Article

Finance and Society
2022, 8(2): 129-48

10.2218/finsoc.7763

The 'fintech revolution' is here! The disruptive impact of fintech on retail financial practices

Gordon Kuo Siong Tan
Singapore University of Technology and Design, Singapore

Abstract

Fintech is celebrated for its disruptive and democratizing qualities that dis/reintermediates the finance value chain. Claims of a 'fintech revolution' assume that fintech is 'disruptive' because of its innovative capabilities, but the extent to which these disruptive forces have reconfigured consumer financial knowledge and practices is not well understood. Using a questionnaire to survey retail consumers in Singapore on their use of fintech in performing different financial tasks, this article critically examines these claims of disruption and democratization by grounding them in the financial behaviors of consumers as informed by a financial ecologies approach. The results show a limited impact of fintech in shaping consumer financial behaviors. Respondents use fintech mainly for basic transactional purposes like making mobile payments and account management, but not so much for more complex matters like savings, investing and credit. The findings also reveal a 'stickiness' in financial behaviors that emphasizes the high touch points of human interaction. This study illustrates fintech's variegated material outcomes by highlighting the unevenness in consumption of digital financial services and the enduring importance of human relationality in financial decision making.

Keywords

Fintech, financial ecologies, democratization, financial behaviors, roboadvisors, Singapore

Introduction

> We can bring together the power of finance and technology, to help create a more inclusive society and a more sustainable planet… This is the vision: every citizen and every enterprise digitally enabled and financially included. (Monetary Authority of Singapore, 2020)

Corresponding author:
Gordon Kuo Siong Tan, Singapore University of Technology and Design, Humanities, Arts and Social Science, Singapore 487372. Email: kuosiong_tan@sutd.edu.sg. https://doi.org/10.2218/finsoc.7763

The above remarks made by Ravi Menon, the Managing Director of the Monetary Authority of Singapore (MAS) during the 2020 Singapore Fintech Festival reflect the widely held belief in the transformative powers of financial technology, or fintech, in bringing about greater inclusivity and sustainable economic growth. Indeed, frequent claims about the disruptive and democratizing powers of fintech are widely circulated in academic, practitioner and policymaking circles. Pundits speak of a 'fintech revolution' that promises to upend traditional finance by revolutionizing the way financial services are delivered and consumed. For instance, Long (2018) claims that financial inclusion is making great strides, thanks to widespread mobile telephony and mobile-internet services that have enabled hundreds of millions of people to participate in the formal financial system. But these claims are rarely supported by empirical evidence beyond the handful of success stories that celebrate the positive qualities of FinTech.

With multiple definitions in the literature (Lai and Samers, 2021), this article adopts Schueffel's (2016: 45) definition of fintech as "a new financial industry that applies technology to improve financial activities". Fintech is often linked to the disintermediation of finance, as perceived through the disruptive tendencies of fintech startup firms in removing traditional intermediaries like banks from the financial value chain. There is a rich interdisciplinary literature on fintech that is mainly located in business and information systems studies. Research from the business literature has emphasized the importance of user behaviors, exploring this theme as specific behaviors within a particular fintech service or as the drivers of adoption of a fintech product. For instance, it was found that in lending-based crowdfunding, colocation is important because lenders tend to support borrowers who are culturally and geographically more proximate (Burtch et al., 2014). Elsewhere, two recent articles (Lai and Samers, 2021; Wójcik, 2021) have revealed a modest but growing body of work coming from geographers that draws out the spatialities of fintech.

This article acknowledges studies highlighting the critical role of fintech in enabling greater financial inclusion in the Global South, with the notable example of mobile financial services in Africa (e.g., M-Pesa in Kenya), which have illuminated the transformational qualities of fintech in leapfrogging traditional financial institutions and shaping consumer financial practices that are digitally mediated. However, it also notes that financial inclusion has become a fuzzy concept given the multitude of actors and interventions involved, where the term assumes various forms and meanings in different places and contexts, depending on access to a wider range of financial services, usage of those services, and the terms on which those services are being provided and used (Kirwan, 2021). Fintech has become closely aligned with the ambitious policy goal of financial inclusion due to its involvement with new mobile technologies in facilitating access to formal financial services for a new class of financial consumers (Gabor and Brooks, 2017). Critical studies on this fintech-led agenda of financial inclusion have portrayed this project as an extension of the broader patterns of the 'financialization of daily life' (Bernards, 2019). These studies have provided valuable critique of how digital technologies facilitate the capturing of data from traditionally marginalized consumers that feed into the behavioral change and risk management strategies of lenders (Gabor and Brooks, 2017), using novel methods of credit scoring to make those consumers 'legible' to credit markets (Aitken, 2017).

However, these accounts fail to consider the uneven progress and limited character of financial inclusion and fintech applications in practice (Bernards, 2019). While current research, especially from development studies, is mostly focused on developing economies with substantial unbanked populations, financial inclusion is less understood in the context of developed countries. As noted by Kirwan (2021), in the Global South, financial inclusion

focuses on changing the conditions of access and usage to financial services, whereas similar interventions in the Global North emphasize changing the financial subject, with knowledge gaps more so than access issues driving financial education programs for marginalized populations. This difference speaks to dimensions of financial inclusion that are not easily quantified, namely the quality of service and compatibility with customers' needs, and the qualitative use of such services by different consumer groups (Koh et al., 2018), which are less discussed in current studies on financial inclusion in the developed world.

It is assumed that fintech is inherently disruptive because of its innovative tendencies that allow it to reconfigure the organization of traditional financial systems. Fintech innovation is derived from three aspects, namely the technological innovations by highly entrepreneurial startups backed by venture capital, the design of new products and services that meet the unserved or underserved needs of consumer segments that are often neglected by mainstream finance and operating new business models that rely on digital platforms to reintermediate the financial value chain (Gomber et al., 2018). The emphasis on the internet and mobile technology in fintech has expanded access for a widened customer base beyond typical bank branches and other financial firms, where big data analytics can provide innovative ways of assessing credit worthiness (Aitken, 2017) and offer more personalized financial recommendations. However, the extent to which these disruptive forces have reconfigured financial knowledge and practices has not been sufficiently examined in the wake of the fintech boom, and in a way that critically analyzes the democratizing, disruptive, and alternative characteristics of fintech (Langley and Leyshon, 2017a). The Covid-19 pandemic has given a further boost to fintech as more countries and smart cities move towards the digitalization of finance, which are by and large characterized by a narrow preference for contactless payments and mobile banking. This is reflected in repeated reminders by authorities for citizens to transition to mobile banking and payments to reduce virus transmission risks. The capacity for fintech to disrupt the financial system is reinforced by the so-called 'cultural circuit of capital' led by management consultancies and think tanks that aim to influence corporate and public policy decision making (Leyshon, 2020).

Fintech's disruptive qualities are projected onto individual consumers and businesses alike. For the former, idealized tropes of the digitally savvy user who enthusiastically embraces all forms of fintech solutions are often employed in encouraging adoption of fintech products and solutions. Retail consumers are portrayed as passive users who are willing and ready to take advantage of the convenience and efficiency afforded by fintech solutions (PwC, 2019). However, how has fintech changed the current ways of performing general financial tasks, like saving, borrowing, and investing in the context of countries that already enjoy a well-developed financial system? Is financial inclusion necessarily a problem for consumers who are already well-served by the existing financial system? This article explores these two questions by exploring pluralistic consumer financial practices through user surveys. Doing so provides a richer understanding of human agency in the context of fintech rather than just framing adoption via the dichotomy of either an embrace of or resistance to digital technology. This article challenges this dichotomous interpretation by highlighting the agency of users in determining their articulation into fintech spaces. To the extent that fintech represents the next frontier in the financialization of users, this article shows how users can 'resist' the adoption of fintech by preferring to stick to analog modes of financial behavior instead of adopting digital solutions.

