensive derivatives trading will be introduced soon. Similarly, Aqumon, which is featured as an alternative fintech app next to Futu in this study, allows its users in Hong Kong and mainland China to invest via the Hong Kong Stock Exchange and various US Exchanges with the stated goal of diversification of investment portfolios via global financial markets.

But besides the exploitation of lived precarity (as a facet of uncertainty) by finance-capitalist fintech, the case of Hong Kong also testifies to the countervailing potential of historical contingency (as another facet of uncertainty) to exceed risk regimes and overwhelm them. Designated to be a 'bridge' between East and West (to reiterate the mythologizing metaphor stemming from colonial times), Hong Kong has facilitated capitalist globalization. However, Hong Kong is also a boundary zone of various political and economic ideologies and policies as well as technological infrastructures and internet ecosystems. As such, it offers no guarantee regarding the global extension of risk regimes and finance capitalism at large. Heterogeneity persists and this becomes obvious, for instance, in the infrastructural and regulatory details of how stock exchanges operate. American exchanges have been shaped to better facilitate algorithmic trading and High Frequency Trading (MacKenzie 2017). In contrast, China's stock exchanges are designed with the intention to protect retail investors, namely the 'Mom and Pop investors', the growing middle class, who are behind 90 percent of all trading accounts in China (Petry 2021). Embedded in authoritarian capitalism, concrete tweaks and regulations imply that mainland-Chinese exchanges prevent 'overspeculation' and integrate finance into the country's developmental agenda (meaning, finance serves bankrolling the 'productive' economy, hence supporting national development). Fintech enterprises in Hong Kong may seek to strategize around such heterogeneity but remain exposed to harming ideologies and policies, especially in times of (geo)political volatility. In the case of Futu, there is a possibility that the US bans Chinese Futu from operating on its stock market or that Chinese companies available for investment via the app are delisted from US indexes. Moreover, Futu was recently threatened to be banned in China, the concern being the outflow of capital as much as data. In Fall 2021, Chinese state-affiliated media questioned how users' data collected by Futu is shared and argued that data security was compromised if authorities like the US Securities and Exchange Commission could request data belonging to the Chinese population (Reuters 2021, Zhu and Yu 2021). To spread risk, the company started a US version (Shen and Galbraith 2021). Indeed, for platforms and users alike, the response to risk is spreading investment, yet globalizing the scale of

activities inadvertently triggers more risk and uncertainty due to exposure to geopolitical tensions, regulatory shifts, and other historical contingencies. At every turn the globalization of risk regimes may be complicated, frustrated, or suspended, facing proliferating uncertainties (Petry 2020). The case of Hong Kong shows that whereas uncertainty is both produced and exploited in finance-capitalist fintech, as historical contingency it can challenge risk regimes and the expansion of finance capitalism, too.

Technological innovation and risk regimes

From contingency to risk

In 1937, the economist John Maynard Keynes characterized uncertainty in the following way:

> By 'uncertain' knowledge, let me explain, I do not mean merely to distinguish what is known for certain from what is only probable. The game of roulette is not subject, in this sense, to uncertainty […] The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence, or the obsolescence of a new invention […] About these matters there is no scientific basis on which to form any calculable probability whatever. (Keynes 1937, p. 214)

Over a decade before Keynes, the Chicago School economist Frank Knight introduced a similar distinction between 'uncertainty' emerging from events that are truly unknowable and 'risk' as intrinsic to events that are not known directly but that can still be calculated by means of statistics and probability (Poovey 2018). However, Knight (1921) reached a different conclusion than Keynes, as for him uncertainty was of great interest financially. Investment opportunities lie exactly in probing the threshold of what is known:

> Profit arises out of the inherent, absolute unpredictability of things, out of the sheer brute fact that the results of human activity cannot be anticipated and then only in so far as even a probability calculation in regard to them is impossible and meaningless. (Knight 1921, p. 311)

In Knight's influential discourse, speculating about generally unthought possibilities distinguishes successful entrepreneurs from their competitors (Amoore 2013, pp. 10–11).

The respective views of Keynes and Knight lay out two sides in a continuing polemic between financial speculators and advisors on the one hand and their critics on the other. According to critics, predictive approaches to uncertainty are ambiguous or even mistaken because they misconceptualize its nature. True uncertainty implies a non-deterministic ontology of open (anti-)systems. Developments cannot be predicted by means of probability