This article contributes by foregrounding fintech in everyday consumer financial behaviors and critically examining the disruptive and democratizing qualities of fintech and the associated idea of financial inclusion. It explores consumer financial practices in five key areas

(paying, saving, borrowing, risk management, and financial advice) by gauging the nature of the disruptive impact of fintech on retail finance consumers. Using a questionnaire conducted with financial consumers in Singapore, this study provides a snapshot of the prevalence of fintech adoption among the population in the performance of various financial tasks, such as making payments and investing money. Thus, the disruptive qualities of fintech are interrogated in the context of user behaviors by examining how fintech has changed how consumers transact. Specifically, how and to what extent has fintech transformed and shaped consumer financial practices? In doing so, this study reframes financial disruption not from a business perspective in terms of the impact on banks, financial institutions, and technology companies (Langley and Leyshon, 2017b), but from a consumer-behavioral perspective that is currently lacking in academic studies on fintech. Investigating how consumers engage with various applications of fintech would help in furthering our understanding of how the increasing digitalization of finance produces new financial subjects and subjectivities. Further, unpacking the attendant issues of power and agency in shaping the terms under which such consumer engagements occur can help break down the current conceptualization of fintech as a monolithic industry-led entity by interrogating the popular discourse surrounding the apparent transformative qualities of fintech.

The remainder of the article proceeds as follows. First, the concept of financial ecologies is elaborated to demonstrate its utility in understanding diverse monetary and financial systems. A discussion of innovation then follows to outline the disruptive qualities of fintech in the context of Singapore. After explaining the methodology, the questionnaire results are presented to evaluate the state of fintech adoption in Singapore. The impacts of fintech on current and future financial behaviors are investigated, guided by the financial ecologies framework that focuses on tracing the relational shifts between consumers and financial firms that give rise to changes in financial practices. The results are then linked back to a discussion of the disruptive and democratizing qualities of fintech and a more nuanced interpretation of financial inclusion. The last section concludes.

Financial ecologies

While ecosystems seem to be the more popular metaphorical description for fintech in both the scholarly and grey literature (Leyshon, 2020), this article uses the ecologies concept as the preferred term. Financial ecologies recast the financial system as a "coalition of smaller constitutive ecologies, such that distinctive groupings of financial knowledge and practices emerge in different places with uneven connectivity and material outcomes" (Lai, 2016: 28). The financial ecologies concept was originally developed to address the geographies of financial exclusion (Leyshon et al., 2004), in which some individuals enjoy privileged access to mainstream financial services while others are either excluded or partially connected to the financial system. Shaped by knowledge and trust, Leyshon et al. (2006) show the emergence of two distinct ecologies in the UK retail financial services. The first is a prime group of customers who are well-connected to mainstream finance, while the second consists of subprime consumers who are serviced by alternative financial providers that rely on 'relic' practices including door-to-door lending. The rapid digitalization of financial services suggests that the same exclusionary dynamics may arise despite claims that digital finance is fostering greater inclusion. Varying levels of competencies in handling digital technologies (e.g., internet banking) and different financial practices that are culturally mediated result in heterogeneity in the way retail financial services are organized and in how the relationships among institutions, markets, and economic actors evolve over space. In short, some places are better

connected to the financial system network than others. This variegated nature of interactions with the financial system produces distinctive types of financial ecologies that are made up of different financial knowledge and practices (Leyshon, 2020: 129).

Economic geographers have applied the ecologies concept to unpack the relationships between space, institutions, and the socioeconomic conditions of financial subjects under different contexts that range from the financialization of urban infrastructure (Grafe and Mieg, 2019) to wealth management for financial elites (Beaverstock et al., 2013) and retail financial advising practices (Lai, 2016). Financial ecologies offer a useful concept for thinking about the heterogeneity of fintech practices as they unfold across space and time. Langley and Leyshon (2017a) identify five distinct ecologies in crowdfunding that are driven by various motivations, such as fandom and affect. With fixed income and P2P lending aligning closely with financial logics via credit-debt relations, they show the variegated and uneven nature of fintech. Ecologies emphasize the relational processes that occur in the coming together of different players, institutions, financial knowledge, technologies in distinct combinations. These relational processes have different topologies as conditioned by proximity and connectivity, giving rise to unevenness in terms of sociospatial inclusion and exclusion, and its attendant inequalities (Langley and Leyshon, 2017a: 1021). A financial ecologies perspective is focused on capturing the emergent and fluid nature of sociospatial relations as they unfold in the evolving roles and structures of institutions, markets and actors, making it appropriate as an analytical tool to examine the nascent fintech sector (Lai, 2020). As noted by Lai (2020: 447), an ecologies framing of FinTech can aid in highlighting the 'stickiness' of particular relations and processes that are more resistant to change than others, allowing for a closer examination of the power relations between the incumbents (mainstream finance) and disruptors (fintech).

Disrupting finance with fintech: The Singapore experience

Disruptive innovation, as coined by Christensen et al. (2015) to guide companies in innovation driven growth, refers to the process whereby a smaller firm with fewer resources can successfully challenge more well-established incumbents by tailoring products and services that meet the demands of overlooked customer segments. In what seems to be a widespread misunderstanding and misapplication of the core ideas of disruptive innovation (Christensen et al., 2015), this article implicitly acknowledges the overly liberal use of the term by academics, policymakers, and practitioners to describe almost any industry shake-up where smaller players undercut the incumbents' existing business models. Fintech has become synonymous with the disruption of traditional financial markets. Since the 2008 Great Financial Crisis that led to the adjustment of post-crisis regulatory frameworks, innovation is no longer the sole remit of banks and other established financial institutions, leading to the emergence of a new breed of start-ups from both the finance and technology sectors that promise to 'revolutionize' finance. This was echoed in a PwC (2016) report, which proclaimed that "the accelerating pace of technological change is the most creative force—and also, the most destructive one—in the financial services ecosystem today" and that "fintech will drive the new business model".

Singapore is ranked as a top fintech hub together with other prominent international financial centres, such as London and New York (Findexable, 2019). This has validated the state's strategy of innovation-driven growth, in which fintech plays an important role in bolstering its capabilities and status as a 'smart' financial center. With regulatory innovations such as sandboxing (consumer trials of new fintech solutions) and a pro-business environment, a vibrant fintech industry has emerged in Singapore over the past five years that

continues to experience dramatic growth. The city-state has been aggressive in attracting fintech startups to promote wider innovation in the finance sector. Fintech firms, particularly the small and agile start-ups, are disrupting the finance landscape with innovative product offerings, new business models, and the responsive deployment of innovative technologies, where they can offer new products and services that meet the specific needs of underserved or unserved customers (Gomber et al., 2017). Between 2015 and 2020, the number of fintech firms has mushroomed from less than 100 to more than 1000, and industry fintech investment has increased steadily from US$299 million to US$861 million (Wyman, 2020). This is supported by continuous infrastructural developments that enhance the national unified electronic payments network. In 2014, the Fast and Secure Transfers (FAST) system was implemented to facilitate direct instant interbank payments between individuals and businesses. This was followed by the PayNow system in 2017 that enabled real-time peer-to-peer transfers using a mobile or personal identification number. A national digital identity system (SingPass) was integrated into the national payments infrastructure to streamline account creation procedures, while the Singapore Quick Response (SGQR) code was launched in 2018 to enable retailers to display just one single QR code that connects to multiple e-payment providers.

In framing its appeal to users, fintech is often described as disrupting traditional finance by using platforms to provide greater convenience, lower costs, higher service quality and efficiency, and customized products and services to different market segments (Lai and Samers, 2021). These affordances have shaped financial practices of consumers. For instance, the invention of portable card reader devices has allowed merchants and consumers to send and receive payments on the go using their mobile smartphones and tablets, instead of being tethered to physical payment terminals. Similarly, in financial advising, online investing platforms, such as roboadvisors like Syfe and StashAway now offer customized portfolios that are tailored to individual investors' financial circumstances thereby replacing the need for physical meetings with human financial planners. Individuals can now easily purchase customized insurance products that are underwritten by data analytics technologies, which charge lower premiums and provide better customer service using automation than the established insurance companies. More importantly, these digital platforms have changed consumer behavior and reshaped financial practices by reducing the need to transact through human agents. These numerous examples support claims of the disruption and democratization of finance, themes that are frequently incorporated into official public narratives that speak of improving consumer financial practices through innovation and technology (see e.g., Monetary Authority of Singapore, 2020).

Methodology

This study is part of a wider research project that explores the impact of the digitalization of finance on Singapore consumers. An online questionnaire was sent in March 2021 with the help of a market research firm (Dynata). The sample obtained was representative of the demographic distribution of Singapore's general adult (21 years and above) population as delineated by age, race, and gender. The study author supervised the review on questionnaire design, survey programming, dissemination and data processing using Dynata's in-house survey platform. The questionnaire aimed to survey respondents on their self-reported use of traditional and fintech-based financial products and solutions.

The Covid-19 pandemic was used as a reference point to determine whether their financial behaviors changed in terms of greater adoption of fintech services,as social

distancing and other public health measures accelerated the digitalization of retail finance. It also allows to gauge expected consumer behaviors by comparing two distinct time windows – one during the pandemic and the other after the pandemic. Besides surveying respondents about their ownership of both traditional financial products, such as bank accounts, and fintech products, such as mobile payment wallets, the questionnaire also asked informants about the motivations behind using fintech. One questionnaire section was dedicated to surveying respondents' attitudes towards the use of human agents and/or automated investing services, i.e., roboadvisors, to determine how fintech has shaped consumer financial practices with regards to financial planning and investing. A total of 613 responses were collected from a sample size of 1000, indicating a response rate of about 61%. Table 1 provides a summary of the demographic profile of the respondents.

Table 1. Profile of respondents.

	Frequency (n = 613)	Percentage (%)
Gender		
Male	307	50.1
Female	306	49.9
Age		
21-24	64	10.4
25-34	141	23.0
35-44	158	25.8
45-54	130	21.2
55-99	120	19.6
Race/Ethnicity*		
Chinese	495	80.8
Malay	44	7.2
Indian	50	8.2
Others	24	3.9
Education level		
Secondary and below	60	9.8
Post-secondary (non-tertiary)	47	7.7
Diploma/professional qualification	172	28.1
University and above	334	54.5
Monthly household income (in US dollars $)		
No working person / Retiree household	16	2.6
Below $1,478	21	3.4
$1,478 – S3,695	147	24.0
$3,696 – $5,912	135	22.0
$5,913 – $8,130	122	19.9
$8,131– $10,347	89	14.5
$10,348 and above	83	13.5

*It is standard government statistical practice to break down race according to the four main categories in Singapore.

Ecologies of fintech adoption in Singapore

The respondents are well integrated into the mainstream financial system in terms of traditional (non-fintech) financial product ownership. A very high proportion of them are

banked (95.4% have a bank account) and 71.5% have private insurance plans. About half (48.6%) have an investing account and 71.3% own a credit card. The results mirror those from recent surveys of financial inclusion, such as the Global Findex database (2017 edition), which indicate that about 98% of Singapore consumers have a financial institution account (Demirgüç-Kunt et al., 2018). However, only about 56% have a fintech account. Among them, 35% have only one account, 30% have two accounts, and 7% have more than five accounts. Given the plethora of fintech options in the market, the adoption rate is lower than expected considering the government's big push towards digital finance.

The use of fintech by consumers in Singapore is motivated by the practical benefits that revolve around convenience and efficiency, cost savings, and improved user experiences. The top three reasons for choosing a fintech product over a traditional financial offering are (i) time savings (77%), (ii) money (cost) savings (37%) and (iii) better service (36%). Figure 1 shows the usage of different solutions among fintech users. Most users (70%) use fintech for digital payments. This is likely driven by the well-developed payments infrastructure, as reflected in the wide acceptance of digital payments on various platforms as well as strong support for electronic payment modes by local banks who partner with technology firms that link locally issued bank cards with payment platforms like Apple and Google Pay. The PayNow and FAST systems also increase consumer familiarity with digital payments by facilitating the electronic exchange of funds between different parties.

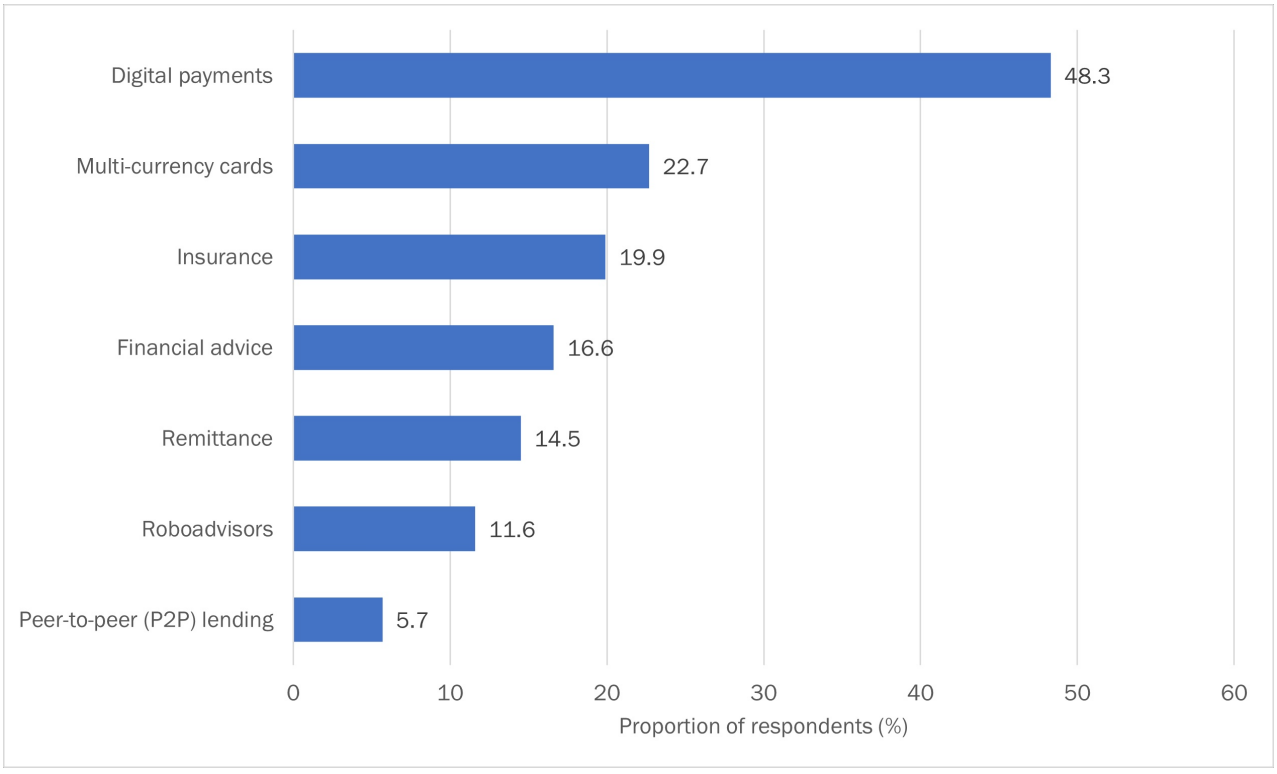

Figure 1. Adoption of various products and services among respondents who identify as fintech users.

As a nation where buying insurance is a prevalent practice (72% of respondents have insurance plans), fintech-based insurance adoption remains rather low with only 20% having used fintech to buy insurance. This may be explained by the current practice of buying insurance in Singapore. Clients typically consult with a financial advisor (Lai, 2016; MoneySense, 2018) who can make suitable product recommendations after analyzing the

client's individual financial needs. This value-added service may result in a weaker inclination towards purchasing insurance through fintech, where information-seeking (such as comparing insurance plans) and decision-making processes rest solely on the consumer.

An interesting observation is that fintech adoption is stratified by age group, education level, and monthly household income (figure 2). Such differences were not observed for gender, where about half of respondents reported having a fintech account. This result suggests that fintech can help to bridge the financial inclusion gender gap that persists even in developed economies (United Nations Conference on Trade and Development [UNCTAD], 2021). The proportion of respondents who have a fintech account within each age group peaks at 25-34 years and then steadily declines. This is consistent with the general observation that technology use declines with age, where older consumers prefer to use traditional methods of making financial transactions compared to younger consumers who are more open towards new technologies. Another possible explanation is that the financial needs of older consumers are already well-served by traditional financial channels, such as buying insurance plans through their financial advisors when they were younger. Even after explaining the fintech concept using various local examples in the questionnaire, 8% of respondents remained unsure about whether they had a fintech account, which suggests a limited awareness of fintech amongst the general population.