calculation, which presumes 'an environment of known probability of loss or gain', since the 'probable distribution of outcomes itself is unknown' (Lockwood 2015, p. 727, Cooper and Konings 2015). Risk in financial discourse however substitutes uncertainty with figures and scenarios of probability/possibility. The financial sector has offered plenty of predictive intelligence that seeks to venture into the uncertain to 'conquer' and subject it to probabilistic and possibilistic predictions, however uncertain and speculative such intelligence itself remains. Starting in the 1920s in the US, Poovey (2018) traces a seeming 'expansion of the domain of the calculable' (p. 232), supposedly obliterating uncertainty in Knight's and Keynes' sense by means of data collection and mathematical theory. Yet even after its mathematization, uncertainty has kept haunting financial intelligence. Through an ethnographical study conducted among financial advisors at a Swiss bank, Leins (2018) details how the anchoring grounds of predictive insights are constantly shifting. For instance, rather than data-driven, algorithmic modelling tools, it may be the personal touch, intuition or creativity of the analyst that is touted as advantage. Also, a single report can combine data-driven and qualitative, interpretive techniques, as well as technical and fundamental analysis of markets, despite contradictions in method or in the actual forecasts produced. Indicating the eclectic and contradictory composition of financial knowledge, Sjol (2021, p. 5) argues that rationalist and mysticist knowledge (defined as 'the belief that there are domains inaccessible to rational knowledge that can nevertheless be apprehended or intervened on through subjective experience') exist side by side, and they work to reinforce rather than unsettle one another.

The latest in the strive to overcome market uncertainty includes algorithmic modelling technology and its supporting trading infrastructures: 'genetic algorithms, neural networks, and machine learning systems, founded on the premises of chaos theory and fuzzy logic' (Lotti 2018, p. 50). Such innovative technologies keep alive the hope of transcending or 'cheating' the uncertainty of stock price developments. The rhetoric around these new modelling technologies seemingly refutes existing objections against the undertaking of prediction. For instance, Roffe (2015) critiques prediction derived from selective historical data, as logically such data has no bearing on the future in an open system and undetermined environment. But technological innovation using Artificial Intelligence and Big Data, including real-time datasets rather than historical ones, can be seen as a new bet for market intelligence that captures the emerging present and imminent future. Likewise, the figure of the 'black swan' evokes improbable, unique events and outliers that break patterns discerned through the lens of probability. Economists allude to the black swan as the exception that confirms the rule, that is to say, as the extremely unlikely exception that 'saves' the legitimacy of probabilistic models overall. The trader-turned-philosopher Ayache (2010, Roffe 2015, p. 21) deconstructs the figure

of the black swan arguing that either we construe all swans as white, meaning that every event is predictable, or we construe a swan that is neither black nor white but has no pre-determined colour, it being a *blank* swan. Nonetheless, the view of the market as an open-ended system or an 'emergent, network effect' operating outside of probabilistic rules informs the rise of complexity economics (Bear 2020). As Bear (2020) argues, 'Crucially, these models anticipate disorder and uncertainty as inherent to the economy, which can only be mitigated or partially predicted by economic institutions' (p. 5). For instance, as equilibrium models failed to predict or account for the 2007–2008 financial crash, they have been questioned and agent-based modelling using non-linear Monte Carlo algorithms has emerged as an alternative.

From risk to actionable speculation

Underscoring the 'folly' of prediction in a carnivalesque manner, the popular press has covered multiple experiments involving animals, such as a monkey and a ginger cat, outperforming experts in picking portfolios of stocks (Leins 2018). But even among participants in the financial sector, there is a deep ambivalence about the accuracy and adequacy of financial models and knowledge in general (Hardin 2021). The situation triggers analogies between predicting markets and gambling, which Leins found to be a frequent theme of insiders' jokes among financial analysts, tactfully hidden from clients (Leins 2018). In similar vein, the Nobel-prize winner and economist Fama said about the influential Capital Assets Pricing Model (CAPM), which informs derivatives trading, that it is 'just a model and so surely false' (Fama 1991, quoted in MacKenzie 2006, p. 92). This comment, in all its irony, leaves one wondering what the purpose of using models is.

With technological innovation venturing into uncertainty, risk regimes have emerged that embrace speculative insight rather than shunning it. Even if a predictive model proves accurate merely slightly over 50 percent of the time, there are profits to be made. In fact, the highly speculative but still marginally successful model may be preferred to models that provide clear wins. In an article that underscores the difficulties of using computational modelling to predict markets, the financial data and media company Bloomberg writes in this regard that using an obvious signal can be less desirable than using a faint signal, meaning one that might predict future prices with merely 51 percent certainty (Dewey 2019). If this percentage would be higher, competitors would discover the signal too easily and trade away the advantage. Therefore, to spot opportunities, models are 'looking for patterns that are just on the edge of detection' (Dewey 2019). Rather than reliable knowledge and containment of risk, the goal is to deploy knowledge that is extremely speculative in order to engage in riskier but supposedly more rewarding trades.

Moreover, rather than accurate, technologies used in the process need to be *actionable* in the face of uncertainty (Amoore 2013), meaning that they lend a mandate for 'market making' as a tactical, creative, and performative process. Indeed, unconcerned with the uncertain status of speculative knowledge, Ayache (2010) is not as much interested in the accuracy of predictive models as in their performative impact on markets. Through the act of trading, market makers 'write' price and produce continually differing futures. As Ayache (2010) writes, 'The reason why probability or prediction doesn't apply to the market isn't that the market is too complex or too human or too chaotic. The reason is simply that the market should be the *alternative* to prediction in matters relating to the future' (p. xvii). By this Ayache means that the market is a medium of contingency, which *brings forth* unpredictable, differing futures. Hence, for Ayache (2010), in a reversal of the representationalist approach to market modelling, '[c]ontingency takes place *after* the model' (p. 5, emphasis in original).