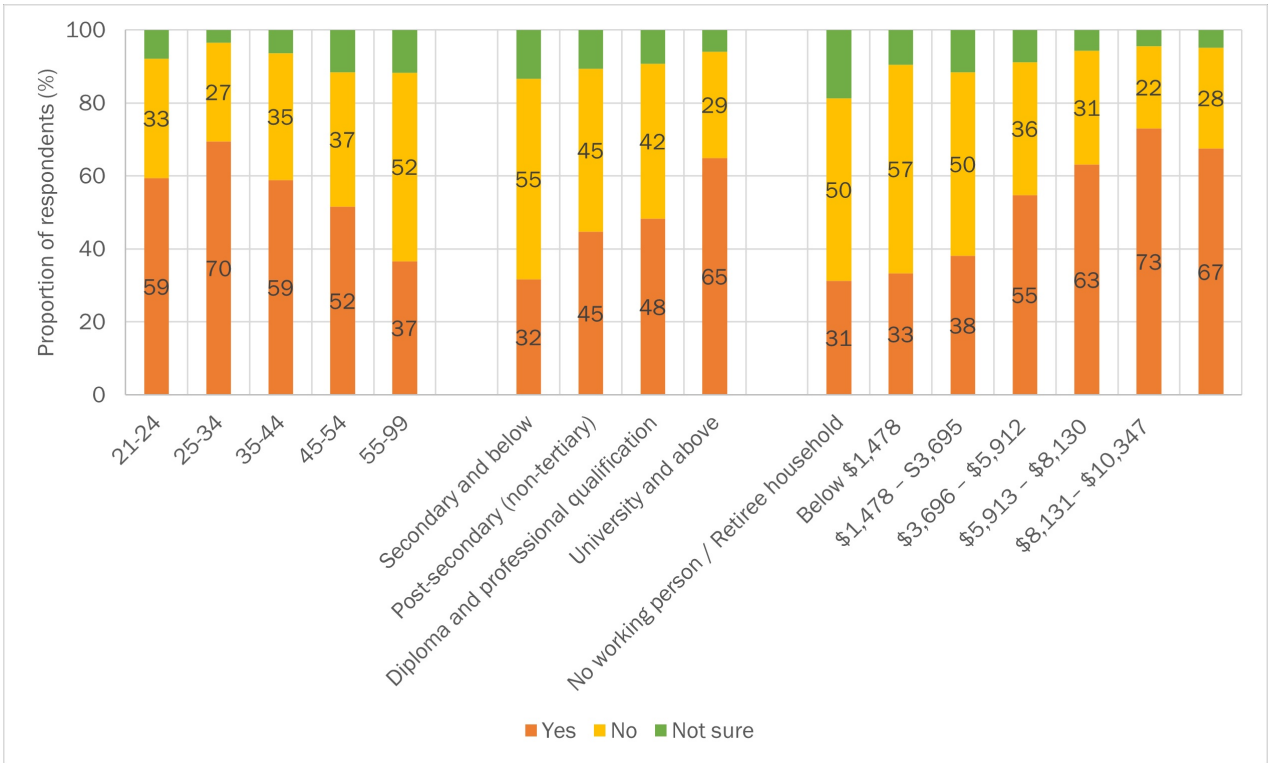

Figure 2. Fintech account ownership by age, education level, and household income

When the proportion of respondents who have a fintech account is broken down by education level, a clear pattern emerges whereby the adoption rate increases with education level, with those having a university degree and above reporting the highest adoption rate. Given the novel nature of fintech and its ongoing development, it is more likely that those who are more well-educated would be able to understand how fintech solutions work and therefore be more willing to use them. Those with lower education levels may be more uncertain as to

whether they even have a fintech account. A similar trend was observed with household income where the proportion of those with a fintech account rises with income, falling only at the highest income bracket. Consumers from more affluent households may be more familiar with fintech as their financial needs become more complex, such as having more disposable income to save and invest, where they perceive more clearly the benefits of integrating fintech solutions in wealth management.

Overall, the analysis shows that the adoption of fintech among different sociodemographic groups is uneven, with the elderly, less educated, and lower income groups being less-active users of fintech. The findings thus point to the limits of fintech in fostering even greater financial inclusion by using technological affordances to democratize access to financial services in societies, which already enjoy wide access to and are well-served by mainstream finance providers. Rather than thinking of fintech as a financial inclusion tool that promotes access to financial services for everyone, this uneven adoption of fintech can be reinterpreted to indicate the possibility for different ecologies to emerge that serve specific consumer groups, some of whom prefer the intimacies of face-to-face meetings. For example, the drop in fintech usage at the highest income bracket may reflect a preference for non-fintech-based services. The complex financial needs of extremely wealthy individuals are addressed by dedicated teams who provide specialized services and independent advice under exclusive private wealth management ecologies (Beaverstock et al., 2013) that are typically out of the reach of ordinary retail consumers.

‘Disrupting’ financial behaviors with fintech

Respondents were asked about changes to their financial behaviors since the pandemic. From Figure 3, except for borrowing and lending money, and meeting their financial advisor online, at least half of the respondents (those who chose ‘somewhat more frequently’ and above) indicated that they were using fintech and other digital channels more actively to perform common financial tasks, like making purchases and paying bills. Paying friends and family and making purchases electronically were among the two activities that saw much more frequent activity, where 72% and 79% of them reported doing these two tasks at least somewhat more frequently. This finding reflects the shift towards online shopping, which surged in popularity as the country instituted a lockdown that saw the closure of restaurants and non-essential establishments (including banks) and other social distancing measures. It is also similar to a 2020 survey that showed that 70% of local consumers had increased their use of digital payment methods since the pandemic (United Overseas Bank, 2021).

About 55% reported visiting physical bank branches at least somewhat less frequently. The integrated national payments network consisting of FAST, PayNow, and wireless payment terminals that links together banks, vendors, and individuals play an important part in driving greater usage of electronic modes of payment and funds transfer, as these contactless payment channels are aligned with the host of social distancing measures implemented during the pandemic. Close to half of the respondents used fintech products more frequently to save and invest money. This result is consistent with news reports about a surge in interest in the financial stock market and greater savings due to worries about the shrinking economy, job insecurity, and the general lack of leisure activities due to the shutdown of many businesses (Awang, 2021; Tan, 2020b). Overall, the pandemic appears to have stimulated the usage of fintech and digital channels in performing general financial tasks.

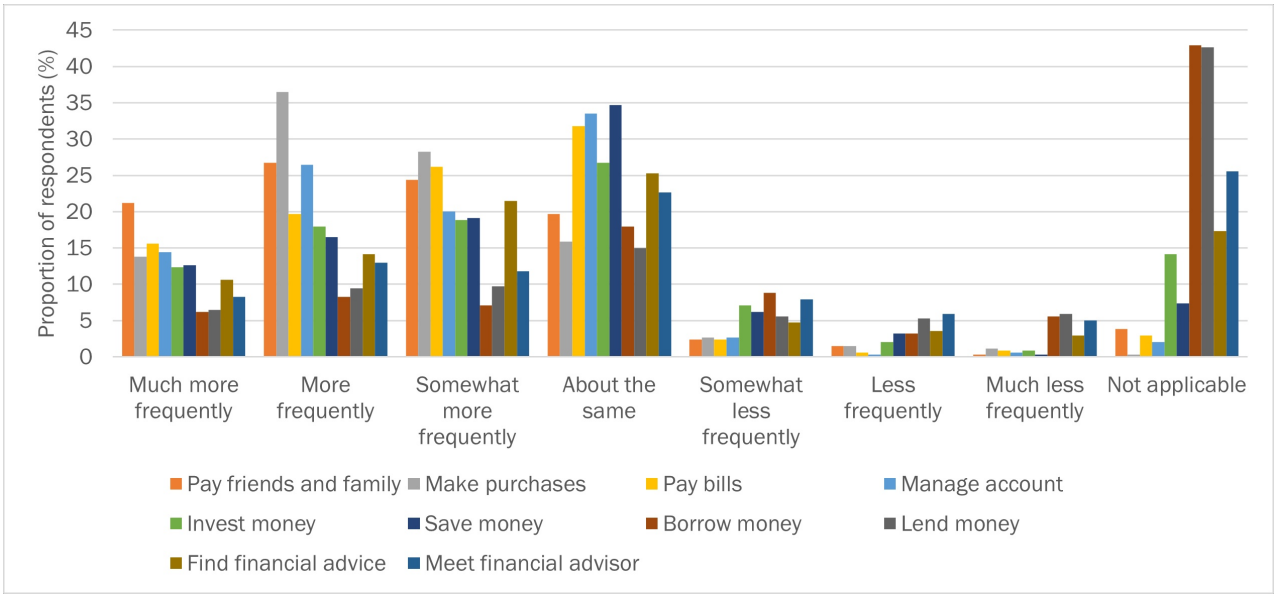

Figure 3. Using fintech to perform various financial tasks since the pandemic (% of respondents)

Another important question is whether the self-reported changes in financial behaviors will persist after the pandemic. Therefore, respondents were asked about the likelihood of them continuing to use fintech services and digital finance to perform financial tasks after the pandemic has ended.[1] Their responses, presented in Figure 4 reflected a continued likelihood of fintech use. Again, their usage is mainly concentrated on payments, with 90% indicating they are likely to continue making purchases electronically and 86% who are likely to pay bills or friends and family via digital channels. Consumer interest in online platforms for growing wealth remains strong, with 69% and 77% reporting they are likely to utilize fintech solutions to invest and save their money respectively.