Trading in derivatives can be taken as paradigmatic for such creative and performative writing of price. This is so because such trading is concerned with market developments rather than determining the fundamental value of underlying assets. Derivatives are one instance of how the financial sector reproduces uncertainty about value, while claiming to reduce it (Kaplan 2003). At stake is the decomposition of a thing or event into a set of attributes whose performance is measurable through specific calculations, so that they can be priced and traded as such (Bryan and Rafferty 2014). However, as Amoore (2013) comments, the derivative is derivative in the sense that it infers 'a range of possible futures on the basis of multiple past data elements – elements from which it is derived but toward which it is largely indifferent' (p. 57). Martin (2015) goes as far as to suggest that derivatives trading operates on the basis of *nonknowledge* because contracts obfuscate ownership and value of underlying assets, which are measured in manifold and doubtful ways. As Martin (2015) argues, 'Derivatives both price uncertainty – that is, they address the unknowable future as an array of possible outcomes that can be acted on in the present – and render the distinction between risk and uncertainty indecipherable' (p. 65). The return of uncertainty stems from the obfuscation of fundamental value through the multiplicity of calculation and the ceaseless contestation around the price of derivatives that marks derivative trading. In this contestation, volatility constitutes a 'horizon of opportunity' (Martin 2015, p. 62, see also Pasquale 2015) for those who can exploit it by means of 'network differentials' (Hardin 2021), namely differences in connectivity or speed.

Concocting techno-financial contingency '*after* the model' to speak with Ayache, predictive models that provide actionable insight ironically may generate unpredictability (Cooper and Konings 2015). Esposito (2018) unpacks how volatility sets in when the expectation of incorrect prediction causes

sudden panic and renders markets extra volatile and indeed unpredictive. But this is neither the failure of markets, nor their end. As Esposito (2018, p. 233) concludes, 'Market dynamics reproduce uncertainty against the attempts to control it, thus reproducing the very resource that finance has always exploited.'

Considering this context of technological innovation and finance capitalism, the remaining sections of this article explore the arrival of fintech retail trading platforms, particularly Futu.

The price of speculation

According to Mr. Li Hua, founder of Futu, the platform addresses the 'three nones' of retail investors, namely, ignorance, boredom, and helplessness.[8] In order to offer support and reduce information asymmetries between institutional investors and retail investors, the platform provides access to information from companies and financial commentators as well as a discussion forum for users.[9] Users also can watch live company events and participate in investment education classes, offered via the Niu Niu Classroom. To bridge language gaps pertaining to US and Hong Kong stocks whose companies produce English-language company reports, there is a 'One-Click AI Translation Function'.[10]

Eager to learn more and make informed and rational decisions, novice Futu users take the task of studying very seriously. Paul, currently a student in Finance, tells me that during a semester break he would study for at least twelve hours per day to read relevant literature.[11] He plans to be a professional investor and believes in a learning curve, despite the losses that are bound to happen in the process: 'You must learn and apply and fail and learn again. You can't just learn for a few months and become a master of investment,' he argues. But he also admits that he got into investment precisely because he expected to make 'quick' money, not requiring hours of labour – an expectation that failed to materialize. Another interviewee, Daniel, considers investing 'a long lesson to learn'.[12] He is determined to 'take it very seriously but it will be a very long way to go'. Fintech users such as Daniel consider their activity on the platform as not just a means of generating income in the present but a way of building up skills and knowledge for the future.

Futu's design encourages its users to spend long hours on the app, sifting through information and glued to the screen. The amount of time spent online is counted and the sum can earn one certain badges and tags that signify recognition. Also counted are the number of videos one watches, news items one reads, one's activity on the platform such as comments posted, and the engagement by other users they attract. Besides recognition on the affiliated platform, perks of a high score include days of commission-

free trading and physical toy gifts.[13] Moreover, the app pushes notifications and news updates constantly to attract attention and prompt users to engage with the app again, which is why the three hours that Harry reports to spend on the app per day pervade his entire day from waking up until sleeping.[14]

Futu discourses seek to cultivate the labourer-speculator, namely a subject accepting the particular combination of effort, risk, and reward that fintech trading involves. Jack reports spending 3–4 h a day – on top of his fulltime job – on studying the stock market and following developments, which often goes at the expense of his sleep.[15] He narrates that

> A few years ago I would not be satisfied with my return.[16] But as I'm getting older, the small income – profit – is bringing me satisfaction. And, of course, I need to spend a lot of effort. A lot of time to study and analyze, and that is like a lot of work. So, now, with any small profit, I am satisfied. I mean, my bottom line is: if there's no loss, we'll be okay.

But in the same interview, he also narrates how investing impacts his health: 'Of course, I'm always nervous.' He has noticed that his heartbeat increases when making a high-risk decision. He speaks about using all his 'brain capacity' to come to decision and feeling exhausted for the rest of the day. Feeling done injustice, he adds about investing: 'To be honest, I don't like it.'

Jack's ambivalence is telling. His experience underlines the technologically mediated asymmetries of finance capitalism at times of coinciding trends toward computation/automation, on the one hand, and widening of market participation via fintech apps, on the other. Those who have network differentials on their side can exploit information abundance and volatility of markets (both generating uncertainty of sorts), whereas Futu traders such as my interviewees pay a heavy price in the form of exhaustion, stress, et cetera. For instance, acting as a broker on HKSE, NYSE and other exchanges, Futu flaunts a duration of merely 0.0037 s to place an order, giving the user a sense of being up to speed in the game that High-Frequency Trading (HFT) sets out. But this assurance is partly empty because the actual speed at which one trades varies depending on the ability to process information, provided on Futu in abundance, as well as a user's own connectivity. Humans could never spot opportunities and place orders at the speed of the HFT algorithms. For them, processing information is a task that takes hours and hours, exacerbated by the market climate described in the previous section. Discourses interpellating the 'educated' Futu user who makes decisions on the basis of information reproduce what Ayache calls the representationalist paradigm, yet actual users are immersed in an environment in which politics of nonknowledge, speed, and volatility prevail. That is to say, in the mid of recognition of the noise and irrationality of markets as well as the underdetermination of open systems, Futu reiterates the discourses and

promises of the (incrementally) knowable market. For users, the sentiment of having no escape from uncertainty but also the felt imperative to study more, check more, and stay online longer, cause distress.

Trading app users have regular jobs as nurses, teachers, students, office workers, and technicians, *et cetera*. Having 'sold' their time already, and lacking nonhuman, automated means to monitor and digest information, some express how much they suffer. Their complaints point to what I call the 'price' of speculation consisting in experiences from vulnerability to financial loss, exhaustion, stress, and little or unrewarded time and effort. Despite the spending of time and efforts, the label of labour remains ill-fitting in the context of speculation (see also Postone 2012, 2017). Alternating between hope and disillusion, users need to come to terms with exerting themselves (that is, spending serious time and effort) not for a wage measured in terms of abstract time (Miller 2004), as in the case of labour, but for an opportunity or *chance* only. As Adkins (2015) argues, in finance capitalism, the wage that workers are paid in money as remuneration for the use of their labour becomes an as-yet-unrealized potentiality and a productive force in the financial context: wage becomes invested in financial markets in the hope it will generate value.

Social speculation

The ordeal of labourer-speculators is marked by a particular double-bind: they are urged to commit to arduous study and long hours of sifting through information to make an educated and informed trading move, yet in the final instance trading involves something more, namely intuition or affect, which haunts their decision-making. Despite Futu's emphasis on education and access to information to combat ignorance and instil rational decision-making, users' experiences retain a strong sense of trading as intuitive speculation. My interviewees are not only concerned about having less information compared to institutional traders but also about having too much information to process. This ambivalence is captured by Chen who points out that not only do institutional traders have more information at their disposal compared to individual traders but they also have access to computers and computational power.[17] According to this interviewee, individual traders struggling with the amount of information resort to their 'intuition' prior to selecting information to find a direction: 'So, we just want to, or we have to, go for intuition. Your intuition says there is a trend, that stock is OK. But you are not sure. Then you will look for reports, which say something to support the stock.'[18]

The role of intuition, or rather affect, is aggrandized rather than diminished by the distinctive social features that Futu has introduced through an online community section called Futu NiuNiu, aimed at mobilizing the 'intelligence

of the crowd'. Allowing users to exchange reflections on the process ranging from stock selection and analyzing the market to placing orders, Futu promotes their social features with the slogan 'Making investing easier and not alone' [*sic*] (translated by the company from: 讓投資更簡單，不孤單). Yet as my interviewees narrate, rendering trading and investment 'social' means inviting hypes and waves of collective affect and emotion, mostly optimism but also anger, when an impactful forecast turns out wrong. Massumi's (2015) characterization of affective dynamics in markets applies: 'The rationalizing indicators stoke economic activity, reinforcing the affective conditions for growth. […] Economically, affectivity and rationality circle creatively through each other' (p. 16). Following this insight, the problem is not 'inaccurate' data rendering markets 'noisy', as dominant financial discourse has it, but affect lacking a clear-cut distinction from rationality, and this ambiguity drives financial activity.