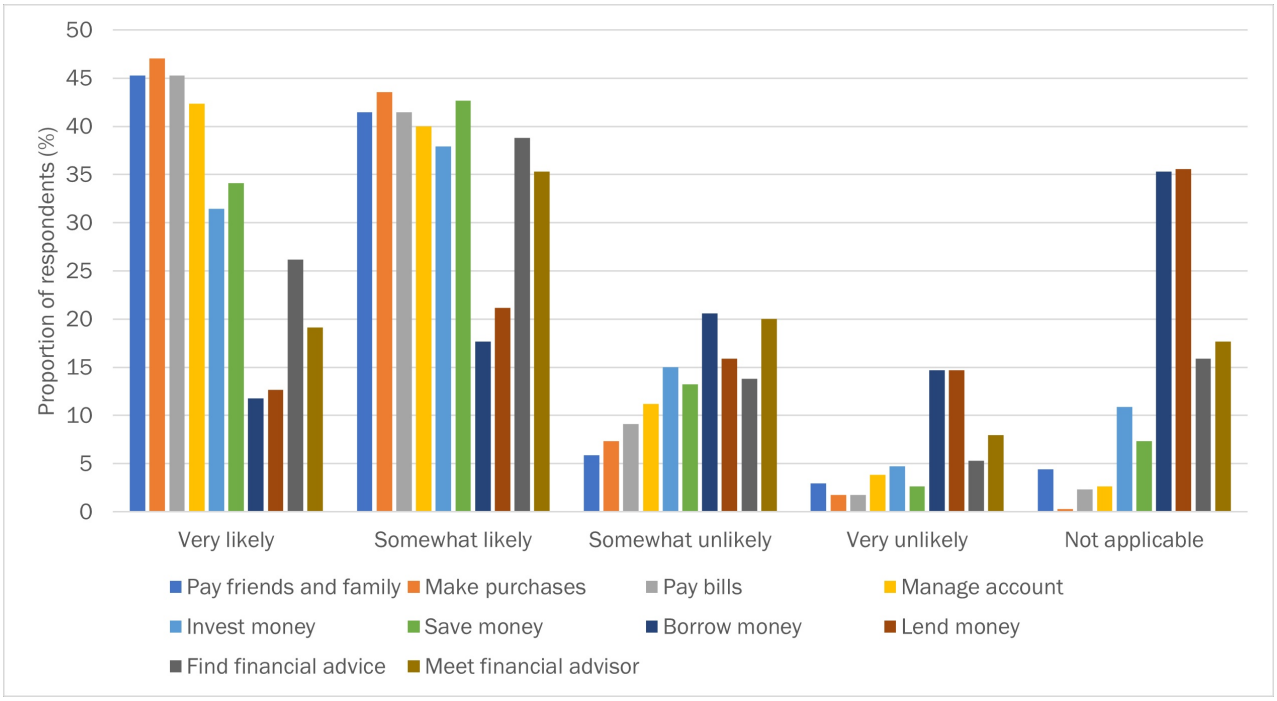

Figure 4. Likelihood of using fintech to perform various financial tasks after the pandemic (%)

Interestingly, using fintech to borrow or lend money remains an unfamiliar practice among local consumers. This finding contrasts with the high popularity of P2P personal lending as the most common form of crowdfunding in many countries (Pierrakis, 2019), particularly in developing countries and for the unbanked, whose marginalization from mainstream finance necessitates the soliciting of credit from alternative providers, like fintech firms (Bhagat and Roderick, 2020). The very high proportion of banked individuals in Singapore may be a reason for this relatively low usage of obtaining or giving loans through fintech platforms. Local consumers already have existing relationships with the banks and may prefer to use banks to meet their credit needs instead of switching to a new provider. Furthermore, trust in financial institutions is critical for essential banking activities to run smoothly (Thakor and Merton, 2018). Saiedi et al. (2020) show that distrust in banks is associated with increased activity in P2P lending as an alternative to traditional bank lending. When this finding is considered in conjunction with survey results that indicate a relatively high level of trust placed by Singaporeans in banks (64 points compared to the global average of 57) (Edelman, 2021), it may explain the low adoption rates of fintech-based funding. This issue of trust will be revisited again in the section on Singaporeans' financial planning and investing preferences.

Figure 5 reveals that analog financial behaviors are persistent. There was an increase in respondents who expected to visit the bank branch at least as frequently (if not more frequently) after the pandemic as compared to during the pandemic. Despite the growing digitalization of financial services, the bank branch remains an important contact point in facilitating retail banking transactions and is a permanent fixture in the financial lives of individuals in Singapore (Lai and Tan, 2015). Similarly, the frequency of making cash purchases is surprisingly 'sticky'. 51% reported similar or more frequent cash usage since the pandemic. This figure increased to 60% in a post-pandemic scenario. This reflects a persistent cash culture even as digital payments have brought greater convenience for consumers, especially in advanced economies that have well-developed digital payments systems (Bech et al., 2018).

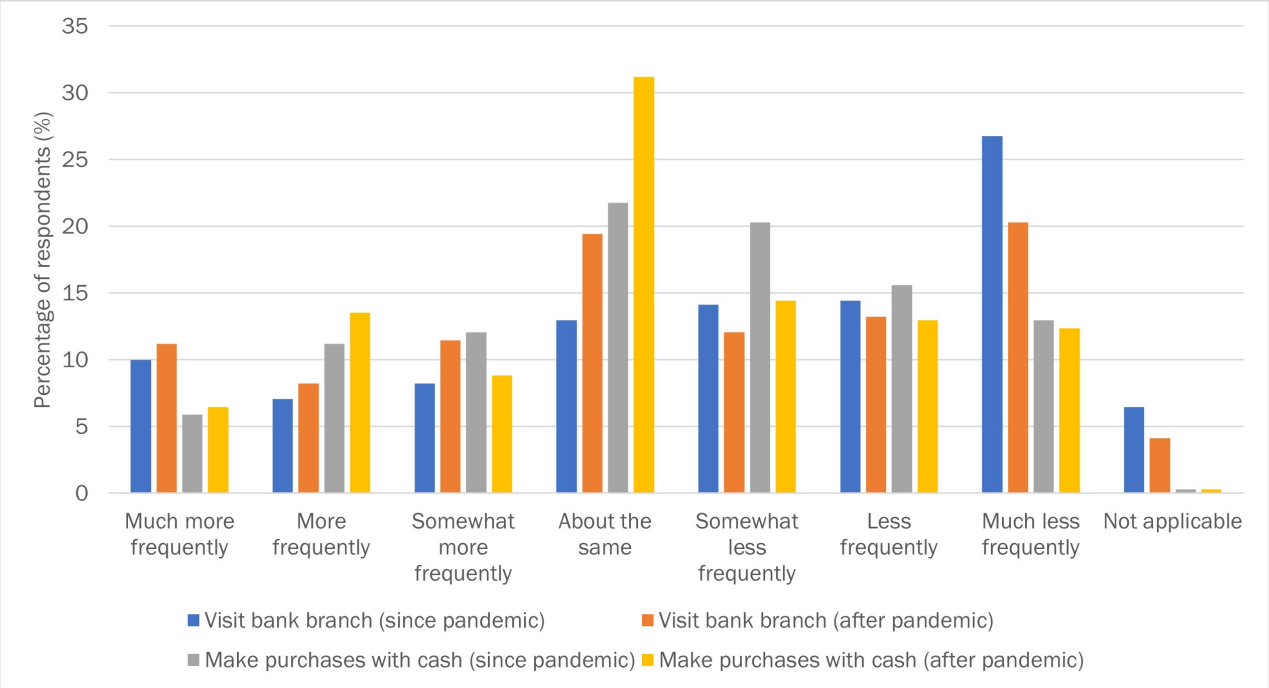

Figure 5. Analog financial behaviors during and after the pandemic (% of respondents)

The greater use of both digital payments and cash seems contradictory at first glance but may be explained by the latter's advantage in certain situations. A 2016 KPMG survey revealed that cash is the most widely used form of payment at hawker centres (businesses selling cooked food) and wet markets (90%) (KPMG, 2016). Even though the government has introduced a QR code-based payment system, cash is still regarded as the more efficient and convenient way to buy food at many hawker centres (Chia, 2020). Even the government has acknowledged that the aim of digitalizing finance is not for a cashless society, and that cash will remain a familiar and convenient payment mode that complements rather than substitutes digital payments (Ang, 2021).