Remarkably, in stark contrast with the rationalist discourse of access to information and education, Futu's design and user practices in multiple ways blur boundaries between reasoning and affect, information and manipulation, and education and 'fun'. Contributing to this are the platform's filters and metrics, which encourage hypes and affective consumption of financial information (which already tends to blur boundaries with advertisement, Wang 2017). As mentioned above, engagement with top posts is rewarded in the score system and there is a 'personalized push' function, meaning that user behaviour feeds into profiling serving algorithmic content recommendation. Mark notes that Futu wants 'the whole platform to be very playful. Social and playful. […] It's playful, like a game even though it's investment'.[19] The Futu platform encompasses actual game elements such as 'paper trading' by game accounts, in addition to an interactive game revolving around farming and growing seeds. Most ostensively, the idea of trading as a 'fun' game appears from a Futu advertisement. In the opening scene, bulls run loose between the skyscrapers of an imaginary business district. The protagonist of the ad is racing on a bull and 'windsurfing' on its back as well as running away from a bear, referring to the trader profiting from ascendent bull markets and fleeing from crashing bear markets. The advertisement uses the genre of slapstick comedy and embraces absurdity by mixing film and animation. Images of a 1990s-style videogame pop up, evoking the thrill of surviving in the face of an irrational force, embodied by a larger-than-life hammer. Overall, the advertisement makes trading seem like a game that is exciting and fun in its madness.[20]

All in all, intuition and affect prove to be intrinsic to information seeking and communication, while investment is presented as a game. Perhaps unsurprisingly, the analogy with gambling resurfaces. The interviewee, Anna, who works as a financial journalist framed the lack of rationality in trading, even when an actor has gotten 'informed' to the best of their

ability, as 'gambling with information that I got'.[21] Faced with such an intensely affective and gamified environment, some interviewees say that they will ignore all of the information and communication on the platform to avoid 'confusion'. But also, rather than the problem of veracity (separating noise from truthful information), for some at stake is the problem of estimating which information will prove emergent and impactful. Information in financial markets loses value once it has spread and become reflected in the price. This is the reason that the financial analysts in Leins' (2018) study decide to ignore outlets such as *The Economist*: there is no 'unpriced information' in it, so nothing new that can be anticipated to impact price. Instead, these analysts turn to the less recognized sites of 'emerging' insights and opinions, such as blogs. In similar vein, Futu users face the task of scouting for 'new' information, but this information further needs to have the potential to be widely impactful. This orients users onto information that has the potential to go viral. Patricia narrates how she has switched from using information to try and assess the 'true' potential of companies and the intrinsic value of stocks to reading comments on the platform and in social media to understand the social mood and spot possible trends.[22] Chen discloses that he keeps track of companies that could potentially cause a hype by leaking information or that could be the subject of rumours that can drive the stock price up or down.[23] He recognizes this is a particularly risky strategy, but also one potentially yielding great gains out of cheap stocks. His strategy implies that affective intensity and ambiguity surrounding the veracity of financial knowledge are not inhibiting markets but enabling them. Indeed, Black, who is one of the authors of the influential Black–Scholes algorithm for derivative trading, stated as much by saying: 'Noise trading is essential to the existence of liquid markets' (cited in Lotti 2018, p. 47) and 'Noise makes financial markets possible', even though it 'also makes them imperfect' (Black cited in Lotti 2018, p. 49).

What are the implications of the relatively 'noisy' environment that Futu introduces along with its risk regime? Futu's distinctiveness becomes clear in comparison with the robo-advisor Aqumon. If Futu's environment encourages a taste for risk and affective absorption in hypes, by comparison, Aqumon nurtures a different speculator subjectivity. Contrary to the instant and continuous short-term trading encouraged by Futu, Aqumon promotes long-term investment by means of automated calibrations of portfolios. Aqumon's robo-advisor is advertised as a means to spare time for the retail investor who invest his hard-earned savings and to prevent uninformed and rash decision-making. A client story by a Youtuber with some following, who is featured on the Aqumon blog, describes the moral character required for investment: 'It is very important to have discipline, patience to succeed, and the willingness to learn along the way.'[24] Ironically, however, the modelling technologies that the robo-adviser deploys include the Markowitz

Efficient Frontier model, which has been criticized for overlooking the impact of irrational, risk-seeking investors, such as the ones nurtured on Futu.

It is striking that many of my interviewees were critical of the, in comparison, 'noisy' trading environment cultivated by Futu. Yet would this mean the failure of its risk regime, which appeals to rationalism but all the while offers a game of gamble that is played by different means? Yes and no. Critique and reflexivity may indicate that the subjectivity of a labourer-speculator who willingly accepts the risks and efforts of trading does not fully come to bear. Yet such attitudes do not take away from the fact that subjects reproduce the very trends they criticize. For instance, when they are committed to a strategy of trying to spot affective trends and viral potential online in order to take advantage of them, investment becomes a matter of guessing others' market expectations, or even, of guessing what everyone else is guessing in this regard (Lee 2022). Hence, finance speculation does not require affective capture per se. Even if speculators set themselves apart from others by posing as rational rather than affective decision-makers, all the while they participate in, and enhance, viral trends. And, in the end, they may rely on intuition when gauging potential hypes, while feeling hyped up about the hype.

Lived precarity

Whereas fintech risk regimes do not unequivocally succeed in constituting the subjectivity of the labourer-speculator, trading nonetheless becomes attractive in the context of extra-financial, lived uncertainty, or precarity: 'an intensification and an increasing normalization of insecurity and instability in our sense of selves, our work/home lives (or even in this impossible separation), time, space and belonging' (McCormack and Salmenniemi 2016, p. 3). In line with the aforementioned trend toward the penetration of speculative activity in everyday life, Hardin (2021, p. 79) argues that the dictum prevalent under (post)industrial capitalism 'One must labor to survive' can be rewritten in the context of finance capitalism as 'One must invest to survive'. This alteration means that the current, widespread compulsion to invest is the driving force that, to speak with Postone, (re)produces a social order. What characterizes this order is that precarity necessitates speculation for the exact same populations that are more vulnerable to, and would suffer more from, a loss; for whom speculation is potentially more damaging, but given the circumstances, also perfectly sensible. Despite inducing vulnerability, fintech trading still provides a sense of agency and makes part of planning for the future. The speculator's sense of agency compensates for a diminished sense of agency regarding the future overall: market uncertainty, which seemingly can be negotiated with more insight and strategies, pales in comparison to the type of

uncertainty stemming from lived precarity, which mostly elicits feelings of hopelessness (for a contextual analysis of affect and structures of feeling in Hong Kong, see Ip 2020).

Though some interviewees say that a desire for an 'easy' or 'smart' (meaning, entrepreneurial) way of becoming 'rich' has stimulated them to engage in trading, in actuality their wants involve basic conditions of livability that are not supported by income through labour. Pointing to experiences of precarity as motivation to engage in trading, one interviewee expresses his frustration: 'And after all these days of investing, sometimes I feel so tired and once I look back to the experience, I would feel angry.' But he argues quitting the practice is not an option because his ever-increasing rental costs mean that his savings are not enough to cover future increases.[25] As suggested by multiple interviews, the rise of fintech trading in Hong Kong is a response to speculation in the housing market. Because land and housing are extremely speculative commodities in Hong Kong, people are forced to invest astronomical amounts as buyers of real estate or else suffer paying steep rents. Moreover, after years of protest movements and the eventual passing of the controversial National Security Law in 2020, Hong Kong's political situation adds to the experience of precarity. One interviewee bluntly states: 'We don't have a future.'[26] She argues that if she wants to have children, she will feel the need to move abroad. While other interviewees do not sound that firm, they maintain that they 'will have to see' how things unfold. Futu trading in the present makes part of an image of the future according to which it is uncertain whether a job can pay the income one needs, how one will earn it, or where.

Risk regimes render commensurate the uncertainties of finance and lived precarity through discourses and sense of risk and opportunity that exceed financial calculation strictly and that are ultimately personal, situated, and embodied. Bahng (2019) highlights the risk-uncertainty dialectic in finance by noting: 'uncertainty cuts loose from risk discourse's capture, eluding containment and quantifcation' (p. 5). Yet 'it remains knowable as lived experience' (p. 5). Notably, this 'precarious encounter with uncertainty' does not imply openness of the future, instead it 'leaves open very few options', forcing one down certain paths of restraint rather than proliferating possibility (Uncertain Commons 2013, p. 36). In some cases, the trader is like a tragic hero bringing about their own sorry fate through their actions. For instance, when investing in real-estate, which is at the centre of Aqumon's 'safe' portfolios, the fintech investor supports the very companies that contribute to rising prices in the housing market.[27] The capital provided by the investor is deployed by REITS (Real Estate Investment Trusts) to buy up real-estate, hence driving up prices, while exploiting the lack of purchasing power of others through rental income and interest payments.

Data opacity

Besides exploiting precarity, fintech produces value through data extractivism and datafication. These novel, still evolving infrastructural procedures constitute a further facet of uncertainty inherent in risk regimes, namely data opacity.

One example of datafication in the context of fintech is offered by the new ways of assessing creditworthiness, making it possible to extend loans to the unbanked and those who were previously excluded from credit services due to their lack of recorded financial history (Aitken 2017). In the wider context of finance capitalism, such datafication underlies the construction of derivatives such as collaterized debt obligations as financial products. While the example of datafication of debtors' lives has received most critical attention, datafication is in fact key to fintech applications of all kinds such as robo-advising, precision marketing, insurance and risk pricing, risk control and anti-fraud as well as trading as retail traders often take out loans to support their trading, either via Futu's margin financing scheme or through other fintech platforms (KPMG 2018, KPMG 2020, Langley and Leyshon 2021). Datafication via fintech infrastructures manifests the growing tendency to draw life itself within capitalist and financialized relations. It generates probabilistic and speculative gazes of which fintech users are the objects rather than the beholders. Even if flawed or misguided, datafication in contexts such as finance and security can have serious implications for a person's chances in life (Amoore 2013). It implies the threat of foreclosure by erasing, as Amoore (2013) with reference to Deleuze puts it, a '"life indefinite," a life of potentiality', the openness of which holds 'the promise of that which is never amenable to calculation' (p. 76).