Figures 3 and 4 show that the financial behaviors that are more likely to be done using fintech are mainly transactional types, such as paying others, making purchases, and account management. The results mirror those from a HSBC survey that showed that Singaporeans tended to use mobile banking apps for basic functions, like checking account balances (75%) and paying bills (67%), but only about 25% used it for investment purposes (HSBC, 2020). Despite the readiness to use fintech for more financial tasks after the pandemic as seen from figure 4, financial habits may be hard to change as suggested from the earlier findings on the persistent use of cash and physical bank branch visits and general lack of interest in fintech-based P2P lending. The survey findings show that the disruptive claims of fintech come up short when measured against the ability to encourage users to go beyond the transactional affordances of mobile payments and to use fintech to participate in other important financial aspects, such as financial planning, loans, and credits and wealth management.

Money management: Man versus robot

Data on the investing and financial planning preferences of respondents was used to gauge the shaping of investment practices by digital solutions, focusing on the use of roboadvisors versus financial planners. Even with roboadvisors gaining popularity as an investing platform (Quah, 2019), investors may be more familiar with investing via conventional methods, such as brokerage firms or under the advice of a financial advisor. Indeed, when asked about the channels they would use for investing and financial planning, 71% of the respondents would choose a human agent compared to 37% who would use a roboadvisor. In addition, 60% would invest and make financial plans by themselves and 29% would seek help from friends and family. This result corroborates findings from a 2017 global survey that ranked Singapore number one in engaging the services of a financial advisor, where 61% of respondents consult a financial advisor compared to the global average of 46% (Tan, 2017). Financial advisors perform a critical intermediary role in articulating individuals into wider financial circuits of products, knowledge, and practices by matching products with their clients' financial knowledge, experience and requirements (Lai, 2016).

A recent survey in 2020 echoed this preference for face-to-face meetings with human advisors when it comes to managing complex financial matters, such as financial planning and loans, where financial advisors are the top source of financial advice and most respondents (94%) preferred to face-to-face meetings with their advisor (Singapore Business Review, 2020). Given that a roboadvisor automatically determines and recalibrates the asset allocation in the client's portfolio and stresses a 'hands off' approach, a financial advisor may provide more value-added by educating the client on product information and impart financial knowledge. Having a human agent in one's personal financial journey demonstrates the importance of forming human-centric relationships in addressing more complex financial

needs beyond investing. These relationships facilitate the exchange of financial advice and provide emotional support especially when one's investment portfolio is subjected to greater fluctuations during periods of high market uncertainty.

We return to the ecologies concept to explain the finding about the importance of human relationships in financial management. Financial ecologies provide "topological finesse around questions of why particular sets of relations are more durable or porous, allowing for more precise consideration of power in relational thinking" (Lai, 2016: 30). Leyshon (2020) further stresses the relational nature of the ecologies concept that illuminates the uneven connectivity of outcomes within the financial system. The survey findings suggest that trust might constitute a topological relation that explains the continued persistence of human financial advisors in influencing retail consumer financial decisions. Trust is an important determinant of financial advice seeking behavior (Burke and Hung, 2021) and in encouraging consumers to transition from offline to online transactions (Balasubramanian et al., 2003). 43% of respondents either disagreed or strongly disagreed with the statement, "I would trust a robot more than a human financial advisor to manage my finances", compared to 37% who agreed and 20% who were unsure. Even though roboadvisors are widely advertised as being a lower cost and easier way for new investors to participate in the financial market (Tan, 2020a), this finding suggests that consumers may prefer a 'high touch' experience where a human individual who they can trust is available to help them manage their money. This preference is reflected in the respondents' top three choices of the perceived benefits of using a human financial advisor, which are (1) the ability to receive professional advice (47%), (2) the ability to build a customized financial plan (38%), and (3) a human touch to financial planning (39%).

The importance of the relational aspect of financial work not easily substitutable by machines emerges here. Financial advisors play an important role in shaping the financial decision-making processes and investment practices of consumers through their professional interactions (Lai, 2016). Furthermore, Baddeley (2010) argues that financial behavior results from both cognitive and emotional factors that require closer examination of sociological and psychological factors. Financial planning and investing are important life goals and learning how to achieve these goals can be a daunting task given the abundance of products and information that are available. Therefore, having someone who can listen and provide appropriate professional advice can be emotionally reassuring. This human touch to financial planning and investing may explain the strong preference for human agents over automated investing services.

The use of either roboadvisors or financial planners may be influenced by the extent of the respondent's knowledge of investing and financial planning. When broken down by the level of financial knowledge as reported by the respondents as presented in table 2, the use of both roboadvisors and financial planners are the highest among the middle groups with a little or some knowledge, where the intended use forms an inverted U-shape as financial knowledge increase. While those who are very knowledgeable tend to manage their finances and investments by themselves, the reluctance to use either roboadvisors or financial planners among those who are not at all knowledgeable is a worrying observation, as they stand to benefit the most from using these external resources to improve their financial health. Yet, for reasons such as the failure to recognize their ignorance about a subject (Kruger and Dunning, 1999) or otherwise, studies have shown that this group is the least likely to seek financial advice (Stolper and Walter, 2017).

Table 2. Respondents' financial knowledge and use of either a roboadvisor or financial planner

	Investing knowledge		*Financial planning knowledge*	
	Would use a roboadvisor	Would use a financial planner	Would use a roboadvisor	Would use a financial planner
Not at all knowledgeable	4.6	12.1	2.5	8.3
A little knowledgeable	14.9	28.1	15.7	29.0
Somewhat knowledgeable	11.6	23.8	12.6	25.8
Very knowledgeable	5.6	6.9	5.9	7.7

n = 613; frequency expressed in percentages (%)

The distinctiveness of Singapore's retail financial ecology is apparent via the strong reliance on human advisors for guiding financial decisions. Monti et al. (2014) have shown that the trust placed in investor-advisor relationships is a more significant driver of portfolio decisions than technical parameters, such as risk and returns. This preference for human advisors is consistent with the rich interpersonal trust placed in socioeconomic life in Singapore (Menkhoff, 1992) that also extends to other Asian economies. It is well-documented that compared to Western societies, individuals in Asian societies generally cultivate stronger social capital through stronger interpersonal networks that include family and friends (Fukuyama, 1995; Witt and Redding, 2013), which are then utilized in business and other areas of modern economic life. Additionally, the high level of institutionalized trust as proxied by the extent of the rule of law is also very high in Singapore (Witt and Redding, 2013).

The control and reach of the disruptive and transformative powers of fintech are less pervasive than what is claimed in public discourse, as evidenced by this article's findings. This observation highlights the agency of users to engage with technologies in unanticipated ways outside of algorithmic predictions or creators' original intentions (Maurer, 2012). By applying the financial ecologies framework to illuminate the topological relations underlying well-established financial practices, this article's findings offer a more nuanced interpretation of the practice of financial inclusion, especially when applied to a population whose financial needs are already well-served by a highly developed financial system.

Conclusion

This article critically examines the disruptive and transformative claims that are associated with fintech, and interrogates the tendency to assume that expanding access to financial services driven by fintech automatically leads to financial inclusion. It focuses on how fintech has transformed consumer financial practices in Singapore, which already has a well-developed financial system. The questionnaire results show that the connectivity to retail fintech services is uneven with adoption rates being low for the less educated, the elderly, and lower income groups. These groups may potentially benefit the most from the low-cost and convenient services offered by fintech, yet the findings reveal that they are hesitant to

embrace digital finance more fully over current analog financial practices. In highlighting the socio-spatial inequalities of fintech and the limited power of fintech to disrupt existing financial behaviors, this article adds to studies that have critically interrogated fintech's democratizing ability to foster greater financial inclusion (Bhagat and Roderick, 2020) by contextualizing usage within an advanced economy where citizens are already well integrated in mainstream financial markets.