China's fintech sector is deeply invested in datafication (KPMG 2018, p. 2020). However, remarkable is that domestically data extraction facilitates not just the financialization of life but particular configurations of state-market relations and remains constraint by them. For instance, the tech giant Alibaba initiated a credit scoring system to assist in examining credit worthiness based on transactional data collected from its online shopping platform and partner companies (Wang and Doan 2018). Flaunting this experience, Alibaba has been vying with other tech companies for state contracts to collaborate with the Chinese state on the introduction of an even more encompassing social credit scoring system in the service of social control (Gruin 2019, Drinhausen and Brussee 2021). Plans have not been realized to the extent initially announced, but the question of how the Chinese state and local companies will share data among them, and what kinds of purposes datafication will serve, remains open. Adding to the uncertainty is that state interventions have hit other Chinese platforms such as the ride-hailing platform Didi. These interventions suggest that local regulatory

authorities may prioritize data security over the growth of these platforms and their ability to play the game of speculative finance in public offerings (Arvidsson and Colleoni 2012, Kaplan 2020, Bloomberg 2021). This goes to show that, as noted in the introduction, heterogeneity in state-market relations persists and becomes manifest at the level of infrastructure. Indeed, datafication is not a homogeneous process of techno-economic organization but, as Mezzadra and Neilson (2019) argue, undergirded by conjunctural complexities, among others variable combinations with state power and labour exploitation.

In general, the lack of insight regarding datafication's current and future application has become a major point of critique (Pasquale 2015, Burrell 2016, Johnson et al. 2019). Likewise, most of my interviewees expressed concern about the opacity of data extraction and datafication via fintech infrastructures, albeit often in defeatist manner. Intensifying the uncertainty stemming from datafication was the city's status as a boundary zone between two internet ecosystems, namely the Chinese ecosystem (see for instance, De Seta 2021) and the global, US-dominated one. Rumour as a genre responded to this type of uncertainty. For instance, during my interviews, I encountered a rumour that data collected through Futu's platform would be directly monitored by the Chinese government in Beijing for sentiment analysis to gain insight into the overall mood in Hong Kong with the intention to modulate negative sentiments associated with the political turbulence that intensified in the recent years. The fear, even if unfounded, is not surprising, given the opacity. Specifically in Hong Kong, the question is: which internet ecosystem does Hong Kong users' data merge into and what companies and organizations will seek to exploit it, for what kinds of programs?

By way of speculative inquiry into data extractivist practices of fintech, I would like to present two maps that 'track the trackers' that are active on fintech websites serving Hong Kong. This inquiry only addresses a select dimension of the complex issues around datafication and data mobilities, but it speaks to Hong Kong's status as a boundary zone between two internet ecosystems. The two visualizations (Figures 1 and 2) indicate that while many prominent fintech companies originate in China, the data emanated from the city feeds into a global, American-led data ecosystem consisting of data companies and tracking infrastructures. mainland-Chinese companies join this ecosystem when operating in Hong Kong, whereas their Mainland-facing websites participate in a separate data ecosystem. The biggest actors in Hong Kong are Google, DoubleClick, whereas the key actors in Mainland are Baidu Ads and Umeng (as far as recorded in the Ghostery tracker database). These maps do not reveal data flows with partner companies or state authorities, so they do not map all cross-border data mobilities. Yet they do suggest a certain orientation. Hong Kong remains firmly embedded

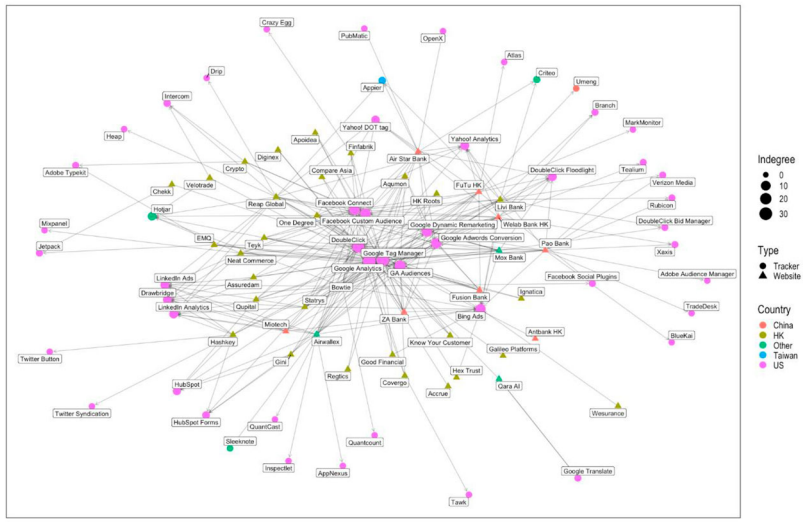

Figure 1. Fintech company websites and trackers in Hong Kong.

in global circuits and Chinese companies simply join these circuits when operating beyond mainland China. The only exceptions of tracking services that operate both in Hong Kong and in mainland China are Market Monitor and Umeng, the latter operating on both Futu's Hong Kong-facing and Mainland-facing websites.