Financial consumers in Singapore mainly use fintech and digital channels for making payments, sending money, and other basic banking functions like account management. Using fintech for credit purposes appears to be less prevalent, which may possibly be tied to the high proportion of banked consumers who prefer to use existing banking relationships to obtain credit. By highlighting the variegated material outcomes associated with the performance of different financial tasks, this article responds to Lai and Samers's (2021) call to consider how the intersections of financial products and services, technologies, and institutions are reshaping economic activities and their uneven outcomes (p. 5).

Even for a country like Singapore, where citizens enjoy access to a well-developed banking and finance system and generally comfortable with using digital technology (Yip, 2019), the fintech industry faces challenges in nudging consumers to further embrace the full suite of fintech services. This article's findings thus complicates the popular discourse that fintech disrupts current financial and technological arrangements (Burton, 2020), and offers a more nuanced argument to the broad objective of financial inclusion beyond cost savings, expanded product choice, and greater opportunities for growing wealth. While the pandemic has increased consumers' willingness to embrace greater use of fintech and digital modes of transacting, respondents indicated that their usage will remain limited to basic banking functions that are transactionally oriented, such as making payments electronically, rather than on growing their wealth or for obtaining credit.

The results also reveal that current financial behaviors, such as visiting bank branches and paying in cash, are ingrained and expected to remain important even after the pandemic ends. This suggests that fintech is likely to complement existing consumer habits rather than replace them entirely. Respondents are less concerned with using fintech to save and invest where they place lower levels of trust in machines than human financial advisors to help manage their financial affairs. Applying the financial ecologies concept has helped us to understand the relational aspects of Singapore's fintech ecology and illuminated the spatial tendencies of knowledge and trust network. This cultural preference for the human touch in financial services, which builds the trust that is important in financial services (Burke and Hung, 2021), speaks to the 'stickiness' of existing financial relationships and processes that persist even when fintech solutions are gaining popularity especially among the younger and digitally savvier crowd.

The analysis in this article is focused on aggregated financial behaviors in terms of consumer usage of fintech and digital solutions in performing common financial tasks. Future work can interrogate further the much-celebrated qualities of fintech in transforming the finance landscape. This can be done by investigating the nature of the barriers (psychological, technical, cultural etc.) that result in uneven fintech adoption, or by conducting qualitative studies to understand how and why some financial behaviors (as identified in this article) are more resistant to change than others. Indeed, the dichotomy between 'fintech' and 'mainstream finance' (Langley and Leyshon, 2017a) might be a false one that offers little analytical utility, as we observe the growing convergence between fintech firms and traditional financial institutions. Responding to the fintech threat, incumbent finance has sought to mimic fintech strategies by leveraging on platforms to deliver products and reach new market

segments (Hendrikse et al., 2018). For example, Singapore's DBS Bank has introduced its Paylah! App that lets users make mobile payments, book rides, and order food among many other functions within one platform. Likewise, fintech firms are encroaching upon the territory of mainstream finance, as seen from Singapore's recent awarding of digital bank licenses to Ant Group and other tech-based firms. This article's use of the ecologies concept has allowed us to move beyond such dichotomous interpretations by focusing on consumer financial behaviors. As users are ultimately the final consumers of digital financial services, further research can help to develop a more nuanced understanding of emerging financial practices being shaped by new products and services, which meet the changing needs of different market segments in a landscape where the boundary between fintech and mainstream finance is becoming increasingly blurred.

Notes

1. Respondents were asked the likelihood of them continuing to use fintech on a scale of 1 to 4. This question was structured differently from an earlier question about the usage frequency of fintech solutions on a scale of 1 to 7 (before and during the pandemic) to distinguish between the two questions. The questions on bank branch visit and cash usage after the pandemic retained the same scale of 1 to 7.

References

Aitken, R. (2017) 'All data is credit data': Constituting the unbanked. *Competition & Change*, 21(4): 274-300.

Ang, P. (2021) E-payments rise, but S'pore not aiming to be cashless society: Ong. *The Straits Times*, 27 February. Available at: <https://www.straitstimes.com/singapore/e-payments-rise-but-spore-not-aiming-to-be-cashless-society-ong>. Accessed 5 May 2021.

Awang, N. (2021) Millennials biggest savers during Covid-19 pandemic, on track to 'comfortable retirement': Survey. *TODAY*, 9 March. Available at: <https://www.todayonline.com/singapore/millennials-biggest-savers-during-covid-19-pandemic-track-comfortable-retirement-survey>. Accessed 13 May 2021.

Baddeley, M. (2010) Herding, social influence and economic decision-making: Socio-psychological and neuroscientific analyses. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 365(1538): 281-90.

Balasubramanian, S., Konana, P., and Menon, N. M. (2003) Customer satisfaction in virtual environments: A study of online investing. *Management Science*, 49(7): 871-89.

Beaverstock, J. V., Hall, S., and Wainwright, T. (2013) Servicing the super-rich: New financial elites and the rise of the private wealth management retail ecology. *Regional Studies*, 47(6): 834-49.

Bech, M. L., Faruqui, U., Ougaard, F., and Picillo, C. (2018) Payments are a-changin' but cash still rules. SSRN Scholarly Article. Available at: <https://articles.ssrn.com/abstract=3139217>. Accessed 5 May 2021.

Bernards, N. (2019) The poverty of fintech? Psychometrics, credit infrastructures, and the limits of financialization. *Review of International Political Economy*, 26(5): 815-38.

Bhagat, A. and Roderick, L. (2020) Banking on refugees: Racialized expropriation in the fintech era. *Environment and Planning A: Economy and Space*, 52(8): 1498-1515.

Burke, J. and Hung, A.A. (2021) Trust and financial advice. *Journal of Pension Economics & Finance*, 20(1): 9-26.

Burtch, G., Ghose, A., and Wattal, S. (2014) Cultural differences and geography as determinants of online prosocial lending. *MIS Quarterly*, 38(3): 773-94.

Burton, D. (2020) Digital debt collection and ecologies of consumer overindebtedness. *Economic Geography*, 96(3): 244-65.

Chia, L. (2020) Going cashless at hawker centres: Challenges and opportunities. *CNA*, 23 December. Available at: <https://www.channelnewsasia.com/news/singapore/going-cashless-at-hawker-centres-challenges-and-opportunities-9256700>. Accessed 6 May 2021.

Christensen, C. M., Raynor, M. E., and McDonald, R. (2015) What Is disruptive innovation? *Harvard Business Review*, 1 December. Available at: <https://hbr.org/2015/12/what-is-disruptive-innovation>. Accessed 18 February 2021.

Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., and Hess, J. (2018) *The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution*. Available at: <https://globalfindex.worldbank.org/sites/globalfindex/files/2018-08/Global%20Findex%20Database.xlsx>. Accessed 5 October 2021.

Edelman (2021) *Edelman Trust Barometer 2021: Global Report – Trust in Financial Services*. Available at: <https://www.edelman.com/sites/g/files/aatuss191/files/2021-04/2021%20Edelman%20Trust%20Barometer%20Trust%20in%20Financial%20Services%20Global%20Report_website%20version.pdf>. Accessed 7 May 2021.

Findexable (2019) *The Global Fintech Index 2020*. Available at: <https://findexable.com/wp-content/uploads/2019/12/Findexable_Global-Fintech-Rankings-2020exSFA.pdf>. Accessed 18 February 2021.

Fukuyama, F. (1995) *Trust: The Social Virtues and The Creation of Prosperity*. New York: Free Press.

Gabor, D. and Brooks, S. (2017) The digital revolution in financial inclusion: International development in the fintech era. *New Political Economy*, 22(4): 423-36.

Gomber, P., Kauffman, R. J., Parker, C., and Weber, B. W. (2018) On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services. *Journal of Management Information Systems*, 35(1): 220-65.

Gomber, P., Koch, J.-A., and Siering, M. (2017) Digital finance and fintech: Current research and future research directions. *Journal of Business Economics*, 87(5): 537-80.

Grafe, F.-J. and Mieg, H.A. (2019) Connecting financialization and urbanization: The changing financial ecology of urban infrastructure in the UK. *Regional Studies, Regional Science*, 6(1): 496-511.