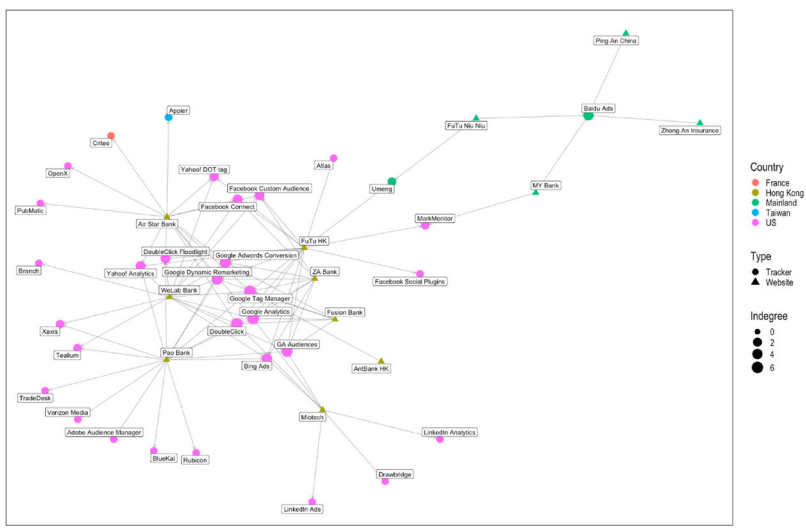

Figure 2. Chinese fintech company websites and trackers in Hong Kong and mainland China.

This exploration into fintech datafication suggests that Chinese fintech companies are seeking expansion, but they do so by integrating with the US-dominated ecosystem and its leading corporations. These maps on the one hand impress us with the globality of datafication and data extractivism. On other hand, we sense the possibility of change and transformation, since the Chinese fintech platforms and companies operating in Hong Kong are also firmly embedded in an alternative internet ecosystem. Data opacity speaks to the instability of finance-capitalist risk regimes and lack of guarantees for their expansion in the light of global heterogeneity and historical contingency.

Conclusion

This article has introduced the notion of risk regimes: sociotechnical assemblages that interweave technologies mediating market uncertainty as well as discourses framing and normalizing risk, technologies of the self that constitute a labourer-speculator subjectivity, and digital infrastructures facilitating datafication. I have considered the coinciding technological trends toward computation/automation and widening of access to financial markets, hailed as 'democratization' of investment. With the introduction of new technologies, market uncertainty is presented as 'cheatable' thanks to superior real-time data monitoring and algorithmic modelling, yet a closer analysis of speculative risk regimes suggests that nonknowledge, speed, and volatility produce and increase uncertainty, merely to be exploited by some. Meanwhile, the price paid for participating in speculation by retail investors such as those using the trading app Futu consists in economic vulnerability, emotional stress, and exhaustion. This is especially so because hailing a rationalist mindset combines with the turn to 'social' and gamified trading, which generates a double bind (see also Tiessen 2015). My interviews suggest that risk regimes are hardly successful in constituting a labourer-speculator subjectivity who accepts the financial risks and nonfinancial costs involved, given the critical views users often express. At the same time, critique and reflexivity do not take away from the fact that subjects participate in, and nurture, the very trends they criticize.

This article has drawn on the work of Postone to contribute to the revision of the production of value beyond labour exploitation. I have addressed how value in the context of a popularized (supposedly 'democratized') finance capitalism does not stem from the discrepancy between abstract labour measured in terms of time on the one hand and exchange value on the other, as in the case of surplus value. Time and effort are surely at stake in trading via fintech apps, but it is users' need for *a chance* that is exploited. Faced with economic, housing-related, and (geo)political precarity, fintech users need a sling at the wheel of fortune. Guiding users with intuited and

reasoned calculations that render risk-taking sensible, risk regimes make weighable and commensurable – to speak with Grossberg (2010) – heterogeneous instances of uncertainty, such as financial risk, unknown historical contingency, political turmoil, and lived precarity. Meanwhile, fintech reproduces the sociotechnical order underpinning finance capitalism including technologically mediated inequalities and asymmetries, rather than subverting it. The subjection of the labourer-speculator to datafication is an additional dimension of such asymmetry, aiding the foreclosure of other futures, even if uncertainty surrounding the opaque processes of datafication remains abound.

Following my critique, the alleged 'democratization' of financial speculation through fintech implies the globalization of risk regimes and their penetration into everyday life. Yet the propagation of risk regimes is not guaranteed. Variability and contingency become especially apparent in Hong Kong as a boundary zone of internet ecosystems. Risk regimes exploit uncertainty and precarity in several ways, yet historical contingency exceeds these risk regimes too. History at large remains open-ended. Taking the case of Hong Kong as a crystal ball to peek into the future, we ought to conclude that we cannot predict how intersecting developments in technology, finance capitalism, state power, and geopolitics will play out.

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