Hendrikse, R., Bassens, D., and van Meeteren, M. (2018) The Appleization of finance: Charting incumbent finance's embrace of FinTech. *Finance and Society*, 4(2): 159-80.

HSBC (2020) COVID-19 could help SG crack the final frontier of online banking. Available at: <https://www.about.hsbc.com.sg/news-and-media/covid-19-could-help-sg-crack-the-final-frontier-of-online-banking>. Accessed 5 May 2021.

Kirwan, S. (2021) *Financial Inclusion*. Newcastle upon Tyne: Agenda Publishing.

Koh, F., Phoon, K. F., and Ha, C.D. (2018) Digital financial inclusion in South East Asia. In: Lee Kuo Chuen, D. and Deng, R. (eds.) *Handbook of Blockchain, Digital Finance, and Inclusion, Volume 2*. London: Academic Press. 387-403.

KPMG (2016) *Singapore Payments Roadmap: Enabling the Future of Payments*. Available at: <https://assets.kpmg/content/dam/kpmg/sg/pdf/2016/09/sg-singapore-payments-roadmap-enabling-the-future-of-payments.pdf>. Accessed 6 May 2021.

Kruger, J. and Dunning, D. (1999) Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology*, 77(6): 1121-34.

Lai, K.P.Y. (2016) Financial advisors, financial ecologies and the variegated financialisation of everyday investors. *Transactions of the Institute of British Geographers*, 41(1): 27-40.

Lai, K.P.Y. (2020) FinTech: The dis/re-intermediation of finance? In: Wójcik, D. and Knox-Hayes, J. (eds.) *The Routledge Handbook of Financial Geography*. New York: Routledge, 440-57.

Lai, K.P.Y. and Samers, M. (2021) Towards an economic geography of FinTech. *Progress in Human Geography*, 45(4): 720-39.

Lai, K.P.Y. and Tan, C.H. (2015) "Neighbours first, bankers second": Mobilising financial citizenship in Singapore. *Geoforum*, 64: 65-77.

Langley, P. and Leyshon, A. (2017a) Capitalizing on the crowd: The monetary and financial ecologies of crowdfunding. *Environment and Planning A: Economy and Space*, 49(5): 1019-39.

Langley, P. and Leyshon, A. (2017b) Platform capitalism: The intermediation and capitalization of digital economic circulation. *Finance and Society*, 3(1): 11-31.

Leyshon, A. (2020) Financial ecosystems and ecologies. In: Wójcik, D. and Knox-Hayes, J. (eds.) *The Routledge Handbook of Financial Geography*. New York: Routledge. 122-42.

Leyshon, A., Burton, D., Knights, D., Alferoff, C., and Signoretta, P. (2004) Towards an ecology of retail financial services: Understanding the persistence of door-to-door credit and insurance providers. *Environment and Planning A: Economy and Space*, 36(4): 625-45.

Leyshon, A., Signoretta, P., Knights, D., Alferoff, C., and Burton, D. (2006) Walking with moneylenders: The ecology of the UK home-collected credit industry. *Urban Studies*, 43(1): 161-86.

Long, S. (2018) Financial inclusion is making great strides. *The Economist*, 4 May. Available at: <https://www.economist.com/special-report/2018/05/04/financial-inclusion-is-making-great-strides>. Accessed 18 February 2021.

Maurer, B. (2012) Mobile money: Communication, consumption and change in the payments space. *The Journal of Development Studies*, 48(5): 589-604.

Menkhoff, T. (1992) Xinyong or how to trust trust? Chinese non-contractual business relations and social structure: the singapore case. *International Quarterly for Asian Studies*, 23(3/4): 261.

Monetary Authority of Singapore (2020) FinTech for an inclusive society and a sustainable planet. Remarks by Mr Ravi Menon, Managing Director, Monetary Authority of Singapore, at Singapore FinTech Festival 2020 on 8 December. Available at: <https://www.mas.gov.sg/news/speeches/2020/fintech-for-an-inclusive-society-and-a-sustainable-planet>. Accessed 30 January 2021.

MoneySense (2018) Buying life insurance online. *MoneySense*, 5 November. Available at: <https://www.moneysense.gov.sg/articles/2018/11/buying-life-insurance-online>. Accessed 14 May 2021.

Monti, M., Pelligra, V., Martignon, L., and Berg, N. (2014) Retail investors and financial advisors: New evidence on trust and advice taking heuristics. *Journal of Business Research*, 67(8): 1749-57.

Oliver Wyman (2020) *Singapore FinTech Landscape 2020 and Beyond. Singapore: Oliver Wyman*. 35. Available at: <https://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2020/dec/singapore-fintech-landscape-2020-and-beyond.pdf

Pierrakis, Y. (2019) Peer-to-peer lending to businesses: Investors' characteristics, investment criteria and motivation. *The International Journal of Entrepreneurship and Innovation*, 20(4): 239-51.

PwC (2016) *Blurred Lines: How FinTech is Shaping Financial Services*. Available at: <https://www.pwc.com/gx/en/advisory-services/FinTech/pwc-fintech-global-report.pdf>.

PwC (2019) *Global Fintech Report 2019*. Available at: <https://www.pwc.com/gx/en/industries/financial-services/assets/pwc-global-fintech-report-2019.pdf>.

Quah, M. (2019) Are robo-advisers the way forward for retail investors? *The Business Times*, 30 May. Available at: <https://www.businesstimes.com.sg/companies-markets/are-robo-advisers-the-way-forward-for-retail-investors>. Accessed 7 May 2021.

Saiedi, E., Mohammadi, A., Broström, A., and Shafi, K. (2020) Distrust in banks and fintech participation: The case of peer-to-peer lending. *Entrepreneurship Theory and Practice*, https://doi.org/10.1177/1042258720958020.

Schueffel, P. (2016) Taming the beast: A scientific definition of fintech. *Journal of Innovation Management*, 4(4): 32-54.

Singapore Business Review (2020) Majority of Singaporeans now prefer professional financial advice: study. Available at: <https://sbr.com.sg/financial-services/in-focus/majority-singaporeans-now-prefer-professional-financial-advise-study>. Accessed 6 May 2021.

Stolper, O.A. and Walter, A. (2017) Financial literacy, financial advice, and financial behavior. *Journal of Business Economics*, 87(5): 581-643.

Tan, G.K.S. (2020) Robo-advisors and the financialization of lay investors. *Geoforum*, 117 46-60.

Tan, L. (2017) S'poreans lead the world in getting financial advice. *The Straits Times*, 13 August. Available at: <https://www.straitstimes.com/business/sporeans-lead-the-world-in-getting-financial-advice>. Accessed 06 May 2021.

Tan, S.-A. (2020) More people trading and investing during Covid-19 pandemic. *The Straits Times*, 26 September. Available at: <https://www.straitstimes.com/business/invest/more-people-trading-and-investing-during-covid-19-pandemic>. Accessed 13 May 2021.

Thakor, R. and Merton, R. (2018) *Trust in Lending*. Cambridge, MA: National Bureau of Economic Research. Available at: <http://www.nber.org/articles/w24778.pdf>. Accessed 7 May 2021.

United Nations Conference on Trade and Development [UNCTAD] (2021) COVID-19 shows need to close financial inclusion gender gap. Available at: <https://unctad.org/news/covid-19-shows-need-close-financial-inclusion-gender-gap>. Accessed 14 May 2021.

United Overseas Bank (2021) COVID-19 game changer: UOB survey shows 70 per cent of consumers increased digital payment usage in Singapore. Available at: <https://www.uobgroup.com/web-resources/uobgroup/pdf/newsroom/2021/UOB-survey-shows-70-per-cent-of-consumers-increased-digital-payment-usage-in-Singapore.pdf>. Accessed 8 May 2021.

Witt, M.A. and Redding, G. (2013) Asian business systems: institutional comparison, clusters and implications for varieties of capitalism and business systems theory. *Socio-Economic Review*, 11(2): 265-300.

Wójcik, D. (2021) Financial geography I: Exploring FinTech – Maps and concepts. *Progress in Human Geography*, 45(3): 566-76.

Yip, W.Y. (2019) Singapore is the world's second most digitally competitive country, after the US. *The Straits Times*, 26 September. Available at: <https://www.straitstimes.com/tech/singapore-is-the-worlds-second-most-digitally-competitive-country-after-the-us>. Accessed 18 May 2021.